The Dawn of Modern Property

-- Legal institutions of the land's airspace/subsurface in urban areas of Germany, the US, and China

Dissertation
Zur Erlangung der Würde des Doktors der Rechtswissenschaft der Fakultät Rechtswissenschaft der Universität Hamburg

vorgelegt von
Ruyi, DU
aus Heilongjiang, VR China

Hamburg 2020

Erstgutachter: Prof. Dr. Hinrich Julius

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Datum des Kolloquiums: 26.06.2019

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Introduction

A. The “urban revolution” and urban land use

I. The urban history and their common “genes”

Where there is a city, there are problems relating to the effective use of land. But when and how did the city come into being?

Gordon Childe, one of the most influential archeologists in the first half of the twentieth century, had identified “Neolithic Revolution” and “Urban Revolution” as two major social transformations even millions of years ago.[1] According to his works, “urban revolution” had “initiated a new economic stage in the evolution of society” in the prehistory of human civilization, and its archeological data could even be found in the historical site of Aichbühl village located in south Germany.[2] His study had not only promoted the concept of urbanism to a considerable early time of human prehistory but also extracted the “urbanism” from several elements as “genes” in cultivating human culture and state. Although the Aichbühl, where the “urban revolution” had happened, seems more like a small village (only 25 houses) by the Feder Lake by most readers today.[3]

In contrast, some other archeological and sociological scholars, adopting a relatively exterior perspective, had dated the emergence of ancient cities back to 5,000 years ago,[4] when the cities are comparatively more “mature” than Aichbühl, and obviously differ from the rural villages (but not from small towns).[5] They preferred to define some larger European cities (emerged during the 600 B.C to 400 A.D.) as “early cities”, such as Athens (120,000-180,000), Syracuse, Carthage. Additionally, ancient Rome had set a record of the largest population among ancient cities for centuries. Then the city of

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[1] *Childe*, Man makes Himself, 1951, pp. 59-86.
[2] *Childe*, 21 Tow. Plan. Rev. 3, pp. 4-6.
[3] Aichbühl, Encyclopaedia Britannica, website at: academic-eb-com.ezproxy.cityu.edu.hk/levels/collegiate/article/Aichbühl/4167, visited at 11/19/2018.
[4] *Gates*, Ancient Cities, 2011, pp. 30-51.
[5] *Davis*, 60 Am. J. Sociol., 429, p. 430.

London had firstly broken this record in the nineteenth century.[6] Nevertheless, these are only examples of "ancient cities", which shared some common distinctive features from modern cities.

The real unprecedented urbanization happened around two hundred years ago.[7] London and Paris were prominent representatives of this trend.[8] As suggested by some scholars, the urbanization and industrialization were not independent of each other, especially in US metropolis.[9] On the one hand, labor-intensive industrial structure, product output, monopoly, and immigration, functioned as spatial, social and economic factors requiring the built-up of metropolitan or megacities; On the other hand, there was, within the metropolitan, tension between the increasing population and shortage of land for apartments, parks, public transportations, etc. From a microscope, in the 1600s, Paris had gradually transformed into a new type of city, which was the dawn of the modern city. The constructions of public facilities, sewerage, big parks[10] were also adopted by other cities throughout the world, and those features were distinct from the medieval cities. The quantitative changes had eventually led to a qualitative revolution in urban history: the birth of the "modern cities". After that, cities were more and more densely attributed around the world, sheltering more residents than the rural areas, and they had become the leading factors of GDP growth worldwide.

From Aichbühl to Athens, from ancient Rome to modern "megacities", the cities had not only become larger in size and population, but also changed in landscape, structures, and functions. However, there was also something coherent among all these cities. According to Childe, there were "ten rather abstract criteria, all deducible from archaeological data, serve to distinguish even the earliest cities from any older or contemporary village." E.g. the distribution of labor affecting city function, exact and predictive science, regular foreign trade over long distances, and a state organization based on residence rather than kinship. Although some features of cities were not so obvious in an agricultural society, even the early cities were "genetically" different from villages. Therefore, the "urban

[6] *Davis*, 60 Am. J. Sociol., 429, pp. 430-432.
[7] *Davis*, 60 Am. J. Sociol., 429, pp. 432-433.
[8] *Schofield*, London, 1100-1600, 2011, pp.241-260.
[9] *Pred*, 55 Geogr. Rev. 158, pp. 158-162.
[10] *DeJean*, How Paris Became Paris, 2014, pp.9-80; 95-143.

revolution" was a constant process, and urbanization seemed like the destiny of human society, which was determined even from Aichbühl.

In fact, Childe was not alone in emphasizing the astonishing "urban revolution". In the 1970s, Henri Lefebvre had titled his book with "Urban Revolution", in which he had adopted a sociological and philosophical perspective on the urban phenomenon. However, different from Childe, Lefebvre emphasized the different functions of cities at different times. According to Lefebvre, the history of civilization should be divided into three periods, the agricultural society, the industrialized society, and the urban society (also the post-industrialized society; the leisure society; the contemporary society).[11] Firstly, Lefebvre believed that urban society represents a process, which would lead to "complete urbanization". He was not the first to find that city centers had transformed into governmental offices or Central Business Districts, and accordingly, the original urban residents were compelled out of the center. Nevertheless, Lefebvre might be the first to point out the modern trend of globalization by means of the "worldwide urbanization", which was not only based on his philosophical thinkings but also on his years of field research, empirical study, and his communications with planners, architects and planning institutions in France. Before writing these books, he had worked in the "*Institut de sociologie urbaine*" with many sociologists, historians, and architects for years.[12] Lefebvre tried to use this theory to explain the post-war western society and regarded urban society and complete urbanization as the themes of modern capitalism. Secondly, he stressed the importance of urban space in urban society. In his later book, with the name "the production of space", he had regarded space as a kind of commodity in the urban society, absorbing the surplus of the post-industrial society through the real estate industry.[13] Lefebvre's study had led to a new change in urban sociology in the western world, especially in Europe. Despite these Marxism factors in his works, his concentrations on urban society and urban space were obviously quite thought-provoking. According to Childe and Lefebvre, two things seem clear, firstly, the cities were

[11] *Lefebvre*, The Urban Revolution, 2003, pp. 1-15.
[12] *Stanek*, Henri Lefebvre on Space, 2011, p. 81-132.
[13] *Lefebvre*, The Production of Space, 1991, pp. 68-168; 169-228; 352-400.

"genetically" different from villages, secondly, the urban phenomenon had, to some extent, become a theme of the modern world. Therefore, there should be corresponding legal institutions serving for the urban transformation and urbanization.

However, many jurisdictions currently have to face such a reality, that we live in an urban society, but most of our legal institutions are deducted from the agricultural social lives and that of early industrialized society, when the nation-state raised in Europe. Why is that? The first reason is the influential Roman Law. as noted by Rudolf Jhering, "Rome conquered the world three times, first by her army, second by her religion, and third by her law."[14] Accordingly, the Roman law of things and land law are no doubt the most influential and far-reaching one. However, too many Roman elements (in the agricultural society) in the continental civil codes might be an obstacle for their modernization. In French Civil Code and German Civil Code, there are dozens of stipulations around the agricultural use of land, the windmills or watermills, harvest, animals, the falling fruit, the ownership of bee swarms, and the merging of bee swarms, etc.[15] It would be unfair to say we do not need these sections anymore, but these issues are currently in lack of practical value in urban life, and the law should obviously pay more attention to the transformation of the urban society.

In fact, urban and commercial activities had stimulated the growth of legal institutions, especially in the field of real estate and land use. Nowadays, more than half of the world's population is thought to be living in urban areas. Moreover, this number will reach 66% in 2050 according to a UN report. Concretely, there were 63% of the 233 countries or areas with a rate of urbanization over 50% by the year 2014, and this number will grow up to 80% in 2050.[16] Coping with the acceleration of urbanization, mega-cities would endure enormous tensions between population and land. The land, as well as its airspace, becomes more and more precious. Because it has obviously more functions besides agricultural aspects, such as for dwelling of a larger population, for public transportations and utilities, and for public parks and entertainment places. These aspects deserve

[14] *Jhering*, Geist Des Römischen Rechts, 1878, p. 1.
[15] See Art. 519- 533, Art. 547-548, Art. 553 of the French Civil Code and Sec. 910, Sec. 911, Sec. 960-964 of German Civil Code.
[16] World Urbanization Prospects 2014, Final Report, p.7.

concerns from real estate law. Therefore, the vertical use of land becomes inevitable in modern cities. However, the traditional real estate law is land-surface-oriented, and accordingly, a real estate law with vertical concern is still needed.[17]

II. Traditional real estate law v. real estate law with vertical concerns: literature and theories

From a historical perspective, no matter in common law countries or civil law countries, the land airspace and subsurface were either absorbed by the land surface or ignored under the traditional real estate law. What had limited the imagination of the ancient lawyers? As will be discussed in Chapter 1, the reasons could be summarized by be the way of life, the agricultural society, and the "path dependence" on the traditional way of land usage. To some extent, the value of vertical land usage was ignored under low technological conditions.

As the emergence of modern cities and the formation of the post-war urban society, the urban world had gradually become the empire of skyscrapers, the empire of underground subways, the empire of overpasses and modern infrastructures, etc. In legal practice, a vertical perspective of land succeeded in many fields of laws. However, due to the path dependence, the current real estate legal systems in many countries (especially the civil law countries) are nothing more than a horizontal real estate system with some vertical exceptions. Accordingly, there is a need to treat the land surface (the traditional "land"), its airspace, and its subsurface equally. But how could it be possible? Is it a must? This is also the main concern of this dissertation. In other words, what this dissertation trying to prove is that, under the pressure of urban society, a real estate law with vertical concerns is needed. It is not so ambitious or so aggressive to overthrow the traditional real estate law, but it hopes that the real estate system would become compatible enough to cope with the trend of commercialization of airspace and subsurface, and the process of worldwide urbanization.

From a theoretical perspective, the law of airspace and subsurface was rarely discussed in both common law and civil law countries. During the 1930s, in order to justify the use

[17] *Marshall*, Planning Major Infrastructure, 2013, p.49.

of airspace by the emerging airplane industry, there were some US scholars researching the legal root of airspace in ancient Roman law. One of their findings is that the common law maxim “who owns the land, who owns from the sky to the earth” have no Roman legal background, and the common law principle is outdated.[18] This could be regarded as a first step in separating airspace and subsurface from the land surface. The second wave of airspace legal study happened around 1970s, influenced by the planning law, the scholars tried to build up a legal system to release the potentials of the commercial value of airspace. They had even made a Model Act of Airspace for the states. In addition, Robert Wright had written one of the most important books in this field, with the title “the law of airspace”. After dating back its historical root, Wright had divided the US law of airspace into three branches, the airspace of the land surface owner, the condominium, and the airspace in modern transportation. Furthermore, he had also studied the commercial practice on the purchase, lease, and register of the airspace.[19] However, this book had never received a second edition. After the 1980s, there was a strong tendency to combine of airspace law with planning law in the US, then the law of airspace was gradually replaced by the law of Transferable Development Rights at the local level.[20] However, this did not mean the end of airspace and subsurface law. The third wave happened after 2000, some scholars had found the new opportunities and challenges for airspace in the era of drones and green economy.[21]

In Germany, the literature was very few on this topic. Before the German Civil Code became effective, Hermann Erythropel had written a book named “the law of airspace (Das Recht am Luftraum)”, which seemed the first book specifically on this theme. In this book, Erythropel supported that the landowner had the right of claim on infringement of the airspace vertically above their land, but he preferred to regard the airspace as the power emanating from land ownership rather than an independent property right.[22] Moreover, Erythropel believed that, in case of social interest or the neighbor relationship, such power on airspace could be changed by the positive law. In addition, Erythropel had

[18] *Banner*, Who Owns the Sky, 2008, pp. 42-68.
[19] Wright, The Law of Airspace, 1968, pp. 305-412.
[20] *Stevenson*, 73 N.Y.U. L. Rev. 1329, pp.1329-1333.
[21] *Rule*, 95 N.C. L. Rev. 133; Rule, 59 UCLA L. Rev. 270.
[22] *Erythropel*, Recht Am Luftraum, 1898, pp. 25-40.

also pointed out that a third property owner had the right of claim to use the airspace, where the surface landowner had no interest. Erythropel had illustrated the theoretical development of airspace law from ancient Roman to the legislation of the German Civil Code. However, he did not connect it with the legal practice, and his scope was limited by the underdevelopment of urban society in German, and accordingly, his book can be regarded as typically "horizontal real estate law with vertical exceptions".

The first German book on both airspace and subsurface of land was written by Ulf Goeke in 1999. This book also concentrated on the historical development of the law of airspace and subsurface and took airspace law in England as a counterpart.[23] However, the scope of this book was confined by its setting as a book of legal history, most of the dramatic development happened after 1900 were unrelated.

Besides these two books, there were also some German legal articles, commentaries and book chapters related to airspace and subsurface, but their discussions were rather fragmented.[24]

Therefore, both the US and German lawyers were trying to harmonize the airspace and subsurface law with the traditional real estate law, because their real estate law, which rooted from the agricultural society, needed to be updated. In other words, under the pressure of modern urban life, a real estate law with vertical concerns seemed unavoidable. However, neither the law nor the theory is quite developed in this field.

China is now at the beginning of the airspace and subsurface law, which include only Sec. 136 of Chinese property law of 2007. This section would be maintained in the future Chinses Civil Code. In addition, there are two monographs on airspace/subsurface law, but also at the very early stage of the comparative study.[25] Comparing with the US and Germany, China is more influenced by Japanese Civil Code and "Civil Code of Taiwan district"[26] in this field, who had admitted the airspace/subsurface rights through inserting

[23] *Goeke*, Das Grundeigentum im Luftraum und im Erdreich, 1999, pp.25-37.
[24] See Chapter 2.2 of this dissertation.
[25] See Chapter 2.4.2.
[26] **For the benefit of neutrality of academic work, the word "Taiwan district" is used throughout this dissertation**, to note the current authority of "Taiwan province", who called themselves as "the Republic of China". As recognized by most of countries in the world (including Germany, the US and other EU countries), Taiwan is an integral part of China. However, as the historical and linguistic tight connections between mainly and Taiwan district, it is hard to miss the "Civil Code of Taiwan district", when introducing the Chinese Civil Law.

a “Superficies for Underground and Overhead Space” section under a German-style Civil Code.[27] In addition, these stipulations are very similar to Sec. 1 Subsec. 1 of the German Heritable Building Act (Erbbaurechtsgesetz), but the Sec. 1 Subsec. 1 of the German Heritable Building right is obviously not aiming at building up an airspace/subsurface law. According to the Japanese/Taiwanese lawyer, the airspace/subsurface rights mainly include the superficies for underground and overhead space, the servitudes for underground and overhead space, and the condominium.[28] However, the adoption of the Japanese “Superficies for Underground and Overhead Space” had only quite limited effect in Chinese society. China is trying to work out a more efficient airspace/subsurface legal regime to alleviate the intense population pressure and overheated urban real estate market.

B. Real estate law with vertical concerns: what and how

Urbanization and the current urban society are playgrounds for all kinds of legal and theoretical changes in real estate law. If we are going to build up a real estate law with vertical concerns, what should it be like? Where did the so-called airspace and subsurface law exist? And how should the traditional real estate law change?

As far as I am concerned, there are roughly three aspects supporting the birth of the real estate law with vertical concerns, including modern transportation and technology, modern lifestyle and the modern value.

Firstly, thanks to modern technology, airspace and subsurface represent endless possibilities to improve the living conditions of human beings. As noted by Harold Demsetz, new property rights are the product of “new technology and the opening of new markets, changes to which old property rights are poorly attuned.”[29] In fact, the legal status of airspace and subsurface were substantially redefined by the technological development in architecture and air aviation.[30] Similarly, the advanced underground public transportation systems are also standard equipment of modern cities.

Secondly, the legal institution on airspace and subsurface lag far behind urban daily life.

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[27] See Japanese Civil Code, Sec. 269-2; see Civil Code of “Taiwan District”, Sec. 841-1.
[28] *Cui*, Real Right Law, 2017, p.296.
[29] *Demsetz*, 65 Am. Econ. Rev. 347, p.349.
[30] See Chapter 3.1 of this dissertation.

Underground shopping malls, multi-layer parking lot and step street air corridor are commonplace in megacities, especially in Tokyo, New York, Hong Kong, or Shanghai, etc. Interestingly, every square meter of the underground parking lot is much more expensive than the condominium in many Chinese cities.[31] What's more, airspace and subsurface mean new opportunities for the future, such as the use of drones, the space of for new energy, the sustainable development of the cities. Therefore, modern cities could be regarded as the laboratory for the legal institution of airspace and subsurface, and only within this modern context, a systematical study of this problem would gain its best achievement.

In addition, no matter in a densely populated area like eastern China, Japan, the eastern coast of USA, Mexico City, or the relatively sparse populated western Europe, the metropolitans are always crowded by skyscrapers and underground shopping malls, which could be regarded as an indispensable element of the urban landscape. In addition, high-rise apartments are typical living place in urban areas.[32] Within a condominium community, it is usually very hard to balance the conflicts between condominium owner's freedom and the common interest. Although most of the airspace and subsurface could be registered within the condominium, there are more problems with the usage in the common area. A general airspace/subsurface law is a good supplement of the condominium law, when there are some loopholes in using the common area.

Thirdly, even from ancient Greek, philosophers had already described their ideal city-state. Similarly, earlier than Greek, both Confucius and Laozi had also described their ideal state and social order. This kind of Utopia thinking is also popular among modern city designers and planners. Nowadays, there are more and more urban theorists seeking more sustainable, more intelligent cities. Obviously, the airspace and subsurface rights are now the potential resources for the green city, the smart city, the slow city, etc.

Therefore, the subsurface and airspace rights are rather revolutionary for the traditional real estate law; it means the endeavor to harmonize real estate law with the modern

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[31] *Zhou*, parking space dearer that the car, and higher in price than the apartment per square meter, report of Jiangmen News, May 18th of 2017, p. B01

[32] *Juday*, Research Report of "The Changing Shape of American Cities" of March 2015 at Weldon Cooper Center for Public Service of University of Virginia, p.5.

transportations, in the modern form of livings, in modern value and modern Utopia cities. From another perspective, the airspace and subsurface rights had functioned as both positive rights and negative rights. For the former, the underground parking lot, the underground shopping malls, and the skyways are all examples; for the latter, for example, how could the landowner fight for his right in airspace against the overflight by the aircraft? The airspace/subsurface right should provide a clear answer to these matters.

C. Methodology

Regarding the current urban society and the path dependence on the traditional real estate law in both common law and continental law countries, this dissertation will adopt a comparative perspective. It will make comparison mainly among Germany, the US, and China. All the three countries are trying to solve the problems around the airspace and subsurface, but the approach between German and the US are quite different. The US was one of the earliest countries to adopt independent airspace right; while Germany relied more upon its public law and legal interpretation to solve such problems (for the details see Chapter 2.2 and 2.3 of this dissertation). China is currently in the crossroad, it had adopted a German-style civil law, but also influenced by the US and Japanese laws in this field, what should China do to alleviate the tension among different regulatory models? This would be a central concern of this dissertation.

As the legislation lagged far behind the social practice in airspace and subsurface usage, the case study would be a good supplement. The importance of the case study is obvious in common law countries (such as the US), and even equally important in post-war Germany. It is because the judgment of BGH should be followed by the whole country. The Chinese cases could provide more facts and perspectives on these topics. Therefore, a case study is quite beneficial in this dissertation.

Historical study and normative analysis are traditional but indispensable in this dissertation. It is because the theoretical developments of airspace and subsurface are extremely complex and uneven. Without illustrating this historical and normative background, the need for a real estate law with vertical concern would never be proved.

In addition, in order to prove the importance of the urban context, some sociological

theories had been also employed, but this dissertation is not so ambitious to make it into an interdisciplinary study. In contrast, it would limit the discussion within the scope of the law.

D. Contents and chapters

The influence of high-tech, the public law influence on property law, and the legal change fueled by value change will be the central concern of this thesis, all of which happened within the context of modern urbanism. Concretely, these concerns could be illustrated by the cases of aviation (urban transportation), the cases of common airspace allocations within condominiums (urban way of living), the new green energy equipment (environmental value and ideal urban Utopia). All these would finally form systematical conclusions for the airspace and subsurface right in modern urbanism.

The contents would be structured in the following order:

Chapter 1 will concentrate on the history of airspace and subsurface. This part will mainly provide evidence on why airspace and subsurface are only possible in modern urban society.

Chapter 2 will make a study on the current legal framework of different countries around airspace and subsurface (normative study). In other words, how they tried to make airspace and subsurface issues compatible with their traditional real estate system.

Chapter 3 will make a comparative case study, concentrating on the airport and landowner relationship. These case groups will help to illustrate the legal mechanisms of boundary setting in the airspace between the landowner and the aircraft owners (negative aspect).

Chapter 4 will deal with another case group, the case of a condominium, its legal nature, and the usage of exterior walls and underground parking spaces (positive aspect), which will illustrate the new decisive factors of the modern condominium: the administrative power.

The conclusion will summarize the contents and draw conclusions of this dissertation.

Chapter 1 The subsurface and airspace right in a historical context of property law

1.1 The definition of airspace and subsurface right

According to the observation with naked eyes, the ancient Chinese believed their living environment was composed of "spherical heavens and flat Earth". In fact, the knowledge of "flat Earth" was shared by many early civilizations in an agricultural society.[33] Accordingly, they tend to regard the land as horizontal rather than vertical. However, the right of airspace and subsurface required a three-dimensional (vertical) perspective on land. As defined by some scholars, the airspace and subsurface represented a column of space vertically above or below a plot of the land.[34] It was not the air or soil itself, but the airspace, which might be filled with air, water, mud, sand, gas, crude oil or anything else.

The airspace definition by the American Bar Association is much more accurate. "…airspace is defined as that space which extends from the surface of the earth upward and which is either occupied or utilized or is reasonably subject to being occupied or utilized or is otherwise necessary for the reasonable enjoyment and use of the land surface and any structure thereon by the surface owner or owners, his or their heirs, successors or assigns. The airspace owned by a surface owner or owners is that which lies within the vertical upward extension of his or their surface boundaries."[35] As described by the US lawyers, the airspace relied on the surface landownership. Similarly, although the subsurface was normally physically filled with soil or other things, its legal nature was the same with airspace. That's why this dissertation tries to discuss them together.

Therefore, from a vertical perspective, the land can be divided into land surface, airspace, and subsurface. From this perspective, the subsurface and airspace rights are column

[33] *Garwood*, Flat Earth, 2008, pp. 3-10.
[34] *Erythropel*, Recht Am Luftraum, 1898, pp. 25-37.
[35] Model Airspace Act, 8 Real Prop. Prob. & Tr. J. 504 (1973).

rights fixed with a parcel of land. Additionally, without mentioning the land surface, it would be hard to distinguish one volume of airspace or subsurface from others. Therefore, a land surface with up and down limits are prerequisites for airspace/subsurface (with three-dimensional shape and geographical position).

Additionally, the airspace and subsurface in the sense of private law are different from that in public law, sociology or other social science. Concretely, the airspace in the sense of public law often relates to the "abstract space". As written by Angelika Siehr, the law of urban open space (öffentlichen Raum) should, as required by the German federal constitutional court, take the basic rights of the citizens seriously.[36] What Siehr meant as open space (öffentlichen Raum) was an "umbrella term" comprises big shopping center, the airport, the streets, or the public squares, etc., which was an abstraction of the different public places in public urban social lives. However, what we defined as "airspace and subsurface right" in this dissertation was the physical airspace volume, which located above and below some parcel of the land surface. Therefore, the airspace and subsurface right are different from the "open space" in public law. They are also obviously different from the concept of "the production of space" by Lefebvre, which was an abstract sociological concept. Because in Lefebvre's view, space was a trinity, including the spatial practice (space for social production and everyday life), representations of space (knowledgeable and ideological space for planners, architects, scientists), and space of representation (the space for dweller and users).[37] Therefore, rather than an abstract concept in public law or sociology, the airspace and subsurface in private law are characterized as "physical" concepts, as it had length, width, height, and concrete locations. In this sense, they have more similarities with the immovable than that with the movable.

1.2 Historical overview and the two conditions

The usage of subsurface and airspace are, largely, depending on the social-technological

[36] *Siehr*, Das Recht am öffentichen Raum, 2016, pp.4-30.
[37] *Lefebvre*, The Production of Space, 1991, pp. 30-40.

level.[38] Over the long history, the social needs, in combination with the improving technologies, are gradually reshaping the human perceptions of subsurface and airspace, as well as the legal institutions to cope with it. For example, Lord Edward Coke preferred to follow the Latin Maxim, "*cujus est solum, ejus usque ad coelum ad infernos* (Whose is the soil, his is also that which is above it into infinity)".[39] Coke's idea is totally different from that of the modern lawyers, who would have to take the aircraft, the condominium, the environmental protection, and sustainable development into consideration.

As noted by Justice Oliver Wendell Holmes, "We must beware of the pitfall of antiquarianism, and must remember that for our purposes our only interest in the past is for the light it throws upon the present."[40]Although this dissertation aims at solving the current problems of the right of subsurface and airspace, it will date back to legal history. Because we could better understand the current situation if we know what it was previously.

The historical study of subsurface and airspace rights includes at least two aspects: its legal institution, and its theoretical development. The former consists the land law and the legal institutions of subsurface and airspace. The latter contains the idea of property, the theoretical structure of real estate law, and the remaining space for airspace and subsurface. Therefore, a study of the real estate law is inevitable because airspace and subsurface derive from real estate law.

From a historical perspective, at least two conditions are required to make the subsurface and airspace right independent from the land surface ownership. The first is, **an idea of land with limited vertical stretches (later as Condition I)**, and the second is, **the recognition of subsurface and airspace as kind of property parallel with its surface ownership (later as Condition II)**. However, from a historical perspective, it was not easy for the countries, no matter in the ancient Romans, continental Europe, the UK, the early US, or China, to meet both requirements at the same time,[41] which eventually led

[38] As Banner wrote, with each new use of air, the law had to adjust. See *Banner*, who owns the sky, 2008, p. 289.
[39] This is just one translation of the Latin maxim. As explained by Yehuda Abramovitch, this Maxim: a simpler explanation "He who possesses the land possesses also, that which is above it". Other elucidations are, "He who owns the soil owns everything above (and below) from heaven (to hell)",' and "He who owns the land owns up to the sky". See *Abramovitch*, 8 McGill L. J. 247, p. 247.
[40] *Holmes*, 10 Harv. L. Rev. 457, p. 474.
[41] The details could be found in Chapter 1.3- 1.6.

to the late birth of the right in airspace and subsurface. Therefore, in order to explain why the airspace and subsurface law could only be possible in modern urban society, this chapter would make historical research on the fulfillment of these two conditions in the European continent, the common law England, the US, and China.

Firstly, the common law founders, especially Sir Edward Coke, believed that the land includes its airspace and subsurface is a tradition from Roman law, whose idea was also shared by many countries in Europe. After that, the common law lawyers tended to believe that land ownership included not only the surface but also its infinite airspace and subsurface.[42] The **condition I** could not be satisfied. This idea of land was not challenged until the advent of airplanes. Similar situations also appeared among France, Netherlands, Austrian, etc.

Secondly, the first change in this trend was made by the legislators of the German Civil Code (but since its second draft), who had made a brand-new Sec. 905, "The right of the owner of a plot of land extends to space above the surface and to the subsoil under the surface. However, the owner may not prohibit influences that are exercised at such a height or depth that he has no interest in excluding them."[43] The legislators meant that airspace and subsurface beyond the surface owner's interest are not components of surface land ownership. Therefore, the **Condition I** was satisfied. Unfortunately, in the general part of the German Civil Code, in section 90, the scope of objects was confined, "Only corporeal objects are things as defined by law." As airspace/subsurface was hard to be attributed as corporeal objects (**Condition II** was not fulfilled), the legislators kept the subsurface and airspace away from the German property law (Sachenrecht) system.[44] The strictness of German property object had not been alleviated until the creative usage of article 14 of the German Basic Law.

Thirdly, in China, the traditional Chinese Code, such as the Tang Code, the Great Qing Legal Code, functioned quite differently from that of the western countries. In ancient China, many concrete rules of the real estate are not codified, but relied upon social

[42] See Chapter 1.5.2 of this dissertation.
[43] The German Minister of Justice and Consumer Protection provides this translation.
[44] This will be discussed in detail in the following part of this Chapter.

custom.[45] The Chinese traditional literature suggested that the ancient Chinese believed that the low airspace and subsurface belongs to the landowner, but usually not stretched high to airspace above the land. (**Condition I** was not satisfied.) It is partly because in Chinese culture, the sky is holy, and the sky sacredly governed the people under it; and partly because the buildings, especially the residential house, was strictly confined by the law in ancient China. People in ancient China must build up their houses according to their social identity. Consequently, only the king and the ministers had the privilege to enjoy bigger and higher houses. The scale, the height, and the volume of the residential house were all strictly limited by criminal codes and building instructions.[46] Since the 1900s, China had begun to follow the steps of continental Germany and Japan to modernize its law, from where it had adopted the idea that the land ownership stretched to where the owner has interest.[47] However, things include movables and immovable (only corporeal objects, **Condition II** was not satisfied). Since 1949, a new state-ownership of land had totally changed the picture of land ownership in socialist China.[48] Only after the Open and Reform in 1979, China had gradually rebuilt its civil and property legal system.

In summary, the airspace and subsurface right had no independent place in history. It was either regarded as components of land, or be ignored, and accordingly had roughly no place in the traditional property legal system. Nevertheless, its significance was dramatically enhanced after the advent of the first airplane in 1903.[49] Although airspace and subsurface right is not fully recognized by all modern countries, its practical value had become bigger and bigger since the prosperous of the aviation industry.

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[45] The traditional Chinese legal focus of the land is on tax. For example, in Song Dynasty, one peasant could be regarded as a "Household (户)", if only he could pay a "penny (文)" of land tax. See *Pu*, Studies on Chinese Legal Institutions on Land Resources in Past Dynasties, 2011, p.234.

[46] In 832 A.D. of Tang Dynasty, according to the law named "Ordinance of Construct Accommodations (Yingshan Ling 营缮令)", the ordinary people were prohibited to build a building of two or more floors. In addition, the one floor house should neither bigger than the officials, nor higher than them. In other words, only the participants of central government could enjoy big house, decent life and its glory as royal servants. See *Wang*, Tang Huiyao, 1884, pp.14-15.

[47] See Chapter 1.6.4 of this dissertation.

[48] See Chapter 1.6.4 of this dissertation.

[49] The rise of aviation had changed the altitude of airspace in technological, political as well as legal sense. See *Meyer*, Luftrecht in fünf Jahrzehnten, 1959, pp.4-20.

1.3 Airspace and subsurface in ancient Roman law: tradition and reception

1.3.1 Condition I: the ideas on airspace/subsurface by Roman lawyers

Roman legal ideas on airspace and subsurface are the starting point for both common law and civil law lawyers. Nearly all of the literature before the 1950s on airspace and subsurface law would spend pages to discuss its Roman law origin. Many common law scholars insisted that the common law principle, "*cujus est solum, ejus usque ad coelum ad infernos*", came from Roman law, which had become their biggest obstacle for independent airspace and subsurface rights. However, it has only a pseudo-Roman history.

1.3.1.1 The pseudo-Roman "*cujus est solum*" principle and its influence in common law

According to the Latin legal proverb, the contents of land ownership are extremely extensive, as airspace and subsurface are included within the scope of land surface ownership. This "*cujus est solum*" principle had dominated the common law for centuries until the late 19th and 20th century, when the legal historians made sure that it was a centuries-long misunderstanding.

The legal historians had listed out their reasons:

Firstly, the "*cujus est solum*" principle could not be found in the remaining Roman legal materials. In other words, the so-called quotation from Roman law made by Sir Coke was not direct, literal and exact. Secondly, the "*cujus est solum*" principle was spiritually more possible to derive from the Jewish law than the Roman law, because similar expressions could be found in the Jewish Mishna and Gemara.[50] Furthermore, some scholar found this maxim "has not yet been traced to a source earlier than the *Glossa Ordinaria*".[51] This explained why this proverb was written in Latin rather than Hebrew. Therefore, the literal source of this so-called "Roman law Maxim" might actually originate from the literature of the 12 century.[52] Thirdly, more concretely, some scholars asserted that this Maxim was

[50] *Abramovitch*, 8 McGill L. J. 247, p. 249.
[51] *Mcnair*, the Law of the Air, 1964, Appendix 1, p.395.
[52] *Lange*, Römisches Recht im Mittelalter, Band I, 1997, pp.60 -70.

deducted from Franciscus Accursius's illustration of the Digest on public land or a public road.[53] Franciscus Accursius, the son of Glossator of Accursius, came to England and gave lectures on Roman law at Oxford in the thirteenth centuries, which had deeply influenced the perception of Roman law in England.[54] Therefore, the court decision setting the "*cujus est solum*" principle was fueled by both the Jewish law and the Glossa, but quite indirectly by the original Roman law.

Responding to the reasons listed by the supporters of "pseudo-Roman history", some scholars questioned that the Latin proverb might not be directly quoted from Roman law, but deducted and summarized from the spirits of Roman law.[55] However, this assumption was contradicted with the remaining legal materials from Roman times. In fact, after reading nearly all the relevant materials on Roman law, Rudolf von Jhering had pointed out that "*cujus est solum*" proverb was not identical with the legal logic and thinking style of Roman lawyers, because a land ownership stretched to the high sky and deep earth might beyond the Roman lawyers' imagination.[56] Therefore, Stuart Banner ended this constant debate in a more accurate way, "the *cujus est solum* maxim was a product of the common law."[57] All in all, now we can safely draw the conclusion that the proverb "*cujus est solum, ejus usque ad coelum ad infernos*" derived not directly from Roman law. It is a "pseudo-Roman history".[58]

Nevertheless, why such a pseudo-Roman "*cujus est solum*" principle could prevail in Great Britain for centuries?

Oddly, different from the civil law countries, the common law lawyers were historically not quite interested in studying Roman law. In other words, common law rarely obtained authority from Roman law. Why did the common law lawyers emphasize so much on the Roman roots of this principle? According to my research, it was because, until the early modern law of the 1800s, the main focus of the British medieval land law was inheritance

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[53] *Klein*, 26 J. Air L. & Com. 237, p.242.
[54] *Klein*, 26 J. Air L. & Com. 237, p.244.
[55] *Lardone*, 2 Air L. Rev. 455, p. 465-467. Lardone found that, "The general conclusion reached is as follows: 1. According to the wording of the Sources, the landowner is given expressly by Roman law the control of the air column above his property at low altitudes, for instance, the height of buildings, of trees, etc. 2. According to the spirit of the Sources, such private control can be extended to any altitude."
[56] *Jhering*, 6 Dogm. Jb. 81, p.81-91.
[57] *Banner*, who owns the sky, 2008, p.75.
[58] *Klein*, 26 J. Air L. & Com. 237, pp. 238-243.

rather than sales and purchase. Therefore, an all-contained land concept fulfilled the need for landowners and aristocracies better, which was the political elements behind the "Roman law adornment". In fact, Sir Coke was himself one of the biggest landlords in his times.[59] In summary, under such economic, social, political and theoretical conditions, an airspace and subsurface right parallel to the land surface was not possible.

Another question is that, what had stimulated this "gold rush" on the Roman legal history of "*cujus est solum*" principle?

The answer seemed the advent of airplanes and the social lives of modern urban society, which had called for a reflection of this common law principle. However, the "*cujus est solum*" principle had both Coke and Roman authority. If they want to overthrow this principle, they have to dig deep into the Roman legal history.

However, after the detailed historical study, it was clear that the "*cujus est solum*" principle was not "Roman" but Jewish and Medieval. It fulfills the social need and the taste of early common law lawyers and obtained enormous power for centuries. However, this is only the common law perspective of Roman law (pseudo), the other perspective had more influence on modern German law.

1.3.1.2 The real Roman legal ideas on airspace/subsurface from Digest

To trace the ideas of the Roman lawyers on airspace and subsurface, a search of the Digest is quite beneficial. Although the Roman Empire at that time was still an agricultural society, some rules on building and construction law had revealed their ideas on airspace and subsurface.

Generally, according to the Roman law, "in new construction works, both the land and the airspace should be taken into account."[60] This rule had shown that the Roman lawyers had already recognized the significance of airspace of the land, at least in constructing new buildings. Furthermore, the wording of this provision was worth to note, "Land" and "the airspace" were not the same things in the eyes of the Roman lawyers; they were already different notions by the Roman lawyers.

Historically, the earliest idea could even date back to the Twelve Tables. As noted by

[59] Coke was believed to own the biggest amount of land for a private individual.
[60] *Mommsen/ Watson*, Digest, 1985, XLIII. 24. 21. 2.

Ulpian in Digest, “the law of the XII Tables intended to establish that the branches of trees should be cut off fifteen feet from the ground so that the shade of the trees should not injure a neighbor’s right.”[61] This rule was quite similar to the modern notion “right to light”, and it provided a vertical perspective on the use of land for construction.

Furthermore, the idea of airspace could not only be found in trees, but also in buildings. “If anyone extends his roof or gutter above a tomb, even if it does not touch the monument itself, but proceedings can also be brought against him by means of the *interdict vi aut clam*. Because a tomb consists not only of the actual ground where the remains are laid, but also extends to all the airspace above: for this reason, the action for violation of a tomb can be brought.”[62]This provision indicated that the tomb also enjoys a right in its vertical airspace, which should not be infringed by the neighboring buildings. Additionally, similar ideas could also be found on the public ground or the public road.

“The fact that public ground or a public road comes in the way does not prevent the servitudes of a right of way, or a right to a passage for cattle or a right to raise the height of a building , but it does prevent a right to insert a beam, or to have an overhanging roof or other projecting structure, and it also prevents a right to the discharge of a flow or drip of rainwater, because the sky over such ground should be free.” [63]

The above pieces of Roman law are examples of airspace right from the negative aspect, while the following piece could represent the airspace right from the positive aspect. “Whoever has a building which is with good sight superimposed on another way lawfully build on the top of his own structure as his as he pleases, so long as this does not impose on the buildings beneath a burdensome servitude than they ought to have to bear. ”[64]

All these above examples illustrated mainly two aspects of airspace rights in Roman law: Firstly, although the Roman land right is not unlimited, the landowners enjoyed the (reasonable) airspace above the land plot. Secondly, the landowner should care about the interests of their neighbors, as well as the public interest. Therefore, according to these examples, the Roman definition of land did not exaggerate so high to reach the sky and it

[61] *Mommsen/ Watson*, Digest, 1985, XLIII. 27. 1, § 8.
[62] *Mommsen/ Watson*, Digest, 1985, XLIII. 24. 22. 4.
[63] *Mommsen/ Watson*, Digest, 1985, VIII. 2.1. Pr.
[64] *Mommsen/ Watson*, Digest, 1985, VIII. 2.24. The German translation of this sentence emphasized the duty of tolerance of the buildings beneath. See also *Behrends/Knütel/Kupisch/Seiler*, Digesten 1-10, 1995, p. 678.

indicated that an absolute property right in land is not a Roman perception.

1.3.1.3 The contents of land ownership in Roman law

In the archaic period[65] of Roman law (451BC-), the property law was under the "*paterfamilias*", and the division between ownership and other property right were still not so clear, "neighbor rights and restricted personal easements are only thinkable on a plot of land."[66] However, as time went by, the land ownership in Roman law had its limit in height and depth. In the area of neighbor right, it had also norms over the servitude of passage for landlocked land, as well as the duty of tolerance for the smoke, water, etc. from adjacent land, when these are not over the usual amount.[67]

In the post-classic time (250-527), the property law was deeply influenced by the development of Roman Vulgar Law, which not only led to the idea of "full ownership" (Volleigentum), but also introduced the social obligation, the public interest, and the state power into private property. Consequently, a system to restrict the "inviolable private property" came into being.[68] In the field of real estate, the land plots were required to cope with public construction management, which was under the name of public interest.[69] In other words, real estate met more restrictions than before. The use of land plot, as well as other property, would have to concern about the public interest. Therefore, an absolute real estate, which combined the sky and the deep earth, would be a fantasy at that time. Nevertheless, the legal status of the airspace and subsurface of land, in other words, whether they are still independent property rights, is still ambiguous in Roman law.

As summarized by Max Kaser, "the airspace over the land plot and the subsurface under

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[65] About the division of Roman law, a commonly accepted idea is that: Roman legal history may also be divided into periods by reference to the modes of law-making and the character and orientation of the legal institutions that prevailed in different epochs. In this respect, the following phases are distinguished: (1) the archaic period, from the formation of the city-state of Rome to the middle of the third century BC; (2) the pre-classical period, from the middle of the third century BC to the early first century AD; (3) the classical period, from the early first century AD to the middle of the third century AD; and (4) the post-classical period, from the middle of the third century AD to the sixth century AD. The archaic period covers the Monarchy and the early Republic; the pre-classical period largely coincides with the latter part of the Republic; the classical period covers most of the first part of the imperial era, known as the Principate; and the post-classical period embraces the final years of the Principate and the late Empire or Dominate, including the age of Justinian (AD 527 – 565). See *Mousourakis*, Roman law and the Origins of the Civil Law Tradition, 2015, p. 2.

[66] *Kaser*, Das Römische Privatrecht, Band I, 1971, p.122.

[67] *Kaser*, Das Römische Privatrecht, Band I, 1971, p.407.

[68] *Kaser*, Das Römische Privatrecht, Band II, 1975, p.262.

[69] *Kaser*, Das Römische Privatrecht, Band II, 1975, p.264.

it belong to the land plot, it extends to as much space as where the landowner has interest."[70] This description of Roman law was identical to Jhering's above-mentioned studies. Therefore, a separation of airspace and its land surface can not only be found in the fragments of Digest but also in general legal institutions. This indicated that Roman law might satisfy **Condition I** (separation between land surface and airspace/subsurface). Then we come to the **Condition II**: is airspace and subsurface right compatible with the idea of the property of the Roman lawyers?

1.3.2 Condition II: Airspace/subsurface as "property" in Roman law?

Compare to **Condition I**, **Condition II** is not normative or descriptive, but a theoretical question. It is worth to note in the beginning, as the theory of "right" was mainly a medieval product ("property right" came even later than "right"), there was neither "property" nor "right" in Roman law. Therefore, all the discussion below is from a modern perspective (using the modern noting to illustrate its origin), and only for the better understanding of the Roman legal system.

In Roman property law, there were a large variety of divisions of things. For example, the temples, the city walls, the tombs were called "*res divini iuris*", because these things included religious elements, and were governed by divine law. While food, clothes, house, and all other things that were not "*res divini iuris*", were called "*res humani iuris*", because they were governed by human law. **Obviously, the airspace and subsurface were "*res humani iuris*".** Similar divisions were very popular in Roman law.[71]

Furthermore, were airspace and subsurface "res publicae", "res privatae", or "res omnium communes"? According to the Institutes of Justinian, "By natural law, the air, flowing water, the sea, and therefore the seashore, are common to all (*res communes*)",[72] did that mean the airspace are *res communes*?[73] As noted at the beginning of this Chapter, land

[70] *Kaser*, Das Römische Privatrecht, Band I, 1971, p.406.

[71] Typical divisions of things in Roman law were "res publicae", "res privatae", "res omnium communes", "res in commercio", "res extra commercium", "res corporals", "res incorporales", "res fungibiles", "res consumptibiles", "res nullius". See *Berger*, Encyclopedic dictionary of Roman law, American Philosophical Society, 1953, pp.677-680.

[72] Institutes of Justinian, II. 1.1. It is a little bit misleading because some scholars will quote it when dealing with the law of airspace and subsurface.

[73] *Res communes* is one of the *Res humani iuris.* It was not capable of being privately owned and was deemed common to all human beings. See *Mousourakis*, Fundamentals of Roman Private Law, 2012, pp. 120-121.

airspace and subsurface was neither the air nor the soil, but the column of space filled with air or soil. The difference between the space and the substance located inside this space was easy to define: as the air would move from one place to another under natural power (thermal convection), but the space vertically above and below a plot of land would stay there. In other words, the airspace and subsurface could be filled with air and soils, but they were independent of these substances. Therefore, **airspace and subsurface were not** the air itself, it does not belong to the Roman notion ***"res communes"***.

In addition, airspace and subsurface were also not *"res publicae"*. The similar terms for land ownership in ancient Roman law are *dominium, proprietas, in bonis esse* or *habere*, or *habere possidere uti frui licere* (early in the republican times).[74] A first division was between state ownership and private ownership. Concretely, the streets, public places, theaters, as well as some other things were under the ownership of the state.[75] Regardless of the debate on whether the private-owned land was earlier than the publicly owned land,[76] or whether the land could also be owned by peregrines according to the peregrine law,[77] one thing was clear, the private ownership of land was permitted in ancient Roman law.[78] What's more, the land could be transferred to others by the following procedures: *mancipatio*, in *iure cessio*, and *traditio*,[79] among which *traditio* became the mainstream and the former two types had gradually disappeared.[80] In addition, for the Roman citizens, *usucapio* opened the door for the acquisition of quasi-ownership.[81] Likewise the common law part, the land ownership could be remedied by a

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[74] *Schulz*, Classical Roman Law, 1951, p.339.

[75] It is in Latin terms as *res publicae*, and some other things such as the air, running water, the sea, were regarded as things common to all, which were called in Latin "*res communes*".

[76] *Diósdi*, Ownership in Ancient and Pre-Classical Roman Law, 1970, pp. 31-42.

[77] *Schulz*, Classical Roman Law, 1951, p.341. In this part, the author listed the four possibilities of the ownership of land in classical time of Roman law in detail: (1)the land might have received *ius Italicum*; then it was capable of being in quiritary and praetorian ownership; (2)the land might belong to the *Aerarium pupuli Romani* or to the *fiscus*; then it was res *publica*;(3) Land belonging to the territory of a *civitas libera et foederata* lay outside the Roman State and the provincial administration; (4)the rest of provincial land was in the ownership of communities or individual persons(Romans or peregrines), but this ownership was neither *quiritary* nor *praetorian* it was an ownership of a special kind subject to a mixture of Roman and peregrine law.

[78] *Schulz*, Classical Roman Law, 1951, p.341.

[79] *Schulz*, Classical Roman Law, 1951, pp. 343-354.

[80] *Schulz*, Classical Roman Law, 1951, p. 351.

[81] *Watson*, Roman law and Comparative Law, 1991, pp.46-47. As the author noted, in classical time, *usucapio* requires the possession of two years, of other things one year, but at the same time, the things should be capable of human ownership, then it must not have been stolen property, and that the possessor must have begun possession in good faith, usually in the belief that he was the owner. But later, the rules changes, that if for ten years the possessor and the actual owner were in the same province, twenty years if they were not in the same province, the previous owner's rights extinguished, although it did not make the possessor to be an owner.

series of complex actions.[82] The Roman land law included also *servitudes* and real security, which enjoyed a worldwide influence, especially after renaissance, coping with the build of the national state and their codification movements. Therefore, **land and its airspace/subsurface could be "*res privatae*".**

Then, airspace/subsurface is neither "*res corporals*" nor "*Res incorporales*". Were airspace and subsurface "*res corporals*"? Obviously not. As noted above, the airspace/subsurface was nothing but the column filled by the air, soil, water, sand, rocks, etc. When you look at it, what you see is the substance (the air, the soil, the water, etc.) filling it; when you touch it, what you feel is also the air, the soil, the water, etc. Therefore, although the airspace/subsurface is physical existence, it is, however, hard for the human eyes to see it, human ears to hear it, or human hands to feel it. From this perspective, it was an abstract existence. Then, does airspace/subsurface belong to the "*Res incorporales*"? However, the answer is no. It is because, in Roman law, most of the "*Res incorporales*" were rights, such as the right of obligation, the right of inheritance, the right of etc. [83] It was obviously not for airspace/subsurface. **Therefore, airspace/subsurface is neither "*res corporals*" nor "*Res incorporales*".**

According to *dominium ex iure Quiritium*, a (property) owner must satisfy two conditions: a person capable of holding it; and a corporeal thing capable of being *in dominio.*[84] In other words, only the corporeal thing could be owned. As airspace and subsurface are neither "*res corporals*" nor "*Res incorporales*", they have no chance to become a kind of property in Roman law. Therefore, **Condition II** is not satisfied.

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[82] *Schulz*, Classical Roman Law, 1951, pp. 367-379. The actions are mainly *Hereditatis petitio*, *interdictum quorum bonorum*, *actio familiae crciscundae.*

[83] *Schulin*, Lehrbuch der Geschichte des Römischen Rechtes, 1889, p. 279. In this book, the author provided many examples to help us learn about the meaning of the two concepts in Roman law.

[84] *Schulz*, Classical Roman Law, 1951, p.339.

1.3.3 Reflections on the legal position of airspace/subsurface in Roman law

As illustrated above, the land ownership was not absolute in Roman law, they had both restrictions from private law and public law. Furthermore, airspace/subsurface was neither "*res corporals*" nor "*Res incorporales*". However, these conclusions were not absurd, because the Roman legal notions were built upon the experience of daily life. The division of "*res corporals*" and "*Res incorporales*" is based on the human's sense organ, which is obviously quite limited. For example, the ultrasound exists in nature, and it is valuable, but we cannot hear it. Furthermore, the gas, the electricity, the magnetism are all similar examples. Comparing with these examples, the airspace/subsurface is more intuitive for human beings. However, they were ignored by the Roman lawyers when distinguishing different "things".

In summary, the drawbacks in Roman law is understandable, but they had led to serious harms to the future development of airspace/subsurface.[85] On the one hand, this design is beneficial, because it effectively allocated the judicial resources to protect the most meaningful and valuable property at that time. However, on the other hand, it might not be a wise choice to follow this conviction eternally, when the technology had dramatically developed, as there would be path-dependence on these theories.

There might be one exception, some evidence showed that some rights of servitude are related to the use of land airspace, such as the right to light, with which the neighbor was not to build higher on his property in such a way that his adjacent owner's light would be affected.[86] However, servitude in airspace does not equal to airspace right independent from the land surface, it is still "a horizontal real estate law with some vertical exception", but not a real estate law with vertical concerns.

In the general norms, the Romans had not directly recommended an independent *dominium* of airspace/subsurface from the land surface. Therefore, due to the social need and technological conditions, the Romans did not recognize the potential value of airspace and subsurface, and accordingly, had not recommended independent airspace right from

[85] *Kaser*, Das Römische Privatrecht, Band II, 1975, p. 376.
[86] *Watson*, Roman Law and Comparative Law, 1991, p.49.

the land surface.

1.3.4 Short summary

The real situation of Roman law, as discussed above, satisfied **Condition I**, but not **Condition II**. Generally, the Roman property law was still very rough and unsystematic, and it was very hard for the airspace/subsurface to find its place in Roman property law. The airspace/subsurface was neither "*res corporals*" nor "*Res incorporales*", and accordingly could not be owned under Roman law. This dilemma was caused by the criteria to divide different legal objects: the human sense organ. However, a deeper reason was the low technology and agricultural usage of land, which made Romans ignored the potential value of airspace/subsurface.

1.4 The reception of Roman law in continental Europe

1.4.1 Reception of Roman law in France, Netherland and some other countries

Despite the fall of the Western Roman Empire in 476 A.D., the Roman law had a long-lasting effect among the western European countries. The medieval Italian lawyers, who were called "Glossator", took the first step in the reception of Roman law, as they interpreted the Roman law by making notes and comments (Glossa).[87] Although most of the Glossator's work was still under the name of interpreting the manuscript of Corpus iuris civilis, actually, their interpretations were rather aiming at adapting to the "modern" circumstance and requirement in Middle Ages.[88] As a result, the Glossator's work was so influential that they had affected the whole of Europe. A saying is that "*quidquid non agnoscit glossa, non agnoscitcuria*" (What the Glossa does not know, the court does not know it either).[89]

The French reception of Roman law could be mainly divided into two forms: in its south,

[87] This activity mainly happened in 12-13 century, which with a series of famous lawyers and their Glossa works, such as Pepo, Irnerius, Bulgarus, Martinus, Jacobus, Hugo, Rogerius, Albericus, Placentinus, Henricus de Baila, Hohannes Bassianus, Azo, Accursius, etc. See *Lange*, Römisches Recht im Mittelalter, Band I, 1997,p.151-155.
[88] *Zwalve/ Sirks*, Grundzüge der Europäischen Privatrechtsgeschichte, 2012, p.33-34.
[89] *Windscheid*, Lehrbuch des Pandektenrchts, Band I, 1906, pp. 8-12.

the authority of Roman elements in its customary law; in the north, the authority of *Corpus iuris civilis* as the source of law for the side of the intellectual's thinking.[90] Nevertheless, as the Roman law were in conflict with the Canon law, the Pope did not allow the Universities in the French Kingdom to teach Roman law, so the customary law becomes very strong, and the Roman law as one of "*ius commune*" was under debate for centuries. Through the Judgment in 1510, this problem was solved by regarding the works of the Jurists as a part of French Common law (droit commun français). This uneven process had gradually formed the different layers for the sources of French private law: the customary law, statute and King's order on the first layer, the Canon law as a subsidiary on the second layer, and the *Corpus iuris civil* as in the third layer.[91] The result of this reception process was the birth of the French Civil Code in 1804, in which the French legislators use the term "bien (property)" to include both corporeal things and incorporeal things.[92] As the French concept of "property" was relatively wide (**Condition II**), they existed some possibility for airspace/subsurface rights. However, the French legislators had also followed the Glossators' interpretation of land ownership under Roman law. Article 552 Subsection 1 of the French Civil Code: "Ownership of the ground involves ownership of what is above and below it."[93] Therefore, in the French Civil Code did not satisfy **Condition I**, and accordingly, airspace and subsurface right were not possible under the French Civil Code.

Undoubtedly, the French-style of civil Code was quite influential, which had also influenced Austria.[94] What's more, "the French version of our maxim made its way into the Codes also of Belgium, Italy, Japan, The Netherlands, Portugal, the Province of Quebec, Spain, Switzerland, and Turkey".[95] Therefore, these countries did not satisfy the **Condition I**. Consequently, the subsurface and airspace cannot be separated from the land surface.

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[90] *Zwalve/ Sirks*, Grundzüge der Europäischen Privatrechtsgeschichte, 2012, pp.35-36.
[91] *Zwalve/ Sirks*, Grundzüge der Europäischen Privatrechtsgeschichte, 2012, pp.38-40.
[92] Malte Stieper in: Staudinger BGB (2017), Sec. 90, para. 8.
[93] Sec. 552, I,"La proprété du sol emporte la proprété du dessus et du dessous." The English translation is provided by Georges Rouhette.
[94] See Section 297 of the Imperial Austrian Civil Code (Allgemeines Buergerliches Gesetzbuch für das Kaiserthum Österreich, 1811).
[95] It is worth to mention that the legislation and legal attitude of the listed countries had changed since the WWII. For further discussion, see *Klein*, 26 J. Air L. & Com. 237, p. 239.

In summary, the Accursius's perception of Roman law ("*cujus est solum*" principle) was only one branch of scholarship of Roman land law, there were still other branches.[96] However, the Accursius's perception was no doubt the most influential one, which had even created a centuries-long misunderstanding. Why is that? In my opinion, such kind of absolute land ownership was revolutionary against the feudal divided-ownership, and it was quite meaningful in the time of the Renaissance. For example, the social contract theory was also built upon assumptions, but Jean-Jacques Rousseau tried to get support from the beginning of human social history. Nobody would deny the rational elements of a social contract, although it lacked the anthropological support. Similarly, Stuart Banner recommend "*cujus est solum*" principle was a product of common law. In a wider sense, it had also fulfilled the social need of other European Nation-State emerged during the 16th -18th centuries, because property rights (especially the land property) were key symbols of the modern human freedom and dignity. Therefore, the centuries-long pseudo-history on airspace was not a joke, it had its historical, social, philosophical and political background. The other side of the coin was that, at that time, the potential interest of airspace and subsurface had not been totally recognized. Accordingly, the real dramatic change in airspace and subsurface would have to wait for the industrial revolution.

1.4.2 The German "invention of Property (Eigentum)" and its strictness

1.4.2.1 Condition I: The German perception of land

Like that in French, the German Civil Code is influenced by both Roman law and ancient Germanic law. It is still ambiguous among the German scholars that, whether the traditional Germanic law permitted the individual land ownership. Because the individual properties were mostly movable things, such as clothes, weapons, tools and other things of daily life.[97] During the Middle Ages, the individual ownership of land was stimulated by the newborn cities in the German area, where individuals were less controlled by their families and relatives than that in the rural area,[98] but the trade of land should be operated

[96] *Erythropel*, Recht Am Luftraum, 1898, pp. 3-7.
[97] *Wesel*, Geschichte des Rechts, 2014, p.262.
[98] Sachsenspiegel, Landrecht, I. Buch, 52. Kapitel, § I: Ane erven gelof unde ane echt ding ne mut neman sin egen

in front of a court according to "Sachsenspiegel". Nevertheless, there was still no clear distinction between occupation and property in traditional German law. The definition of the property did not appear until its reception of Roman law.[99] What's more, the Roman law had also a great practical meaning for the German areas. Especially in the 16th and 17th century, the interpretation of *Corpus iuris civilis* and its medieval Glossary were cherished by the German jurists over the requirement of any other time.[100] Accordingly, the Roman legal terms in Latin was used by the German lawyers to note the property, for example, *dominium* and *propritas*.

The social structure of the German districts was feudal society, and was accordingly not identical with the Roman real estate terms. Christian Wolff, an influential jurist in the first half of 18 century, creatively developed the "divided property (das geteilte Eigentum)" theories by using the legal terms "*dominium directum*" and "*dominium utile*" in Latin. In his book, Wolff defined the relationship between landlords and peasants in feudal Germany as the upper ownership (Obereigentum) and under ownership (Untereigentum). The former enjoyed the right of disposition; while the latter enjoyed the right of use. This theory was influential even in the early 19th century. However, the feudal social-economic structure was gradually resolved by the trend of industrialization.

Friedrich Carl von Savigny was the founder of historical schools in German law, and the Pandectists had spent too much time and energy in interpreting the text of Roman laws, which was criticized by Rudolf von Jhering.[101] However, the historical study helped the German lawyers to clarify some long-lasting misunderstandings by the Glossators.

In the first draft of the German Civil Code, the definition of land ownership was also similar to the French Civil Code. However, following the Roman tradition, the German legislator adopted a land ownership concept limited in heights and depth since the second draft. It was section 905 of the German Civil Code, which satisfied **Condition I**: a

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noch sin lude geven- Without agreement of the successor or without real things, nobody is allowed to sell his land plot, or the person belongs to him. See Wesel, Geschichte des Rechts, 2014, p. 318.

[99] The legal definition was adopted from Bartolus "ius in re corporali perfecte disponendi nisi lege prohibetur", a tolerable translation might be "property is the collective right to control over corporeal things, which are not prohibited by law." What's more, the word "Eigentum" stem also from a book written in Latin at Cologne in the year of 1230, its corresponding Latin word is "*hegindum*". See *Coing*, Europäisches Privatrecht 1500 bis 1800, Band I, 1985, p. 291. See also *Wesel*, Geschichte des Rechts, 2014, p. 318.

[100] *Zwalve/ Sirks*, Grundzüge der Europäischen Privatrechtsgeschichte, 2012, p.42.

[101] *Jhering*, Scherz und Ernst in der Jurispurdenz, 1885, pp. 247-333.

separation of land and its airspace and subsurface.

1.4.2.2 Condition II: the strictness of German property law

Literally, it would be no precise to use the word “property (Eigentum)” before the rise of historical School and Pandectists in Germany, especially for the social structure before 1848.[102] Because in Roman law or in the Medieval Glossary, there was no such a concept to note the all-contained collective controlling rights over things,[103] although the main skeleton of property institutions, as mentioned above, had its embryo even in Roman law.[104]

The German Civil Code had a book named “Sachenrecht”, which literally meant “the law of things”, but the translators preferred to translate it as “property law”. Nevertheless, “Sache” in Germany was not equal to “property”. According to Sec. 90 of the German Civil Code, “Only corporeal objects are things (Sache) in the legal sense”, which was also influenced by medieval jurists’ Glossary.[105] Apparently, the legislators had defined “Sache” as “only corporeal things”, which definition was very different from that in “General State Laws for the Prussian States (Allgemeines Landrecht für die Preußischen Staaten)”.[106] In addition, the corresponding word in German for “property” was “Vermögen”. Unfortunately, this word had played no part in the German Civil Code, especially in the book of property law. Therefore, “Sache” was one of the central concepts in understanding German property law. Therefore, **Condition II** was not satisfied with German law.

In summary, the German Civil Code was deeply influenced by Roman law, they took very

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[102] The Roman law does not use such a concept same as the modern property, and in the middle ages, the Manorialism land system has divided the land ownership into lordship (Obereigentum) and the property to use (Nutzungseingentum), only after the revolution of 1848, the European countries are gradually changing their altitude and improve their theories. See Christoph Althammer in: Staudinger BGB (2016), Einl zu §§ 903 ff, para. 2, para.51-55.

[103] *Althammer* in: Staudinger BGB (2016), Einl zu §§ 903 ff, para. 2.

[104] *Mousourakis*, Roman law and the Origins of the Civil Law Tradition, 2015, pp.113-126. The author had divided the “Roman property law” into ownership, servitude, real security, and possession in this book.

[105] *Zwalve/ Sirks*, Grundzüge der Europäischen Privatrechtsgeschichte, 2012, p.181.

[106] In I, 2, “§1. Sache überhaupt heißt im Sinne des Gesetzes alles, was der Gegenstand eines Rechts oder einer Verbindlichkeit sein kann.
§2. auch die Handlungen der Menschen, ingleichen ihre Rechte, insofern dieselben den Gegenstand eines anderen Rechts ausmachen, sind unter der allgemeinen Benennung von Sachen begriffen.
§3. Im engern Sinne wird Sache nur dasjenige genannt, was entweder von Natur oder durch die Ubereinkunft der Menschen eine Selbständigkeit hat, vermöge deren es der Gegenstand eines dauernden Rechts sein kann.”
From these historical texts, the perceptions of “things” in the General State Laws for the Prussian States (PrALR) of 1794 is still very broad, it generally included all the objects of rights or obligations.

similar land ownership to Roman lawyers. However, the legislators narrowly defined the objects of the property law, which made airspace/subsurface impossible in German Civil Code.

1.4.3 Short summary

Built upon solid historical studies on Roman law, German Civil Code was the first to adopt limited land ownership, which satisfied **Condition I**. However, due to the strictness of the private legal objects (corporeal), there was little space for airspace/subsurface to become a kind of property. Therefore, it was hard to add airspace/subsurface right into the family of German property rights. The German situation was similar to the situation in ancient Roman law.

1.5 The common law perspective: prequel and sequel of the Latin proverb.

As introduced in Chapter 1.3, the most important principle in common law on airspace and subsurface was the "*cujus est solum*" principle. However, it was proved to be a pseudo-Roman maxim. Banner had frankly recommended that it is the "product of common law", which was set in 1586. Nevertheless, how did the common law treat airspace and subsurface before that case and after that?

1.5.1 The uniqueness of the British land law: prequel of the Latin proverb

The widely applied military land tenure in England was quite unique in medieval Europe.[107] After the Norman Conquer in 1066, a land tenure system was built up in England, which had become a leading and comprehensive part of early common law.[108] The feudal land law was a mixture of public law and private law, because, besides the property relationship, it emphasized the military and personal obligations of the vassals

[107] This previously military related doctrine of tenure in the medieval European Continent was applied universally to the land law, which is a purely English phenomenon.
[108] *Holdsworth*, A Historical Introduction of the Land Law, 1927, p.6.

to the King, and the obligations tenants to tenant-in-chief.[109] Therefore, the specialty of Britain land law is its military land tenure, while its "divided land ownership" was quite similar to the medieval European continent. Despite the pseudo-Roman history, the "*cujus est solum*" principle had set a new legal order in land law, which dominated the common law world for centuries. The **condition I** is, therefore, not satisfied.

As airspace/subsurface is absorbed by the land surface, there were no other places for them in British law, although the scope of property of British law was very wide.[110] Similar to the Roman tradition, there were many incorporeal things in British real estate law, e.g. advowsons, rights of common, rents, annuities, easements, etc.[111] However, the airspace and subsurface were excluded and ignored, because such primitive legal institutions and complicated military land relationships left little space for airspace and subsurface right.

1.5.2 Condition I: The US reception as the sequel of the Latin proverb

As one of the previous colonies of Great Britain, the commentaries by William Blackstone were widely accepted and very popular among the American lawyers.[112] Accordingly, the "ad coelum" principle is accepted. For example, this principle appeared in "Commentaries on American law" by James Kent in 1820s, and gradually become a US law. These traditional cases often related to trespass in the land, for example, in case Whitaker v. Stangvick, the court regarded the defendant's gunshot over the plaintiff's airspace as a trespass, "it is immaterial whether the quantum of harm suffered be great, little, or unappreciable".[113]

Richard Epstein insisted the specialty of the US property law, "The English system of property rights in land, however, did not carry over to the United States. …The basic conception of property rights allowed the owner to take from the center of the earth to the outer reaches of the heavens. "[114] However, as one of the colonies of the British Empire

[109] *Simpson*, An Introduction to the History of the Land Law, 1961, pp. 24-43.
[110] *Smith*, Property Law, 2017, pp. 3-11. *Panesar*, General Principles of Property Law, 2001, pp.7-20.
[111] *Simpson*, An Introduction to the History of the Land Law, 1961, pp.97-111.
[112] *Jones*, 39 J. Marshall L. Rev. 1041, pp. 1041-1055.
[113] Whitaker v. Stangvick, 100 Minn. 386, 111 N.W. 295 (1907).
[114] *Epstein*, 56 Brook. L. Rev. 747, p.750. Epstein had also provided cases to illustrate this idea in the footnote 15 of

before its establishment, the US legal terminology and its primary legal knowledge were inevitably influenced by the British common law. The early legal educations in the US were mainly a repetition of the works of William Blackstone.[115] Therefore, the "*cujus est solum*" principle set by Sir Coke were observed for quite a long time in the US court, regardless of the coming of the industrial society. It had caused much inconvenience for urban daily lives. For example, some landowners would build up a wall over the whole street, which disturbed the common usage. However, the judges, at that time, had to recommend that it was the freedom of the landowners coherent with the "*cujus est solum*" principle. Nevertheless, this situation did not last long; the judges' attitude had changed in the second half of the 19th century.[116]

Currently, there are at least 16 states in the US have a separate civil code of civil law chapters in the code of those states.[117] Although more and more lawyers in the US had doubted the reasonableness of the "*cujus est solum*" maxim and its applicability to the aeronautics even since the late nineteenth century,[118] this maxim had its legal basis in a various statute at the state level. In the 1930s, there were still 19 states in the US recommending this maxim in their civil code or statute.[119] In 1947, even after the famous Causby case (the United States v. Causby), in which the US Supreme Court had pointed out the absurdity of this maxim,[120] these relevant rules in some states had remained unchanged, e.g. state of Louisiana.[121] Therefore, we have to admit that the law of airspace and subsurface in the US had lived under the shadow of the ancient "*cujus est solum*" maxim even in the age of airplanes.

Therefore, "*cujus est solum, ejus usque ad coelum ad infernos*" is dominant in the common law UK and the US for centuries, which still had its market even in the 1930s

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this article, e.g., Arnett, 416 U.S. at 153-54 (plurality opinion by Justice Rehnquist); Mathews, 424 U.S. at 319 (opinion by Justice Powell holding that evidentiary hearing is not required prior to termination of disability benefits).

[115] *Banner*, Who Owns the Sky, 2008, p.17.

[116] *Banner*, Who Owns the Sky, 2008, p.7.

[117] These states are Alabama, California, Colorado, Connecticut, Delaware, Florida, Georgia, Iowa, Kentucky, Louisiana, Mississippi, Nebraska, New Jersey, New Mexico, New York, and Texas.

[118] *Banner*, Who Owns the Sky, 2008, p.7.

[119] *Eubank*, 9 Phil. L.J. 351, pp. 354-355.

[120] "The air is a public highway, as Congress has declared. Were that not true every transcontinental flight would subject the operator to countless trespass suits. Common sense revolts at the idea. To recognize such private claim to the airspace would clog these highways, seriously interfere with their control and development in the public interest, and transfer into private ownership that to which only the public has a just claim." See United States v. Causby, 328 U.S. 256, 261 (1946), reversing 60 F. Supp. 7511 (1945).

[121] *Eatman*, 8 La. L. Rev. 118, 118-120.

US. Accordingly, "*cujus est solum*" principle become the biggest obstacle for a real estate law with vertical concern in both the UK and the US (do not satisfy the first condition). Such belief had not been challenged until the invention of airplanes,[122] its subsurface was also challenged by the rise of the mining industry.[123] Therefore, **Condition I** is satisfied.

1.5.3 Condition II: The bundle of rights as an open system

As William Blackstone commented, "there is nothing which so generally strikes the imagination and engages the affections of mankind as the right to property."[124] The concept of property in common law is very broad, but primarily it is a right to a thing. However, this dominant idea changed by the 19th century's US scholars, who preferred to regard property as a "bundle of rights".[125] "Bundle of rights" was a vivid metaphor, as it regarded different functions of property rights as different sticks in a bundle. This perspective is still the mainstream in the US legal scholarship.[126]

Literally, the English words "property" is a rather comprehensive concept, which was endowed the dynamic to survive the legal changes from the Norman Conquest to modern times. Now it is still the most meaningful and powerful concept in private law, including the human body, the software, pension, cyberspace, virtual property, or even the ownership of a company through stocks.[127] Thanks to its "ambiguity", the word "property" had enjoyed a rather long and vigorous life despite its changes in contents, which would definitely contain more and more new contents in the future. In summary, the US property concept no doubt fulfills the second condition, which provides much room for the airspace and subsurface to be included within the property law.

Therefore, after "*cujus est solum*" principle was found a long-lasting misunderstanding

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[122] *Banner*, who owns the sky, 2008, p. 259.

[123] Not only England, or the US, the property law of nearly the whole Western Europe in the 19th century had experienced a restriction by the mining law. The related countries, such as French, Netherlands, Luxembourg, Belgium, Spain, Prussia, Switzerland, Austria. See *Coing*, Europäisches Privatrecht 1800 bis 1914, Band II, 1989, p. 388.

[124] *Blackstone*, Commentaries on the law of England, Vol. II, 1876, p.1.

[125] *Penner*, 43 UCLA L. Rev. 711, pp.711-715.

[126] *Stern*, 47 U. Pitt. L. Rev. 1229, pp. 1229-1235.

[127] In the 1930s, Berle and Means has written the famous book, "The modern corporation and private property", in which the author pointed out the division between ownership and control in modern company, say, the stockholders are no longer the real manager of a company, and the latter have much more economic power, which is a challenge for the property rights. See *Berle/ Means*, the Modern Corporation and Private Property, 1991, pp.244-253.

and “overthrown” in legal practice, the airspace and subsurface law had grown fast in the US. Because its openness had provided very rich soil for the development of airspace and subsurface right.

1.5.4 Short Summary

The US was the first to escape the British circle of “*cujus est solum*” principle, therefore, Condition I was satisfied. As the popularity of “bundle of rights” in property, it was not hard to accept airspace/subsurface within the scope of the property. As airspace/subsurface right was both intangible and immovable. If it was a kind of property, should it be attributed to personal property or real estate? (detailed analysis see Chapter 1.7.1)

1.6 Property and airspace under the Chinese legal perspective: from ancient to contemporary

1.6.1 The real estate law and airspace/subsurface in ancient China

1.6.1.1 Condition I: land ownership and social hierarchy in ancient dynasties

“Under the whole heaven, every spot is the sovereign's ground. To the borders of the land, every individual is the sovereign's minister.” This is a quotation from “Shi Jing (诗经)”, which is a collection of poems and songs by the philosopher and poets of the Chinese ancestors between 1100 BC and 600 BC. Shi Jing was edited by Confucius and was therefore deemed as one of the main sources of Chinese customary law. As described in this poem, similar to that in Britain, all the land was considered to be owned by the Kaiser since the Shang Dynasty,[128] when China was still a feudal and slavery country.[129]

From a microscope, like the ancient Germanic land law, most of the land was either under state ownership or joint ownership (Gesamteigentum) in Shang Dynasty and Zhou

[128] *Confucius,* Shi Jing, 2002, pp.335-336.

[129] Ownership in Britain is limited to a formal importance because the land is deemed to be owned by the Queen or the King, the ownership of property in private law sense, is freehold and leasehold.

Dynasty. Even in the Han Dynasty, the absolute state land ownership still existed in the non-arable land, such as mountains, forests, pastures, rivers, and lakes, etc. Therefore, the hunters, fishers, shepherds, and the like would have to pay tax (10%) for the government. In addition, some arable land was also owned by the state, which was called "official/public arable land (Guan/Gong Tian)". Some farmers worked on such land and gave 10% of their harvest back to the government as a rent. It sounded like "Tax", but actually, it was rent. This kind of official arable land was always given to the landless farmer after a natural disaster and play a role as social benefits. For the state land ownership, it obviously stretched from the sky to the earth, as the hunters should also pay tax when hunting in such areas. Therefore, this land perspective did not fulfill **Condition I**.

The land should not be sold until the Han Dynasty (202 B.C. -220 A.D.).[130] However, private land ownership had become popular since the Han Dynasty, which is one of the most powerful and prosperous Dynasties in Chinese history. At that time, state ownership on arable land only consists of a small portion of the land market. Even some Kaiser (typically Kaiser Ling) was trying to enlarge his private amount of land, which led a nation-wide adornment of private land ownership. Besides the Kaiser, the ministers, the aristocracies, the merchants, the ordinaries and the family-collectives, all sought opportunities to buy more land. However, the ancient Chinese society was built upon social status, the lower social hierarchy's land was always quite venerable under the pressure from higher social standing or from state powers. For example, the government had supported the Buddhist temples to infringe the land ownership of ordinary individuals in the Tang Dynasty. Another notorious example in the Qing Dynasty (1644-1912) had lasted for decades, which was called "eight banners' enclosure 八旗圈地". In this event, many peasants and landlords of Han nationality had lost their fertile arable land, although the Kaiser only permitted the eight banners to occupy the wasteland.[131]

One exception of private ownership is that the Kaiser's property enjoyed absolute ownership. Since the Han Dynasty, there was always a portion of arable land near the

[130] *Dai*, Chinese Legal History, 1979, p. 289.
[131] *Lu*, The legal status of Bannermen in Qing China, 2017, p.133.

capital city under the control of the Kaiser personally, and the officer especially responsible for such property named "Shao Fu (少府)".[132] In the Qing Dynasty, the large-scale "Kaiser's Farm (皇庄)" had played an important role in the state economy.[133] The Kaiser's right to this land is quite similar to the description of the common law "*cujus est solum*" principle, and it is free of tax. Comparing with the land tax, the real burden for the peasants are the "Yaoyi (similar as "corvée" in western history), who have to work for the government at least one month per year between 23 years old and 56 years old and provide one-year military service in the frontier, which always led to death or disability.

Symmetry with the different landowners, there is also a division of land according to the usage. For example, in Tang Dynasty, the official prescribed land quota for each person ranged from 1,000 square meters to 250 square meters according to their identities, the sequence is males, old males, disabled, widows, handcrafters, and merchants, monks, others. Another distinction is in accordance with usage: minister's permeant arable land, ordinary arable land, residence land, Kaiser's reward land, tomb land. Normally, the user should not use special land for another purpose. However, there were no recorded laws or cases especially on the discussion of airspace and subsurface. Alternatively, the airspace and subsurface were absorbed by the land surface.

From Ming dynasty, the arable land was clearly divided into different layers, **the land skin, and the land bone**. The land skin is used to produce agricultural products (35 Liang silver), while the land bone is the right to obtain rent (0.5 Liang silver per year). In the middle of Ming Dynasty (1368 - 1644), the price of arable land rises rapidly, in order to get money, some landowners would sell their land skin, and the buyer becomes the usufructuary, i.e. the land skin owner.[134] The division between land skin and land bone is a separation of land ownership from management. However, the land skin and land bone are just metaphor, but not equal to a vertical perspective on rural land. In fact, it was quite similar to the "divided land ownership (das geteilte Eigentum)" in medieval Europe. Therefore, the airspace/subsurface right seemed beyond the imagination of the ancient

[132] *Xu*, Han Agriculture, 1980, pp.170-180.
[133] *Li/Mu*, Archa. Stud.125, 2016(3), pp.125-129.
[134] *Kong*, Chinese History of Civil Law, 1996, pp. 526-529.

Chinese, and **condition I** is not satisfied.

In summary, although there were different landowners and different types of land in ancient China, their main focuses were the land surface rather than its airspace or subsurface. Among all these lands, the most valuable land was the arable land. However, even in the 17th century, the most valuable part of arable land is still "land skin", while the airspace and subsurface were ignored. Accordingly, there was little room for airspace and subsurface right in ancient China.

1.6.1.2 Condition I: the concrete airspace/subsurface cases in ancient China

Although there were few clues on airspace/subsurface in the general code of different Chinese dynasties, the ancient Chinese idea on airspace/subsurface could still be traced by the recoded contracts. Because in ancient China, the contract had also played a role of property right certificate.[135]

As an exception of ancient Chinese land law, mining is a good clue to trace the ancient Chinese's idea on the subsurface right. For example, salt mining in Sichuan Province could date back to 250 BC.[136] In the slat mining, the ancient Chinese had to dig deep holes into the underground. Then they obtained natural gas from the underground through bamboo pipelines; at the same time, they got salted water with another bamboo pipelines. To make full use of the two resources together, they cleverly used the gas as fuel to boil the salted water[137] and obtained clean salt in the end. This technique had lasted for more than 2000 years. In the Han Dynasty, all the enterprises related to salt mining and iron making should be owned by the government after Kaiser Wu.[138] The technological breakthrough happened in 1040s' Song Dynasty (960 - 1279) by the invention of "Zhuotong Salted Well (卓筒井)", which required only small holes from the ground. Accordingly, the salt workers did not need to work underground anymore, and animal power, water power were gradually adopted as a substitute. Consequently, the private ownership and management of salt wells become much more possible and common.[139]

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135 *Dai*, Chinese Legal History, 1979, p. 285.
136 *Yang*, Sci. Edu.329, 1955(8), p. 329.
137 See *Yang*, Sci. Edu.329, 1955(8), p.329. See also the description and pictures in Tiangong Kaiwu (The Exploitation of the works of Nature). *Song*, The Exploitation of the works of Nature, 1628, pp. 69-71.
138 *Huan*, Discourses on Salt and Iron, 2017, pp. 1-72.
139 *Bai*, 4 Stu. His. Natur. Sci. 175, pp175-178.

The salted water under the earth was regarded as the property of the surface landowners, and the landowners could sell, rent the land with slated waters to make fortune.[140] Further, using the land to joint venture was nothing new in 1868 among the salt managers in Sichuan Province of China.[141] This stimulation promoted the salt production amount to 200-300 million kilos per year by the salt factories only in Fu county and Rong County of Sichuan Province in 1870s.[142] The salt mining industry created a distinct social class, which were called "salt typhoons",[143] the richest group ever in Chinese history. And the mining rights were undoubtedly allocated to the surface landowner, which can be regarded as a clue of the Chinese understanding and practice of using land subsurface. Alternatively, if you wanted to get salt, you had to obtain the land surface first or got permission from the surface owner. Therefore, from the practice of salt mining, one thing was clear, the subsurface belonged to the surface landowner. Therefore, **Condition I** was not satisfied.

Unlike salt mining, the mining of metal and coals were mainly under government control until the Sui Dynasty (581-619), because they are vital resources in ancient China.[144] The Kaisers of the Tang Dynasty (618-907) changed their attitude towards private owned metal mining. Since then, there was an officer named "the officer of mining", who was in charge of all the taxation of private-owned metal mining. However, the mountain was still under state-ownership, and the government required the mining operator to pay 10% of their productions as a tax. Therefore, underground mining was also absorbed by surface mining rights. Again, **Condition I** was not satisfied.

Another exception happened in the neighbor relationship had shown some knowledge of airspace of ancient Chinese, which was recorded by an ancient contract. In 1873, two cousins and neighbors, Lü Zhongtai and Lü Zhongqing, had signed a contract to leave

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[140] *ZD/EIB/UoS*, Selected Documents of Contracts in Salt Industry, 1985, pp. 315, 337, 953, 1073. Compare *Zhang*, J. S. U. Sci & Engi 6, 2012 (12), pp.6-11.
[141] *Wu*, Stu. Soc. Eco. His. Chi. 60, 1992 (4), pp. 60-61.
[142] *Zhang*, Stu. Soc. Eco. His. Chi. 57, 1982 (2), p. 58.
[143] *Ho*, 17 Har. J. A. Stu.130, pp. 130-168.
[144] After the first unity of China in 221BC, the Kaiser of Qin Dynasty collected all the private metal weapons through the whole China and melted them into 12 very big "metal persons". His strategy was clear: by melting the metal weapon in private hand, there would be no easy rebellion under his reign. See *Sima*, Records of the Grand Historian, 1959, p.139. On the discussion of the importance of this book, see *Watson*, Ssu-ma Ch'ien Records of the Grand Historian, 1958, pp.70-134.

one *Chi* (尺, about 35.5 cm) of airspace from Chongqing's land for the house of Zhongtai to alleviate the rainwater, which could be regarded as a land easement in the airspace. Therefore, it would be unfair to say that the ancient Chinese had precluded the possibilities of airspace. However, the terms in the contract are quite misleading, they do not use airspace, but “one Chi land”. From this example, we can see that in the eyes of ancient Chinese intellectuals, the airspace is also absorbed by the surface land ownership. **The condition I** is not satisfied.

In summary, no matter in the arable land, mining land or residential land, the airspace and subsurface were regarded absorbed by the surface ownership in ancient China. By the end of the Qing Dynasty, some foreign companies are trying to obtain mining rights in China, which arose many outrages from the bottom of society. Due to the pressure both domestically and internationally, the Tsing Empire began to follow the steps of Japan and Germany to reform its traditional laws, including the land law, as well as the airspace and property rights. This was regarded as the first step from ancient Chinese law to modern Chinese law.

1.6.1.3 **Condition II**: the idea of property in ancient China

Like that in ancient Roman law, there were different kinds of property rights in ancient China, e.g. ownership, neighbor right, usufructs (easement, farmer’s Emphyteusis), pledge, pawning right, etc. However, there was no general and abstract “property right”. Nevertheless, the division between movable and immovable existed. Therefore, there was not enough evidence to show that **condition II** was satisfied in ancient Chinese law.

Therefore, although the airspace/subsurface was used for different purpose, there was no place for airspace/subsurface right in ancient China. The airspace/subsurface was absorbed by the land. In addition, there was no general property right in ancient China, although they have different kind of them in civil and commercial transactions.

1.6.2 The last Chinese Empire and the three civil codes in pre-socialist China

Since the late Qing Dynasty, China had to adopt the western legal terminology and a German-style Civil Code from the Japanese jurists, which means a harsh process of

modernization. The legal order had totally changed. Since the 1920s, China was already a member of the German legal family.

1.6.2.1. A matter of translation: the beginning of misunderstanding

Due to the legal implantation from both common law and German laws, the concept of "Property" in Chinese law is a little bit misleading. Literally, in the modern legal Chinese, the property is called "Caichan（财产）", while "property right (Sachenrecht)" in a German sense is mostly called "Wuquan (物权)". The Chinese scholars had kept this habitat since the late Qing Dynasty. However, this is not strict, because some scholars prefer to translate "Eigentum" as "Caichan (财产)", and the word "property" was often translated as "Chanquan (产权)", especially in the books on law and economics by the US scholars.[145] Therefore, China was trying to combine the common law concept and civil law concept together, but it was obviously no easy work.

In the 1900s, the Chinese legal scholars were deeply influenced by the legal terms adopted by the Japanese Civil Code, and "Wuquan" got its dominant position in a series of legislation. A second change was that China had gradually become a member of the civil law legal family. Therefore, it was necessary to read the sections of the historical Chinese Civil Code, in order to obtain their idea of land, property concept, and their attitude towards airspace and subsurface.

1.6.2.2. The first try of making a western-like Chinese Civil Code

As discussed above, the modernization of Chinese civil law actually began in the year 1907.[146] This time, China had implanted German law from Japan, which was supported by the last dictatress in China: Empress Dowager Cixi. However, the concrete and professional arrangements were led by Shen Jiaben (沈家本), advised by Dai, Hongci (戴鸿慈), and helped by the Japanese jurist Matsuoka Yoshikazu (松岡義正　まつおかよしまさ). Accordingly, the draft of the Chinese Civil Code was directly influenced by the Japanese Civil Code, and indirectly but deeply influenced by the German Civil Code. In just 3 years, the draft of Chinese Civil Code of Qing Dynasty had been finished in a

[145] *Yin*, Theoretical Comments and Reflections on Property Law, 2004, p. 1-6.

[146] Although translation of western civil law began in 1880, the process is quite slow, and the reformers must wait for the support from the top of the political power: the Kaiser.

typical German-Japanese style, consisting of five books: The General provision of Civil law, the property, the obligation, the Family, the inheritance.[147]

According to section 166 of the Chinese Civil Code of Qing Dynasty, "The word "property" was used to name the corporeal things."[148] The Chinese legislators follow the German Pandects' School and its follower: the Japanese Civil Code. Therefore, **Condition II** cannot be satisfied.

Additionally, in section 991, "Unless restricted by law or by ordinances, ownership of land extends to height and depth above and below the surface. Interference by others cannot be excluded if it does not obstruct the exercise of the ownership." It was quite similar to section 905 of the German Civil Code, but there were no other laws to limit its height at that time. In addition, it is in lack of another limit "where the landowner has interest". Accordingly, the land would stretch very high in the sky and very deep under the earth. This is a repetition of section 207 of the Japanese Civil Code, nearly word by word. Therefore, **Condition I** would also not be satisfied.

In summary, the first reform had nothing to do with airspace and subsurface. The legal implantation would be quite absurd if one had only copied the stipulations but without acknowledgment of the systematic and functioning of the foreign law. However, the Qing Dynasty was overruled in 1911 before this draft came into effect.

1.6.2.3 The second and third try under the influence of the first

After the Republic of China was built up in 1912, the "Draft of Chinese Civil Code of Qing Dynasty" was partly recommended by the Ministry of Justice of the Beiyang Republic of China.[149] The value of the previous draft was under debate. According to Jiang, Yong (江庸), the chief of legislative amendments of the Republic of China, there were at least four drawbacks in this draft:

"Firstly, the former Draft was a copy of the German Civil Code and the Japanese Civil Code, it emphasized the individual interests. However, society has changed. If we do not set social interest as a foundation of civil law, it cannot fulfill the current needs.

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147 *Yang*, Chinese Civil Code of Qing Dynasty & Republic of China, 2002, pp. 3-200.

148 *Yang*, Chinese Civil Code of Qing Dynasty & Republic of China, 2002, p. 21.

149 According to the third supplement of "Bulletin of Ministry of Justice" on October 30th ,1915, "The civil legislation by the former Qing Dynasty, expect the sections in contradiction with republic state system and the gradually made statutory law, should be deemed still effective."

Secondly, regardless of the Chinese traditional sources of law, the Draft was mainly a result of legal reception. This kind of legislation will have such great influence on the social economy, which should not be ignored.

Thirdly, the family and inheritance part of the former Draft, was totally alienable to the Chinese society, which resulted in the difficulties of application in concrete cases, the judges are frequently in dilemma: if they apply the traditional law, it would contradict with the "rule of law", if they apply the Draft, the dispute would not be settled. Therefore, they would always pay too much time for consideration.

Fourthly, there is still much work to do before the new legislation (because the old law had not set it well). [150]A new Draft of the Civil Code of the Republic of China was made in 1925, in whose section 95 adopted a similar concept of property as the former Draft, which used word "property" to name the corporeal things. What's more, "The legally controllable natural power was deemed as corporeal things." This revision of the former draft was also influenced by the new ideas of the German and Japan lawyers.[151] These changes revealed that Chinese lawyers were trying to "digest" foreign laws. However, although expanded, the property was still the "corporeal things", **Condition II** was not satisfied. In its section 772, it repeated the section 991 of the previous draft, word by word. Therefore, **Condition I** was not satisfied. Therefore, airspace and subsurface rights were still not mature in China.

In 1928, "the Civil Code of the Republic of China" was enacted, which was led by Chiang Kai-shek government. This civil code had more German elements. In its section 773 writes, like a repetition of section 905 German Civil Code, "Unless restricted by law or by ordinances, ownership of land extends to such height and depth above and below the surface as is advantageous for the exercise of such ownership. Interference by others cannot be excluded if it does not obstruct the exercise of the ownership." The airspace and subsurface had finally divided from the land surface by interest (advantageous).

[150] *Jiang*, the Five-decade Legal Development in China. In: the Recent Five Decades, 1922, pp.258-259.

[151] It could be easily found in both German and Japanese commentaries of its Civil Code, whether the controllable natural power should be deemed as corporeal things. At that time, the crime of stealing electronic power had happened in both Germany and Japan. The court of the former found the "suspect" not guilty, according to the principle of "Nulla poena sine lege". While the court of Japan had found the "suspect" guilt because they adopted an amplified interpretation. The Chinese legislation and its amendment are just catering to this trend. See *Chen*, Chi. J. L. 38, 2005(2), pp.41-45.

Therefore, **Condition I** was satisfied.

However, in section 67, "All things other than immovables mentioned in preceding articles are movables."[152] This is imported from section 516 of the French Civil Code, "All property is movable or immovable". In other words, the scopes were still corporeal things. Again, **Condition II** was not satisfied. Therefore, even after the three legal reforms, the **Condition II** for airspace/subsurface was still not satisfied.

However, despite the strictness of the Civil Code of the Republic of China, the Taiwan lawyers (e.g.Xie Zaiquan, Wen Fengwen) had forged the "airspace and subsurface" in Taiwan district in recent years,[153] which has become a consensus locally. How could that become possible? The tension between population and available land, and the improvement in construction technology had gradually changed the lawyers' altitude.[154]

1.6.3 Airspace/subsurface and property law in socialist China

1.6.3.1 The four draft of Socialist Chinese Civil Code after 1949

The people's republic of China was built up in 1949; all the laws of the Republic of China were abolished. For a long time, there was only an effective marriage law in the Chinese civil law field. From 1955 to 1957, the legislation had tried four times to make a totally socialistic civil code, but the process was interrupted by the coming social movement, such as the "Anti-Rightist Movement" in 1958, the cultural revolution from 1966-1976.

From a historical perspective, the four drafts had tremendous differences in just 2 years between 1955 and 1957, especially in its definition of property.

In its first draft, according to section 28, "the object of civil right includes things and rights", and in section 29, "the object of the civil right, is the means of production, means of livelihood and other things, which can be possessed and dominated". It had set also detailed conditions of the property, which reflected its socialist ideology and the consideration of state safety.[155] Obviously, this code had adopted a very different way of

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[152] This translation is quoted from "the Civil Code of Republic of China", translated by Hsia/ Chow/ Chang, Shanghai: Kelly & Walsh, 1930, p.21. In its section 66, "Immovables are land and things permanently affixed thereto. The products of an immovable constitute a part of the immovable so long as they are not separated therefrom."

[153] *Xie*, On Property Right of the Civil Law, 2011, pp.171-173.

[154] Details see Chapter 1.6.3.2.

[155] The following sections regulate the perception of property by the socialism legislator in detail.

defining property from the continental dogmatic, under which the altitude on the property since the 1900s had changed. **Condition II** was roughly satisfied. In fact, this definition was deeply influenced by the Civil Code of Russian Soviet Federated Socialist Republic (RSFSR), as written in its subsection 2 of Article 1. Tasks of the Civil Code of the RSFSR, "The basis of property relationships in Soviet society is the socialist economic system and socialist ownership of the equipment and means of production." [156] However, the dominant priority of the code is state-ownership, and the scope of private real estate ownership was quite limited, and there would be no more space for the independent airspace/subsurface right.

From the second draft to its fourth draft, the theme of the property changed not so much, but the wording was, gradually, much more concise. Notably, in section 27 of the second draft, "things and rights are the means of production, means of livelihood and other property-interest-obtainable rights, which can be dominated by citizens and legal persons." The property concept seemed much more concise. However, the third draft adopted a different term, "the objects of civil rights are the means of production, means of livelihood and other property-interest-contained rights, which can be dominated by civil subject." Then the fourth draft used the term "property" (财产), [157]which were different from the former three drafts. Obviously, the legislators had totally changed their original terms in discussing the property. **Condition II** was satisfied. However, nearly all the real estate was either state-owned or collectively-owned after 1956, and it was hard to imagine

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Section 30" the following things and rights can be object of civil rights: (1) the things that are not forbidden by the State; (2) the property rights, obligation rights, as well as other legitimate rights with property interest, which can be transferred according to its character."
Section 31"Land can only be transferred, in the sense of civil right, according to its legal condition and process."
Section 32, the fixed assets of socialist economic organization, the state-owned buildings and equipment, should not be transferred to private individual; and also, should not be set as object of mortgage; should not be the object of legal enforcement to pay debt according to a court decision."
Section 33, the following things was forbidden to be transferred among private persons, (1) weapons, ammunition, explosive things, aviation parts, strong poison, highly chemical flammable substance, wireless equipment under restriction; (2) gold, silver, raw materials, silver coin, state public debt, foreign currency, nonnegotiable instruments, securities; (3) the file of government agency, social group, school, enterprise.
Section 34, all the things, which are forbidden or limited in civil relationship, can only be transferred within the limited extent under special law.
Section 36, all the transferable things and rights in civil law are protected by law. Nevertheless, nobody shall be permitted to harm public interest using the things and rights under his control.

[156] Gray/ Stults, co-translated. Civil Code of the Russian Soviet Federated Socialist Republic, University of Michigan Law School, 1965, p.1.

[157] Section 22, Except prescribed by law, all the property, including means of production, means of livelihood and other property-interest-contained rights, can be the object of civil rights.

airspace/subsurface right under such circumstances.

1.6.3.2 The GPCL of 1986 as a new beginning for Chinese property law

The Reform and Opening policy was a huge stimulation on the property law. The term "property (财产)" in the fourth draft was adopted by the General provision of civil law (GPCL) in 1986, which had dominated the Chinese property legal theory for more than 20 years. Nevertheless, the legislators had this time defined the property differently. According to Sec 71, "Property ownership means the owner's rights to lawfully possess, utilize, profit from and dispose of his property." In addition, in section 75, "A citizen's personal property shall include his lawfully **earned income, housing, savings, articles for daily use, objects of cultural relics, books, reference materials, trees, livestock, as well as means of production** the law permits a citizen to possess and other lawful property. A citizen's lawful property shall be protected by law, and no organization or individual may appropriate, encroach upon, destroy or illegally seal up, distrain, freeze or confiscate it." Obviously, this property concept was individual-oriented, with a wide scope and very concrete. Therefore, **Condition II** was satisfied. However, the land was mainly state-owned, absolute, sacred and inviolable (Sec.81; Sec.73), and accordingly, there existed no discussion of airspace and subsurface. (**Condition I** was not fulfilled.) Only the apartments could be the legitimate personal real estate. Therefore, the Chinese socialist property legal theories were still influential in China even after the political separation between the Soviet Union and China. It was because, on the one hand, most of the socialist legal scholars at that time received their education in the socialist countries, especially in Moscow University; and accordingly, there were somewhat "path-dependence". On the other hand, political separation only means the head of the two communist parties had different ideas in achieving their communist goal.

Therefore, there would be very little possibility to have some airspace/subsurface right, when most of the land, as well as the airspace/ subsurface, were state-owned.

1.6.3.3 The Chinese airspace/subsurface law in Japan style

The 2007 property law, to a large extent, was a copy of the property book of the German Civil Code. The legal term, basic structure, the sequence, and the theoretical basis were

all in German-style. Similarly, things were mainly corporeal things. Following the French Civil Code and the Civil Code of “Taiwan District”, it was written in Subsec. II of Sec. 2, “For the purposes of this Law, things include the immovable and the movables. Where laws stipulate that rights are taken as objects of the property right, the provisions of such laws shall prevail.” Did that mean **Condition II** was not satisfied? The specialty in China was that the property concept of GPCL was also effective. Accordingly, there were both “Sache” and “property” in Chinese civil laws, such dualism helped China to satisfy **Condition II**. In sections relating the land ownership, however, the legislators emphasized the state- and collective ownership, but ignored the up and down limit of the land surface. However, this loophole was compensated by section 136, “The right to the use of land for construction may be separately created on the surface, above or under the ground.” Following the trend of Japan and Taiwan, the airspace/subsurface law found its legal basis in Sec. 136 of the Chinese property law. From a systematic interpretation, it was convincing to believe the legislators had recommended the airspace/subsurface right in China, especially in the field of land use right for construction (similar as “Erbbaurecht”).

The Sec. 136 of Chinese Property Law looked like the Sec. 184a of the Civil Code of “Taiwan District”, and Sec. 269b of the Japanese Civil Code. This Japanese method was quite “cunning”. As we all know, both the Japanese Civil Code and the current Civil Code of “Taiwan District” are German-style, which means the scope of “Sache” was very limited. The cunning of this strategy was that, regardless of the scope of “Sache”, the legislators recommended the airspace/subsurface right within the field of the heritable building right (“Erbbaurecht”). It was because the heritable building rights were most urgently requiring an airspace/subsurface right in Japan and “Taiwan District”. This seemed a shortcut to achieve “airspace/subsurface right” while reserving the German-style property system at the same time.

However, this cunning way was just an interim period from the perspective of the author, because this regime “contaminated the purity” of German property system on the one hand, and on the other hand, hindered the formation of other branches of new airspace

rights. What's worse, they take the vertical heritable building right as a substitute of the general recommendation of airspace/subsurface right, which made it quite hard to mitigate the loopholes in different branches and caused discrepancies in law application in different regions, especially in China.

1.6.3.4 Chinese Civil Code 2020: a new journey or merely a repetition?

Now China was making a new Chinese Civil Code. The book of general provision had been finished in March 2017, and the other parts would hopefully be finished at 2020.[158] Within the book of general provision, the concept of property maintained the attitude of the property law of 2007. In section 114, "The parties to civil legal relations enjoy real rights in accordance with the law. A real right is the right holder's exclusive right to directly dominate a specific thing in accordance with the law, including ownership, usufruct, and security interest." which was roughly a repetition of Section 2 subsection II of the Property law of PRC 2007. Again, this did not mean **Condition II** was not satisfied. It was because, the "Sache-property" dualism would be maintained in the future Chinese Civil Code, which meant **Condition II** will still be satisfied. In addition, the Chinese legislators were trying to insert the newest development of social lives into the new Chinese Civil Code. Such as personal information (Section 111), data and network virtual property (Section 127).[159] What's more, they had also set the environmental protection (Section 9) as a general principle of Chinese Civil Code.[160] Obviously, comparing the "Sache" system, all these new elements could co-exist better under the "Sache-property" dualistic system.

For the book of property, the draft had not been fully published. However, the currently published information had revealed that there was no breakthrough for the part of airspace and subsurface. Section 136 of the property law of PRC would be maintained. Moreover, the land registry had also not many special rules for the airspace and subsurface.

As commented by prof. Jiang Ping, the new legislation was outstanding in legal reception

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[158] *Fu*, China will finish the draft of its Civil Code in 2020, by representative of National people's Congress on March 4 of 2017, published on the official website of the National People's Congress of PRC, at http://www.xinhuanet.com/politics/2017lh/2017-03/04/c_129501190.htm, newly visited at 1 June of 2018.

[159] Du, 4 Z. J. U. Law. Rev. 37, pp. 45-48.

[160] Section 9 The parties to civil legal relations shall conduct civil activities contributing to the conservation of resources and protection of environment.

(especially from the comparative law), but in short of creativity.[161] The protection of personal information, data, and network virtual property were just declaratory. It still required much more patience and time to arrange the whole code throughout, and then we could know whether these new things would receive full and effective protection under the new umbrella.

Therefore, in the future Chinese Civil Code, the property concept would be much more open, and the dualism of "Sache-property" would be maintained, nevertheless, the legal institute on airspace/subsurface would also remain the same (Japanese Style). However, the drawbacks of this strategy had already revealed in many aspects.[162]

1.6.4 Short summary

In ancient Chinese law, legislators in the agricultural society had ignored the value of airspace and subsurface. However, the ancient mining law and residential land provide a different perspective, the result is that subsurface and airspace are absorbed by the surface landownership (Condition I unsatisfied). In contrast, the history of Chinese legal modernization since the 1890s was much more fruitful.

Although China has adopted legal institutions from a wide variety of countries, e.g. French, Japan, Britain, the US, Soviet Union, etc., both the pre-socialist (from the 1890s to 1949) Chinese Civil Codes and the undergoing Chinese Civil Code are German-styled. In a word, Chinese legal modernization began with the German Civil Code and is now coming back to the German Civil Code. However, we have to admit, the German Civil Code had also changed dramatically during the last century, although its basic structures were maintained. As Germany has been growing from an early industrial country to a developed urban society, some agricultural stipulations are not so frequently used as before. In recent decades, both Germany and French had "modernized" their law of obligation, which can be regarded as the endeavor to keep pace with the high speed of

[161] *Jiang*, Book of the General Part of Civil Code is outstanding in Legal Reception but short for Creativity, published at Caixin news, with website address: http://china.caixin.com/2017-03-20/101068173.html, newly visited at 6 June 2018.

[162] See Chapter 3.2.3, Chapter 3.3.3, Chapter 4.4.3, and Chapter 4.5.3.

change. However, this did not mean in the field of property, there is no need to update. Therefore, China cannot easily copy German Civil Code words by words, as it did a century before. Nevertheless, it would also be unrealistic to totally escape from the basic structure of the German style. Therefore, the change must be based on modern social need and the legal resources in hand.

From a comparative perspective, the Chinese "property-Sache" dualistic system is relatively open, and the Chinese property law had already tried make the airspace and subsurface right more compatible, although section 136 is still at the very primary stage. Currently, the Chinese airspace and subsurface right is in the crossroad. As introduced in the previous paragraphs, for the airspace/subsurface right, there are German-Style, the US-Style, and the Japanese Style. Currently, the Japanese Style is most influential in China mainland and "Taiwan district" are the, which is not beyond criticism. However, the German Style is also not easy to adopt, as the requirements of high-level interpretation techniques, the interactions between public law and private law and highly qualified judges. The US style seems a choice, but Chinese law is not based on common law. What should China do next? This is also one of the central concerns of this dissertation.

1.7 Summary of this Chapter

1.7.1 Unfulfillment of the two conditions: why are there always obstacles?

As explained in Chapter 1.2, there are roughly two conditions set at the very beginning of this chapter, which could make the airspace and subsurface right possible. However, under the French Civil Code, the common law, the Japanese Civil Code and the ancient Chinese real estate law, the airspace and subsurface were absorbed by the land surface, which had precluded the possibilities of airspace and subsurface right. The airspace was regarded as an indispensable part of the land. Therefore, the first condition is not satisfied. The earth is flat, and the surface landownership should contain the airspace above and subsurface underground, such viewpoints were shared by many countries, which is irrelevant with whether it has a real or pseudo-Roman historical basis ("*cujus est solum*"

principle), why? The low technology and social need of the agricultural society had limited the human perception of the world and their imagination of a vertical real estate legal system.

This trend was changed by the German Civil Code and its follower, such as the Civil Code of Republic China. They tend to regard the surface land ownership is limited, which leaves some room for the development of airspace and subsurface law. However, such designs in civil law theory only fulfill the first condition but not the second condition. They defined things as the corporeal object, which leaves airspace and subsurface outside the scope of the property. Therefore, the German law and its followers failed to have an airspace and subsurface right due to its strictness of property object. All these problems in each country could explain the late birth of airspace and subsurface right.

In contrast, the ancient Roman property law satisfied both the first and the second condition, which might cultivate an airspace and subsurface right. However, the ownership of airspace and subsurface, as commented by Jhering, was beyond the imagination of Roman lawyers, although their consideration of the importance of airspace has been revealed in some fragmented materials.

The modern challenges in urban society had changed the traditional appearance of airspace and subsurface law. The aviation industry, the modern condominium apartment, the underground parking lot, etc., all are demanding a real change in airspace and subsurface right. Therefore, it would be unfair to blame the horizontal property law, or to blame some countries did not satisfy the first condition, while others did not fulfill the second condition. Most of the current situations could be explained by the economic stimulation and social need. Therefore, urban society is the soil for airspace and subsurface.

All in all, the hardship of airspace/subsurface right is that they are immovable, but different from the traditional real estate, which normally contains land or buildings. People can see and touch the land, the buildings, etc., however, the airspace is a transparent vacuum, when we touch, we are really touching air, but not the airspace. Therefore, the airspace/subsurface is rather an abstract physical existence. This

contradiction is caused by the traditional standard of division, our ancestors had relied too much on the human senses: see, hear, touch, taste, and smell. Normally, the immovable can be seen and touched. However, airspace/subsurface is a kind of immovable, which cannot directly be seen or touched. The human sense is right for most of our daily lives, however, after the industrial revolution, the drawbacks of the basis of these divisions have also revealed. In other words, we still use an outdated and inaccurate tool to divide the modern legal object, which would inevitably lead to a dilemma.

In summary, the airspace/subsurface exists above and below every parcel of land, and can be measured and registered by the modern registry. Therefore, the airspace/subsurface is a "new" kind of incorporeal "real estate", which requires a very mature modern land register system. Alternatively, the airspace/subsurface right is only feasible, when there exists a solid legal and technical background and great social need for the development of airspace/subsurface.

1.7.2 Industrial revolution as a basis for airspace/subsurface right: a modern phenomenon

Another conclusion from this Chapter was that the subsurface and airspace rights were only possible after the industrial revolution. However, the above introduction focused on the developments in legal history, some social and economic changes should still be illustrated.

The progressive technological change, the modern urban lifestyle, and the enormous potential economic value on airspace and subsurface are the main stimulus for subsurface and airspace right. Historically, this pressure had occurred since the 1840s, when the modern industrial sectors had emerged. In fact, the earliest separation of subsurface from land happened in the modern mining law. The tremendous need for coal and steel in the industrial society had changed the ideas of land property. For example, the US federal mining law of 1866 was a consequence of the gold rush.[163] However, as noted by Jürgen

[163] See Chapter 1.5.2.

Osterhammel, the 19th century is a "century of coal (Das Jahrhundert der Kohle)".[164] Germany, the US, and China in the late 19th century had all recognized the significance of coal during the process of industrialization.[165] Therefore, the mining right had justified itself through social need.

The rise of mining law had also dramatically changed people's ideas on land subsurface, which was historically not a common law phenomenon. It had also happened in ancient China (salt mining)[166] and in the European continent (such as Germany).[167] However, the enormous economic needs of coal and steel had stimulated the modern mining industry, which totally changed the significance of land surface and subsurface. Concretely, in the previous agricultural society, the land surface is most important, because no plant can grow up without land surface, the houses would also be built up over the land surface. In contrast, in industrial society, mining itself can be much more profitable than growing crops.[168] Therefore, the mining right should be respected due to its social need. The mining right gradually separated from the land property right. "The mining law of the US had its beginning with the discovery of gold in California and the rush there with its forty-niners." During that time, there were over 500 hundred "mining districts", which had attracted people around the world. Accordingly, the gold rush was an unimaginable scale of immigration in an agricultural society.[169]

Actually, this was just a tip of the iceberg, because industrial revolution and the following waves of technological revolution had totally changed people's lives, among which the most dramatic changes happened in the urban areas. Another revolution had happened in transportation: the age of aviation. Just shortly after the invention and prosperity of planes, the lawsuits between the airport and landowners had become commonplace. Consequently, the aviation legislation is necessary, and a proper limit of the property right seems inevitable. Because under the Roman "ad coleum" Maxim, the aircraft would inevitably infringe the surface landowner's property right.

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164 *Osterhammel*, Die Verwandlung der Welt, 2011, p. 928.
165 *Shellen*, Empires of Coal, 2015, pp.129-159.
166 See Chapter 1.6.4 of this dissertation.
167 *Willecke*, Die deutsche Berggesetzgebung, 1977, pp.15-29.
168 *Umbeck*, 20 J. Law & Econ. 421, p. 421-425.
169 *Costigan*, Mining law, 1910, p. 300.

The development of architectural technology and the trend of urbanization had reshaped the citizens living form. Skyscrapers become a modern sign of new urban culture; the US urban districts had become an empire of skyscrapers. Coping with the trend of urbanization and migration into the cities, the Condominium had gradually become a dominant form in modern urban life After WWII. Accordingly, there are new problems on effectively using the airspace and subsurface, e.g. the use of exterior walls, the allocation of underground parking lot among condominium owners. In a word, the new form of using airspace (condominium) had brought new problems of airspace and subsurface within the condominium property right.

On the other hand, there was enormous potential economic interest behind airspace and subsurface. In the US, the trade of airspace right in the city center would be an astronomical figure. In China, the underground parking lot per square meter is dearer than the condominium apartment. The negative easement is also profitable in urban society. Therefore, the real estate law should provide answers to the new types of property, and building up new legal orders for these objects.

As we all know, technological evolvement is a double edge sword. It had caused fatal environmental problems for the earth, as people were enjoying its convenience and benefits. Therefore, there are calls for building up “green city”, “ecological city” or “the sustainable city” in recent years.[170] The remaining airspace and subsurface had obtained a brand-new meaning: environmental protection and space for a green economy. For example, much of the urban and suburb airspaces are used for wind energy equipment or solar penal as a priority. To some extent, this function of the airspace and subsurface can also be regarded as a by-product of the technological revolution.

In short, the industrial revolution had changed the traditional way of land usage. In contrast, they had endowed new meaning on the airspace and subsurface of land. For example, in a modern city, the landowner could enjoy her land by building beautiful houses and drinking tea in the garden. While at the same time, there were planes flying above her land plot, a piece of the solar panel above the roof of her house, the underground

[170] Beatley, Green Cities of Europe, 2012. See also Newman/Matan, Green Urbanism in Asia, 2013, pp.7-80.

sewerage pipes, power cables vertically under her feet, and in the deep earth under her land plot, the miners were silently drawing crude oil through pipelines. Actually, this picture is not rare in modern urban lives, the only differences among countries are, how to achieve this picture through legal institutions and mechanisms.

Industries, transportations, residential buildings, green energy, infrastructure, are all indispensable functions of a modern city. Therefore, the above-listed phenomenon could be regarded as different branches of airspace and subsurface in modern urban daily life. What's more, nearly every aspect requires some volume of airspace and subsurface. As all these problems related to urban management and public service, the modern state could not ignore them. Although airspace and subspace were at the very beginning not regulated specifically in the different legislation, all legislation saw the necessity to adapt to challenges from airspace and subspace usage. What's more, these topics are also central concerns of the following chapters of this dissertation.

Therefore, the general and macro scope of study of the airspace and subsurface right in current law is required. As discussed above, in China, the US, and Germany are dramatically different from each other in historical backgrounds, currently legal frameworks and regulatory strategies on airspace and subsurface. However, there were still common features in three categories, which would help us to clarify this new legal field.

1.7.3 The definition of Airspace/subsurface right revisited

Considering the strategies adopted in Germany, the US and China on airspace and subsurface in history, although they were quite different from each other, there were still some common features, which would help us to clarify what are airspace and subsurface rights, and how they functioned. An airspace and subsurface law should answer the following questions: How could the airspace/subsurface right in vertical direction technologically possible in property law? Where did the airspace and subsurface right exist? Alternatively, where the surface landownership ended, and the parallel airspace/subsurface rights began? How many kinds of airspace/subsurface right existed?

How could the airspace/subsurface right be specialized? How did the airspace and subsurface function in different jurisdictions?

In order to answer these questions, a systematic study of airspace/subsurface law was inevitable, which contained at least the airspace/subsurface law in general and in different branches. Correspondingly, dealing with these different categories, the airspace and subsurface law were used under dramatically different meanings. Concretely, **for the airspace/subsurface in the widest sense**, it included all the activities happen in our planet, both the private law and public law, which using the airspace/subsurface was within the scope, e.g. the usage of the sea, the fishing rights, the hunting rights, the aviation law, the mining law, the infrastructure law, the condominium law, the building law, and the planning law, etc.; **for the airspace/subsurface in the middle scope**, it dealt with most of the airspace/subsurface issue within property law, including the ownership and restricted property rights on airspace/subsurface, the rules on the register and transfer of the property rights on airspace/subsurface, and the rent, mortgage rules, etc.; **for the airspace/subsurface in the narrowest meaning**, it related to the airspace/subsurface matters within different branches, for example, the use of the airspace/subsurface in the exterior wall of with a condominium, or the allocation of underground parking lot. Therefore, the definition listed at the beginning of this chapter was just the most common concept, but not the whole. In fact, the airspace/subsurface legal system was very comprehensive.

The following Chapters would try to draw a picture of the general airspace/subsurface right (Chapter 2), and then clarify how the airspace and subsurface functions in both negative sides (Chapter 3) and positive sides (Chapter 4) within different branches.

Chapter 2 Subsurface and airspace right in general

2.1 The basic structure: airspace/subsurface law in three layers

As summarized in Chapter 1.7.3, the law of airspace/subsurface should answer a series of modern questions, which requires a systematic study in general and in branches. In fact, the three meanings for airspace/subsurface from the widest to the narrowest sense, are corresponding to the three layers of airspace/subsurface law, which is also its basic legal structure.

The first layer is the general legal order on airspace and subsurface. After adopting a vertical perspective on land, a separation from the surface land ownership and the vertical airspace/subsurface right seems necessary. Above which height is for aircraft navigation, under which height is especially for mining. In urban society, the traffic light, the sewerage system, the electricity pipeline, etc. All these things would occupy some space, but there requires a legal order to unify them. Therefore, in the first layer, all the relevant public and private laws get together to draw a picture of airspace/subsurface usage, and every law is solely or combined responsible for some height or depth.

Therefore, the airspace and subsurface right should first clarify the general legal order of airspace and subsurface law. Nearly all modern countries have such divisions, as this division is the basic prerequisite of urban society. In addition, besides clarifying the general vertical legal order, the function of the first layer is to make sure the boundary of airspace/subsurface right in property law, because the first layer is the foundation of the second and the third layers.

The second layer is the general property rights on airspace/subsurface. As illustrated above, this layer is within the property law and is related to all the routines of a typical property right. Such as the rules of ownership, register, transfer, mortgage, etc. However, due to the differences in the openness of the property system, not all countries would accept such a general airspace/subsurface right within property law, such as Germany. However, German law has its own solutions, which would be illustrated in the following chapters. The general airspace/subsurface right is accepted among the different States in

the US. In contrast, under the Japanese style, both mainland China and "Taiwan district" has some ambiguity in the stipulations of property law, although there seems no doubt of accepting a general airspace/subsurface right by scholars. Therefore, under the Japanese style, much endeavor must be made by the judges through legal interpretations.

The third layer is airspace and subsurface law in different branches. Comparing with other property rights, the uniqueness of airspace and subsurface are that they need to be clarified through other relevant laws, especially the administrative laws. Because without the interpretation of these laws, it is hard to draw the boundary of airspace and subsurface from the surface land ownership. Therefore, the aviation law, the mining law, and many other laws are all useful tools to build up the legal order of airspace and subsurface.

In the US and Japan, both the condominium and the superficies are regarded as typical airspace/subsurface right. This had influenced mainland China and "Taiwan district." However, in Germany, although the Section 1 of Heritable Building Act had literally mentioned "to build something above or below the land surface (auf oder unter der Oberfläche des Grundstücks in Bauwerk zu haben)", the legislators were not aiming at building up an airspace/subsurface right within heritable building rights. In the later development, there was also no special link between vertical land use and the heritable building rights in Germany.

Therefore, in order to illustrate the whole legal system of airspace/subsurface right, this dissertation would have to select the most representative field to discuss.

Firstly, this chapter will list the general vertical legal order of airspace/subsurface, and introduce the general property rights on airspace/subsurface (Chapter 2).

Secondly, in order to illustrate how the general vertical legal order works, the detailed case study would be made to illustrate the boundary of airspace/subsurface. (Chapter 3), the landowner use airspace right as a defense against the overflight. In such a relationship between the surface landowner and the aircraft owners (airspace user), the airspace right of the surface landowner was always used as a weapon of defense.

As the condominium and the superficies were regarded as most representative branches of airspace/subsurface right in the US, Japan, and China. However, in Germany, the

heritable building right was not used to typically deal with such problems.[171] Therefore, this dissertation selects Condominium as a common basis to illustrate the jurisprudence of airspace/subsurface law. On the one hand, why condominium was regarded as a typical kind of airspace/subsurface right; on the second hand, the importance of general property rules in dealing with the airspace/subsurface allocation within a condominium, especially when there were loopholes in the common areas (Chapter 4).

In the relationship between different condominiums owners using their exterior wall or underground parking spaces, the positive side of airspace/subsurface law become effective. In such relationships, the effective use and allocation of undefined airspace and subsurface become a central concern.

2.2 The general vertical legal order of airspace/subsurface

As illustrated in the first chapter, the basic structure of the vertical airspace/subsurface legal order was the division land surface, and the airspace above the land surface, and the subsurface under the ground. Although the high airspace and subsurface were occupied by industrial activities, such as aviation and mining, the land surface was still the most valuable part of the entire system. Therefore, the sequence of introduction would be based on land surface, airspace above, subsurface below.

2.2.1 The general vertical legal order of airspace/subsurface in Germany

In Germany, section 905 of the German Civil Code is the key to the whole system, because it sets the basic division of the land and its airspace/subsurface on the one hand, and on the other hand, sets the basic jurisprudence of such division: the “duty to bear-public law justification” rule.

2.2.1.1The legal structure of surface land ownership: under 300 meters

2.2.1.1.1 Section 905: the height or depth where the landowner has no interest

In Germany, the land is mainly owned by private individuals. However, ownership is no

[171] See Begründung zur Verordnung über das Erbbaurecht, vom 15. Januar, 1919, in: Deutscher Reichsanzeiger und Preußischer Staatsanzeiger den 31. Januar, 1919, pp.1-2.

longer an absolute right. On the one hand, the property has a social obligation; on the other hand, land ownership has its physical limit. As the vertical land use become possible, a redefinition of real estate right leads to the "confined land ownership". Which is clearly expressed in section 905 of the civil law (BGB) with the title "Restriction of ownership", "The right of the owner of a plot of land extends to space above the surface and to the subsoil under the surface. However, the owner may not prohibit influences that are exercised at such a height or depth that he has no interest in excluding them." This section had firstly revealed that the ownership of land would not include the land surface but stretched to its airspace and subsurface vertically. Accordingly, the landowner had the right to exclude others from infringing her/his airspace or subsurface. Furthermore, the infringement is not limited to current interest but also include future interests.[172] However, this right in airspace and subsurface is not unlimited; it should be limited to the extent of her/his enjoyment of the interest of the land. In fact, further questions could be asked in light of the US management on airspace and subsurface. Firstly, within the scope of the surface landowner, could the landowner sell his airspace (which he might not be able/unwilling to develop financially) to someone who wants to use such airspace? Secondly, who owns the airspace and subsurface where the landowner has no interest? Or is it free to public use? Alternatively, who have the right to use such airspace and subsurface? Obviously, these airspaces and subsurface are significant resources in urban society. However, the German logic seems different, instead of privatizing or commercializing the airspace and subsurface, they tend to leave this right "dormant" when there are no legal conflicts.

In German law, section 905 of the German Civil Code is the eye of airspace and subsurface right. Because this section forms the skeleton of airspace and subsurface right. As mentioned in the previous paragraphs, on the one side, this section had indicated the surface landowners have legitimate right on its vertical airspace and subsurface but was limited the height and depth of the landowner to where he/she have interest. However, this is just half of the picture, as it indicated that the vertical neighbor might have the right

[172] *Roth*, in: Staudinger BGB (2017), Sec. 905, para.5.

to airspace and subsurface. Then the legal order of airspace and subsurface at different height and depth would come into being in the urban areas. In fact, this part is very limited and uncommercialized in Germany.

2.2.1.1.2 Section 906 and the private neighbor relationship: legal order of land surface

It worth to note that section 905 is in itself not a claim, the landowner could use section 1004, or section under 906, or section 823 of German Civil Code.[173] The legal system of airspace and subsurface in private law consists of these rules. Concretely, section 906 is the General norm of the private neighbor law (from section 905 to section 924), which related to the landowner and other legitimate right holder's right to exclude pollution (mainly) from their neighbor and the obligation to bear without compensation.[174] The equilibrium point between the two is whether the interference had constituted a "significant/material interference". However, this section located in the first part of the "book of property" in the German Civil Code, which mainly related to the content of ownership. Therefore, section 906 in itself is also not a basis for a claim (Anspruchsgrundlage), which would have to use in combination of section 1004.[175] For the content of section 906, it mainly related to environmental pollutions, such as the introduction of gases, steam, smells, smoke, soot, warmth, noise, vibrations, and similar influences. Therefore, there also exists the competition of legal remedy (Rechtsbehelfskonkurrenzen) between section 906 and section 22 of Federal Environmental control law. Accordingly, the plaintiff generally has the freedom to choose between the two remedies.

Similarly, there is also competition between section 906 and section 1004. For the protections on property law, section 1004 would apply, while section 823 is responsible for the remedies in tort law. Furthermore, section 906 is also an element of a tort (Tatbestand), say, the unlawfulness (Rechtswidrigkeit). If an influence only constitutes an insignificant interference, the landowners and other relevant right holders had the obligation to bear, which means there were no unlawfulness on tort law, and therefore no

[173] *Rösch* in: jurisPK-BGB (2017), § 905 BGB
[174] *Wilhelmi* in: Erman BGB (2017), § 906 BGB, Rn.3.
[175] *Roth*, Staudinger BGB (2017), § 906, para. 3.

tort responsibilities.[176] In legal practice, this legal system within private law is much more complex, which would be discussed with cases in the following paragraphs.

2.2.1.1.3 The legitimate the restrictions on section 905 under public law

In fact, section 905 of the German Civil Code has adopted a theory of "limited interest", which makes the distinction between real estate right and the right of subsurface and airspace possible. Section 905 leaves spaces for the restrictions of land ownership by laws and regulation both at the federal level and state level. Actually, the various public laws reshape and consist of the real legal body of the airspace and subsurface law. Again, in this branch, section 905 only partly explains "why" the vertical use of airspace and subsurface is possible, but is by far not enough to explain "how". Therefore, only in combination with the relevant public laws, we know how the surface land ownership is limited, and what kind of rights his vertical neighbor might obtain. Alternatively, how is the airspace and subsurface law functioned at the height and depth, where the surface landowner has no interest.

It is normally discussed under the title of "social obligation of property law (Sozialpflichtigkeit/Sozialbindung des Eigentum)" in German law, to deal with the extent in which property rights, especially the real estate, are confined by the building law (BauGB), nature protection law and monument protection law (Naturschutz- und Denkmalschutzrecht), street and transportation law, and also many other public laws.[177] In addition, the German land utilization law regulates how the cities land would be used.[178] For example, there exist a series of laws and judgments about the use of airspace by aircraft, the use of land by near traffic and street, the use of land by a public supplement company, as well as the groundwater and mining rights.[179]

2.2.1.1.4 The real picture of land surface legal order: 300 meters as a boundary line?

Firstly, as stipulated in section 905 of the German Civil Code, the land ownership has its

[176] *Wilhelmi* in: Erman BGB (2017), Sec. 906, para. 3.
[177] *Schellhammer*, Sachenrecht nach Anspruchsgrundlagen, 2017, p. 54.
[178] Such as the division of living area (§4, §4a), rural area (§5), mixed area (§6), pivotal area (§7), commercial area (§8), industry area (§9), parking place by renting and garage (§12). This law will decide how a concrete parcel of land will be used, and in each type of land there exist some limitations for its use, such as coverage ratio, floor space ratio, and cubic index (§17). See Fickert/Fieseler, Baunutzungsverordnung, 2014, Sec. 17, para. 8-29.
[179] Franz Säcker, in: Müchener BGB (2017), Band 6, Sec. 905, para. 1-6. The detailed cases would be discussed in Chapter 3-5 of this dissertation.

limits in both height and depth, to where the landowner has interest. However, there was no exactly height limitation within the "book of property". Why is that? It is partly because the legislators are also not sure, to which height or depth the surface land ownership should end. And it is partly due to the nature of this problem, which could be traced from case to case by the court[180] and predictably changes from time to time. Actually, although this section leaves much work to the judges for legal interpretation, had also provided the flexibility and space for the future development of airspace and subsurface law.

Due to the flexibility of section 905, the interest of landowner in German law is determined by its concrete usage. For example, in the urban areas, the most common usage of the land surface is the buildings. From a practical view, the buildings range from several meters to more than three hundred meters in Germany.[181] For example, the commercial bank in Frankfurt is 259 meters high, and 300 meters high with its antenna, which is the highest building in Germany. What's more, in Frankfurt, there are over 30 buildings higher than 300 meters.[182] Nevertheless, there are evidently not so many skyscrapers in the whole of Germany as that in American or the east coast of China. Even in big cities like Hamburg, Berlin, there are not so many skyscrapers. In fact, the heights for high buildings are normally less than 100 meters.[183]

Within this vertical space, the land ownership (Grundstückseigentum), the condominium ownership (Wohnungseigentum), the neighbor relationship (Nachbarrecht), and other property rights function as the main legal institutions for the focus of this dissertation.[184] Naturally, the owner of the skyscrapers of over 300 meters should have a legitimate interest to that height, as well as several meters higher than that to guarantee the

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[180] *Roth*, Staudinger BGB (2017), Sec. 905, para.2.

[181] For example, the Hamburg Building law had stipulated that the high of a living house can be divided into three categories, (1) the house lower than 7 meters, (2) the house height between 7 and 22 meters, (3) the house higher than 22 meters. The last type (over 22 meters) was regarded as high building in Hamburg. See Hamburgische Bauordnung, Sec. 2, Sec. 25-27.

[182] According to a report, there are still 13 places for the high buildings in Frankfurt, see Rainer Schulz, Mehr Raum für neue Türme, Frankfurter Allgemeine Zeitung, March 12th ,2016. For its current information for high buildings, see: http://www.frankfurt.de/sixcms/detail.php?id=3793412.

[183] 20 meters to 50 meters is a normal data for high buildings in Germany, and mostly situated in the cities.

[184] Naturally, the other kind of law can also exist in this area, its vertical structure is substantially a result of several laws, especially the §126 of building Code (BauGB), § 76 of the telecommunication code (TKG), and § 32 of the Passenger Transportation Act (Personenbeförderungsgesetz, PbfG). Siehe BGB Kommentar, 11. Aufl. Lemke, §906, Rn. 3.

enjoyment and safety of this skyscraper. The landowner had the freedom to build up high buildings as long as permitted by the zoning authority. From the perspective of air traffic control law, when flying above the urban area, highly inhabitant area, industrial buildings, people assembled area, unfortunate places, such as catastrophe area, the lowest safe flying attitude is 300 meters. Therefore, 300 meters might not be regarded as a top limit for a surface landowner in Germany. New record might be made according to social need.

However, would it be absurd, if a two-story house owner (within 10 meters in height) require the same right of airspace for 300 meters as the skyscraper's owner? The US logic is that the surface landowner can enjoy more airspace than he could use (he really needed), and this is the starting point of the regime of "transferable development rights". However, it seems that German law does not follow this logic. What the German lawyers concentrated is the airspace really occupied by the surface landowner. Accordingly, the interest of prohibition (Verbietungsinteresse) should be determined on a case by case basis, it should be concrete (rather than abstract).[185] Moreover, the "interest" within section 905 can be any interest that deserves protection, if only it related to the use of land plot. The criteria were set roughly based on the generally accepted view (Verkehrsanschauung), which should pay more attention to the concrete "local conditions (örtliche Verhältnis)" between the infringement and the interest of landowners.[186] The future interest is also protected if it is not too far away and impossible to realize.[187] This section is also applicable to public law, in which situation the public use of land airspace or subsurface had interfered the surface landowner. For example, the owner of an unconstructed land had the interest to prohibit the installation of municipal sewerage pipe at a depth of 1.7 meters according to section 905 and section 1004 of the German Civil Code.[188] Furthermore, the interest of the landowner could even be without economic value, but merely of purely aesthetic value. For example, the road owner could prohibit an over-hanged advertisement, as it had made the scenery of the locality ugly. A more

[185] *Roth*, Staudinger BGB (2017), Sec. 905, para.3.
[186] BGH, Urteil vom 23. Oktober 1980 – III ZR 146/78, –, juris.
[187] BGH, Urteil vom 01. Februar 1994 – VI ZR 229/92 –, BGHZ 125, 56-68, –, juris.
[188] Although there are different ideas between district and differences among these types of cases, the recent case had shown an emphasis on the respect of the interest of the owner. See VG München, Urteil vom 19. April 2007 – M 10 K 06.1472, –, juris.

interesting interest within this section is that the landowner's right to see the free sky, which could prohibit the cable line from crossing his land in the airspace.[189]

In addition, there are not only buildings but also roads, forests, lakes on the land surface. In Germany, the land of road and street can also be privately owned. The owner of such areas was treated differently from the landowners for buildings. For example, the common use (Gemeingebrauch) of the forest should allow the right to go across and the right to collect fruit and mushrooms in the forest.[190] Moreover, there are water rights of common usage within the state legislative power. An extreme example is a Bavarian state, in which the owner of the water body (Gewässereigentümer) should provide their water to the public without permission for all economic use or give grant and permission free of charge.[191]

2.2.1.3 The vertical neighbor relationship under 300 meters

Actually, the most valuable airspace is the altitude below 300 m. Because this area can be used to serve different purposes, e.g. the traffic, the infrastructure, the dwelling the huge urban population. Accordingly, there are conflicts between different usages.

2.2.1.3.1 Vertical neighbors and the use of airspace

Again, we meet the problems of drawing the boundary between the surface land ownership and their "vertical neighbors". The land ownership extracted to the height, where the owner had interest. In addition, the basic rules to interpret "interest" had already been discussed above. Actually, the interest within section 905 is not enough to set a fee for the permission of the usage of the airspace. For example, the landowner has no commercial interest, when a zeppelin flying above his land with an advertisement appearance at a considerable height, or a sports airplane with a banner advertisement hanging below. In such situations, the landowner has no right to prohibit according to section 1004. However, there exist some possibilities under competition law.[192]

In practice, the use of the airspace of the street is very common, which includes the above power cables for the tram, the lines for public utility companies, the lighting equipment,

[189] RG, Urteil vom 29. Oktober 1904 – V 165/04 –, RGZ 59, 116-120, –, juris.
[190] *von Rinck*, MDR, 1961, p.980.
[191] See Bavarian Water Law (Bayerisches Wassergesetz, BayWG), Sec. 4.
[192] *Barber*, WRP, 2006, pp. 184 - 188.

the traffic signs, or overpass, etc. The street owner had generally the right to prohibit long-term use of the airspace. However, “the right to prohibit” is limited by the “public use” and “the use of residents nearby”. When the canopy of a restaurant 3 meters above the land surface, had inserted into the airspace of a busy street in a big city, the street landowner had no obligation to bear according to section 905 subsection 2. Moreover, using the street airspace for light advertisement at a height of 10 meters is also not permitted by section 905 subsection 2. On the contrary, the right to prohibit does not exist in a situation that the gas station hose infringes the airspace of the street when refueling the car.[193] In Germany, a traditional form of shop sign was called “nose sign (Nasenschild)”, which would be hanged two or three meters above the ground and inserted into the airspace of the street. The street landowner has the right to preclude according to section 1004 of the German Civil Code.[194] This rule is also applicable to the vending machine, which stretched into the airspace of the street airspace.[195]

2.2.1.3.2 Airspace right and the vertical neighbor

For the normal private land plot, the airspace disputes happened mainly within the scope of the neighbor relationship. Generally, the landowner has the right to preclude the neighbor from infringing his airspace. For example, the landowner could preclude his neighbor from putting the construction crane into his airspace. In a recent case, the crane located at a height of 25 meters,[196] similar legal effects would happen in rainwater gutter, the oriel, the “encroachment of the heat insulation (Wärmeschutzüberbau)”, cable railways (Drahtseilbahnen) at a height of 9.5 m,[197] which occupies the airspace of the neighbor’s land.

For the power cable, the landowner had also no obligation to bear in general. However, the public telecommunication cable could use the airspace of the traffic road free of charge, according to section 68 subsection 1 of the Telecommunication Act. For the normal land, section 76 of the Telecommunication Act is applicable, under which the landowner has the obligation to bear the use of airspace. However, this does not mean the

[193] RG, Urteil vom 07. Februar 1936 – V 183/35 –, RGZ 150, 216-227–, juris.
[194] As such kind of signs insert into the airspace of street, which looks like a nose of a face.
[195] BGH, Urteil vom 04. Mai 1973 – V ZR 176/71–, juris.
[196] OLG Düsseldorf, Urteil vom 26. Februar 2007 – I-9 W 105/06–, juris.
[197] OLG Kassel OLGE 18, 121–, juris.

telecommunication cable could use the land airspace in any way it wishes. In practice, the land plot would sometimes suffer substantial infringement by the mere installation of the cables, when the cable installation infringed the usage of the land surface for long-term. The court should balance the conflicting interest in such a situation.[198] In addition, the landowner has the obligation to bear the sign for the bus stop, tram stop, the subway station and other stations of public transportation by the section 32 subsection 1 No. 2 of the passenger transportation act. Furthermore, the landowner shall "tolerate on his land the erection of 1. Fixtures and supply lines for street lighting including streetlamps and accessories, and 2. Identification plates and signs for local public infrastructure". And "the owner shall be given advance notification." Which is stipulated by section 126 of Federal Building law.

For the normal public use, the landowner had normally no right to exclude. For example, putting the dustbin along the street, or putting the bulky waste (Sperrmüll) in the previous day by the resident nearby (Anliegergebrauch). However, for the special usage of the airspace, the street landowner could charge for the usage. The municipal, as street construction authority, could make rules on the usage of the airspace of the street at higher altitude, which would reduce dispute on the airspace and save the fees.[199]

2.2.1.4 The airspace above the land surface: legal order above 300 meters

Although the maxim "*cujus est solum, ejus usque ad coelum ad infernos*" had substantially played a role as a bridge connecting the ideas of property between medieval time and the modern western countries, it had only very limited influence on the German Civil Code.[200] Actually, the German lawyers had regarded this maxim as merely a theoretical description.[201] However, this widely accepted maxim had suggested that the landowner in ancient times have no ability to make full use of this space but setting the airspace and deep subsurface aside. In contrast, modern technology has made the usage of airspace feasible and profitable.[202]

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[198] BVerfG, Kammerbeschluss vom 25. August 1999 – 1 BvR 1499/97–, juris.
[199] *Roth*, Staudinger BGB (2017), Sec. 905, para.25.
[200] Theoretically, the German saying was similar, but much more exaggerated, which would extend the landownership to the moon (bis zum Mond). *Roth*, Staudinger BGB (2017), Sec. 905, para.5.
[201] *Roth*, Staudinger BGB (2017), Sec. 905, para.5.
[202] Especially the development of the building technology, the aviation technology, the telecommunication technology in Germany, whose relevant cases will be discussed in the following Chapters.

As is known, the earth is surrounded by the air. However, the airspace at different altitude was not equally treated by the law. For example, the outer space had a significantly different legal status.[203] Therefore, the first boundary should be drawn between airspace and outer space, then the airspace at different layers.

For the up limit: According to the consensus of the legal and technical professionals, 100 km above the earth surface is currently regarded as the extreme attitude for aviation,[204] which is also a result of the limit of current technology.[205]

For the lowest height of aviation by German law. Ordinarily, people regard all the space beyond the land surface ownership as airspace. Actually, the German law restricts the lowest flying attitude through section 37 of the "airspace traffic regulation" (Luftverkehrs-Ordnung), which is in accordance with the corresponding European Union law.[206] Actually, there are already "Standardized European Rules of the air" for such kind of technical rules.[207] When flying above the urban area, highly inhabitant area, industrial buildings, people assembled area, unfortunate places, such as catastrophe area, the lowest safe flying attitude is 300 meters. While flying above the area near the highest obstacles, the lowest safe flying attitude is 600 meters, and in other situations, the limit is 150 meters over ground and water surface.[208] The bridge and similar buildings as well as aerial line and antenna, should not be flying through from beneath. Further, according to safe flight rules, the lowest flying altitude for a cross-country flight, with a motor-drive flying

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[203] The airspace is subject to the aerial sovereignty of a state, which is not only written in Chicago Convention of 1944, but also in so many domestic laws all around the world. While the outer space is according to international law the common use space and resource.

[204] *Meyer*, Luftrecht in fünf Jahrzehnten, 1959, p. 58. See also Hobe/Ruckteschell/Heffernan, Cologne Compendium on Air Law in Europe, 2013, p.206.

[205] It is because in 80-90 km, the airplane will have to accelerate in the thin air to get enough support, but at that attitude, to keep its speed, the airplane would even melt. And the attitude for the lowest satellite's orbit would be at approximately 90 km. See Hobe/Ruckteschell/Heffernan, Cologne Compendium on Air Law in Europe, 2013, p. 207.

[206] Commission implementing Regulation (EU) No 923/2012 of 26 September 2012, laying down the common rules of the air and operational provisions regarding services and procedures in air navigation and amending Implementing Regulation (EU) No 1035/2011 and Regulations (EC) No 1265/2007, (EC) No 1794/2006, (EC) No 730/2006, (EC) No 1033/2006 and (EU) No 255/2010.

[207] Section (f) of the SERA.5005 Visual flight rules:
"Except when necessary for take-off or landing, or except by permission from the competent authority, a VFR flight shall not be flown:
(1) over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height less than 300 m (1 000 ft) above the highest obstacle within a radius of 600 m from the aircraft;
(2) elsewhere than as specified in (1), at a height less than 150 m (500 ft) above the ground or water, or 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft."

[208] Lufverkehrs-Ordnung(LuftVO), §6 ff. (BGBl. I S. 580)

machine, is normally 600 meters over ground and water.[209]

Practically, the German law divides the airspace into “higher Airspace” and “lower Airspace”, which is required by the “European organization for the safety of air navigation (Eurocontrol)”, aiming at achieving a common air traffic control in the higher Airspace among its European member states. According to this division, the altitude around 8,000-15,000 meters is called higher Airspace, while the attitude below 8000 meters until the earth surface is called lower Airspace. Why 15,000 meters? It is because civil aircraft cannot use the airspace higher than 15,000 meters now.[210]

In short, the aviation airspace over the land can be divided into three parts: a) 150/300m-8000m, the lower Airspace, which is mainly used for the member countries of aviation. b) 8000m-15000m, is controlled by the Eurocontrol. c) 15,000m-100,000m is normally for military use. Therefore, German law is quite technical in this area, and the European Union standards have played an important role in its unification.

2.2.1.5 The subsurface below the land surface: mining rights and other usages

2.2.1.5.1 The division of land ownership underground and minerals

Again, as introduced above, there is actually no exact number in depth in German law, where the land ownership ended. From a practical perspective, the normal depth of a surface landowner for a building is several meters to 100 meters.[211] Moreover, 100 meters underground is also a boundary in the federal Mining Act.[212] According to section 3 subsection 2 of German federal mining Act, there is a division between freehold

[209] Elmar Giemulla /Walter Schwenk, Handbuch des Luftverkehrsrechts, 4.ed, Carl Heymanns Press, 2013, p.165.
[210] Elmar Giemulla /Walter Schwenk, Handbuch des Luftverkehrsrechts, 4.ed, Carl Heymanns Press, 2013, p.169.
[211] The depth of the earth is not so clear in the stipulation of the statute in Germany, because the limit of the height of the building also includes its depth. This is an area of most of the time, state (Land) legislation. For example, in Bavarian state of Germany, there are limitations on the house which are higher than 50 meters, which are measured from the lowest point of the building to the highest point, which means, if they use the underground space, the depth will also be calculated. Vgl. Jürgen Busse /Alfons Simon, Bayerische Bauordnung, § 2, Rn 380-382.
[212] Section 127 Drilling (1) Sections 50 to 62 and 65 to 74 shall apply mutatis mutandis to drill holes and the accompanying facilities not provided for in Section 2, if the holes are not intended to exceed 100 meters in depth, with the following stipulation:
1. Commencement and termination of drilling shall be announced two weeks beforehand. If drilling work must be stopped sooner, notification shall be given without delay.
2. Section 51 (1) shall apply only if the competent authority has required an operating plan in a particular case with a view to protection of employees or third parties or to the significance of the operation.
3. Any party executing drilling for the account of third parties shall also be deemed an entrepreneur.
4. The obligation to provide information pursuant to Section 70 (1) shall also apply to the results of drilling.
5. If one entrepreneur fulfills these obligations, the other entrepreneurs shall be exempted.
(2) The provisions of the Federal Water Resources Act, the water acts of the Länder and any regulations based on these acts shall remain unaffected.

resources and free mineral resources.[213] Only the former was regarded as part of the land. Actually, “the most important and significant for national economy minerals” was not included within the scope of land ownership (Section 905),[214] especially those listed within the mining law.[215] The underground water, after an important judgment by a federal court of justice in 1982,[216] is also outside the scope of section 905. However, for the remaining not so important minerals, section 905 is still applicable, e.g. quartz sand, soapstone.[217] Therefore, the surface owners own the soil, the sand, and gravel,[218] as well as these “freehold minerals”. Nevertheless, this does not mean that these spaces (filled with soil or freehold minerals) were also monopolized by the landowner.

2.2.1.5.2 The underground usage of urban areas

Actually, the use of subsurface is complex in urban areas. There are roughly two parts of them. The first part is the neighbor relationship; the second part is the infrastructure. Firstly, the “interest of prohibition” within section 905 sentence 2 is not enough to set a fee for the permission of the usage of the underground.[219] For example, the landowner should not grant an admission fee on his neighbor for digging a cave underground as his

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[213] Freehold resources are the property of the owner of the real property. Ownership in a piece of land shall not extend to freely mineable resources.

[214] see Hans Schulte, Freiheit und Bindung des Eigentums im Bodenrecht, JZ, 1984, pp.297-304.

[215] There are a list for these minerals under section 3 of the German Federal Mining Act,
(3) Freely mineable resources shall be deemed the following, unless provided for otherwise under old rights that have been maintained (Sections 149 to 159) or under (4): actinium and the actinides, aluminum, antimony, arsenic, beryllium, bismuth, boron, cadmium, cesium, chrome, cobalt, copper, francium, gallium, germanium, gold, hafnium, indium, iridium, iron, lanthanum and the lanthanides, lead, lithium, manganese, mercury, molybdenum, nickel, niobium, osmium, palladium, phosphorus, platinum, polonium, radium, rhenium, rhodium, rubidium, ruthenium, scandium, selenium, silver, strontium, sulfur, tantalum, tellurium, thallium, tin, titanium, tungsten, vanadium, yttrium, zinc, zirconium – in pure form and as mineral ores, except in bog, alum and vitriol ores – ;
hydrocarbons and any gases generated during the extraction process; hard coal and lignite and any gases generated during the extraction process; graphite; halite, potash, magnesium salt and borate salts and any salts occurring in these salts in the same deposit; brine; calcium fluoride and barium sulfate.
The following shall be deemed freely mineable resources: 1. all resources in the area of the continental shelf and, 2. unless otherwise provided for in old rights (Sections 149 to 159),
a) all resources in the area of coastal waters, as well as
b) geothermal heat and the other energy sources generated during its extraction (geothermal heat).

[216] “Naßauskiesungsbeschluß” by federal court of Justice. BVerfGE 58, 300, 336, - Juris.

[217] (4) Freehold resources as provided for in this Act shall mean only the following, unless otherwise provided for in old rights (Sections 149 to 159):
1. basaltic lava with the exception of columnar basalt; bauxite; bentonite and other montmorillonite-rich clays; clay, if suitable for manufacturing incombustible and acid-resistant ceramics or ceramic products not considered to be brickwork products or suitable for manufacturing aluminum; diatomite; feldspar, china clay, pegmatite sand; mica; quartz and quartzite, if suitable for manufacturing incombustible products or ferrosilicon; roof slate; soapstone, talc; trass;
2. all other resources not covered by (3) or no. 1, if they are explored or extracted underground.

[218] Herbert Roth, Staudinger Kommentar zum Bürgerlichen Gesetzbuch (2017), Art. 905, para. 9.

[219] *Wilhelmi* in: Erman BGB (2017), Sec. 905, para. 4.

entrance, which extended to the underground of his land.[220] The landowner should not prevent other firms to put electronic cables under his land in a corresponding way if he had permitted one firm for his own use.[221] The same is for the underground salt mining and railways tunnel.[222] Secondly, the usage of underground depth should be interpreted strictly. For example, the landowner shall not bear the construction of the underground railway at a depth of 13-15 meters underground without fee, in which situation normally need an easement.[223] The street landowner could forbid the long-term usage of the underground, e.g. the installation of underground sewerage, subways, supply lines, cellar, etc.[224] Thirdly, the previously discussed criteria should base on the concrete circumstances of the case. For example, if the underground tunnel located near the land surface, or made the surface shaking, or even cause the risk of collapse, the surface landowner has the right to prohibit. However, for the public interest, the street railway enterprise must permit the installation of the heating pipeline at a depth of 1.79 meters under the railways, and the sewerage pipeline at a depth of 5 meters underground.[225] Therefore, if the underground installation would not cause harm to the solidity of the land structure, or caused a reduction of the value of land surface, it should not be banned.

2.2.1.5.3 The rules of public use (Gemeingebrauch)

Another dimension is the public usage of underground and the usage of a nearby resident. For the public street, there exist generally the right to use its subsurface. However, in the situation of special use (Sondernutzung), the rule of public use (Gemeingebrauch) is not applicable. The special use should be in charge of the German Civil Code, as stipulated by the federal street act (Section 8 subsection 10 of the federal street act). The most typical form of special use is the “private Konzessionsvertrag” between the street landowner and the infrastructure firm. Therefore, for the installation of the water, heating, gas, electronic, sewerage pipelines belong to private law, and accordingly, the landowner could set permission and corresponding fees for such kind of usage. However, the special use of

[220] *Heck*, Grundriss des Sachenrechts, 1930, p.214.
[221] *Roth*, Staudinger Kommentar zum Bürgerlichen Gesetzbuch (2017), Art. 905, para. 11.
[222] BGH, Urteil vom 23. Oktober 1980 – III ZR 146/78–, juris.
[223] BGH, Urteil vom 01. Februar 1982 – III ZR 93/80 –, BGHZ 83, 61-71–, juris.
[224] *Roth*, Staudinger BGB (2017), Sec. 905, para. 14.
[225] OLG Bremen OLGZ 1971, 147; OLG Hamburg NJW 1991,403–, juris.

construction of cellar in the subsurface of the street, and the installation of the geothermal heat pipelines were within the scope of public law. For the underground public telecommunication cable, the street landowner should provide continence to come across under section 68 of the Telecommunication act; while the normal landowners have the obligation to bear according to section 76 subsection 1 No. 2 of the telecommunication act.

2.2.1.6 Short Summary

The German legal framework on airspace and subsurface can be summarized as follows. Section 905 plays a central role, but it sets just a skeleton. From section 905, we just know the surface land ownership is limited in height and depth, but there is no clue from the exact number. Such work was done by the public law, the aviation law, the mining law, and the urban public facility laws, which forms the flesh of the airspace and subsurface legal order in Germany. Therefore, the Germans are using the urban airspace and subsurface without defining the legal status of airspace and subsurface in civil law. Their logic seems clear: where the surface land ownership is limited by public laws, the use of such airspace is justified. This model has its advantage in flexibility, but leave the legal nature of airspace and subsurface in private law ambiguous, which precluded the possibility of commercialization of airspace and subsurface.

2.2.2 The US situation

As introduced in Chapter 1.5, the biggest obstacle for airspace and subsurface right in common law countries is the "*cujus est solum*" principle, as it does not fulfill the first condition. However, this common law principle is challenged by the modern aviation industry and the mining industry. Fueled by the constant endeavors from the aviation lawyers and scholars, it was finally overruled by the court. In fact, the delete of this "*cujus est solum*" principle had deliberated the potential economic value of airspace, especially in the hand of private landowners. Therefore, to some extent, the US airspace/subsurface law was a by-product of aviation law.

After the "*cujus est solum*" principle was overruled by the US courts, there was no general

stipulation in the US law, which functions as section 905 of the German Civil Code. However, the “navigable airspace” defined by the Congress could be regarded as a substitute.

2.2.1.1 The minimum safe altitude: the nominal boundary for landowners and air traffic

In fact, most of the US airspace was uncontrolled airspace in early twenties century. Only the federal airways and the airspace around very busy airports were controlled. However, as the increase of the frequency of the traffic, and the technical improvement in air-traffic-control capabilities, more and more airspace become controlled airspace in the US. Now the only remaining uncontrolled airspace in the domestic US exists below 1200 feet (365.76 m) above ground level (AGL) away from airports.

As the airspace law is a by-product of aviation law in the US, the first step to clarify the airspace legal order is to introduce the relevant aviation rules. According to the Civil Aeronautics Act 1938, all flight enjoyed “a public right of freedom of transit in air commerce through the navigable air space.” Within the navigable airspace, the aircraft have the privilege of overflight. Therefore, the minimum safe altitude became a baseline for the division of the public and private airspace.

The minimum safe altitude: the US minimum safe altitude for aircraft is very flexible. According to Federal Aviation Regulation (FAR) section 91.119, the minimum safe altitude for aircraft ranged from 1000 feet (609.6 m) above highest obstacle over congested areas to 500 feet (152.4 m) above the surface over other than congested areas.[226] Therefore, the boundary between the landowner and the air traffic seems clear either in congested areas or in other than congested areas.

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[226] §91.119 Minimum safe altitudes: General. Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:
(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.
(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.
(d) Helicopters, powered parachutes, and weight-shift-control aircraft. If the operation is conducted without hazard to persons or property on the surface—
(1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and
(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.

2.2.1.2 The Causby case: the substantial boundary for landowners and air traffic

The leading case in this area was the United States v. Causby in 1945. The Causby family were chicken farmers and lived near an airport, but suffered severe noise pollution from overflight by the military airplanes, and sued for compensation. The Supreme Court, on the one hand, emphasized the upper airspace was a public highway for aviation, which every private landownership should respect. While on the other hand, considering the specialty of this case, held that the Causby family should be compensated, because the frequent overflight by military planes had constituted a "taking".[227] Different from setting a height, the Supreme Court set the boundary to such an extent: "the airspace for the landowner only limited to the extent to a necessary and reasonable enjoyment of their property rights."[228] This ruling replaced the "fixed height theory" and changed to "effective possession". Additionally, this case set the basic boundary of the subsurface landownership and the aviation industry.

From a comparative perspective, such boundary was similar to section 905 of the German Civil Code, because section 905 also emphasizes the surface landowner should have "interest". However, there are still dramatic differences. Firstly, the Causby case is a case from the negative side (defense right) of airspace right, there is still the positive side in the US airspace law. The landowner would separate the airspace into new and independent airspace ownerships. In contrast, in German law, the main function of airspace is to defense. Secondly, the Causby is only one leading case on the boundary. The US airspace law has more legal institutions, which would allow the surface landowner to sell their airspace to others. While in Germany, section 905 seems not so broad in interpretation, the airspace should mainly serve the surface landowner. Accordingly, there was no much possibility to have independent airspace/subsurface right from the surface landownership.

2.2.1.3 The division of airspace in the US

Different from the division of lower airspace and higher airspace in Germany, the airspace classification in the US provides four general categories of airspace: the positive

[227] 328 U.S. 256, 261 (1946).
[228] See also Geller v. Brownstone Condominium Ass'n, 402 N. E. 2d 807(Ill. App. Ct. 1980).

controlled airspace, controlled airspace, uncontrolled airspace, special use airspace.[229] This classification is not only relevant to the height of airspace but also relates to the benefit of air traffic control, as the clues could be traced from their names.

Then, the Federal Aviation Administration (FAA) had adopted and implemented the recommendations on the reclassification of the airspace by National Airspace Review (NAR) since 1993, which are known as Class A, B, C, D, E, and G airspace. From the perspective of the old airspace classifications, the class A, B, C, D, and E airspace is generally a form of controlled airspace, while Class G is designated as uncontrolled.[230] In fact, class A represents airspace with altitudes at and above 1,8000 feet (5486.4 m) mean sea level (MSL), class B represents airspace surrounding high-density airports up to an altitude of about 10,000 (3048 m) feet above ground level (AGL). Class C is for medium-density airports, while class D is for surrounding nonradar control towered airports, their altitude should be concretely decided. Class E represents airspace 700 feet or 1200 feet above ground level according to the surface of the earth, which extends up to but not including 18,000 feet mean sea level. Class G represents the airspace not included in Class A, B, C, D, or E designations, which is the uncontrolled airspace mainly below 1400 feet.[231] The new airspace classification differs from each other in the level of control, the permitted flight operations, the aircraft entry requirements, the services provided by ATC to IFR aircraft, minimum visibility for VFR aircraft, and minimum distance from clouds for VFR aircraft.[232] Therefore, the six categories of airspace in the US are a result of technical development and mainly for the benefits of modern aviation needs. Like that in Germany, the legal order for the high airspace is always very technical, but it does not necessarily mean the boundary between the surface landowner and the aviation operation.

2.2.1.4 The US subsurface legal order

For the subsurface rights, the subsurface is also deemed belongs to the landowners, but it depends on the shallow or deep subsurface. The shallow surface is no doubt under

[229] We could trace some clue from their name. However, as the positive controlled airspace
[230] *Nolan*, Fundamentals of Air Traffic Control, 2011, p. 140.
[231] *Nolan*, Fundamentals of Air Traffic Control, 2011, p. 140.
[232] *Nolan*, Fundamentals of Air Traffic Control, 2011, pp. 156-157.

protection. When there was a third party who intruded into the shallow subsurface,[233] such as in case Edwards v. Sims, the court used the maxim that if the plaintiff could prove he owned the surface of the land, he could consequently have the subsurface.[234] For the deep surface, the court made it clear, "ownership rights in today's world are not so clear-cut as they were before the advent of airplanes and injection wells."[235]

The subsurface in the US is generally divided into the shallow underground, and deep underground. For the benefit of the surface landowners, the former is no doubt under protection, while the latter is normally not under protection if it does not infringe the enjoyment of the real property of the surface landowner. However, there is still a great need for using the shallow underground in the urban areas, and accordingly, the normal solution for land use is an easement.

For underground minerals, different policies are adopted by different states in the US. There are 16 states apply the ownership principle, which allocated the gas and oil to the surface owner, while other seven states had applied the exclusive right principle, which regards underground minerals as wild animals, are not owned in place and therefore cannot be owned until captured.

In addition, the subsurface law in the US had paid much attention to the water right. The ownership of water mainly depends on whether the water is navigable. If the water is not navigable, the landowner of the bank has the ownership of the riverbed until the center of the river. On the contrary, if it is navigable, the general rule is that the state owns the bed to the average or mean high-water mark.[236]

Therefore, influenced by the "*cujus est solum*" principle, the surface landowner seems to enjoy more subsurface right than that in Germany. Such a legal design had deeply influenced the US airspace/subsurface market.

2.2.1.5 The legal order of airspace in surface land ownership

Although there is minimum safe altitude, it does not mean that every private landowner

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[233] *Sprankling*, Understanding Property Law, 2017, p.520.
[234] Edwards v. Sims,24 S.W. 2d. 619, 620(Ky. Ct. App. 1929).
[235] Chance v. BP Chemicals, Inc.670 N.E.2d 985(Ohio 1996).
[236] 78 Am. Jur. 2d, Waters § 44(1975). Quoted from Robert Aalberts, Real estate law, 9th ed. 2014, p75. States are allowed under federal law to determine who is to have title to land underlying navigable water. See PPL Montana LLC v. Montana, 132 s. Ct. 1215(2012).

in the US enjoys 500 feet -1000 feet airspace ownership above his land. In the 20th century US, even in the big cities, the skyscraper would normally be lower than 400 meters in height, and the minimum safe altitude is 1000 feet (609 meters), why is that? In my opinion, the minimum safe altitude had played a role as buffer-zone. Its existence would guarantee 300-meter airspace above the city untouched, and accordingly would avoid the collision of aircraft and the high buildings. We can imagine that if the high buildings in the US become higher than 600 meters on average, the minimum safe altitude would naturally grow higher. Therefore, even theoretically, the private ownership of airspace should be much lower than the minimum safe altitude.

2.2.1.6 Federal statute on land use and zoning: a limitation for airspace and subsurface

There were many federal regulations which might affect land use and indirectly affect airspace and subsurface. In fact, as showed in table 1, there were mainly two kinds of federal regulations. The first part is the airspace and subsurface in the condominium, in aviation, in telecommunication, in farmland, etc. These federal statutes helped to define airspace and subsurface in different branches. Alternatively, through these regulations, we know how airspace and subsurface law in the different legal field function. The second part is the environmental law directly affects the zoning law and land use, while indirectly affects the concretely use of airspace and subsurface. In addition, the environmental law and the cultural law had made the use of airspace and subsurface rationally, effectively, and ethically. In fact, there are more federal regulations in different areas may relate to land use, and accordingly to airspace and subsurface. The complicity and comprehensiveness would be helpful to explain, why the land use law in the US had gradually become a new legal field.

Table 1. Related Federal regulations on land use(direct) and airspace and subsurface (indirect)

Categories and Name of regulation		Mechanism or tools or method	examples
Condominium and airspace and subsurface	national Manufactured Housing Construction and Safety Standards Act	Shelter the poor	Mainly affect the condominium, social justice

Aviation and airspace	Federal Aviation Act	which Regulation of Airports and Surrounding Areas	Causby case
Airspace and subsurface and telecommunication	Federal Telecommunications Act of 1996	Amateur radio antennas, wireless telecommunication facilities, substantive limitations and standards governing local regulation of wireless facilities, the effect of prohibiting the provision of wireless services, unreasonable Discrimination among wireless providers, and regulations based on environmental effects of radio frequency emissions.	Pine Ridge Recycling v. Butts County case, the court found that as a broad interpretation of the statute will "authorize exclusive agreements for the handling of solid waste and violate the commercial Clause", so "a narrower interpretation of the state authorization was required and state action immunity would not lie."
Airspace and subsurface and farmland	Farmland Protection Policy Act (FPPA) (part of the Food and Agriculture Act of 1981)	sets the criteria for the environment and farmland protection	Sprawl of city
Environmental issue	National Environmental Policy Act of 1969	environmental Assessment	A plan is not permitted without an environmental assessment
	Federal Water Pollution Control Act of 1972; Clean Water Act (1977&1987); Rivers and Harbors Act of 1899	Environmental Impact Statement	Calvert Cliffs' Coordinating Committee, Inc., v. U. S. Atomic Energy Commission case, "If the decision was reached procedurally without individual consideration and balancing of environmental factors- conducted fully and in good faith- it is the responsibility of the courts to reverse."
	Clean Air Act of 1970(the CAA)	Greenhouse Gas Emissions, Air Quality Standard, the Attainment and Nonattainment,	more underground Subways may help to improve the air condition, which may be taken into consideration in the city planning for effective land use.

		Stationary Sources Regulation, Mobile Source Regulation, Permit Program	
	Marine Mammal Protection Act in 1970, the Endangered Species Act of 1973	provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved" and to "provide a program for the conservation of such endangered species and threatened species.	endangered species live underground or in the air, the use of airspace and subsurface should adopt an animal-friendly way
	Coastal Zone Management Act of 1972	preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations	the interest of coastal zone protection and development
	Resource conservation and recovery act (RERA)	hazardous waste and solid waste	Comprehensive environment response, compensation, and Liability Act (CERCLA) regulates the place of abandoned disposal sites.
Cultural and historical consideration	National Historic Preservation Act (NHPA)	historic or cultural resource, especially the place with "historical resources of federal interest	

Source of this table: the above table is summarized from a series of books by the author, mainly including Juergensmeyer/Roberts, Land Use Planning and Development Regulation Law, 2018 & Sterk/Penalver, Land Use Regulation, 2016.

The law of land use in the US had functioned as a limitation on the usage of airspace at the local level. One of the most famous cases in this field was the Penn Central

Transportation Co. v. New York City, in which the landowner wanted to build a 55- story building atop the Penn central station, but was rejected by the Landmarks Preservation Commission according to New York City Landmarks Law (effective since 1965). The landowner sued to the court. The final decision made by the Supreme Court held that such a decision did not constitute a "regulatory taking", because such decision did not prevent the landowner from gaining the value of the airspace through "TDR" program (detailed discussion of TDR, see Chapter 2.3.2.2.2). TDRs (Transferable Development Rights) represented a new orientation of airspace law, which is a mixture of airspace law and zoning law at the local level.

2.2.1.7 Short summary on the legal framework

In summary, the US airspace/subsurface law is a by-product of aviation law. The minimum altitude plays a role as a buffer zone for the landowner and the aviation industry. In addition, the leading case Causby is also a case between landowner and aircraft owners, which had set the up-limit of the surface land ownership as "guarantee the enjoyment of their property." Such a standard seems a denial of the fixed-height standard, its practical value had revealed in the vicinity of an airport, as the aircraft owner could not use navigable airspace as an excuse any longer. Therefore, the Causby case is the first time to provide full protection of airspace right of the surface landowner. Influenced by the "*cujus est solum*" principle, the surface landowner would own the underground crude oils in many states of the US. Therefore, the surface landowner enjoyed a broad scope of rights. However, the surface landowners' rights were limited by various laws. The federal environmental law, cultural law, water law, etc., coping with local planning and zoning laws, had made a new legal field, the land use law. The land use law is a new limit for surface owners, which is also an indirect limit for the airspace and subsurface. Therefore, the US airspace/subsurface law is also a mixture of private law and administrative laws.

In summary, the US land surface ownership plays a central role in airspace/subsurface. It has enormous potential values. The TDR programs represent the privilege to build higher buildings in a central urban district.

2.2.3 The Chinese situation

Similar to that in Germany, in China, there is also one section functions as section 905 of the German Civil Code, which is section 136 of the property law of PRC of 2007. However, the realistic effect of this section in Chinese law is very limited. Furthermore, although the Chinese property law follows the German legal term and main structure, the airspace ownership does not function as the German way. As the land is owned by the state, the surface landowner would only use the space what he applied, and what he applied is always what he uses. Such a regime had caused some dilemma.

2.4.1.1 The division of airspace

In China, the minimum aviation safety altitude is different from that in Germany and the US. As written in section 82 of the General Flight Rules of PRC, “The safety altitude for airway, air route or ferry flight over high terrain or in mountainous areas shall be 600 meters above the highest elevation within 25 kilometers on either side of the airway centerline or air route to be flown. Elsewhere, 400 meters above the highest elevation within 25 kilometers on either side of the airway centerline or air route to be flown.” [237]

The Chinese division of airspace is much more functional-oriented. According to section 12 subsection 2 of the General flight rules of PRC, “The airspace is usually divided into aerodrome flight airspace, airways, air routes, prohibited areas, restricted areas, and danger areas. Air corridors, fuel dumping areas, and temporary flight airspace may be established when necessary for the need for airspace management and flight missions.” As a founding member of the ICAO, many of the rules are directly adopted from the international standard. An example is a division of “Holding airspace”.

“Holding airspace is usually established over the navigational aid; it may be established in the vicinity of the airspace of the aerodrome with heavy air traffic. The vertical clearance from the lowest holding level to the highest ground obstacle shall not be less

[237] This article is quoted from section 82 of General Flight Rules of the People’s Republic of China (2017 Revision), in the same article, it also prescribed:
“The flight safety altitude refers to the minimum flight altitude allowing a clearance between aircraft and ground obstacles for the prevention of collisions.”
”For aircraft with performance constraint, the safety altitude for airway, air route or ferry flight shall be separately prescribed by the relevant aviation administration department.”

than 600 meters. Below 8, 400 meters, the flight levels in the holding airspace shall be separated by 300 meters. From 8, 400 meters up to 8, 900 meters, the holding level shall be separated by 500 meters. From 8, 900 meters up to 12, 500 meters, the holding levels shall be separated by 300 meters. Above 12, 500 meters, the holding levels shall be separated by 600 meters. The plan for the establishment of an aerodrome flight airspace shall be put forward by the aviation unit stationed at the aerodrome and submitted for approval to the corps-level aviation unit of the People's Liberation Army or the Air Force of the major military command in the locality. The flight airspace of adjacent aerodromes may be adjusted for use among themselves."

Therefore, the airspace above the 400 m/600 m could be regarded as aviation space. The division of these aviation space is much technical, and China had adopted the international standard.

2.4.1.2 Real estate mostly under state-ownership: land surface and subsurface

Does that mean, the surface land ownership is the airspace under the minimum safe altitude? Theoretically yes. It is because the land was owned by the state and the rural collective, including the airspace and subsurface.

As mentioned above, there is a strong flavor of socialism in Chinese property law, as the land could only be owned by the state or the rural collective.[238] Most of the real estates are under state ownership by the property law of PRC (2007), e.g. all mineral resources,[239] waters and sea areas,[240] natural resources as forests, mountains, grasslands, wasteland, and tidal flats (section 48 of property law), all infrastructures such as railways, highways, power facilities, telecommunications facilities and oil and gas pipelines (section 49 of property law). Therefore, the land, most of the resources, underground minerals, and most of the real estate (surface or underground) in China are state-owned. The newly "Chinese

[238] In section 47 of property law of PRC: "Land in the cities belongs to the State. Land in the rural and suburban areas which belongs to the State as is provided for by law is owned by the State."

[239] Mineral Resources Law of PRC

Article 3 Mineral resources belong to the State. The rights of State ownership in mineral resources is exercised by the State Council. State ownership of mineral resources, either near the earth's surface or underground, shall not change with the alteration of ownership or right to the use of the land which the mineral resources are attached to.

[240] See the Constitutional code of PRC Article 9 [Resources] (1) Mineral resources, waters, forests, mountains, grassland, unclaimed land, beaches, and other natural resources are owned by the state, that is, by the whole people, with the exception of the forests, mountains, grassland, unclaimed land, and beaches that are owned by collectives in accordance with the law.

This article is repeated in §46, §48 the property law of 2007.

Civil Code" under the legislation is seemingly to maintain this approach.

As written in section 3 subsection 1 and subsection 2 of Chinese property law (2007), "sub 1. In the primary stage of socialism, the State upholds the basic economic system under which public ownership is dominant and the economic sectors of diverse forms of ownership develop side by side. Sub 2. The State consolidates and develops the public sectors of the economy, and encourages, supports and guides to the development of the non-public sectors of the economy." Therefore, a simple answer to the legal order of the land surface and subsurface is that all of them were either under state ownership or collective ownership. Does there exist some real conflict, if both the surface and subsurface were state/collective owned?

An example might illustrate the institutional advantage of this legal system: the "West-East Gas Pipeline" project. This state project was initiated in 2002 and was put into trial operation in 2004. It consisted of three lines, in which the first came from Xinjiang province to Shanghai with a length of 4,000 kilometers. The second pipeline was from Xinjiang province to Guangdong province. It had a total length of 8,704km and travels through 15 provinces, which was the longest natural gas pipeline in the world.[241] Imagine if the government needed to pay for the usage of the airspace and subsurface by the pipeline, the total project would be economically unfeasible. This example might explain the advantage of the state ownership of the whole land, including the land surface, its airspace and subsurface, the minerals, and the waters. However, there were also drawbacks under the current land system, that the potential value of airspace and subsurface is neglected unless fully allocated into the private hand (through various land usage rights). Therefore, under such situations, the real conflicts in using land surface, airspace and subsurface occurred among the users.

2.4.1.3 The administrative concentration on urban subsurface

In China, the legal system is composed of legal norms of a different hierarchy, which were laws by National People's Congress, administrative regulations by State Council, Local Decrees, Autonomous Decrees, and Special Decrees, and Rules by local people's

[241] *Wang/Nie*, in: China's Gas Development Strategies, 2017, pp.233-235.

congress, and local government.[242] Normally, the laws and administrative regulations are applicable to the whole country, while the local decrees and rules are normally applicable to the province or the city. The subsurface legal system could be illustrated as follows:

The 2008 revised Chinese "urban and rural planning law" emphasized the importance of underground space, but very generally.[243] Additionally, the administrative regulation "Regulations on the management of subsurface of the land" (地下空间管理规定) by the Construction department of China is also very general and abstract, which set the basic framework of urban subsurface land use plan. Such a plan should include: "a) the current condition and development of subsurface land; b) the strategies for subsurface development; c) the layer, content, and time period of subsurface land; d) the scale and layout of the subsurface land; and e) the steps to implement of the subsurface plan". However, it is very general regulations at departmental level, which indicates little about how the land subsurface shall be used in detail.

At the provincial level, only four southeast provinces[244] in China have "rules by local government" on urban subsurface land use, as these provinces are most densely populated and urbanized. Moreover, there are 9 big cities in China have local regulations on subsurface land use,[245] and 38 other cities have "rules by local government". Both types of local rules are more detailed regulations than the regulation by the construction department, especially on the register, rent of subsurface, or land use contract, safety criteria, and relevant matters. Nevertheless, comparing the number that there are 218 Chinese cities with a large population on the list of worlds' biggest 1000 cities,[246] the total 47 local regulations are rather tiny in number. In addition, most of these local regulations[247] or rules are stipulated after 2006, when the Chinese property law is

[242] See legislation law of PRC, section 7, section 56, section 63-67.

[243] "The subsurface shall be conducted according to the economic and technical development level, the principles of overall arrangement, comprehensive development and reasonable utilization shall be followed, and the needs for disaster prevention and reduction, civil air defense and communication shall be taken into full consideration. It shall also be in line with the city planning, and the examining and approving formalities must be handled."

[244] The four provinces are Fujian, Jiangsu, Zhejiang, and Guangdong.

[245] The cities are Benxi (2002), Shanghai (since 2006), Tianjin (since 2008), Shenzhen (2008), Shenyang (2011), Guangzhou (2012), Wuhan (2013), Jinan (2013), Nanchang (2013).

[246] See the data at website: http://www.newgeography.com/content/005933-world-urban-areas-1064-largest-cities-2018-update, recently visited at 03.Jan.2019.

[247] Except four cities with an early focus on these matters, which are Beijing (2001), Benxi (2002), Zhengzhou (2004), and Chongqing (2005).

legislated. Therefore, a unified law on airspace and subsurface at national law is still in great need.

In addition, despite these local rules or regulations, in some cities, there are concrete decisions by local authorities on a big building project, which would also refer to the subsurface. Sometimes, within these administrative documents, it would announce that a "leadership team" on this project[248] have been founded. However, most of these documents are not so detailed on the matter of legal aspect of the subsurface, except for a few big cities, e.g. Guangdong, Shanghai, and Beijing.

All these administrative regulations are either too general or too abstract, which just reveals that the government had gradually realized the importance of airspace/subsurface because there is less and less remaining land in the hand of the local government. Therefore, most of the administrative rules on airspace/subsurface have little influence on the concrete legal institutions. Consequently, the airspace/subsurface law in China mainly replied upon the civil law institutions, especially the property law.

2.2.4 Short summary

In the widest sense, airspace/subsurface is a stage for all kinds of human activities. The general legal order from the high airspace to the deep subsurface is the first layer of airspace/subsurface law, in which each relevant property law and administrative law are responsible for some height. Although modern urban society has quite similar divisions on aviation airspace, surface landownership, underground space, the regulatory strategies are quite different.

In Germany, section 905 played a key role in collecting all the relevant rules together. Within the airspace/subsurface legal order, the "private duty to bear- justification in public law" is a typical German solution for all kinds of airspace/subsurface usage, which the

[248] Leader team, which is translated from Chinese "Lingdao Xiaozu（领导小组）", is usually used in Chinese governmental documents, and is usually composed of the mayor, some other vice-mayor, and the head of some related bureaus, most of the team member are part-time work for this team, because they are all officials in different branch, but they normally make administrative decisions, not making concrete rules. So this kind of "leader team" can be regarded as a primary stage of an organization in China, which show the emphasis of this matter by the local government.

user is not the landowner or other restricted property right holder or creditor. Therefore, there is a strong sense of public law, especially administrative law. The real estate law just sets the framework, while the administrative law fills the concrete contents. In the US law, as there is no stipulation like section 905 of German Civil Code, the airspace/subsurface law is a by-product of modern aviation law, the upper boundaries were set by both technical and substantial rules. Under the buffer-zone, the surface land ownership plays a central role, coping with its general airspace/subsurface right, the airspace/subsurface market is prosperous. In China, the boundary setting is also quite technical, which follows the international trend. The public laws on airspace/subsurface at both departmental level and local level are quite general and abstract. Therefore, the only possibility in China for a feasible and practical airspace/subsurface law is property law. However, the state-landownership in surface, airspace, and subsurface make the division and marketing much more difficult. Concretely, the conflicts usually originate among vertical users at a different height, but not the owner. Such features have also influenced the Chinese airspace/subsurface right in general and in branches.

Such a general vertical legal order provides a basis for the other two layers, the boundary setting is a huge topic and quite influential on the use of land surface (details see Chapter 3), which is also a topic on how and to what extent should the private law and public law cooperate under the modern urban society. In addition, the airspace/subsurface within different branches would also face the intrusion by public laws, the vertical legal order is beneficial to solve these problems.

2.3 The general property rights on airspace/subsurface

Different from the general vertical legal order of airspace/subsurface (in Chapter 2.2), the general property rights on airspace/subsurface concentrated on the property right on airspace/subsurface, which is mainly within the scope of private law. In this field, Germany had no general property rights, but it creatively used public law as a tolerable substitute. The US is the first country to recommend a general property right, the surface landowners played a central role in the airspace/subsurface market. Under Japanese

influence, China is the third type, which only admitted airspace/subsurface right in the superficies (land usage right for construction) within the property law stipulations, while recommending the general property rights on airspace/subsurface through legal theories and judgments. However, different legal frameworks and strategies might cause different effects in both law and economics.

2.3.1 The absence of general property rights in Germany: law, theory, and judgments

Due to its strictness in legal objects of the "book of property", there were no general property rights on airspace/subsurface in Germany. However, facing modern challenges, there were endeavors from both the scholars and judges to alleviate the strictness. Nevertheless, despite these endeavors and new possibilities from the public and constitutional law, airspace/subsurface seemed not an urgent topic for the German lawyers.

2.3.1.1 The basic legal framework: the closed and "Eigentum-oriented" property system

In Roman law there was no "property right", but "res" consists both "*Res Corporales*" and "*Res Incorporales*".[249] However, the German legislators only concentrated on the former.

Similar to the French absolute ownership, the word "Eigentum (ownership)" was one of the most typical representatives of German property law, with much philosophical and political meaning. It meant personal freedom and individuality, as well as the emancipation of the serfs (Bauernbefreiung). In section 903 of the German Civil Code, "The owner of a thing may, to the extent that a statute or third-party rights do not conflict with this, deal with the thing at his discretion and exclude others from every influence." Cope with the trend of the French Civil Code, the establishment of an "absolute" and personal "ownership" had its revolutionary meaning even in its enactment of 1900 in Germany. Moreover, it was regarded as also a constitutional right. Therefore, in some articles or legislation, other than mentioning together with usufruct right and mortgage rights, the German word "Eigentum" would be used sometimes inaccurately to represent

[249] *Mousourakis*, Fundamentals of Roman Private Law, 2012, p.121.

the “property” as a whole. Therefore, the German property law is “Eigentum-oriented”.

As mentioned in Chapter 1.4.2, the German ownership is defined in section 903 of German Civil Code, “the owner of a thing may, to the extent that a statute or third-party rights do not conflict with this, deal with the thing at his discretion and exclude others from every influence.” This is just the concept of full ownership. Actually, there are other kinds of property rights in German Civil Code, such as servitudes (Dienstbarkeit, including Easements and Usufruct, §§1018-1093), the right of preemption (Vorkaufsrecht, §§1094-1104), charges on land (Reallasten, §§1105-1112), mortgage (Hypothek, §§1113-1190), pledge (Pfandrecht, §§1204-1296), and so on. From a German perspective, all these limited property rights (beschränkte dingliche Rechte) are derived from the full property right, because they function as a burden on the main property owners. Therefore, ownership is much more important because it is the origin of all other property rights.

Moreover, the influence of the ownership is not limited within the “book of property”. For example, heritable building right (Erbbaurecht) was previously within the scope of the German Civil Code (§§1012-1017), nevertheless, it had become an independent law since Jan.15, 1919. Additionally, inventions, literary and artistic works were previously regarded as “spirit property (geistige Eigentum)” in the 1890s in Germany, but they were now mainly under the protection of intellectual property law. However, some current German lawyers still tended to use this historical name (“geistige Eigentum”) to note “intellectual property”. In addition, many other independent rights were deprived of “Eigentum”. Again, the mining property (Bergwerkseigentum) originated from the neighbor relationship of land plot (Grundstücksnachbarverhältnis). However, it had gradually changed from a property right into a right of public law, although section 906 of the German Civil Code was still applicable to mining property cases.[250] Additionally, profound changes had happened in German property law after WWII. One of the most obvious change was the legislation on condominium (Act on the ownership of apartments and the right of permanent residency, WEG), which were previously denied by the legislator of German Civil Code. Moreover, some other new members of property law

[250] *Althammer* in: Staudinger BGB (2016), introduction of section 903, para. 12.

included the so-called “right of public things (offenlichen Sachen)”, and the “commercial ownership (wirtschaftliches Eigentum)” of German tax law. Therefore, many rights were derived from “ownership (Eigentum)” in Germany, which could be regarded as a starting point of German legal thought in this field. However, there are more and more special property rights outside the German Civil Code.

As introduced in the previous Chapter, the biggest obstacle of accepting airspace and subsurface right as a property right in German law is that the airspace and subsurface are regarded as incorporeal objects, which are not “things” according to section 90 of German Civil Code. Therefore, section 90 would preclude the airspace and subsurface from “the book of property”. However, this obstacle does not prevent the formation of the legal order on airspace and subsurface.

2.3.1.2 Legal theory: the “Objectrecht” and airspace/subsurface right

From the normative perspective, the German way of treating airspace and subsurface relied more upon public law. However, in the field of private law, the scholars had never stopped making a more compatible property law.

As introduced in Chapter 1, the biggest obstacle to accept airspace and subsurface in German private law is the strictness of its object of property law. However, the German scholars had constantly endeavored to overcome these drawbacks. There are roughly two branches, the first is making the object more compatible; the second is the function of section 14 of German Basic law, which is a mainstream currently.

Even before the German Civil Code become effective, some scholars had already pointed out the necessity to take the incorporeal things inside the scope of private law. As introduced in Chapter 1.1, Hermann Erythropel had also insisted that, although the airspace and subsurface are incorporeal, they should be included within the scope of the power of land ownership. Such an endeavor was constant in Germany. As summarized by Peter Kreutz, there was a formal school (Zitelmann), transaction school (Sohm), material/natural school (Wieacker), systematic school (Larenz) in contemporary Germany dogmatic to alleviate its strictness in the law of object.[251]

[251] *Kreutz*, Das Objekt und seine Zuordnung, 2017, pp. 375-432.

The formal school emphasizes the legal object should be whatever (things, rights, natural power, workforce, personal activities) stipulated by normative law and has the promise of protection (Schutzverheißung). Ernst Zitelmann is the representative of the formal school. In a book on international private law (published in 1897), he insisted that the right of the name and the right of spirit work, although incorporeal, should be included inside the property.[252] However, his ideas are not adopted by the German Civil Code.

Basing on a technical approach, the transaction school believe the legal object in German Civil Code only contains the object with transferability. However, as criticized by some scholars, his endeavor is not successful in the interpretation of section 90 of the German Civil Code.

The natural object school by Franz Wieacker took an obviously critical attitude towards the narrow scope by section 90 of the German Civil Code. They claim that "all the object of the natural world" should be the legal object if it could be individualized and have property value. For example, water power, the electricity, the thermal energy, and radiant energy is a natural object. As a Roman law scholar, Wieacker treats the German term "Sache (thing)" and the Latin word "res" equally.[253] In addition, by using the "res extra commercium", Wieacker had unified the terms on the object of the German Civil Code.

Karl Larenz tried to explain the legal object from the subject-object relationship, rather than merely from the stipulations of the German Civil Code. According to his metaphysical and abstract approach, "object is, what corresponding to subject." Instead of defining the "transferability", he had divided the legal object into different categories, the first object, the second object, the third object. For the first object, is for the traditional legal object, the corporeal thing and the incorporeal, mainly applicable to the right of control and usufructuary right.[254] In contrast, the second object includes the rights and legal relationship. The third is more complex, such as the enterprise, it could be regarded as property (Vermögen) as a whole.

All these scholarships seek to develop a more compatible object law, which would grasp

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[252] *Zitelmann*, internationales Privatrecht, 1897, pp. 50-52.
[253] *Wieacker*, Zum System des deutschen Vermögensrechts, 1941, pp. 26-37.
[254] *Larenz/Wolf*, Allegemein Teil des Bürgerliches Rechts, 2004, p. 350.

the new development of modern urban society. In order to summarize the new phenomenon, the term, such as “immaterial goods (Immaterialgut)”, “economic good (Wirtschaftgut)”, is widely used among the German scholars. However, from a dogmatic perspective, these endeavors in civil law did not enjoy strong support among judges. Therefore, most of the theories are still theories. Another side of the coin was that such endeavors were not fruitless. Although the property law is strict, much of the contract rules could be used on these “new objects”. The contract law rules could guarantee the minimum standard of protection, such as sales, purchase, and rent. Therefore, the theoretical evolvement in German law of object is not only beneficial for airspace and subsurface, but also for the data, intellectual property, virtual property, etc. To some extent, the theoretical necessity for the latter is more urgent, but such theoretical preparation had also paved ways for a real estate law with vertical concerns in Germany.

2.3.1.3 Judicial solutions the alleviate strictness of objects: combine with public law

Besides these theoretical endeavors, there are also some other typical German ways to achieve these goals. As illustrated above, although German Civil Code does not directly refuse the other intangible things to be regarded as property, it leaves rare space for the application of the norms for intangible property in the civil code.[255] For example, the intangible things such as trade secret are also regarded as “Geistiges Eigentum” (spirit property) in German law, but the property law of BGB is not applicable due to its “intangible nature”. However, the competition law,[256] the criminal law,[257] the federal fiscal code,[258] the federal freedom of information Act,[259] and even the good faith principle[260] in obligation law of BGB are relevant to this field of law. The German dogmatic is very thought-provoking from a comparative perspective. Instead of making new statutes or rules, the German lawyers usually prefer to creatively apply the existed rules (from other legal fields) to deal with new problems. What’s more, sometimes the rules from the public law are also used in filling the legal loopholes. In short, “use the old

[255] *Stieper* in: Staudinger BGB (2017), Art. 90, para. 4, para.5.
[256] Section 17 of the Act Against Unfair Competition (Gesetz gegen den unlauteren Wettbewerb – UWG, effective since 2004).
[257] Section 203 German Criminal Code (effective since 1871).
[258] Section 30 (1) of the German Fiscal Code (Abgabenordnung - AO, effective since 1976).
[259] Section 6 of the Freedom of Information Act (Informationsfreiheitsgesetz - IFG, effective since 2005).
[260] Section 242 of the German Civil Code (effective since 1900).

bottle to fill new wines." In addition, the task to build up a new system around a new phenomenon, containing both private and public legal rules, was usually through the endeavor of the judges.[261] It was called "the law of the judge" (Richterrecht). Some German scholars are worried about whether Germany would irresistibly go to the "Empire of Judges" (Richterstaat).[262]

Not only for the above-mentioned trade secrets or the so-called "new incorporeal property", but also for the right of airspace and subsurface, the German lawyers had adopted quite a similar approach.[263] They would use the European Union law, constitutional law (Grundgesetz), aviation law, condominium law, environmental law, planning law, as well as a lot of other laws to tackle the legal issues around airspace and subsurface in Germany currently.

Therefore, the German legal dogmatic for the new phenomenon is that they set the rules for the most important properties, the movable and immovable in its time of legislation (beginning of 20th century). Then, for the newcomers of the property family with high significance, they employ both old and new legal norms to deal with them. Despite the gap between private and public law rules, the judges as well as other scholars make them applicable and forming a new system. In other words, a high-quality judiciary and a ripe methodology of legal interpretation guarantee the compatibility, integrity, and harmonization of the law, as well as solving the new problems in property law by case law, but at the same time, keep the property law in civil code undisturbed.

In summary, although the legislators of the German Civil Code had left little space for the development of airspace and subsurface right, and they currently play no role in the private legal system, the German model enlightens a new way to solve the airspace and subsurface problem outside property law.

2.3.1.4 Court rulings and article 14 of German Basic Law: another possible future

In contrast with the theoretical endeavor by the private law scholars, the development of article 14 of the German Basic Law had gained more support from the court.

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[261] *Du*, 4 Z. J. U. Law. Rev. 37, pp. 45-50.
[262] *Rüthers*, Die heimliche Revolution vom Rechtsstaat zum Richterstaat, 2016, p. 8.
[263] See Chapter 3- Chapter 5 of this dissertation.

2.3.1.4.1 “Eigentum” as property: changing nature and supplementary functions

As introduced in previous Chapters, “Eigentum” in the German Civil Code is only one kind (the most important and comprehensive) of property rights. However, as pointed out by Julius Gierke, the word “Eigentum (literal ownership)” was usually used by the nonprofessionals to note all kinds of property rights, which meaning was different from the “ownership” by the legislator of German Civil Code. And the Weimar constitution, in article 153, had also adopted this broad meaning.[264] After WWII, the heritage of article 153 of the Weimar Constitution had been inherited and developed into article 14 of the German Basic Law. Accordingly, the word “Eigentum” in article 14 of the German Basic Law had also adopted this broad meaning.[265]

From a historical perspective, the property concept and its function in German constitutional law had always been changing. As Martin Wolff had noted in 1923, in the Weimar constitution article 153, “Property is guaranteed by the constitution.” This meant that the Weimar constitution would not only protect the property on things (German property law) but also protect all the possible private rights with property value (vermögenswert).[266] In other words, it meant the protection of every individual’s existing and new-founded property rights. However, Wolff had also found that there existed some technical limits for the German word “ownership (Eigentum)” in this situation, as the “ownership” legally meant the right of “control”. It should not go too far from the original settings of the legislators.

After WWII, the German Basic Law had restated the rule of “Eigentum” in article 14 as one of the constitutional rights of the citizen. As the design of a social state of the federal republic of Germany, Günter Dürig had already pointed out that the public legal position, such as the social legal interest should also be included within the scope of “Eigentum” of German Basic Law.[267] In the 1980s, Peter Häberle, adopting a perspective of law and economics, had pointed out the “Eigentum” in German Basic law should also serve its cultural function. “This is the interpretation of the constitution in an open society, which

[264] *Gierke*, Sachenrecht, 1925, p.44.
[265] *Lege*, Ad Legendum, 2016, pp.9-16.
[266] *Wolff*, in: FS W. Kahl, 1923, pp.2-19.
[267] *Dürig*, in FS Willibalt Apelt, 1958, p.13-30.

obtain its concrete method through the property policy and property interpretation of the open society, and base on the uniqueness of property culture."[268] In addition, Peter Häberle had also found that the constitutional property in German law had developed in a way identical with the "constitutional state", through which comes a tendency of the equation among the property owner, non-property owner and the neighboring property owner. Therefore, the "Change" of property in German law had already become a commonplace.[269]

Although the primary task for Article 14 of the German Basic Law was to fight against the infringement by state power, it had indeed made a wide space for the modern development of property right in Germany. As the scholar summarized, it had mainly two functions, the institutional guarantee, and the individual guarantee. For the former, "property (Eigentum)" should adopt a rather narrow meaning, because it only ensured the protection of a minimum set of property-related activities. In contrast, for the latter, the meaning of "property (Eigentum)" was rather comprehensive, because it included generally every concrete subjective and property legal position.[270] Concretely, the word "property (Eigentum)" contained not only the ownership of things in German property law but also all the limited property rights. Therefore, the word "Eigentum" in article 14 of German Basic Law, to some extent, would equal to "property" in common law.

2.3.1.4.2 The scope of "Eigentum" under Art. 14 of German Basic Law by the courts

According to the German federal constitutional court, "Eigentum" in the sense of article 14 contains intellectual property rights, appropriation right, the right of membership, the right to establish and operate business or medical clinic, etc. Furthermore, the word "Eigentum" in this sense contains also some obligation rights, such as the rental of a dwelling (Wohnungsmiete).[271] Therefore, to some extent, the "Eigentum" in the sense of article 14 of German Basic law functioned similarly as "*Res Incorporales*" in the ancient Roman law.

Additionally, the German Court of Justice (BGH) had also recommended many rights

[268] *Häberle*, AöR, 1984, pp. 59.
[269] *Häberle*, AöR, 1984, pp.59-60.
[270] *Leisner*, Eigentum in: Isensee/ Kirchhof, Handbuch des Staatsrechts: Band VIII, 2010, pp. 307-308.
[271] BVerfG, Beschluss vom 26. Mai 1993 – 1 BvR 208/93 –, BVerfGE 89, 1-14; BVerfG, Kammerbeschluss vom 28. März 2000 – 1 BvR 1460/99, - Juris.

with pecuniary value as “Eigentum” under Section 14 paragraph 1 of the German Basic Law. For example, the property legal position in subjective public law, the pension right in social security law could also be included. In addition, the copyright, patent rights, hunting rights, monetary property (Euro), mining property in previously East Germany, the possessory right of the tenants, and so on.[272] However, the “Eigentum” in article 14 of German Basic Law is not an all-contained concept. There are still some property rights outside its scope, which were called “Vermögen als solches”, such as mere chance, expectations, etc. The common characters of these rights are the lack of a concrete worth for the right holder.[273]

Therefore, the property rights in the German Civil Code functions differently from the “Eigentum” in article 14 of German Basic Law. It is because the former would keep the traditional property legal system stable, while the latter keeps changing with the new social needs. Actually, the constitutional “Eigentum” functions as a comprehensive “parent right”, from which new types of rights could derive on a case-by-case basis.

In summary, both the theoretical endeavor in civil law and the judgment in German Basic Law did not pay much attention to airspace and subsurface right. In contrast, such endeavors concentrate on the problem of immaterial goods, spiritual property, virtual property, data, rental of a dwelling, etc. All these modern phenomena seem more urgent than airspace and subsurface right. Therefore, the airspace and subsurface were ignored by most of the scholars and judges in Germany, which leaves only a few cases dealing with the airspace and subsurface in property law and currently no judgment especially on airspace and subsurface right in Germany constitutional court.

2.3.1.5 Short Summary

From the legal structure of German law on airspace and subsurface, the regulatory structure seems clear: section 905 set the skeleton of the vertical legal order of land. Limited surface land ownership, which extends to where the owner has an interest. Various public laws would justify the usage of the vertical airspace/subsurface, which located within or beyond the scope of the surface landowner. Corresponding to the

[272] *Althammer* in: Staudinger BGB (2016), introduction to sec. 903, para. 22-25.
[273] *Althammer* in: Staudinger BGB (2016), introduction to sec. 903, para. 25.

complexity of urban society, there are a wide variety of public laws involved. Therefore, the civil law set the basic structure, and public law illustrates the details. However, such a legal structure had made whole German legal order of airspace/subsurface built upon the justified limitations of the surface land ownership, which do not care the legal status and legal nature of the airspace/subsurface.

The theoretical endeavor from legal object had provided a good basis for accepting airspace/subsurface as a property right, although the main focus of the scholars was intellectual property, the enterprise, the data, virtual property, etc. However, the only problem is that their theories were mostly written in a textbook or monography, but not popular among the judges.

In contrast, the interpretation of section 14 of the German Basic Law had also pointed out a possible new orientation for airspace/subsurface. Airspace/subsurface, in its legal nature, is a kind of real estate right, but different from land or buildings. As the copyright, patent rights, hunting rights, monetary property (Euro), and the possessory right of the tenants had been adopted as a property right in the sense of section 14 of the German Basic Law by the courts, airspace/subsurface right could logically be regarded as a constitutional "Eigentum". However, the current problem is that such determination depended on if there were such cases (up to now, no such suit), but not pure logic.

In summary, the current legislation, the theoretical and judicial endeavor had all revealed the German attitude on airspace and subsurface, which depended more on the various public law rather than the private tools. Additionally, some landowner in German prefers to justify their real estate through public lawsuits (see Chapter 3.4). Therefore, the absence of a general property right on airspace/subsurface seemed compensated by its developed public law and high-qualified judiciary.

2.3.2 The US: general airspace right and its future trend

The US is the first country to recommend general property right on airspace right. Primarily, the independent airspace right happened in cities like New York. As the land price was very high, some low building owners would make an easement for others to

build on top of its buildings. However, some consumers preferred to purchase the airspace but not paying for rent or easement. Then the airspace/subsurface market began to appear. Such practice happened even before the aviation stimulation on airspace theory. In other words, the law lagged behind commercial practice.

Different from the strict procedural requirements in German real estate law (dingliche Geschäft), the sales contract had played a key role in the US. There were, accordingly, not much theoretical or practical difficulties. It would be apparent that, after the transaction of airspace, the new airspace owner could create new airspace within his ownership. Therefore, there would be infinite possibilities after the privatization of airspace. The market had proved the enormous potential value of airspace and subsurface. Therefore, the strictness in object law in German law seemed an obstacle for the free market of airspace/subsurface.

2.3.2.1 The commercialization of airspace: practice before the legal basis

As introduced by Robert Wright, there was a mature system of private law in airspace and subsurface in the 1960s. The evaluation, the sales contract, the rent contract, and the taxations. All of these transactions even had a series of "form contract". His book was trying to provide both a theoretical and practical base for training airspace lawyers.[274] This category in the US could be regarded as the classic category of airspace/subsurface right.

In legal practice, airspace and subsurface had been widely accepted, especially in big cities. As noted by Robert Krueger and his colleagues in the Report on airspace in the 1970s, the airspace and subsurface had already been developed into three categories: the aviation airspace, the condominium airspace, the traffic airspace. However, this is not the whole picture of airspace and subsurface, because there is still some airspace or subsurface under negative conveyance, such as the right of light.[275] All these types of airspace and subsurface right fulfill the need of urban society and were regulated by relevant special statutes at the state level. Different from the attitude on airspace and subsurface ownership and conveyance, nearly all the states in the US had adopted similar

[274] *Wright*, the Law of Airspace, 1968, pp.385-432.
[275] *Committee*, 5 Pro. & Tru. J., 347, pp. 347-355.

laws on aviation airspace, condominium airspace, and railway airspace. Why? Because these were the prerequisite conditions of urban life, while the private ownership of airspace could be solved by the market. As the cities and the urban population became larger and larger, there was great tension between the transportation spaces and dwelling space, because they were in a competing position, making the traffic underground and developing the air traffic became a solution.

Despite the unequal state legislatures, the trade of airspace between private parties had gradually become popular in business transactions since the 1910s, especially in the central business district.[276] Before the 1960s, the most common form of airspace transaction was the airspace upon the railway station, especially in New York, Chicago, Cambridge (Mass.) and Cleveland. From the legal perspective, the trade of airspace had mainly four ways: Lease of air rights, the sale of entire fee rights to land and airspace, the sale of air rights and caisson lots, the sale of air rights with a grant of easement for foundations. All these forms of trade were originally business creation through contract. Therefore, contract law in the US could also be regarded as a legal source of airspace and subsurface. As pointed in the report on air rights, "The incentive to develop structures on air rights is a result of two interrelated aspects of urban growth — rising land values and expanding transportation facilities."

Therefore, the free trade of airspace/subsurface came even earlier than the theory. Comparatively, the surface land ownership was very broad in the US, and the surface landowner had played a central role in the allocation of airspace/subsurface. The enormous market value of airspace/subsurface had won their status as a kind of real estate, especially in the eyes of taxation.

2.3.2.2 Legal basis: the airspace/subsurface model law

The previous focus in the US airspace and subsurface law had mainly two aspects, from the negative side, the surface landowners would employ airspace law to fight against overflight and vertical infringement. From the positive side, the surface landowners and the airspace owner would make a profit from a series of civil transactions, rent, easement,

[276] *American Society of Planning Officials*, Chicago 37 Illinois, Information Report No. 186 (1964).

etc. Then the appearance of TDR had become a good substitute for the previous airspace law at the local level. However, the airspace/subsurface law is not outdated.

2.3.2.2.1 Airspace and subsurface as kind of real estate: the model airspace law of 1973

The decade's commercial practice and the theoretical preparation have made the airspace right more and more mature in the US. In the 1970s, there comes a "model airspace law" by the US lawyers. In this model law, the much academic consensus was recorded. After defining the airspace, they recommend that "Airspace, as defined herein, is real property". In addition, they tend to regard the airspace as the property of person/persons holding title to the land surface below the airspace, "until the title thereto or rights, interests or estates therein are separately transferred". In addition, they claim that the airspace could be divided or apportioned in any physical form, and be transferred. The real estate rules are roughly applicable to the airspace. In addition, the airspace should be taxed, "to the same extent and in the same manner as other real property" (except as otherwise provided by law). In addition, there are also rules on way easement, disposition, eminent domain, and condemnation.[277] Following this model act, some states had stipulated similar rules, which partly or wholly accept the ideas of this model law. For example, in 1973, a stipulation was added into the property statutes of Oklahoma Statutes, which clearly defined airspace as a kind of real property.[278]

This model act is the summit of more than four decades (popular since the 1930s) of airspace legal studies, judgments, and commercial practices. Although not widely accepted by among the states, this model law had really functioned as a model in the private legal regimes of airspace. Even the current textbook of real estate would cite this model airspace act.

2.3.2.2.2 Change of theories: from airspace law to TDRs

Parallel to the "real estate airspace/subsurface" regime, some big cities in the US had adopted the TDR program, which is a combination of airspace right and the zoning and

[277] Model Airspace Act, 8 Real Prop. Prob. & Tr. J. 504 (1973).

[278] Title 60 § 60-803. Airspace as real property. Airspace as defined herein is real property, and until title thereto or rights, interests or estates therein are separately transferred, airspace is the property of the person or persons holding title to the land surface beneath it, subject to the limitations relating to wind or solar energy agreements provided in Section 1 of this act. Added by Laws 1973, c. 199, § 3, eff. Oct. 1, 1973. Amended by Laws 2010, c. 334, § 2, eff. July 1, 2010.

planning regulations. It seems more popular than the model airspace act locally.

In fact, TDRs could be regarded as a flexible instrument for airspace transaction. The uniqueness of the US airspace was the mechanism of transferable development rights (TDRs),[279] the airspace was regarded as the ability to build, but the landowner may not possibly use his allocated number according to the zoning law (something like Quota, links to the land). In German law, when someone wanted to build up a building, they must apply first to the county (Gemeinde), they had to get the license respectively and specifically for himself. However, the TDR certificate, as its names, can be transferred among the landowners.[280] The legal nature of TDR was real property, a kind of "the bundle of rights". Before the Zoning law, the landowner had the right to develop its real estate as he wishes, "so long as it did not create or result in a common law nuisance". However, after the enactment of zoning law under the state police power, the land's zoning potential was limited. Therefore, "The "development rights" should be recognized as the progeny of zoning, and treated as zoning rights under the then applicable zoning laws rather than as genuine real property development rights." In other words, TDR was a compromise between the potential of development of the land plot and the local zoning considerations.

This mechanism resembled the Carbon trade system,[281] which is used internationally and domestically in some countries to allocate the license for Emission and aiming at the control of climate change. The more Emission should pay his extra, to compensate the less.[282] TDRs is a mechanism, which on the one side, protect the ownership of the landowner, and on the other hand, alleviate the conflicts between private ownership and the zoning law. In addition, it makes the airspace really transferable and valuable. Overall, this mechanism will help to avoid urban sprawl and support the smart growth of modern cities.[283]

Actually, the TDR could be regarded as a new stage of development of the right of

[279] *Pedowitz*, 19 Re. Pr. & Tr. J. 604, p.604-608.
[280] Stevenson, Banking on TDRs, 73 N.Y.U. L. Rev. 1329, p. 1329.
[281] *Welti*, 21 Geo. Int'l Envtl. L. Rev. 337, pp. 339-345.
[282] But some moral and philosophical reflections can also be leaded in another way, See *Shue*, 15 Law & Pol'y 39, pp. 39-49.
[283] *Beetle*, 34 Rutgers L.J. 513, p.525.

airspace and subsurface.[284] According to traditional perceptions, the airspace and subsurface must locate above or below some parcel of land. It could not be identified without the land surface. However, this new invention of TDR had deliberated the airspace and subsurface from the land plot. The potential development of land is respected, and accordingly, the century-long dispute of taking and just compensation could end because the market would pay the just price. This is a new zoning tool, and make a public city planning among the jungles of private land ownership possible. A recent example to illustrate its advantage is the transformation of the meatpacking district. As written by Vicki Been and John Infranca, this district "is now a celebrated urban park. It is also the centerpiece of the Special West Chelsea District, a rezoning that dramatically altered the neighborhoods-built environment, enabling the transformation of warehouses and meat processing plants into high-end residential and commercial spaces. This transformation was achieved in part through the use of transferable development rights (TDRs)."[285]

The TDR is more and more popular in the US, and accordingly, the discussion of airspace and subsurface would, to some extent, equal to TDRs. However, there is still some theoretical problem with this mechanism. For example, the constitutionality, the interrelation between TDR and "Taking" is still in doubt, despite the embarrassment of "take two" in the Penn Central case.[286] From a functional perspective, regardless of the legal nature of TDRs as a regulatory property right, it is rather a tool for urban future development. Because under traditional constitutional law, the "taking" clause had provided comprehensive protection on the land plot, as well as its airspace and subsurface, which might be an obstacle for the feasibility of future urban development. Therefore, the TDR could be regarded as an institutional compromise between the need for modern urban development and the full (but not excessive) protection of land ownership.

In summary, despite the similarities of the aviation legal framework on airspace, the US airspace, and subsurface rights emphasize the function of the market, many initiatives are made by the lawyer rather than the legislators. Far from mature, the TDRs are products

[284] *Marcus*, 50 Brook. L. Rev. 867, p. 867-869.
[285] *Been/Infranca*, 78 Brook. L. Rev. 435, p. 437.
[286] *Serkin*, 92 Notre Dame L. Rev. 913, pp. 913-922.

of zoning, which have combined the urban development and the regulatory property rights together. Therefore, TDRs represent a new orientation of airspace and subsurface law.

2.3.2.3 Short summary

The US is the first country to recommend a general property right on airspace/subsurface, in addition, due to the openness of property law, both the model law and some state law had regarded the airspace/subsurface as a kind of real estate. Under such general property right on airspace/subsurface, the commercialization of airspace/subsurface had reached a high level in the urban areas, especially the city centers.

Another specialty of the US airspace/subsurface law is that the surface landowner occupied a central role, most of the airspace/subsurface right is divided from the surface landownership. In other words, the surface landowners enjoy a large portion of airspace and subsurface, he can sell some part of these airspace/subsurface to others for any purposes they agree. Then, the airspace/subsurface becomes a new real estate, which is independent of the surface land ownership, such division could, theoretically, continue to be divided into countless new independent spaces.

As the airspace/subsurface ownership is very strong, it is in conflicts with many other private and public right holders. The taking of a parcel of land would become extremely expensive if the undeveloped airspace/subsurface were added into the total value. The TDRs is a compromise, which combines the local planning and zoning rules with the property airspace interest together. The urban goals become possible, at the same time, the corresponding surface owner could sell his undeveloped portion to others in other places within the locality. However, without a developed zoning law and a mature land market, such solutions in other places, like China, it would cause more problems than achievements.

All in all, the general property right on airspace/subsurface is helpful for a healthy land surface, and airspace/subsurface market. The TDRs are much developed, but they are obviously more meaningful under the US legal regime.

2.3.3 The Chinese situation: special airspace/subsurface right with the general theory

In China, the vertical land usage right for construction is recommended by section 136 of property law, which is a typical airspace/subsurface right under the Japanese influence. However, as introduced before, the Japanese school had not literally recommended a general airspace/subsurface right in the general part of the property. It is an interim strategy. In China, there are also no general property rights on airspace/subsurface. However, the general property rights on airspace/subsurface are supported by many jurists and judges. They had developed the general property rights on airspace/subsurface through books and judgments.

2.3.3.1 The special airspace/subsurface stipulations: condominium and land use right for construction

As most of the land and resources are state-owned or collectively-owned in China, the apartments have consequently become one of the most valuable real estates for the individuals. Accordingly, the real estate industry is one of the most profitable industry, especially in Beijing, Shanghai, Shenzhen, and Guangzhou, which are called the "first-tier cities". In China, most of the residents in big cities live in condominium buildings. These buildings normally do not amount to skyscraper-like in the US, but 10 to a 20-floor high building is very common in Chinese middle-scale cities. Accordingly, the high land price had also caused the development of urban subsurface and airspace. But no doubt, many airspaces and subsurface disputes happen within condominium community, where most of the Chinese live.

Besides condominium, the most important real estate right in current Chinese urban society is the "land use right for construction", which is similar to "heritable building right" (Erbbaurecht) of German law.[287] This mechanism was primarily only used in some coastal cities as a try to attract foreign investment at the 1980s. Then it was recommended

[287] This is a Chinese legal concept, in Chinese "Jianshe Yongdi Shiyong Quan (建设用地使用权)", which is quite similar with the German heritable building right (Erbbaurecht). The landowner can only be the State, while the market economy reform calls for a wide variety of civil and commercial land use, so a mechanism to justify the private use of land and allocate the economic interest between the landowner (the State) and the private land user should be created after the Reform and Open policy in 1979. As written in Article 135 of property law of PRC, "The holder of the right to use land for construction shall be entitled to possess, use and seek proceeds from the land owned by the state, and be entitled to make use of the land for constructing buildings, fixtures and their auxiliary facilities."

by the land management law of PRC and finally inserted in the Property law of PRC in 2007. Such half-privatization of land had successfully supported the economic take-off of China during the past three decades.

Concretely, the land ownership is still state-owned in the urban areas, but the local government would create "land use right for construction" by assignment (paid), allocation (free of charge) or other means for private users (section 137). The private users would pay for the assigning and other fees, and such right would last no longer than 70 years. This legal mechanism can be regarded as a half-market reform for the originally planned economy. The local government had consequently become substantially the seller of the "primary market", and the huge benefits from such a deal was named "land finance".[288]

Just under such a legal mechanism, section 136 of "land use right for construction" had become the statutory basis for airspace and subsurface law. According to this section, "The right to the use of land for construction may be separately created on the surface, above or under the ground. The newly created right to the use of land for construction shall not infringe on the usufruct which has already been created thereon." This section was regarded as the legal basis of airspace/subsurface right in China. The legislator had adopted a vertical perspective on land, and treat the surface, airspace, and subsurface equally. As all the three kinds of rights were "land use right for construction", the airspace/subsurface right would not be mistakenly regarded as the power of the surface landownership.

Even more special, in order to get the "full ownership" of the buildings, all the holder of "the land usage right for construction right" should d apply for administrative permission on the concrete purpose to use the parcel of land in China, within which application, the

Deeply influenced by the Japanese airspace/subsurface theory (Japanese theory is influenced by US theory), according to the Chinese scholars, "Kongjian Quan" is a word including both airspace and subsurface, which represent a volume of airspace vertically located above or beneath some plot of land surface, which length, height, depth, and

[288] Liu/Fan/Yue/Song (2018). 72 Land Use Policy, pp.420-432.

geographical position. From a wider perspective, the “Kongjian Quan” include all kind of rights, which aims at using some airspace to do something, such as mining, hunting, fishing, building houses, easement of light, etc. However, there were mining laws, hunting laws, fishing laws, building laws in China, the “Kongjian Quan” would not replace their concrete rules, but only provide the basic protection on the side of real estate. From a narrow scope, the “Kongjian Quan” mainly represent the airspace/subsurface matters within condominium and land use right for construction. These two categories are obviously most profitable in Chinese urban society, and in need of rules and jurisprudence on the allocation of airspace/subsurface.

2.3.3.2 General property rights on airspace/ subsurface in legal theory: Kongjian Quan

The earliest monography on airspace/subsurface right was written by Chen Jiangxiang, who insists the airspace/subsurface right in China could divide into airspace easement and airspace ownership. Obviously, the latter belongs to the state, while the former belongs to private individuals.[289] Chen prefers to use the term “Kongjian Quan” in a broad sense.

Then Xiao Jun had written a monograph mainly on the urban subsurface development. Xiao’s study mainly based on modern Japanese law, and trying to active the Chinese administrative law to unify the underground easement and enhance the compensation of surface land users.[290] According to Xiao, China could learn from Japan, make a huge underground pipeline commonly for water, electricity, internet, gas, etc., all these public facilities using the same easement, which is money-sparing and easy to repair. His focus is expropriation of the subsurface, which could be regarded as a kind of concrete measure to develop Chinese underground. There are still some underground development books from an economic or architectural perspective, but not quite relevant to the focus of this dissertation. These studies mainly use the term Kongjian Quan in a narrow and technical sense.

Cui Jianyuan has two monographs in this field, one is about “quasi-real rights”, the other

[289] *Chen*, Studies on Airspace/subsurface Right, 2009, pp. 16-42.
[290] Xiao, Studies on the Legal Institutions on Subsurface Land Use, 2008, pp. 75-119.

relates to "the group of rights in land".[291] According to his study, the mining rights, water rights, fishing rights, and hunting rights are defined as "quasi-real rights". The reason is that, unlike the typical real rights, these quasi-property rights have only part of the features of typical real rights. He insists that these rights were different from the typical real rights (e.g. ownership, easement, and mortgage), but these rights are obviously land-related and with some features of real estate. Obviously, Cui had used the term Kongjian Quan in a wide sense.

Although airspace/subsurface law occupied only a small part in his book, he insists the airspace/subsurface right should be respected in modern urban society. According to his studies, the conflicts between mining right and surface ownership are intense. For example, mining at night might interfere with the house owner on the surface. In the rural district, the mining activity might also influence the groundwater, which causes the surface farmland user extra cost in digging deep wells. In which situation, it would have to use the following law altogether, sections on "neighbor relationship" within property law, the mining resources law of PRC, the Law on the Contracting of Rural Land, the land administrative law. As a matter of fact, most of these relevant rules were absorbed by the new legislation of Chinese Civil Code. Accordingly, we can expect that most of the airspace/subsurface rules in a narrow sense would be found within the future Chinese Civil Code.

Therefore, similar to that in Japan and the US, "Kongjian Quan (airspace and subsurface right)" in Chinese theory is clearer than that in legislation. It was a kind of real right, and the task for Chinese scholars is to harmonize the Kongjian Quan theory within other real rights in the current legal framework, which is by far no easy task.

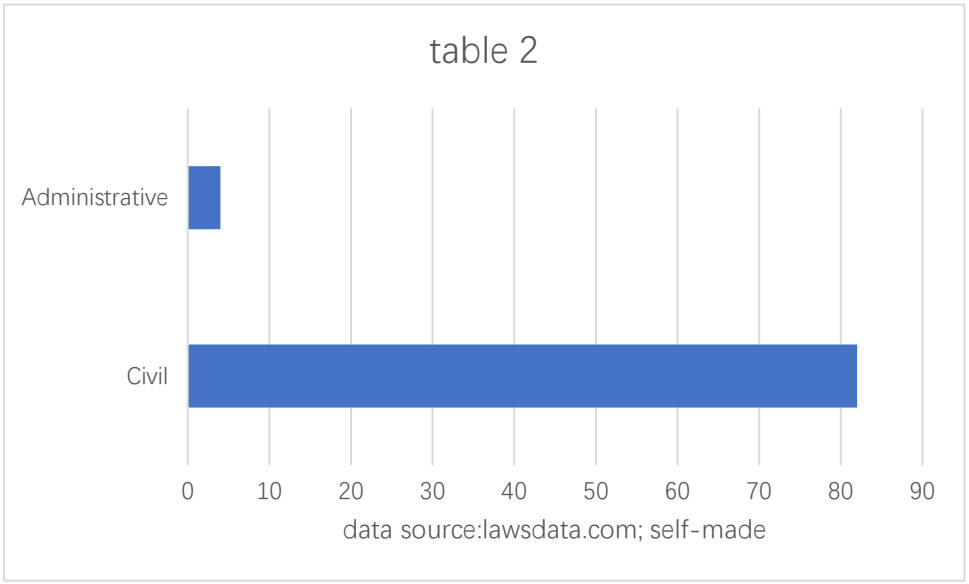
2.3.3.3 The recognition of general property rights on airspace/subsurface in court decisions

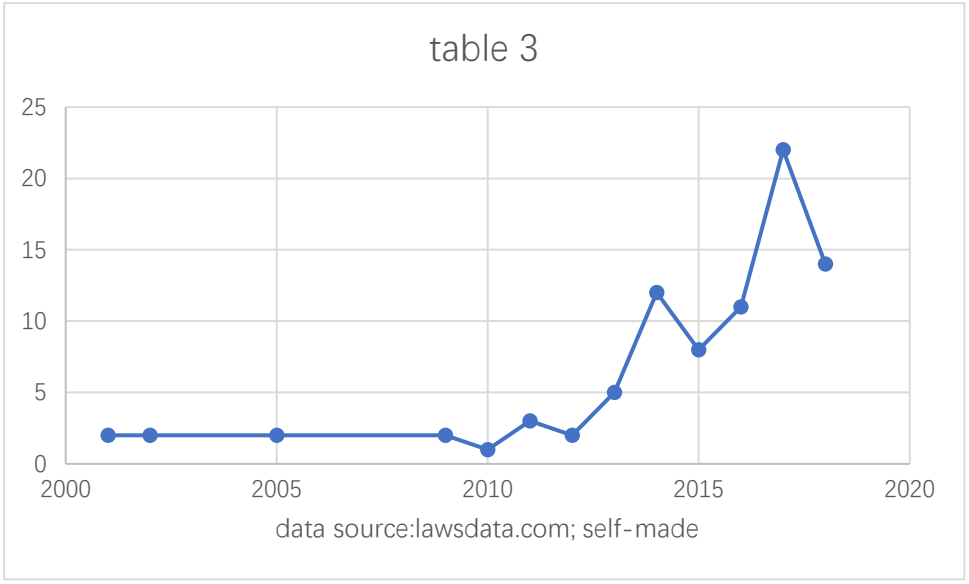
Although the general "Kongjian Quan" could not be found literally within the property law of 2007. The theory is very popular among Chinese lawyers and adopted by many

[291] Professor Cui Jianyuan is one of the most famous Chinese private law scholar teaching at Tsinghua University in Beijing, who had made original contribution to the Chinese land law and contract law. These two books are "on the group of right in land" and "treatise on quasi real rights". See *Cui*, On the Group of Right in Land, 2004, pp.316-359. See also *Cui*, Treatise on Quasi Real Rights, 2012, pp. 237-543.

judgments. In other words, the court judgment becomes a pioneer in shaping the Chinese airspace/subsurface law. In China, there was no administrative court, but inside each court, there are at least civil tribunal, administrative tribunal, and criminal tribunal. Within the intermediate court, provincial high court, even the civil tribunal had been divided into three or four sub-tribunals, each of which is responsible for a special field of dispute.

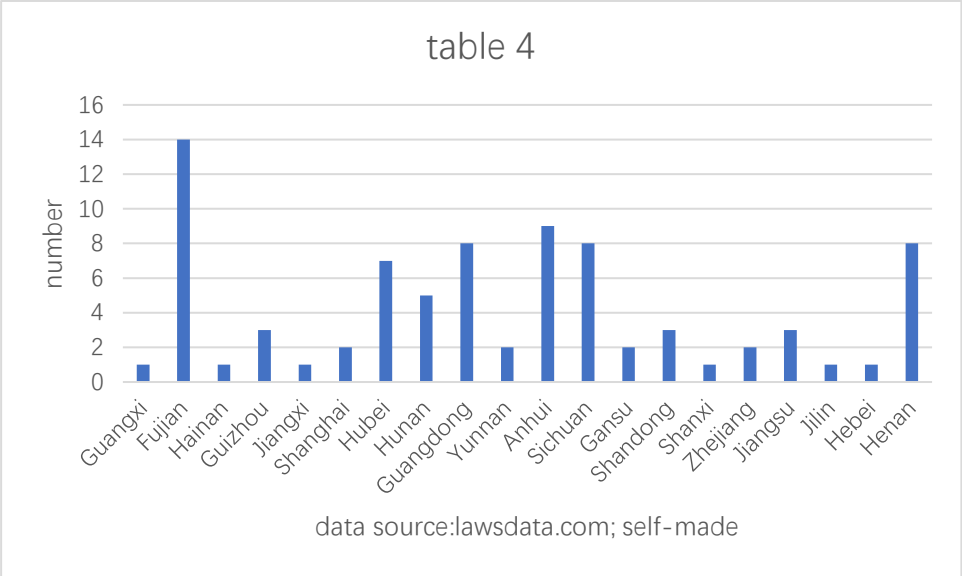
Firstly, most of the airspace and subsurface case in China was regarded as civil cases rather than administrative cases. As shown in table 2, there are 86 cases directly use the term “airspace right”, among which 84 are civil cases, the other two are administrative cases.



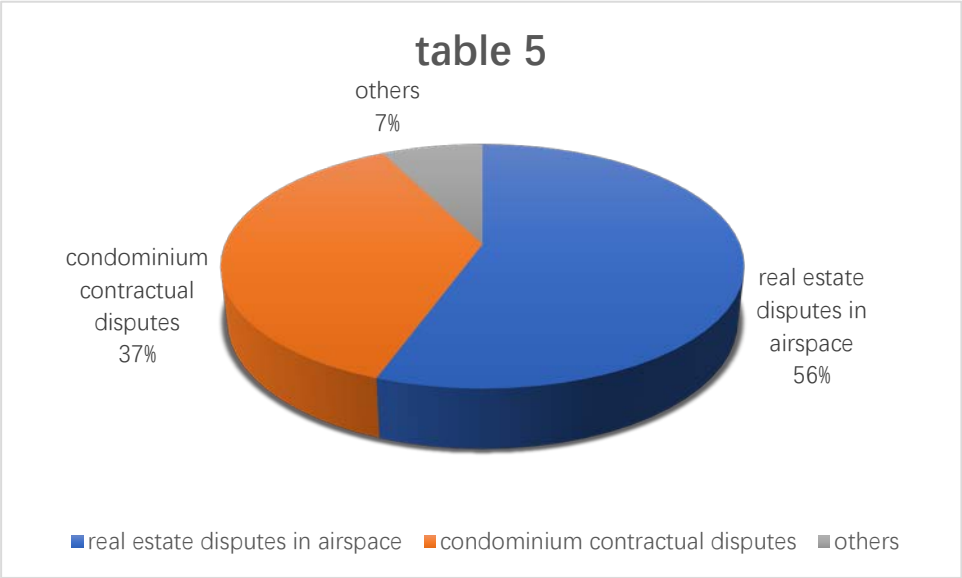


Secondly, although there was still no supreme court judgment, as shown in table 3, the

airspace/subsurface judgments spread among 20 provinces of China, which could be regarded as mainstream. Among these 86 cases, half were tried in intermediate courts (usually including one big city, several small towns, and districts), which means the consensus of the locality. Furthermore, five of them were tried in the provincial high court.



Thirdly, according to table 5, the airspace and subsurface cases in China are mostly real estate related cases, among which the common airspace in a condominium plays a key role. When such disputes happened between condominium owners, they tend to sue within property law. When such disputes happened between developers and condominium owners, the condominium owner would seek remedies from contractual claims.



According to the logic of the continental system, the claim should have a statutory basis

(Anspruchsgrundlage). However, the Chinese court was very bold in this field, as there is still no stipulation using the term "Kongjian Quan" within the property law. However, according to the courts, section 136 is the statutory basis for airspace/subsurface right. Accordingly, the airspace/subsurface claims are admissible by most of these cases. However, in an administrative case, the condominium owner sued the planning permission on the second phase of a condominium development project, which would exceed the original plan of the land plot. The condominium community would become narrower and more crowded. The condominium owner believes their usufruct rights and airspace right were infringed by the permission. However, the Xihu local court of Hangzhou held that "the plaintiff's claimed right on the undeveloped land were not concrete, and there were no stipulations on the general airspace/subsurface right in the current legal system". Accordingly, the condominium owners have no "locus standi".[292] Therefore, the administrative branch of the local court is not familiar with the airspace/subsurface right, and tend to judge base on the current law. The attitude of the court is understandable because the principle of legal reservation (Gesetzvorbehalt) is one of the basic principles of the administrative law. In addition, the attitude of the administrative branch of the court might explain why people in China tend to seek civil remedies rather than administrative remedies in this field.

There are some common criteria on airspace by the court. **Firstly,** the court would not support airspace claims when the ownership of the land surface was uncertain. In case Chen v. Cui,[293] Cui had built up a new multi-floor house with exterior stairway, and installed air conditioners in the exterior wall of his house. However, Chen found the stairway and the air conditioners infringed his airspace right, and sued for removal. The Shangqiu Intermediate court held that "the airspace/subsurface right relied upon the usage right of the land surface. In this case, as the ownership of the disputed land is uncertain, the claims on its airspace would not be supported. This is from the negative side of airspace/subsurface right (right as defense).

For the positive side, in defining an airspace/subsurface right, the court repeated the

[292] Shi & Zhou v. Planning Bureau of Hangzhou City, Case No.: (2011) Hang Xi Xing Chu Zi Di 56.
[293] Chen v. Cui, Case No.: (2016) Yu 14 Min Zhong 1077.

interpretation of the Supreme people's court, "1. It has an independent structure and can be clearly distinguishable; 2. It can be used independently; and 3. It can be registered under the name of a specific owner." In which, the Supreme Court had adopted the same criteria for the "premise (unit), parking space, booth or any other specific space", which had revealed the Chinese perception of the condominium. However, for the airspace infringement, such requirements were normally not necessary. Therefore, in justifying an airspace/subsurface right, firstly the claimer should have legitimate rights, and secondly, the airspace should satisfy some special requirements.

Secondly, the court would not support airspace/subsurface claims when the occupation had not caused harm to their neighbors. In case Wang Qifang v. Wang Qiang & Kuang Shangmin,[294] Wang Qiang had built up a 7-floor house. However, the anti-theft grille outside the window had spread into Wang Qifang's airspace. The Fuqing local court held that the defendant, Wang Qiang, is responsible to remove the obstacles of the first floor, but can keep the anti-theft grille outside the window from the second floor, because these grilles had not blocked the ventilation, lighting or sunshine of the building of Wang Qiang. According to section 84 and 89 of the Chinese property law, Wang Qiang has the obligation to bear, and his airspace right is, accordingly, not infringed. Such ruling is repeated in Wang Lizhong v. Ouyang Bingqi,[295] in which the defendant had used the neighboring subsurface for the sewerage. Therefore, for the neighboring airspace disputes, the neighbor relationship has priority over the airspace right.

Thirdly, the compensation of airspace should depend on volume. In case Wang & Chen v. Baili land development Ltd,[296] Wang & Chen had bought a commercial condominium unit from Baili Corporation. In this contract, the unit should be 5.4 meters in height, however, the real height is only 5.1 meters. The condominium owner sued for compensation of the lost airspace right. The Wuhu intermediate court had supported the plaintiffs' claim and calculated the loss according to the volume. This can be regarded as a rule of compensation for the airspace right.

[294] Wang Qifang v. Wang Qiang & Kuang Shangmin, Case No.: (2016) Min 0181 Min Chu 3778.
[295] Wang Lizhong v. Ouyang Bingqi, Case No.: (2014) Ji Zhong Min San Zi Di 199.
[296] Wang & Chen v. Baili land development Ltd, Case No.: (2015) Wu Zhong Min Si Zhong Zi Di 00301.

Fourthly, for the district in lack of subsurface register, the developer is not liable for the impossibility. According to section 16 of the land administrative law, “Disputes arising from the ownership or use right of land shall be settled through consultation among parties concerned; should consultation fail, the disputes should be handled by people's governments.” Therefore, the local registry and local government are responsible for the land ownership/use right. In a series of cases in the Quanzhou City of Fujian Province, many people had bought the underground commercial condominium unit from Jinxin Group Ltd. However, the Jinxin Group was not able to finish the register of the subsurface condominium within 90 days due to the lack of such policy locally. The court held that Jinxin Group is not responsible for such delays and the condominium owner has to wait.[297]

In summary, the courts take a first step in the definition of the airspace/subsurface rights in Chinese law. Although the amount of the cases is still tiny, more than half of Chinese provinces seems influenced by the theory that the airspace/subsurface could be regarded as a kind of real estate. Not all the airspace/subsurface could be regarded as an independent right, some requirements should be fulfilled (positive side). In the infringement of airspace/subsurface rights, the plaintiff should prove the legitimate rights on the land surface, and the compensation should base on the loss of volume. In some cities, where there is no relevant register regime for underground units, the developer is not responsible for such problems.

In fact, there are still many cases in different branches of airspace/subsurface right, but the court did not directly use the general term “airspace/subsurface right”. These 84 cases had already revealed the Chinese judicial perceptions of airspace, which is typically real estate based and highly recommended in different provinces.

2.3.3.4 Summary

In summary, under the German-style property law and great social need of utilizing airspace and subsurface, China adopted a middle way, which is accepting the

[297] Lia Sizhong v. Jinxin Group Ltd., Case No.: (2016)闽民申 1411 号; Yang Liangzhu v. Jinxin Group Ltd., Case No.: (2016)闽民申 1409 号; Li Yuecai & Zhuang v. Jinxin Group Ltd., Case No.: (2016)闽民申 1410 号; Zhang Yuhua & Zheng Songmou v. Jinxin Group Ltd., Case No.: (2016)闽民申 1730 号.

airspace/subsurface through superficies, but leaves the general property rights on airspace/subsurface ambiguously. In fact, benefited from the “property-Sache” dualist property system, China has more space to forge airspace/subsurface right than Japan and the “Taiwan District”. Therefore, the majority of scholars and the judges tend to recommend the general property rights on airspace/subsurface in China. But it seems that the theories and judgments are not enough to provide a common and nationwide general property rules on airspace/subsurface, which could only be achieved by the legislation.

In addition, Chinese land and airspace/subsurface are characterized by the state-ownership, which can be regarded as an obstacle to the liberation of airspace/subsurface market in China. From the perspective of the author, clear legislation on the general property rights on airspace/subsurface is also a good choice to initiate the airspace/subsurface market in China.

2.3.4 Short Summary

In the second layer, Germany, the US and China had adopted a dramatically different attitude towards the general property rights on airspace/subsurface. There were no general property rights on airspace/subsurface under German law, however, the US is the first country to recommend it. Influenced by Japan, China is in the middle, which had a stipulation on land usage right for construction, but leave the general property rights on airspace/subsurface to the scholars and the judges. Therefore, for general property rights on airspace/subsurface, the three countries are respectfully negative, positive and half-positive. The following question is that, does the general property rights on airspace/subsurface replaceable? Alternatively, what is the advantages and disadvantages of adopting a general property right on airspace/subsurface? This is a central concern of this dissertation.

2.4 Summary of this chapter

TABLE 5

	Germany	*The US*	China
GENERAL VERTICAL LEGAL ORDER	Sec. 905 filled with various public laws	*Minimum safety altitude & Causby case; land surface owner oriented*	Technical & international standard, state-owned land surface, airspace/subsurface
THE GENERAL PROPERTY RIGHTS ON AIRSPACE/ SUBSURFACE (GPRAS)	No GPRAS. The possibility exists in the creative use of public laws and Art. 14 of German Basic Law.	*The first to recommend GPRAS. The surface landowner occupied the largest portion and is also the seller of airspace/ subsurface. The airspace/subsurface become independent from the land surface after the sale.*	Partly recommend GPRAS by theories and judgments. Follow Japan and recommend the vertical land usage right for construction in section 136 of property law.

As shown in Table 5, this chapter firstly aims at clarifying the general legal order of airspace and subsurface in Germany, the US, and China. In this sense, the division is quite similar among the countries under urban society, the high airspace for aviation, the land surface and lower airspace for business, dwelling, transportation, garden, park, etc., and the subsurface for a shopping mall, sewerage, electricity, gas, heating, etc. Although different in the concrete number, the navigation airspace is quite technical and unified by several international conventions and standards, accordingly, the rules are quite similar among the three countries. For the underground legal order, the differences mainly exist in mining law. E.g. the surface landowner could own underground mineral in many states of the US, some minerals in Germany are state-owned, while in China all the minerals are state-owned.

In the second layer, the general property right on airspace/subsurface is dramatically different. In Germany, the basic legal structure is limited land ownership (to where he has

interest) with various obligations from public law. Therefore, section 905 functions as a bone, while multiple public law rules function as fleshes. Although the German surface landowner could certainly set easement in his airspace or subsurface under his control, these easements were regarded as easements on the land surface rather than airspace/subsurface easement. Accordingly, most of the airspace/subsurface rights in Germany were absorbed by surface land ownership. In addition, due to the strictness of the object of property, the airspace/subsurface was very hard to be regarded as kind of property right under German property law, although there were some theoretical and judicial endeavors to alleviate its strictness. In fact, such endeavors are more stimulated by modern information, personal data than the urgency of recommending the airspace/subsurface as a kind of property. Therefore, there was just a possibility for airspace/subsurface in public and constitutional law, but there was currently no judgment.

In contrast, in the US, the landowner could divide his unused airspace/subsurface into new independent airspace/subsurface right and transfer them to others. The market had functioned as a basis for the enormous potential value of airspace (especially) in big cities. All these theoretical preparation and commercial practice had contributed to the airspace model law of 1973, which is a real estate law on airspace. After that, the airspace/subsurface law had been gradually replaced by the TDR programs, which could be regarded as an updated airspace law, combing the airspace law, market regime, zoning law altogether. Despite the unconstitutionality disputes among scholars, the surface landowner's interest, the planning interest, and the public interest seem better harmonized through TDR programs. There are similar stipulations as section 905 of the German Civil Code in Chinese property law. However, influenced by Japan, section 136 of Chinese property law does not set general airspace right, but only airspace/subsurface land use right for construction. Accordingly, the Chinese airspace/subsurface law was built mainly upon scholars and court judgments.

In summary, the general vertical legal order of airspace/subsurface existed in Germany, the US, and China, which was a common feature of urban society in modern times. In contrast, their differences in recommending the general property rights on

airspace/subsurface were mainly caused by different regulatory strategies and models. Concretely, Germany relied more on the public law, while the US relied mainly on market by endowing the surface owner the power to divide into small. China adopted the German property theory and basic framework but followed the Japanese strategy (only recommending the superficies), which had caused more dilemma and difficulties.

The following question is, the different strategies might cause totally different consequences. In fact, the general property rights on airspace/subsurface have at least three advantages, the first is stimulating the potential of the airspace/subsurface market. The US practice is a good example, in fact, the model airspace law of the 1970s is just a summary of the decade's urban airspace transaction. In other words, the general property rights on airspace/subsurface functioned as customary law in the US before the model law. Secondly, the general property rights on airspace/subsurface is a strong shield to defense the various intrusions from the state, the public and other individuals (see Chapter 3). Thirdly, the general property rights on airspace/subsurface are a good supplement on the branches, when there are some loopholes (see Chapter 4). In addition, the general property rights on airspace/subsurface could also provide protection before the new branches come into being (see Chapter 3.5). In summary, the general property rights on airspace and subsurface are very important in the three-layer structure, which is, to some extent, irreplaceable. In the following Chapters, when studying the concrete fields of airspace/subsurface, the importance of general property rights on airspace/subsurface would be proved.

Chapter 3 Who owns the sky? The airspace between landowners and aircraft

Chapter 2.2 had introduced the general legal order of airspace/subsurface. However, the airspace right is rather complex in nature, which could not be fully explained through a general and theoretical study. Therefore, a detailed case study of airspace and subsurface in concrete fields is still required. This chapter mainly deals with the boundary of land ownership and aviation freedom (the boundary between the first layer and second layer), whose conflicts would intensify near the airport.

From the perspective of urbanology, air traffic is rather a typical form of modern transportation, which had played a larger and larger role in modern urban lives. Despite the number of military airports, there are over 2300 airports throughout the world until 2016.[298]Moreover, the number of air passenger had increased to 7.2 billion worldwide.[299] Not only the big cities in the world, but also many middle-scale cities would normally have more than one civil airport. Moreover, even small cities in Europe and the US would have at least one civil airport. Additionally, the busiest 37 commercial airports had over 40 million passengers in 2015.[300] The other side of the coin is that almost every big city in the world would face the problem of aircraft noise, especially the landowners in the vicinity of the airport. It is not a new problem but stimulated by the development of modern aviation. Concretely, the conflict between landowners and air traffic would become much fiercer as the prosperity of civil aviation. Interestingly, the boundaries between the surface landowner and vertical airspace owner/user had been mainly clarified through these airport-landowner cases.

The third dimension of this Chapter is to show how aviation technology would affect real estate rights, especially the airspace right. In the face of the era of drones, this chapter would also try to make out how could the legal theories and legal institutions of airspace

[298] Among these 2300 airports, “as of January 2017, accounts for 623 members operating 1,940 airports in 176 countries” see Annual Report 2016: the voice of the world’s airports, published by Airports Council International 2016, p. 8.
[299] Supra, p.18.
[300] Supra.

better adapt to modern technological change.

3.1 Short introduction

3.1.1 The use of airspace by aircraft in Germany

3.1.1.1 The aviation law and obligation to bear

As introduced in Chapter 1.4.2 and Chapter 2.1.3, in German law, there is basically no debate about the use of airspace at high altitude. Because the land ownership by the German Civil Code extends only to where the landowner has interest. In addition, the landowners should enjoy their land ownership "to the extent that a statute or third-party rights do not conflict with" (section 903). What's more, the landowners have the obligation to bear, when the interference had reached "only to an insignificant extent (section 906)".

On the other hand, the German Air traffic Act (Luftverkehrsgesetzes) had in Section 1 subsection 1 clarified the landowner's obligation to bear (without compensation) for the proper (ordnungsgemäßen) use of airspace by the aircraft.[301] However, the landowners still have the right to preclude overflight according to section 905 subsection 2 and the right of a claim based on section 1004 of the German Civil Code, if the aircraft would fly at a very low altitude, or make much noise during its take-off and landing.[302] In addition, the landowners have also no obligation to bear for the frequent overflight by the drones.[303]

For the aviation noise control, there is already legislation at the EU (previously, European Economic Community) level since 1979.[304] However, for noise pollution, the courts had adopted a strict standard of evidence. Accordingly, it was hard for the plaintiff to prove harm and get compensation. This problem had been shown in the early case of "silver fox" in Germany.[305] In this case, the landowner had a silver fox farm near an airport. Unfortunately, many of his foxes were dead due to the aircraft noise. Then the landowner

[301] *Goeke*, Das Grundeigentum im Luftraum und im Erdreich, 1999, p.140.
[302] *Roth*, Staudinger BGB (2017), Sec. 905, para. 21.
[303] *Solmecke/ Nowak*, MMR 2014, 431, pp. 431-435.
[304] Waggon GmbH v Bundesrepublik Deutschland, case C-389/96, European Court Reports 1998 I-04473–, juris.
[305] RG, Urteil vom 04. Juli 1938 – V 17/38 –, RGZ 158, 34-40–, juris.

sued the air traffic enterprise for compensation but was denied by the Imperial Court of Justice (Reichsgericht) due to his failure in proving causation.

According to the recent court decisions, some objective standards had already been set. For example, a military aircraft was liable for overflight at an altitude lower than 300 meters.[306] Additionally, when there was a plan to build up a new airport or enlarge the previous airport, different from the traditional civil remedies, better protection against the aircraft noise was provided by section 43 of the Code of Administrative Court Procedure (Verwaltungsgerichtsordnung, VwGO) for the residents.[307]

3.1.1.2 The German court structure and the cases of different types

The German court systems are different from that in the US and China. The cases are tried by different types of courts according to their legal nature at both the federal and state level. Concretely, there were the ordinary courts for civil and criminal matters, the constitutional courts for constitutional matters, the administrative courts for administrative disputes, the labor courts for labor disputes, and the social courts for social disputes, etc. In fact, the above listed five types of courts constitute the main skeleton of the German court system.[308] Another specialty worth to mention is that each court has its corresponding substantive and procedural code. Moreover, the above-listed courts at the federal level are normally the "supreme court" in Germany for the relevant disputes,[309] while the federal constitutional court has the last word, although it deals only with the constitutional suits.[310]

As the rise of European Union law, the German domestic laws have been reshaped by the ever-expanding EU laws, which could be regarded as a supranational obligation of Germany as a member state. Playing a central role in interpreting EU laws,[311] the Court

[306] VG Darmstadt, Urteil vom 06. Oktober 1988 – III/V E 827/81 –, juris; VG Oldenburg (Oldenburg), Urteil vom 22. März 1989 – 7 A 172/86 –, juris.

[307] See Chapter 3.4 of this dissertation.

[308] Wolfgang Heyde, Justiz in Deutschland, 6. ed., Bundesanzeiger Press, 1999, p.16. see also Andreas Heusch in:Bruno Schmidt-Bleibtreu/Hans Hofmann/Hans-Günter Henneke, Grundgesetz Kommentar, 14.ed, Carl Heymanns Press, 2017, section. 95, para.3.

[309] However, this is not absolute. For example, most of the apartment leasing cases ended within the states at ordinary court. But the apartment leasing contract cases could also reach the federal court of Justice or federal constitutional court, when there are special matters within the case.

[310] Andreas Heusch in:Bruno Schmidt-Bleibtreu/Hans Hofmann/Hans-Günter Henneke, Grundgesetz Kommentar, 14.ed, Carl Heymanns Press, 2017, section. 95, para.5-7.

[311] Alina Kaczorowska, European Union Law, 4.ed. Routledge Press, 2016, pp. 148-151.

of Justice of the European Union (CJEU) has been more and more influential in different EU jurisdictions. The supremacy of EU law functioned as a tool in unifying the EU-law-related areas among member states, which was illustrated in Case 6-64 Flaminio Costa v E.N.E.L. [312] However, this supremacy is not absolute, as illustrated in case 11-70 "Internationale Handelsgesellschaft", the fundamental right cannot be disregarded by the EU.[313] Moreover, the CJEU would allow the member state to provide "higher protection" than the EU law on overlapping fields.[314] Therefore, when mentioning the German law and the German court system, it would be inevitable to pay attention to the EU law and CJEU.

Under the German court system, there are 155 airport-landowner cases recorded in the database "Juris". [315] Among which, only 11 cases are tried by the ordinary court, while 117 cases are tried at the administrative court. Within the 117 administrative cases, 107 cases related to environmental law. The distribution of cases had revealed that two-thirds of the airport-landowner disputes in Germany are solved through the environment law rather than civil remedies. What's more, only 13 cases happened before 2000, and 41 were cases were tried by the CJEU. This data indicates that most airport-landowner disputes in Germany are solved through environmental law. As mentioned above, the civil remedies for the aircraft noise and the exhaust gas could also be found in section 1004 of the German Civil Code. However, in legal practice, the suits are particularly common in the field of environmental law. This data had again proved the conclusion of Chapter 2 that public law determines the contents of property in Germany, and the landowners fight for their property right in airspace through the public law.

[312] As noted by the ECJ in this case, "the law stemming from the Treaty, an independent source of law, could not, because of its special and original nature, be overridden by domestic legal provisions, however framed, without being deprived of its character as Community law and without the legal basis of the Community itself being called into question."

[313] The ECJ ruled, "the law stemming from the Treaty, an independent source of law, cannot because of its very nature be overridden by rules of national law, however framed, without being deprived of its character as Community law and without the legal basis of the Community itself being called in question." See ECJ case 11-70 Internationale Handelsgesellschaft mbH v Einfuhr- und Vorratsstelle für Getreide und Futtermittel.

[314] For example, in the above-mentioned case: Waggon GmbH v Bundesrepublik Deutschland, the ECJ had recommended that Germany is recommended to adopt a stricter standard than the EEC on aircraft noise matters.

[315] This and the following data are based on the German legal database "Juris" on February 9th 2018.

3.1.2 The US: legislative endeavor and the Causby case

The airspace and subsurface laws in the US are somewhat different. Because there are various cases and legal norms (both domestically and internationally) to alleviate the tensions between the landowner and the airport, which process had begun since the invention of aircraft at the beginning of the 20th century. Interestingly, the century-old debates about balancing the landowner-airport interest had eventually created a very profitable profession, say the aviation lawyers.[316]

3.1.2.1 The early cases and the Causby case

For some background knowledge, the case "Smith v. New England Aircraft" happened in 1930s' US, which had set criteria of "500 feet (152.4 m) as the minimum altitude for flight".[317] Actually, during the domestic or international flight, the planes, most of the time, flew high above the sky. Therefore, it normally caused little harm to the surface landowners. However, it would be time-consuming for the huge aircraft to reach the aviation altitude, which would inevitably make much noise and infringe the airspace of some of the landowners nearby during the take-off or landing process. In this special situation, the old problem comes out again: is there a boundary vertically in airspace for the aircraft and the landowners near the airport?

The leading case in this field was United States v. Causby, which had set the basic legal framework of landowner-airport disputes and the appropriate usage of airspace in the US. In this case, the Causby family were chicken farmers, but their chicken died due to the aviation noise by the frequent low flight of the military plane. Then Causbys sued for compensation. Traditionally, it should be a nuisance or trespass case; however, their neighbor had a special identity: airport under military usage. The lawyer changed his mind to seek constitutional remedies. Therefore, it became a "taking" case of the Fifth Amendment of the US constitution.[318] The change led to a functional transition for the airspace law. However, from a wider scope, the legislative endeavor was much more

[316] *Banner*, Who Owns the Sky, 2008, pp.205-223.
[317] *Logan*, 6 J. Land & Pub. Util. Econ. 316, pp.316- 324.
[318] For the details of this case, see Chapter 3.2.2.

fruitful than the case-by-case method of common law.

3.1.2.2 Legislative endeavor in regulating airspace: under navigable airspace is the private airspace ownership

The US legal institutions on airspace have generally two sources. One is what we discussed in Chapter 2.1.4, the common law, and the other is the relevant legislation oriented by Congress.

Historically, the Congress had also tried to clarify the legal identity of the airspace, which emphasized the sovereignty on airspace. The Congress had primarily written in section 1508 of the US code in 1958, "Declaration of national sovereignty in air space; operation of foreign aircraft." Then in 1994, the Congress tried to "make technical improvements to laws relating to transportation, and through a 658-page statute, enacted many laws then codified in Title 49 -including the sovereignty provision at issue here - into positive law."[319] After the 1994 codification, there were still some minor changes as time went by, and accordingly, that section had gradually become now section 40103, "(a) Sovereignty and Public Right of Transit. (1) the United States Government has exclusive sovereignty of airspace of the United States." Moreover, subsection 2 of this section had recognized the public use of airspace only above "navigable airspace", thereby retaining private ownership below "navigable airspace". [320] This became a boundary for landowners and aircraft operators through legislative endeavor by the Congress. Then the question is what is navigable airspace?

In addition, Congress had also constantly redefined the concept of navigable airspace. In the Air Commerce Act of 1926, the Subsec.10 of Sec. 9, "As used in this Act, the term 'navigable airspace' means airspace above the minimum safe altitudes of flight prescribed by the Secretary of Commerce under section 3, and such navigable airspace shall be subject to a public right of freedom of interstate and foreign air navigation in the conformity with the requirements of this Act." For the minimum safe altitude, its height normally ranged from 500 feet to 1000 feet in the US (as introduced in Chapter 2.4.2.2), which was based on the conditions of the ground (congested areas or not). Therefore, the

[319] *Migala*, 82 J. Air L. & Com. 3, p. 5.
[320] *Schwartz*, 89 Fla. B.J. 42, pp. 45-50.

normal height for urban private airspace should be 1000 feet (304.8 meters),[321] which was similar to the German practice (See Chapter 2.4.1.1.1).

In the 1940s, the Causby case revealed a legal loophole in the act of 1926 as well as that in the Civil Aeronautics Act of 1938, so a 1958 Act make some improvement. “Navigable airspace means airspace above the minimum altitudes of flight prescribed by regulations under subparts I and III of this part, including airspace needed to ensure safety in the takeoff and landing of aircraft.” However, this supplement did not change the idea of Justice Douglas on that matter, as he had repeated the Causby ruling in case Griggs v. County of Allegheny (1962).[322] Therefore, although the legislator had tried to make certain standard and updated their concept of navigable airspace, the effective law on the airspace was still the ruling of Causby. The deviation between the legislative standard and Supreme Court ruling had caused much more complexity and ambiguity in the US airspace law, especially the airspace under 500 feet.

However, when regarding the recent development of the airspace law, the deviation had been gradually decreased. As summarized from a large volume of cases[323] by Stephen Migala, “when the government, even with helicopters, flies below 500 feet, such flights are compensable takings, even if they are only transitory.”[324] Therefore, the 500 feet had gradually become a standard, which was a compromise between the court rulings and legislative endeavors.

However, legislative endeavors never ended. A new legal concept was created, the national airspace system (NAS), which was the first time in the history of the US to endow the FAA (Federal Aviation Administration) the special power to regulate airspace below 500 feet.[325] Additionally, the provision in 49 U.S.C. § 40103(b) (2) seemed to endow the

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[321] According to 14 C.F.R. § 91.119, in accordance with the requirement of “Minimum safe altitudes”, aircraft should remain at least 1,000 feet over cities or persons, and above 500 feet elsewhere, except over open water or sparsely populated areas.

[322] Griggs v. Allegheny County, 369 U.S. 84 (1962).

[323] Griggs v. Allegheny City., Pa, 369 U.S. 84, 90 (1962). Palisades Citizens Ass'n v. C. A. B., 420 F.2d 188, 392 (D.C. Cir. 1969); United States v. 15,909 Acres, 176 F. Supp. 447, 448 (S.D. Cal. 1958); Speir v. United States, 485 F.2d 643, 646-47 (Ct. Cl. 1973); Aaron v. United States, 311 F.2d 798, 801 (Ct. Cl. 1963); A.J. Hodges Indus., Inc. v. United States, 355 F.2d 592, 597 (Ct. Cl. 1966); Jensen v. United States, 305 F.2d 444, 446 (Ct. Cl. 1962); Dick v. United States, 169 F. Supp. 491, 494 (Ct. Cl. 1959); Highland Park, Inc. v. United States, 161 F. Supp. 597, 598 (Ct. Cl. 1958); Persyn v. United States, 34 Fed. Cl. 187, 195-96 (1995), affd, 106 F.3d 424 (Fed. Cir. 1996); Hsu v. County of Clark, 173 P.3d 724, 731-32 (Nev. 2007).

[324] Stephen Migala, UAS: Understanding the Airspace of States, 82 J. Air L. & Com. 3 (2017).

[325] “National Airspace System (NAS). The NAS consists of the overall environment for the safe operation of aircraft that are subject to the FAA's jurisdiction. It includes air navigation facilities, equipment and services, airports or

FAA some power in "protecting individuals and property on the ground".[326] Furthermore, regulating the drones had also extended the power of the FAA, as the drones would normally fly under 400 feet (121.92 m). This modification could be regarded as a reflection of the age of drones.[327] However, all these changes should not violate the starting point of federal law, which was the division of power between state and federal government. Accordingly, the non-navigable space (under 500 feet) was still the main field of state legislative power. Therefore, the FAA had no sole power to regulate the non-navigable space (under 500 feet).

Therefore, the US legal framework on the "aircraft operator-landowner" relationship based on both the Causby case and the legislative endeavor. Although more details should be taken into consideration, the 500 feet (152.4 m) seemed an acceptable boundary between the landowner and the aircraft.

3.1.3 The Chinese: lack of "cause of action"?

As introduced in Chapter 2.2.3, the state is the theoretical owner of both the land surface and its airspace and subsurface in China, and accordingly, the main disputes on airspace and subsurface happen mainly among the surface land users and other users. Moreover, the real estate for individuals are limited to apartment ownership, and practically the majority disputes on airspace and subsurface in China are condominium suits. (e.g. the use of the exterior wall, the allocation of the underground parking lot, the register for the underground shop, etc.)[328]

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landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system components used by the DoD." C.F.R. § 245.5 (2016). Quoted from Stephen Migala, UAS: Understanding the Airspace of States, 82 J. Air L. & Com. 3 (2017).

[326] (b) USE OF AIRSPACE. —(1) The Administrator of the Federal Aviation Administration shall develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace. The Administrator may modify or revoke an assignment when required in the public interest.
(2) The Administrator shall prescribe air traffic regulations on the flight of aircraft (including regulations on safe altitudes) for—
(A) navigating, protecting, and identifying aircraft;
(B) protecting individuals and property on the ground;
(C) using the navigable airspace efficiently;
and (D) preventing collision between aircraft, between aircraft and land or water vehicles, and between aircraft and airborne objects.

[327] See Chapter 3.5 of this dissertation.

[328] See Chapter 4.4.3 and Chapter 4.5.2.

However, as the fast development of the Chinese aviation industry in recent years, some cases concerning the apartment owners (land users) and the airport appeared. Actually, this kind of cases was not so popular. It was because such disputes were solved through neighbor relationship rules within property law, which required a high standard of tolerance. Even worse, some administrative rules had clarified that such cases(aircraft noise, airspace infringement, waste gas pollution) between landowners and airports should not be regarded as the civil cause of action,[329] and the court had no jurisdictions on that matter. But this special rule is not absolute. As China is a big country, and accordingly the uneven perception of these norms among courts in different districts are inevitable. Therefore, some victims had finally gotten the compensations for aviation noise in several local courts.[330] Therefore, the Chinese situation is complex, there still need unification of both the legislation and the application of the law.

3.1.4 Short summary

In summary, air transportations are indispensable parts of modern urban life, and accordingly, the side effects of the aviation industry had become a common problem among the three countries. The crux of this problem is how to balance the interests between a surface landowner (surface user) and the aviation industry. Actually, the real conflicts exist between the aircraft operator (especially the airport) and the surface landowners nearby. However, it would be impractical to sue a concrete aircraft. Because the aircraft was always flying at high altitude with high speed, and accordingly this type of cases had become the landowner-airport dispute.

In Germany, although section 905, section 906 and section 1004 of the German Civil Code are relevant, the landowners usually prefer to seek remedies from administrative law (Environmental law) rather than from property law. In the US, the Causby case had become a cornerstone for the relevant legal framework. In China, such cases were not unitarily treated, but in some civil cases had already revealed the Chinese perception and

[329] See Chapter 3.2.3.
[330] See Cao Xiuli etc. v. Luokou International Airport of Nanjing, which was discussed in Chapter 3.4.4.2.3 of this dissertation.

solutions for this problem (neighbor relationship).

In general, there are generally four categories of cases in this field: the first category is the boundary between surface landowner and aircraft, especially in the vicinity of airports (Chapter 3.2). The second category is an environmental remedy and its remodeling for the landowner-airport relationship, which can be regarded as a supplement for the first aspect (Chapter 3.4). The third category is the height limitation for landowner around the airport, which is from the positive effect of aviation law (Chapter 3.3). The fourth category is the cases on drones, which type of aircraft needed no airport (Chapter 3.5). The whole chapter would focus on these four-category cases to show the airspace law in a dynamic modern urban and technical context.

3.2 Who owns the sky： A clearer line between the landowner and the airport?

As introduced in Chapter 2.2, there are both technical divisions of airspace and “minimum safe altitude of flight” in Germany, the US and China, which had formed part of the legal order of airspace and subsurface. However, it is just a “buffer-zone” but not a substantial boundary for landowner and aircraft. Alternatively, these rules would be challenged by the operation of take-off and landings at the airports, as the aircraft would unavoidably disturb the surface landowners (users) nearby. Only in this extreme situation, the substantial boundaries between the landowner and navigable airspace would be finally clarified.

3.2.1 The boundaries in German law

3.2.1.1 The prohibitory injunction and the obligation to bear

As introduced in Chapter 2.1.3 and Chapter 2.2.1, the landowners have the obligation to bear, especially when “limits or targets laid down in statutes or by statutory orders are not exceeded by the influences established and assessed under these provisions” (section 906 of the German Civil Code). Moreover, if the surface landowner had an obligation to bear,

the prohibitory injunction would not take effect.

3.2.1.1.1 The obligation to bear as a threshold

This “duty of bear” functions as a threshold in German law, which can be illustrated by a case by regional court Essen in 2017. In this case, the landowner lived near the runway of an airport. He sued the airport for the exhausted gas pollution, especially when the airplane landed. The court analysis this legal issue with section 906 and section 1004 of the German Civil Code. However, the court found no illegal use of the land and its airspace by the airport. Because the landing of a plane, as well as its take-off, would usually use the airspace at a height of 500m-2000m. Although it caused much loud noise and was very harmful, such usage of airspace and the land in the vicinity are permitted by the section 29b of the aircraft transportation law (Luftverkehrgesetz).[331] Therefore, the landowner had the obligation to bear, which had prevented the landowner from using section 1004 to fight against aviation noise. Consequently, the airport was not responsible for compensation. [332]

The attitude by the German federal court of Justice was clear, the landowner’s interests in the airspace and subsurface should be respected. Nevertheless, the peaceful enjoyment of private land should also take the public interest into consideration, which meant the landowner should tolerate when the interruptions were “legitimate”. Therefore, the obligation to bear is the primary consideration for such kind of cases in German law, which could partly explain why there are so few airspace disputes in private law in Germany.

At the state level, there were already discussions on a more accurate standard (concrete numbers in height) for the aircrafts’ flying altitude by an administrative court. In a case by the administrative court Darmstadt, the military planes flow over the landowner’s land

[331] Section 29b [Obligation to Reduce Aircraft Noise]
(1) I Aerodrome operators, aircraft holders and pilots in command shall be obliged to prevent avoidable noise and to reduce the spread of unavoidable noise to a minimum in air and on ground, if this is necessary to protect the population against hazards, substantial disadvantages and substantial disturbances. Most notably, sleep time of the population must be taken into consideration.
(2) The aviation authorities and the body responsible for air traffic control shall work towards the protection of the population against intolerable flight noise.
This translation is provided by Markus Geisler and Marius Boewe. See Markus Geisler, Marius Boewe, German Civil Aviation Act, Eleven International Publishing, 2009, p. 43.

[332] LG Essen, Urteil vom 18. August 2017 – 16 O 302/16 –, juris.

at an altitude of 300 meters, which was not identical with the 450 meters standard for such type of military planes set by section 6 of the German air traffic act. The military planes had also failed to prove the "emergency". Consequently, the court admitted the flying altitude at 300 meters was unacceptable, and accordingly the landowner had no obligation to bear.[333]

3.2.1.1.2 The prohibitory injunction: high standard for evidence

In Germany, there are also cases like "Causby", the most important one might be the case tried in 1986 by the German Federal Court of Justice (BGH). In this case, the landowner near the airport found that the airplanes had flown over their land below the (minimum) safe altitude, and its flying altitude had become lower and lower. The exhausted gas from the planes caused air pollution, so the landowner sued the airport (according to section 1004 of the German Civil Code) to seek a prohibitory injunction.[334] The court held that, firstly, section 6 of the German air traffic act (LuftVO) is inapplicable because there was no emergency. Secondly, the plaintiff only saw the planes and measured the flying height with their naked eyes, and accordingly, she could not provide accurate evidence on "when the planes of which company flying at which height", and "to what extent caused exhausted gas pollution". The only evidence at such accuracy could satisfy the standard of proof by the federal court of justice.

This case, different from the Causby in the US in 1946, emphasize the accuracy of the evidence, which would be difficult for the ordinaries to prove in the 1980s. However, the positive side of this case was that the German Federal Court of Justice, substantially, recognized the boundaries of the safety aviation height should be respected, and the landowners had the right to seek a prohibitory injunction if the evidence provided had fulfilled the burden of proof. As written by the Federal Court of Justice in this case, "Only in this situation, a prohibitory injunction is conclusive, when it was proved that whether and when one of the defendants had already (at least) once illegally infringed one of the plaintiff's real estate, and to what extent, there existed risk of re-offending."[335]

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[333] VG Darmstadt, Urteil vom 06. Oktober 1988 – III/V E 827/81–, juris.

[334] According to section 1004, "If further interferences are to be feared, the owner may seek a prohibitory injunction."

[335] The original German judgement was written as follows, " Der Unterlassungsantrag der Kl. ist nur dann schlüssig,

As mentioned above, it might be very hard for the ordinary people (technical limitation) in the 1980s in Germany to take the burden of proof for making precise evidence on the infringements of his airspace. From the perspective of current environmental jurisprudence, the allocation of the burden of proof, in this case, is not beyond criticism, although it is just a civil case. This case had indicated that the vulnerability of the landowner's airspace at that time.

However, the Federal Court of Justice in a 1977 case supported the prohibitory injunction based on section 1004 German Civil Code.[336] In this case, the land located in 1000 meters away from an airfield (Flugplatz) and on the flight route. Some aviation teams and aviation associations were members of this airfield, who had flown under the lowest flying altitude by take-off or landing and had accordingly made much noise. Consequently, the landowner sought a prohibitory injunction based on section 1004. The federal court of justice believed that the aviation association is responsible for the noise, due to their failure to fulfill the duty of avoiding noise pollution for whatever substantive or legal reasons. What's more, the federal court of justice had pointed out a mistake by the lower court that when balancing the interests of both parties in the undisturbed use of their plots, "the only thing to be considered is whether the effects of noise significantly or negligibly affect the use of the property."[337]

In summary, the aircraft should not fly below the minimum safe altitude if there are no emergency or other reasons provided by the law. The boundary between the landowner and the aircraft should be set at a height, which should ensure "the effects of noise significantly or negligibly affect the use of the property". Moreover, airspace infringement should be proved by accurate evidence.

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wenn behauptet wird, ob und wann die einzelnen Bekl. das Eigentum des jeweiligen Kl. schon einmal vorschriftswidrig gestört haben und inwieweit auch eine Wiederholungsgefahr besteht. " see BGH, Urteil vom 31. Oktober 1986 – V ZR 61/80–, juris.

[336] BGH, Urteil vom 10. Juni 1977 – V ZR 242/74 –, Juris. (NJW 1977, 1920-1922.)

[337] Kurzreferat

Der Verfasser berichtet, der BGH habe in dem Urteil vom 1977-06-10, V ZR 242/74, NJW 1977, 1920 über Unterlassungsansprüche wegen Fluglärmbelästigung ausgehend von einem in der Nähe des betroffenen Grundstücks gelegenen Verkehrslandeplatz entschieden. Das Gericht habe die Flugsportgemeinschaft auch als Störerin angesehen; die behördliche Genehmigung und die mit ihr verbundene Betriebspflicht könne die privaten Rechte Dritter bei Landeplätzen im Gegensatz zu Flughäfen nicht berühren. Weiter habe das Gericht entschieden, daß die Vorinstanz nicht im Rahmen eines gestellten Antrags eine Verurteilung ausgesprochen habe. Bei der Abwägung der gegenseitigen Interessen der Parteien an ungestörter Nutzung ihrer Grundstücke sei allein darauf abzustellen, ob die Geräuscheinwirkung die Benutzung des Grundstücks wesentlich oder unwesentlich beeinträchtige.

3.2.1.2 The expropriation: no compensation without casualties

In the previous cases, the landowners mainly concentrated the prohibitory injunction, but not compensations. In a similar case by the federal court of justice in 1971, the peasant has a land plot of 93,8017-hectare for various usage, including upland field (Ackerland), green land, wood, moor, and farmland for crops. In 1961, a fortification (Verteidigungsanlage) was built up and the whole land was categorized into the "military protective area". The farmer believed that this arrangement had constituted an expropriation, and sued for compensation. The court found that there were actually no casualties of the farmer, because the surface, as well as the airspace and subsurface of that land plot, remained undisturbed (as these land plots were used as agricultural land). It was therefore not expropriation. On the other hand, rent/easement was possible for the restriction by the change.[338]

Although the aircraft had not appeared in this case, the court had in its judgment showed its respect on the airspace and subsurface of the land plot, when determining if there was an expropriation. Therefore, the airspace and subsurface, although not be regarded as independent law in Germany, was at least respected for the interest of surface ownership. This case had proved one of the general conclusions of Chapter 2, which in Germany, the airspace/subsurface right was partly absorbed by the surface landownership.

3.2.1.3 Short summary

As indicated in the cases above, the landowner-airport boundaries at airspace are not easy to define. Firstly, the minimum safe altitude set by section 6 of the air traffic act could be regarded as an explicit boundary, which should not be violated if there is no emergency. Secondly, the minimum altitude is not enough to cover all circumstances. Because the take-off and landing of the aircraft would surely disturb the surface landowner in the vicinity. Therefore, new rules are still needed. The first consideration is the landowner's obligation to bear, if there exist such obligations, the prohibitory injunction would not take effect. If the landowner had no obligation to bear, the substantial consideration is that if the inconvenience caused by the aircraft had "significantly or negligibly affect the use

[338] BGH, Urteil vom 20. September 1971 – III ZR 18/70 – , BGHZ 57, 278-291–, juris.

of the property". In addition, the plaintiff should provide persuasive evidence. Combining the previously discussed silver fox case,[339] all these factors in material and procedural law could explain why using these sections (mainly section 906 and 1004) in the German Civil Code is unpromising. That is why the commentator had concluded, "the administrative suit (in this field) had significant meaning."[340]

3.2.2 US: The Causby Case and its sequel

3.2.2.1. The Causby case and its heritage

As introduced in Chapter 3.1.2.1, the farmer Causby sued the military airport for the compensation of death of his chicken. "Army and Navy planes took off and landed constantly, at all hours of the day and night", [341]as Tinie Causby testified, "one plane right after another, and they would swoop so close to the house it seemed they were taking the roof off." [342]

Justice Douglas had written in the opinion of the Supreme Court, "Under the facts of this case, there can be no doubt that the defendant has committed numerous trespasses upon the plaintiffs' property. It has traversed many times the airspace above their property at such an altitude and with planes of such a character as to seriously interfere with plaintiffs' use and enjoyment of their property even to such an extent as to make it necessary for them to abandon it as a chicken farm." [343]

The heritage of the Causby case is undoubtedly enormous. Firstly, it clarified the boundary for the surface landowner in the airspace. "Landowner owns at least as much of the air space above the ground as he can occupy or use in connection with the land, and fact that he does not occupy it in a physical sense by the erection of buildings and the like is not material." Secondly, "minimum safe altitude of flight" was not a justification for frequent overflight above the surface landowner at low altitude (in its airspace). Because at that time, the aviation airspace did not include the path of glide.[344] Thirdly,

[339] See Chapter 3.1.1 of this dissertation.
[340] *Roth*, Staudinger BGB (2017), Sec. 905, para. 21.
[341] *Banner*, who owns the sky, 2008, p.228
[342] *Banner*, who owns the sky, 2008, p.228
[343] United States v. Causby, 328 U.S. 256, 66 S. Ct. 1062, 90 L. Ed. 1206 (1946).
[344] As the judgement writes, The fact that path of glide taken by airplanes in taking off and landing over plaintiffs'

such situation constituted a taking. As pointed in the judgement, “where federal Government permitted its airplanes to fly so low over plaintiffs' land which adjoined municipal airport in North Carolina leased by Federal Government as to deprive plaintiffs of use and enjoyment of their land for purpose of raising chickens, there was a “taking”, so as to entitle plaintiffs to recover just compensation.”[345] Fourthly, Causby deserved a just compensation,[346] and the compensation should be calculated at market value.

In fact, this case is still quite influential in the US. Firstly, it sets the boundary for the landowner-aircraft relationship. Secondly, it opens a new door to solve such kind of disputes through the Fifth Amendment of the US constitution (Taking clause) at the federal level, rather than through tort law at the state level. Thirdly, it is effective nationwide.

Obviously, the Causby case meant much more than the compensation of several hundred dead chickens. At that time, there were actually 847 airports under government control.[347] In order to reduce this kind of dispute, Congress had redefined the concept of “navigable airspace”, which then contained the runways for take-off and landing. However, again, in 1964, Justice Douglas repeated the ruling of Causby, regardless of the revisions by the Congress. According to the “Westlaw” database, the ruling of Causby case has been frequently quoted, which number even amounts to 3450 times up to now. However, for the aviation noise dispute, there is already a new design to limit the lawsuits of landowners. For example, many states would provide “noise exposure maps”, which could “restrict landowners’ ability to file lawsuits against an airport based on the noise created by airport operations.”[348]

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land, which adjoined municipal airport leased by federal Government, was approved by Civil Aeronautics Authority, did not prevent the flights over plaintiffs' land from constituting a “taking” entitling plaintiffs to just compensation, since the path of glide is not the “minimum safe altitude of flight” prescribed by Civil Air Regulations as the downward reach of navigable air space placed within public domain by Congress. Air Commerce Act of 1926, § 10, 49 U.S.C.A. § 180; U.S.C.A. Const.Amend. 5. See United States v. Causby, 328 U.S. 256, 66 S. Ct. 1062, 90 L. Ed. 1206 (1946)

[345] United States v. Causby, 328 U.S. 256, 66 S. Ct. 1062, 90 L. Ed. 1206 (1946).

[346] “A holding that flights by airplanes at low levels over plaintiffs' land, which adjoined municipal airport in North Carolina leased by federal Government, deprived plaintiffs of use and enjoyment of their land and constituted a “taking,” so as to entitle them to just compensation, was not inconsistent with local law of North Carolina governing land owner's claim to immediate reaches of the suprajacent air-space.” See United States v. Causby, 328 U.S. 256, 66 S. Ct. 1062, 90 L. Ed. 1206 (1946).

[347] Banner, Who owns the sky, 2008, p. 238.

[348] *Pearson/Riley*, Foundations of Aviation Law, 2015, p. 244.

3.2.2.2 The sequel of the Causby case

As mentioned above, the Causby case had set the legal framework between the landowners and airport in the US. Additionally, Justice Douglas repeated the ruling of Causby in 1964. Furthermore, it had also been applicable to helicopter cases. A series of the cases were regarded as compensable "takings" (according to the ruling of Causby), e.g. Griggs v., Allegheny in 1962, Speir v. the United States in 1973, Persyn v. the United States in 1996, and Hsu v. County of Clark in 2007. Astonishingly, Causby still has its meaning for drones.[349]

However, the Causby case is not conclusive and comprehensive. Alternatively, it is quite special, which has left many legal problems unsettled. Firstly, many landowners in the US were not so lucky, because their neighbors were not the military force or the US government, and accordingly, the cases were no longer a "taking" case. The most common cause of action for such cases, however, is nuisance or trespass,[350] whose outcomes are normally not quite satisfactory to the plaintiff. Secondly, the standard adopted in judging the airspace infringement various from court to court at the state level.

Robert Wright had explained the chaos after Causby. For example, in case Antonik v. Chamberlain, the Ohio court held that "discomfort from aircraft was part of the price to be paid for living in the modern world."[351] While in Crew v. Gallagher, the Pennsylvania court used the nuisance theory to enjoin the use of the airport.[352] What's more, the Anderson v. Souza case in California, the State Supreme Court found the evidence insufficient to warrant an injunction against the airport operations, even though some of the flights were as low as 25 feet.[353] In case Batten v. the United States, the court described vibrations, sound waves, exhaust fumes and smoke as the bases of nuisance allegations.[354]

Therefore, the standards for the boundaries between the landowners and airports are rather uneven from state to state. In contrast, the Causbys were rather fortunate.

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[349] See chapter 3.5 of this dissertation.
[350] *Wright*, the Law of Airspace, 1968, p.157.
[351] Antonik v. Chamberlain, 78 N.E.2d 752 (Ohio Ct. App. 1947).
[352] Crew v. Gallagher, 58 A.2d 179 (Pa. 1948).
[353] Anderson v. Souza, 38 Cal.2d 825.
[354] Batten v. United States, 322 F. Supp. 629 (E.D. Va. 1971).

3.2.3 The Chinese "Causby" case

In China, as previously introduced, airspace law is mainly discussed within condominium property. However, there are still some cases like Causby in Chinese courts. The two plaintiffs were both farmers like Causby, and fortunately, both of them get compensation caused by the overflight above low airspace of their land.

3.2.3.1 Zhang Yanting v. agricultural airfield service station of Sujia Tun

The first case happened in 2002 in Sujia Tun, which was a district of Shenyang City. Mr. Zhang Tingyan was a chicken farmer. Then government-based local agricultural airfield service station and center of agricultural technology extension provided a map to affirm the flight route for spraying pesticide. Unfortunately, they forgot to make a special notice for Mr. Zhang's chicken farm in the map, and accordingly, the planes flew over the chicken farm at very low altitude in the airspace. The sudden and huge noise had made 1,021 chicken died and caused other 6,080 chickens suffering from digest disease (eating disorders anorexia). Mr. Zhang suffered from a loss of 172,002.50 RMB and thereby sued for compensation.

The court emphasized, "The legitimate property rights of the citizen are protected by the law. The planes from the 'local agricultural airfield service station' flow over Zhang's chicken farm at very low altitude in the airspace, which was the reason for the death and slow growth of Zhang's chickens. Consequently, this flight had caused Mr. Zhang's harm. In addition, this behavior was not merely a delict, but also a violation of 'Rules on Civil Aviation Flight', which required the avoidance of special buildings such as fish ponds, chicken farm, etc., when flying at very low altitude." [355]Although the court pointed out that the plane had flown at very low airspace over Zhang's chicken farm for more than five times in the judgment, the legal reasoning was based on whether it had constituted a tort in Chinese law.

Fortunately, Mr. Zhang got his compensation for the loss of the Chicken. However, the judgment had not mentioned whether merely the overflight at very low altitude, would in

[355] See Zhang Yanting v. agricultural airfield service station of Sujia Tun, in the appeal procedure, the airfield service station is the appealer, while Zhang Yanting is the appellee. Case No. [2002] Shen Min Yi Zhong Zi No. 31.

itself constituted an infringement of Zhang's airspace right. Additionally, for the justification of the flight seemed not a big problem. The landowners were local government, and the planes were employed for agricultural purposes supported by the local government. Although Mr. Zhang was the restricted property right holder of the land of a chicken farm,[356] the overflight would easily be justified by "public interest" in China. Therefore, lacking the approach of airspace/subsurface law, the court had made this case nothing different from a common tort case in China. Accordingly, this case was not known as a Chinese case equivalent to "Causby" in the US.

3.2.3.2 Lin Sumei v. Hiwing general aviation Equipment Company

Another similar case happened also in Liaoning Province in 2014. Ms. Lin Sumei was a duck farmer, who made her life by selling duck eggs. There was a small airport named "Qianmu forest" nearby, which was rented by "Hiwing General Aviation Equipment Company" to train their remote-controlled aircraft models. The aircraft models flow very low above Ms. Lin's duck farm, making a lot of noise. On May 20th, 2014, an aircraft model even crashed into her duck farm. The sudden accident had caused the 3,500 ducks suffered from shock and consequently led to a decrease in egg production. Ms. Lin sued for compensation according to the tort liability law of China. However, the infringement of airspace was not independently discussed either.[357]

Actually, the first case happened even before the legislation of Chinese property law, and accordingly the main legal remedy at that time was tort law. However, when the second case happened, Chinese property law had already been implemented. Regardless of the severe infringements of the airspace, the plaintiffs also tended to seek remedies in tort. An explanation was that the airspace right was still revolutionary in the eyes of the ordinaries, as well as the local court. They tend to focus on the substantial loss of chickens and ducks rather than criticize the behavior of infringement of low airspace. However, as showed in the judgment, the airspace above the land surface was protected by Chinese aviation law, which should not be infringed.

[356] In China, it is called "Rural Land Contracted Management Right", which is a kind of property right.
[357] See Lin Sumei v. Hiwing general aviation equipment company, case No. [2014] An Tai Min Er Chu Zi No. 00274.

3.2.4 Short summary

In summary, the airspace infringement on airspace of the surface landowners has become almost a commonplace of modern urban life. However, it was technically not possible to set a boundary between the surface landowner and aircraft. In practice, the landowners near airports are most vulnerable, as the planes have to take off and land over. As shown in the statute and cases, the first tool is the minimum safe altitude, which the **US had a limitation of 500 feet (152.4 m)**, while in the above **German case 300 m (case of VG Darmstadt, 1988)**, in **Chinese case 150 m**. This is a **technical baseline** for the landowner's airspace and air traffic. As analyzed in Chapter 2, such height had actually played a role as a buffer zone, it is not the exact height for the boundary between the surface landowner and the aircraft operator. So, what is the real boundary between the landowners and the airport operators?

However, the practical problems are much more complex, which would permit the aircraft to fly under this minimum height, when there exists an emergency. However, the routine, frequent and severe infringements on surface land by aircraft through the noise, exhaust gas pollution, crash risks, etc., should not be so serious that constitute a deprivation of the landowner's enjoyment of his surface land plot. This can be regarded as a **substantial boundary**.

From this perspective, although Germany, the US, and China had adopted a different technical standard in regulating airspace, their legal structures in regulating the aircraft-surface landowner relationship are quite similar, which are consist of the technical baseline and substantial boundary.

3.3 The height limitation around the airport

The aviation infringements of lower airspace are just one aspect of the aircraft-landowner relationship. Actually, the height limitations on the landowner around the airport constitute another aspect. Moreover, many modern countries would endow the airport the discretionary power on the planning matters, in order to ensure air traffic safety.

3.3.1 The German situation: a representative case

3.3.1.1 Legal background

Different from the terms “height limitation” used in the US, German lawyers prefer to use the word “Baubeschränkung”, which means “restrictions on building”.[358]According to section 8 of the civil aviation law, the construction restriction zone (in German as “beschränkter Bauschutzbereich”), which is normally “within a radius of 1.5 kilometers around the point equivalent to the airport reference point.”[359] In addition, the German airports, similarly, also have the power to control the building height of its surroundings, for the benefit of aviation safety.[360]

According to section 12 of the aircraft transportation law,[361] the airport authority has the power to control a very large area of land in their buildings plans, who can permit all the buildings inside the 1.5 km, the 25 m buildings inside diameter 4 km, and 4km -6km the buildings of 45m -100m in height. What’s more, the power of the airport can also stretch to 8.5 km until 10 km, if the airplane route reached there. These provisions had endowed the airport discretionary power in deciding the permissibility of high buildings around the airport, or below the flight route. Again, we encounter the German style that the public law had defined the content of property.

On the other hand, environmental protection could be regarded as some kind of political correctness in Germany. The construction and operation of installations, which might be environmentally unfriendly, shall be subject to licensing.[362] The installation should satisfy a series of criteria in order to be successfully licensed (Section 5). What’s more,

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[358] The word “Baubeschrankung” could also be translated as “zoning restrictions” in some situations.

[359] See section 17 of the Civil Aviation Law.

[360] See Section 12 subsection 1 sentence 1 of the Civil Aviation law. “A construction plan must be specified for the approval of an airport.”

[361] See Section 12 of the Civil Aviation Law.

[362] Section 4 Licensing (1) The construction and operation of installations which, on account of their nature or operation, are particularly likely to cause harmful effects on the environment or otherwise endanger or cause significant disadvantages or significant nuisances to the general public or the neighborhood, and the construction and operation of stationary waste disposal plants designed to store or treat wastes shall be subject to licensing. With the exception of waste disposal plants, installations which do not serve commercial purposes and are not used within the framework of business undertakings shall not be subject to licensing unless they are particularly likely to cause harmful effects on the environment caused by air pollution or noise. After hearing the parties concerned (section 51), the Federal Government shall specify by ordinance, with the consent of the Bundesrat, those types of installations which require licensing (installations subject to licensing); the ordinance may also provide that licensing is not required for any installation which, in its entirety or in essential parts specified in the ordinance, has been type-approved and constructed and operated in accordance with the type approval.

in some situations, the licenses should be granted, if it fulfills some requirements,[363] which is one of the prerequisites for licensing. In practice, the installation of a wind energy equipment obtains usually a priority and a privilege in planning laws.[364]

3.3.1.2 Wind energy equipment v. aviation safety

However, the high administrative court of the North Rhine-Westphalia state had approved the priority of aviation security over "wind energy equipment" in a case in 2014. In this case, the plaintiff operated a wind farm with large wind turbines (totally 179.38 in height m). In order to obtain an environmental licensing (federal immission control act, BImSchG) for the installation of four wind turbines, the plaintiff had made distinguishing marks on the wind turbine identical with the requirements of the airport. However, the airport refused the application by pointing out the potential risk of the wind turbine for the airplanes, especially in bad weather. Therefore, a conflict between environmental protection and aviation safety would be unavoidable.

Firstly, the court held that the federal immission control act and civil aviation law were not in conflict with each other. "According to the logic of this section, if the construction and operation of such installation conflicts with any other provisions under public law, or any occupational safety and health concerns, it deserved no licensing. As the erection of the four wind turbines is in contradict with aviation safety, the plaintiff deserved accordingly no approval from emission control law."

Secondly, the court concentrated on the interpretation of risks of section 12 of the civil aviation law. It held that the plan was not supported by civil aviation law. Because the criteria were whether it would constitute a concrete risk (especially unbearable infringement of the aviation security) when a building structure just obstructed the take-off and landing of the aircraft in their navigable airspace, or just made the aircrafts vulnerable to crash.

Thirdly, the normal lowest safe altitude is 2000 feet (609.6 meters), while the wind turbine

[363] Section 6 Prerequisites for Licensing
(1) A license shall be granted if
1. it is ensured that the obligations arising from section 5 and from any ordinance issued under section 7 will be complied with and if
2. The construction and operation of such installation does not conflict with any other provisions under public law or any occupational safety and health concerns.

[364] Oberverwaltungsgericht für das Land Nordrhein-Westfalen, Urteil vom 09. April 2014 – 8 A 431/12–, juris.

is below 200 meters. Therefore, it is difficult to prove that the wind turbine would severely affect aviation safety. The court had explained that the lowest flying altitude of the cross-country flight (section 6 subsection 3 sentences 1) functioned differently from the lowest safe altitude (section 6 subsection 1 of the civil aviation law). Because the aircraft could, in practice, fly below that lowest safe altitude.

Fourthly, the court pointed out that the decision by the defendant (section 12 subsection 1 of the civil aviation law) was neither a planning law decision nor a decision of its own discretion. In contrast, the decision was based on the opinion of evaluation by the responsible aviation security authority, the DFS (German Air navigation service) Co., which the aviation administration was not bound.[365]

This case was just an example of the "restrictions on buildings" around the airport in Germany, which threw some light upon the specialty of the problems of "restrictions on buildings" by the airport. In this case, the main conflicts existed between the development of green energy (environmental interest) and aviation safety. While the private ownership on airspace was, unfortunately, taken for granted. Although there exists a "freedom to build (Baufreiheit)" according to article 14 of German basic law generally, the use of each land plot should be identical with the planning law, as well as the aviation law and the environmental law if it located around the airport. Therefore, the airspace right of the surface landowner did not play an important role in such cases, which is the reality of Germany.

3.3.2 The US

In contrast, the height limitation around the airport is regarded as a taking (or a per se Taking) of airspace without just compensation in the US. The Supreme Court had illustrated such ideas in case Jankovich v. Indiana Toll Rd. Comm'n in 1965.

3.3.1.1 Cases at the federal level

3.3.1.1.1 Taking and "per se taking"

[365] Oberverwaltungsgericht für das Land Nordrhein-Westfalen, Urteil vom 09. April 2014 – 8 A 431/12–, juris.

In case Jankovich v. Indiana Toll Rd. Comm'n,[366] the Supreme Court held that, firstly, the city's airport zoning ordinance-imposed height limitations on buildings and other structures, had constituted a "taking of private property for public use without just compensation" in both state and federal level. Moreover, this ordinance had violated both the Indiana Constitution and due process clause of the Fourteenth Amendment to the Federal Constitution. However, the federal jurisdiction would be deprived due to the "independent and adequate state grounds".[367]

Similarly, a recent case at the federal level had regarded the height limitation near the airport as "per se taking of airspace without just compensation." In case Vacation Vill., Inc. v. Clark County., the United States Court of Appeals for the Ninth Circuit had clarified the court's perception of height limitation: "In the absence of federal preemption, pursuant to the Nevada Supreme Court's decision in Sisolak, zoning ordinance imposing height restrictions on land located near county airport, as applied to landowners' property, amounted to a regulatory per se taking of airspace requiring compensation under the Nevada Constitution. West's NRSA Const. Art. 1, § 8(6)." [368]

Therefore, the height limitation around the airport normally constitutes "taking" at the federal level.

3.3.1.1.2 Height limitation for the plants around the airport

In addition, there is a height limitation for plants around the airport. In a case by the federal appellate court of the Fourth Circuit, the Maryland regulation that barred landowners from allowing vegetation to grow to such a height as to be airport hazard. However, this ruling did not establish "duty of care" owed by owners of land adjacent to the airport to the passenger, who was injured when airplane clipped landowners' trees shortly after takeoff and crashed, given passenger's status as an uninvited entrant on

[366] As summarized in the syllabus, the fact of this case is as follows. "Petitioners, operators of a municipal airport, brought suit in a state court for injunctive relief and damages against respondent toll road commission which had constructed a toll road whose height at a point from a planned runway petitioner contended exceeded that permitted by the municipal airport zoning ordinance."

[367] "State Supreme Court rested its decision upon independent and adequate state grounds, even though it also relied on similar federal grounds, and this Court is therefore deprived of jurisdiction to review the state court judgment."

[368] Vacation Vill., Inc. v. Clark Cty., Nev, 497 F.3d 902 (9th Cir. 2007).

landowners' property.[369]

Therefore, the height limitation was not limited within buildings, but including plants if they had caused a risk for aviation safety.

3.3.1.1.3 APT Minneapolis, Inc. v. Eau Claire City: for land users

For the user rather than landowners, the federal court had adopted a different attitude. In case APT Minneapolis, Inc. v. Eau Claire City., a wireless communications provider wants to build up a new tower. However, “A person seeking to erect a structure exceeding the height limitation (1100 feet by the County's Airport Zoning Ordinance) must obtain a variance from the Eau Claire County Board of Land Use Appeals in accordance with a series provision.” The court held that “the decision of the board to deny plaintiff's application for a variance from the height limitation ordinance did not violate the Telecommunications Act. Although the board's decision may mean a loss of revenue for the plaintiff and the city and may require the plaintiff to construct multiple towers to achieve the coverage it desires, nothing in the act requires a local zoning authority to allow wireless telecommunications companies to construct towers in the locations of their choice or to maximize their profits. The board concluded from substantial evidence in the record that plaintiff had alternatives.” [370]

Therefore, the height limitation in the name of aviation safety had reduced the land user’s profit but did not prevent the user from doing business, which extent was accordingly acceptable by the court.

3.2.1.2 Cases at the state level

3.2.1.2.1 Supreme Court of South Dakota: compensation

In September 2007, County filed a petition to condemn approximately 206 acres of real property for an airport runway expansion project. The 206 acres, located north of and contiguous to the airport, were part of a larger parcel of approximately 515 acres owned by the estate of Elvin E. Mitchell and Chris Miller (Owners). The dispute was the appraisal of the value of airspace.

The court held that “The damage clause of the South Dakota Constitution's condemnation

[369] Walsh v. Potomac Airfield Airport, 31 F. App'x 818 (4th Cir. 2002).
[370] APT Minneapolis, Inc. v. Eau Claire City., 80 F. Supp. 2d 1014, 1016 (W.D. Wis. 1999).

provision allows a property owner to seek compensation for the destruction or disturbance of easements of light and air, and of accessibility, or of such other intangible rights as he enjoys in connection with and as incidental to the ownership of the land itself."[371]

Therefore, the county should compensate for the loss of the landowners due to height limitation. Nevertheless, the court had also pointed out that only the currently 206 acres are within compensation, for the remaining parts of the 515 acres would not be compensated as they are speculative.[372]

3.2.1.2.2 Supreme Court of Kansas: height limitation could be justified

In the Supreme Court of Kansas, Kimberlin v. City of Topeka, actions were brought challenging validity of joint airport hazard zoning ordinance and resolution adopted by city and county. According to the court, firstly, "Adoption of joint airport hazard zoning ordinance and resolution of city and county placing height and use restrictions on property located near two airports did not constitute taking of private property without just compensation." Secondly, "Joint airport hazard zoning ordinance and resolution of city and county placing height and use restrictions on property located near two airports was reasonable within the meaning of statute [K.S.A. 3–706(1)] requiring airport zoning regulations to be reasonable." [373]

Therefore, the attitude towards height limitation changes from state to state.

3.2.1.2.3 The Supreme court of Wisconsin: vagueness and public hearing

The State v. Chippewa Cable Co. case was a civil action to abate a public nuisance. "The suit was brought because the state aeronautics commission, which contended that an antenna tower was hazardous to air navigation, did not have the power to issue injunctions." However, the Supreme Court of Wisconsin held that "Statute prohibiting erection, without a permit, of an object more than 500 feet above ground within one mile of its location was not unconstitutional on the ground of vagueness. W.S.A. 114.135." In addition, the court had also discussed the procedural matters (hearing) in defining

[371] Lawrence County. v. Miller, 2010 S.D. 60, 786 N.W.2d 360.
[372] Lawrence County. v. Miller, 2010 S.D. 60, 786 N.W.2d 360.
[373] U.S.C.A. Const.Amend. 14. Kimberlin v. City of Topeka, 238 Kan. 299, 710 P.2d 682 (1985)

"hazardous",[374] which can be regarded as a new point of such cases. [375]

3.2.1.2.4 Supreme Court of Virginia: clear zone and taking

For the situation in Virginia, in case "Richmond, Fredericksburg & Potomac R. Co. v. Metro. Washington Airports Auth.", the owner of land adjoining airport, part of which fell within "clear zone" in which development was restricted by the Federal Aviation Administration (FAA), brought an action seeking a declaratory judgment that actions of airport authority in seeking to acquire property or obtain land use and navigation easement over property constituted taking requiring just compensation. There were mainly two points in this case. Firstly, the fell within "clear zone" did not constitute "taking". As the "authority constantly resisted FAA pressure to acquire property and finally offer of an easement over the zone, letter in which owner consented to use of clear zone to support its non-clear zone land was purely voluntary, and no evidence indicated that effect of flights over land arose to level which would constitute taking." [376] Secondly, "Flights over private land are not 'taking' for which just compensation is required under State Constitution unless they are so low and so frequent as to be direct and immediate interference with enjoyment and use of land. Const. Art. 1, § 11." [377]

In summary, at the federal level, the height limitation would normally be regarded as kind of taking without just compensation in the US. However, if the state had judged on an independent and adequate basis, the federal jurisdiction would be deprived. The height limitation would also apply to plants.

At the state level, the perception on height limitation varies from state to state. For these states regarding height limitation as taking, the compensation should not include the airspace might be taking in the future. In addition, the height limit should be clear in meaning, and in some circumstances hold a hearing according to law. Nevertheless, the "clear zone" in Virginia was not regarded as taking.

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[374] "The question whether the tower was so hazardous that application for a permit would have been foredoomed to denial at a hearing by the aeronautics commission, if the commission had not failed to follow its own rules requiring a grant of hearing, was a question for the trial court, to be determined by resolution of conflicting expert opinions."

[375] State v. Chippewa Cable Co., 21 Wis. 2d 598, 124 N.W.2d 616 (1963)

[376] Richmond, Fredericksburg & Potomac R. Co. v. Metro. Washington Airports Auth., 251 Va. 201, 468 S.E.2d 90 (1996)

[377] Richmond, Fredericksburg & Potomac R. Co. v. Metro. Washington Airports Auth., 251 Va. 201, 468 S.E.2d 90 (1996)

3.3.3 The Chinese representative case

3.3.3.1 Hu Po & Cai Liang, etc. v. central and south bureau of China civil aviation

In China, there are also cases related to height limitation around the airport to ensure aviation safety. However, discretionary power is not solely from the airport.

3.3.3.1.1 Basic facts

In case Hu Po & Cai Liang, etc. v. central and south bureau of China civil aviation, the central and south bureau of China civil aviation (local branches of CAAC) permitted "Hanjing center project (320-meter skyscraper)", which located within the airfield "clear zone".[378] The adjacent condominium owners of Tencent Mansion (222.15 m) sued against this administrative approval for its illegitimacy based on the potential risk from the "Hanjing center project".

3.3.3.1.2 The relevant legal norms

The court had firstly listed the Chinese legal structure of this case. According to section 47 of the "rules on administration of operation safety in the civil airport", "When the local government above county level making decisions on the permissibility of construction project within the airfield clear zone, they should seek opinions from the civil aviation administrative mechanisms where the airport located." Accordingly, central and south bureau of China civil aviation has the power to make permission on the local project within airfield clearance zone. Additionally, according to section 58 of the Civil Aviation law of PRC, "such behaviors are prohibited within the boundaries of civil airport and airfield clearance zone delimited under the guidance of state's law: 3. the construction of buildings or equipment incompatible with the requirements of airfield clearance zone." What's more, in section 3 of "rules on administration of operation safety in the civil airport", "Civil Aviation Administration of China (CAAC) should unitarily supervise and control the operational security of airport in the whole state. Local branches of CAAC supervise and control the operational security of the airport within its scope.

[378] As noted by the court, "the Hanjing center project with the height of 320 meters (376.2 meters above sea level) belongs to very-high building. In addition, it located within the clearance zone of Nantou Helicopter airport, and near the Bao'an Airport of Shenzhen city."

Administrative organ of Airport should unitarily administrate the operational security of the airport, organize and coordinate the security and normal operation of the airport, and take responsibilities when needed." These rules had shown us a picture of the co-governance between CAAC and "the administrative organ of the airport" for the "operational security of airport". Furthermore, some more guidance could be found in section 158 of the rules on the administration of operation safety in the civil airport. "Administrative organ of the airport should positively harmonize and cooperate with the planning bureaus of cities government. Under the guidance of all the relevant laws, regulations and standards, the administrative organ should make and enact concrete rules on clearance protection, clarify the regular cooperation mechanism between government and airport. The clarifications include procedures of permission to build, rebuild, or enlarge buildings or structures, procedures to deal with the new obstructions; effective ways to keep the signatures of obstructions obvious." [379] In this part, the Chinese relevant laws and their relationship were clarified.

3.3.3.1.3 The legitimacy and proportionality of the administrative decision

Then the court held that "the defendant, as local branches of CAAC, had naturally discretionary powers and supervision powers on clearance zones height limit of the related projects." Therefore, the decisive factor was whether the defendant had made this decision legitimately and proportionately.

The court found that the defendant's decision was based on the following materials. The evaluation report on effects of this project for aviation, a meeting to evaluate the effect of this project on the clear zone, discussion on its feasibility by experts in this field too, and a printed the "Meeting Minutes". The court held that "All these behaviors of the defendant had proved that he had already fulfilled his duty of careful review." In contrast, the plaintiff had not provided persuasive evidence to prove the increase of aviation safety, and thereby affect the personal and property safety of the plaintiff. Therefore, the court would not support the claims of the plaintiff.

Actually, height limitation is quite common in China. For example, the height limitations

[379] Hu Po & Cai Liang, etc. v. central and south bureau of China civil aviation, Case No. (2016) Yue 71 Xing Chu No. 536.

for the buildings around historical sites are very common in Peking. However, it would rarely become a lawsuit. It is because the land in China is state-owned, accordingly the over-height building would not get approval from the planning authorities. Therefore, the land user in China would usually apply within the permitted height, if he still wants to get permission in the end. Consequently, few reasonable people would sue the government for the loss of its vertical development or the so-called “airspace right (空间权)”. As illustrated in Chapter 4.4.3, the airspace right is mainly used to handle the problems in condominium through a case-by-case method in China currently. The legislators and judges were currently not so ambitious to build up a magnificent system of airspace right. On the other hand, there are some obstacles to initiating the landowner-airport case, which would be discussed in Chapter 3.4.4. In this sense, the Hanjing center project case is rather an anomaly. It is because the defendant is a local branch of CAAC, however, the plaintiff is not the direct land user, but condominium owners of a neighboring skyscraper, who want the administrative authority to withdraw the permission of the project to secure the safety of their condominium property.

3.3.4 Short summary

For the height limitations on buildings near the airport in China, the US, and Germany, their aims are quite similar, which put aviation safety as the best priority. However, the US had already used the theory of airspace; while the German lawyers endeavor to make out a result through clarification of the relationship of the public laws and the conflicting interests. China also limited the use of airspace theory in this area, but the court even closed their doors for that kind of suits.

3.4 The reshaping of a landowner-airport relationship through the environmental suit

As mentioned above, in the US, the law of airspace is relatively mature, and it had played some role in the landowner and airport relationship. Comparatively, in China and

Germany, the lawyers do not usually use the airspace right. In China, there are some obstructions for such kind of litigation. While in Germany, the plaintiffs tend to seek remedies from public law. Consequently, the real estate law (as indicated in Chapter 3.2.1) plays rather a smaller role in shaping the landowner-airport relationships. This part of the chapter will analyze the most popular way in Germany to solve the landowner-airport disputes, say, the environmental suit.

3.4.1 Noise suit and the matter of night flight

In Germany, the most common lawsuits between the landowner and airport are the noise suits.[380] As introduced in chapter 3.1.1.2, the environmental cases in Germany are tried by the administrative court. Different from these civil cases, which would always focus on the "basis for the claim (Anspruchsgrundlage)", however, the court in administrative cases would concentrate on the legitimacy and proportionality of the concrete administrative act, as well as the procedural matters (e.g. public hearing). The following cases by the federal administrative court of Justice would show the art of balance of interest in noise suits and night flight of landowner-airport disputes.

3.4.1.1 The noise dispute in case Berlin-Schönefeld airport in Brandenburg

The Berlin-Schönefeld airport case was adjudicated by the Federal Administrative Court of Justice in 2011.[381] In this case, the plaintiffs were a local community and some of its landowners living near the Berlin-Schönefeld airport. The plaintiffs sued for the additional planning decision on the new construction of the Berlin-Schönefeld airport in adjacent land, which would permit "night flight (22 o'clock to 6 o'clock)" and would predictably affect the neighboring residents.

Primarily, the court admitted the *locus standi* of both the affected landowner and the local community. Then the court listed the prerequisites for the approval, which should include the aim of the plan, the justification of the new construction or the enlargement of the

[380] At the federal level, there are 12 cases, and 9 of them are noise cases, which constitute 75% percent of the total amount. So, it is the most common and important type of case in this field.

[381] BVerwG, Urteil vom 13. Oktober 2011 – 4 A 4000/09; BVerwG, Urteil vom 13. Oktober 2011 – 4 A 4000/10 –, juris.

airport, the reasons from the air transportation market, and some structural reasons to support the night flight against the interest of noise control of the residents.[382]

3.4.1.1.1 Public interest v. private interest

Instead of building up a new airport (an expensive alternative), the enlargement of the Berlin-Schönefeld airport has many advantages. a) Meet the requirements of the increasing demand of international air transportation; b) boost the economy of the state of Berlin and Brandenburg; c) politically fulfill Berlin's special function as the capital city and the residence of the federal government, which was also supported by the federal ministry of transport.[383] Although these points would not directly support the decision of night flight, they were important as evidence for the "demand for air transport" in Berlin.

3.4.1.1.2 The necessity of night flight

Five reasons could justify the night flight. a) The Hub-feeder-transport. Building up this transportation hub is quite important to maintain a good domestic and international network for a fight (obstructed by limitations on a night flight). b) The direct connections among the conventional airlines, which would have to travel at night hours due to the "jet lag" among different regions of the world. c) The demand for low-cost-carrier and tourist travel, which would always be arranged during nighttime.[384] d) The training flight and pilot education (until 23 o'clock), air cargo transportation, airmail transportation, the governmental flight, all required the possibilities of night flight. e) The frequently delayed flight after 22 o'clock or earlier reached flight before 6 o'clock in the morning.

3.4.1.1.3 Flight route and settlement structure

The aviation noise was not only determined by the style and surroundings of the airport, but also by the flying altitude and flight routes of the airplanes. Rather than justified by the local plan, the use of the airspace near the airport should be decisively determined through "flight route",[385] including the flight paths, flying altitude, reporting point.

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[382] The two parts of the case would totally amount to nearly 100 pages in German, the author try to preserve the whole analytical structure of the court, but summarize the rulings within 2 pages.

[383] It is now "federal ministry of transport and digital infrastructure", which is in German „Bundesministeriums für Verkehr und digitale Infrastruktur (BMVI)".

[384] The statistics are also recommended by the court, "In 2008, 402 of totally 978 possibilities of the cross-continental flight was arranged in Berlin-Schönefeld airport as an alternative airport, but not in Berlin-Tegel, due to the impossibility of night flight in Berlin-Tegel airport."

[385] The flight route should be fixed according to law by the "Federal Air Traffic Controlling Office (bundesaufsichtsamt für flugsicherung, BAF)" through the preliminary work of DFS.

a) **The planning approval authority** should consider only the "determined flight route" (rather than future flight and its noise pollution). Which should depict the arrangements of the flight operation and precisely cover the control of the protection and compensation areas.[386] b) The operation of the flight (including the take-off and landing procedure) should be **defined by the airport** at a certain location with some particular settlement structure around it. Certain residential areas may be affected by aircraft noise should be assessed in airport planning according to local conditions. c) Considering these backgrounds, a change of the flight routes for the regulation of the night flight operations is only relevant, if much more densely populated areas would rely on passive noise control than assumed.

3.4.1.1.4 For the standard of tolerable noise

The binding benchmark for evaluating the interest of noise control was the reasonable threshold in technical planning law, as well as the passive noise protection, which was to be granted if the noise exceeded this threshold. If the planning approval authority had decided the reasonable threshold in technical planning law faultlessly, it was principally sufficient for the purpose of the assessment to weight the noise protection issues starting from this threshold. In this case, the authority (defendant) had faultlessly decided this (reasonable) threshold, for granting the passive sound insulation for sleeping quarters.

The new amended flight noise control law (FluglärmG), intended to regulate restrictive covenant and sound insulation in planning law in the vicinity of aerodromes for the purpose of protecting the general public and the neighborhood from aircraft noise (section 1 of the flight noise control law). The section 8 subsection 1 sentence 3 of the civil aviation law in conjunction with section 2 subsection 2 of the Aircraft Noise Act, set the threshold of reasonableness in the technical planning law, and have a normative influence on the technical planning consideration.

3.4.1.1.5 Comment: the significance and influence of Berlin-Schönefeld airport case

[386] The court also points out how to divide the influenced residential area. "The latter should make it possible to enforce individual protection claims which cannot be overcome by means of consideration. On the other hand, it is to decide on the regulation of air traffic based on a balance (§ 8 para. 1 and 4 LuftVG). And the relevant elements for the balance is that how many residents generally were influenced by the noise of aircraft noise, and the extent of severity it reached. Which part residents influenced by the aircraft noise were not considerable, the others belong to the protection and compensation areas."

This is one of the most important and typical landowner-airport cases in administrative procedure. Because this case had shown the normal analytical framework of the administrative approach on noise and night flight disputes, which would focus on the procedural and substantial legitimacy of the administrative decisions.

Some German scholar believed that this case had set the basic framework of the airport noise cases in environmental law.[387] Firstly, "Choosing the standing point of the international commercial airport is a priority in the spatial planning decision." However, in the same case, the court also said, "In the situation that the planning approval authority after balancing came to a conclusion that there are unavoidable obstructions or avoidable public/private interests against it, which happened just at the position of planning approval site. In such circumstances, the project must be denied."[388] Secondly, the court had also mentioned the matter of noise, "the developer of the regional planning must achieve the clarity on the noise infringed at a "surfaces and measurement appropriate" scale of the location through the assessments of the alternative location." Thirdly, on the justification of the night flight, a standard was set. "In order to justify the unlimited night flights, the larger the number of the people infringed by the aircraft noise, the more urgent the need of aviation transport should be." Fourthly, for the protection of the residence from noise, the court had held that "protecting the residential use during the daytime had included the defense against unreasonable communicational infringements, as well as the recreational function of the inner and external living area." This endowed the special protection of the living area for residential use.

Therefore, this case had set the basic legal framework on the environmental remedy of the airspace infringement and noise pollution by aircraft.

3.4.1.3 The case of the Weeze-Laarbruch Military airport: cross-border noise

The Netherlands residents in the vicinity of Weeze-Laarbruch Military airport sued the exceeding noise in a German administrative court of justice against the decision of changing Weeze-Laarbruch Military airport into civil use.[389]

[387] Giesecke, ZLW, 2014, 2, pp. 2-9.
[388] BVerwG, Urteil vom 13. Oktober 2011 – 4 A 4000/10 –, juris.
[389] BVerwG, Urteil vom 16. Oktober 2008 – 4 C 5/07 –, BVerwGE 132, 123-151 –, juris.

After recommending the *locus standi* of the foreign residents, the federal administrative court of justice emphasized that the planning approval authority should take the noise control of neighboring foreign residents into consideration. a) It was an international obligation from both international treaties and requirements of the EU law. b) The prohibition of "cross-boundary exceeding environmental impacts" belonged to the seldom environmental protection rules, which was part of the universal customary international law. c) The "third party protection (Drittschutz)" was not limited by the national boundary, whose "balancing requirements (Abwägungsgebots)" aimed at investigation, estimation, and evaluation of all the relevant private and public interests under such circumstances, and included especially protective goods, such as life, health, and property.

Therefore, the cross-board aviation noise was also actionable for the foreign adjacent residents.

3.4.1.2 The case of airport Leipzig/Halle: night flight and expropriation

3.4.1.2.1 The basic facts and the attitude of the court

The airport Leipzig/Halle had a south runway of 2500 meters, and north of 3600 meters. The landowner in the vicinity challenged the administrative decision to extend the south runway to 3600 meters for the better cooperation of the two runways, in which the fright transportation during nighttime (22:00-6:00) was also permitted. The noise would reach 45 dB during the nighttime.[390]

The specialty of this case was that the plaintiff had tried to use the article 14 of the German basic law[391] to protect their real estate, and try to prove that the government had expropriated (enteignen) their property. Primarily, the court found that the Halle government has no procedural error. Then the court held that the claims were only partly well founded. Nevertheless, the main claim, the withdrawal of the planning approval decision, was dismissed for the following reasons.

[390] BVerwG, Urteil vom 09. November 2006 – 4 A 2001/06 –, juris.

[391] Article 14 [Property – Inheritance – Expropriation] (1) Property and the right of inheritance shall be guaranteed. Their content and limits shall be defined by the laws. (2) Property entails obligations. Its use shall also serve the public good. (3) Expropriation shall only be permissible for the public good. It may only be ordered by or pursuant to a law that determines the nature and extent of compensation. Such compensation shall be determined by establishing an equitable balance between the public interest and the interests of those affected. In case of dispute concerning the amount of compensation, recourse may be had to the ordinary courts.

3.4.1.2.2 Indirect infringement and expropriation

The court held that, the assessment of the "target conformity" of the plan should not only be made in the situation when the third party was expropriated but also be made when the landowner was indirectly infringed (protected by subsection 1 of the Art. 14 of the German basic law) by the land use plan. The infringement on the real estate should fulfill the basic principle of proportionality.

The defense right of the landowner against the planning decision existed, when the plan was illegal due to its infringement of subjective-right norms and there was a causal link between the treatment of the land real estate and the legal deficiencies.[392]

However, "an indirectly infringed plaintiff can, therefore, make sure that the intended project, which is identical with the aim setting of the technical planning law, is of no need to litigate. But the plaintiff can't freely demand the test that whether it is generally identical with the project pursuing public interest (especially that fulfill the public welfare of Art. 14 subsections 3 of the German Basic Law), to prevail over the property right."

3.4.1.2.3 Justification for the enlargement of the airport

The defendant claimed that in order to enable the "central hub in express air freight traffic", the parallel runway system, whose take-off and landing runways could be used independently, are necessary. While the existed runway system could not realize such function.

Only through the extension of the south runway could make the night express air freight traffic possible. The plaintiff's demand for prohibiting extension would shake the basic structure of the plan and the planning approval decision would be useless. Therefore, the enlargement of the south runway was necessary.

3.4.1.2.4 Night flight and additional measures by the developer

Firstly, the night express airfreight traffic represented the most significant public interest in traffic and economic. Such interest was higher than the interest in noise control. Secondly, the approval of night flight required a higher standard of justification. Concretely, there was an obligation to employ special measures to secure the nighttime

[392] Urteil vom 18. März 1983 - BVerwG 4 C 80.79 - BVerwGE 67 –, juris.

peace of the people, primarily during the time from 0 o'clock until 5 o'clock in the morning. This requirement would not be fulfilled until the project developer had given up providing amply dimensioned passive sound insulation. Thirdly, the noise control concept, which made the flight transportation also possible during the nighttime, had made itself prior to reaching the goal of avoiding the wake-up reaction from aircraft noise. This goal could be reached not only by fixing a maximum level supplemented by a continuous sound level, but also by using the concept of the DLR (German Aerospace Center), which was not based on acoustic parameters but on a dose-response relationship.

3.4.1.3 Frankfurt airport enlargement: case at the state level

One of the Frankfurt airport enlargement cases[393] happened in 2009 by the Hessian administrative court of justice.[394] The planning approval authority permitted the Frankfurt airport enlargement project, as well as night flight. The plaintiff was the landowners near the airport, who suited planning approval decisions against aircraft noise and night flight. The specialty of this case is that the plaintiff had used his land to build up a gasoline station, which belongs to commercial use according to German planning law. It is, therefore, different from normal residential use.

The Hessian administrative court of justice had paid much attention to the balance of interest. a) For Germany and Europe, this enlargement project would help the capacity of this airport increase to 88.6 Million, and made 701,000 times of flight for passengers by 2020, which would help state Hessian to secure its position in the aviation and serve for the maintenance and improvement of public interest within the aviation infrastructure. b) The enlargement of the airport would strengthen the function of airport Frankfort as "the hub of the national and international airport" in the competition with other hub-airports. c) The court had also listed the future benefits of this enlargement of the airport in the regional economy, and for the state as a European and international center for mobility of the people and the exchange of goods. d) it would also provide more job opportunities for the local people. Therefore, the planning approval authority had already considered public interests and balanced them legitimately.

[393] This airport had enlargement for several times and caused many lawsuits in Germany.
[394] Hessischer Verwaltungsgerichtshof, Urteil vom 21. August 2009 –, juris.

In the later discussions, for the night flight and noise matters, the court had found that the plaintiff would not be influenced by the night flight in substantial perspective. Accordingly, no right would be infringed. In addition, the courts had made it clear that the commercial facilities (Gewerbe Anlage) were not under the protection of the "Act on Protection against Aircraft Noise" according to the legislator. The applicable rules in this field are from labor law, for example, the commercial operator should keep the workplace out of the noise.[395]

Therefore, the different treatment between residential use and commercial use in aircraft noise pollution has its legal basis in Germany.

3.4.2 The change of flight route and flight procedure

In practice, not only the landowner near the airport might be influenced by aircraft noise. The change of the flight route or flight procedure might also severely infringe the serenity of the landowners for their enjoyments of their real property, as the sudden overflight would happen above their land plot. According to German scholars, the flight route is a normal word in common life, which means the highway for the aircraft to fly. In contrast, the flight procedure is a technical term in aviation; it included nearly all the arrangements for the plains around the airport, such as the position and the way for take-off and landing, as well as the speed, the time, etc.[396]

3.4.2.1 The Müggelsee case at the federal level: protection of the fishery and birds?

In practice, the most relevant environmental case is the Müggelsee case.[397] In that case, the plaintiff's land located in the east of Berlin around the Great Müggel lake. However, a planning approval decision was made to change the flight procedure of take-off and landing of the airport Berlin-Brandenburg, which would lead to frequent overflight above the plaintiff's land and cause much noise. [398]

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[395] Moreover, for the benefit of the noise pollution, the planning approval authority has rightly decided that commercial facilities have not been included in the protection concept of the Aircraft Noise Act by the legislator, but have been left to the protection regime for workplaces. Thereafter, it is up to the operator of the facility to provide the necessary protection against noise disturbances, even if noise emissions from outside occur the commercial plant interact.

[396] *Kaienburg*, ZLW 2015, 615, pp.615-617.

[397] BVerwG, Urteil vom 18. Dezember 2014 – 4 C 35/13 –, juris.

[398] Külpmann, jurisPR-BVerwG 10/2015 Anm. 3

3.4.2.1.1 Müggelsee case by high state administrative court

In the previous procedures by the high state administrative court, a local fishery and a famous environmental protection organization had also joined as plaintiffs, who claimed that the change of the flight procedure would cause not only noise pollution for the residents, but also hurt the fishery in the Müggel lake, and endanger the birds nearby. The environmental protection organization wanted to make sure that whether the approval decision should observe the EU law, and therefore to implement an "environmental impact assessment (Umweltverträglichkeitsprüfung)".

Firstly, the court had admitted the standing of the environmental protection organization as a plaintiff but dismissed the right of action of the fishery. It was because the fishery right did not contain the right to maintain natural conditions, which belongs to the landowner.[399]

Secondly, in justification of the change of flight-procedure approval decisions, the court firstly set the basic framework for evaluating the legitimacy of change of the flight procedure, which paid much attention to the foundations of the approval of the plan and the aviation licensing of the flight procedure.[400] Then the court listed a series of situations which would make the approval decision illegal, such as the breach of the foundations of the planning law, or the approval of the flight procedure depart from the rough planning of this district, and consequently against the environmental impact assessment. In this case, a) the Müggel lake flight procedure was not against the aim of the effective planning approval decision and did not deviate the planning basis. b) There were inevitable conflicts between the environmental impact assessment and the aim of the plan.[401] c) There was no intolerable aircraft noise. d) The appeal of preservation of the legitimate expectation was ruled out because the determination of divergent departure routes in the planning approval procedure was never excluded. "All in all, the flight procedure

[399] As the words employed by the court, "The holder of a right to fish lacks the standing to adjudicate on flying procedures, which carry him over the waters in which he is granted the right to small-scale fishing. The right to fish does not include the right to maintain natural conditions as an acquisition right."

[400] In this part the court mentioned the use of airspace, "Even if the use of the airspace cannot be regulated there, the Federal Supervisory Office, for its part, must comply with the decisions made in the planning approval and the air law approval; their exploitation must not frustrate it."

[401] Rather, the planning approval decision with the EIA check carried out for the construction of the aerodrome and its (flight) operational effects also triggers the conflicts caused by the deviating from the rough planning setting the Müggelsee route.

approval decision is legitimate. In particular, the considerations made by the Federal Supervisory Office are not legally objectionable."[402]

3.4.2.1.2 Müggelsee case by the federal administrative court of justice

The plaintiff appealed to the federal administrative court of justice but lost the case again. The court had mainly focused on two parts. Firstly, the environment effect assessment was not necessary. a) No such necessity. b) National laws were identical with EU laws on this matter. c) There was no need for such an assessment, and no need to refer the CJEU. Then the court emphasized that the exclusion of flight procedures in the plan approval decision could pursue different objectives. For example, a ban on overflights may protect noise-sensitive animals, concern about flight safety, and protect the landowners and residents from aircraft noise. The second point was that it would also require some attention to the review of the balancing decision when limiting the judicial review on the protection of subjective rights.

In balancing the conflicting interests, the court held that. "It is, therefore, conceivable that the planning approval decision expressly or implicitly excludes the determination of a particular flight procedure, solely in the name of public interest. For example, for reasons of nature conservation. The rights of landowners would not be violated in this situation, even if this demand was disregarded. Because the property owners affected by a flight procedure cannot stand any better than those can only indirectly be affected by a planning approval decision, which is limited to asserting an infringement in their own rights. Therefore, the landowners are not entitled to comprehensive judicial review on the planning approval decision. It was required that only the examination of the conditions from the planning-approval decision included a third-party protection effect in favor of the respective plaintiff (landowner)."

3.4.2.2 The flight procedure case at the state level: special protections for the leisure and recreational community?

At the state level, the Hessian high administrative court had tried a case in 2013 for the disputes on the planning approval decision on a take-off and landing flight procedure.[403]

[402] Oberverwaltungsgericht Berlin-Brandenburg, Urteil vom 14. Juni 2013 – OVG 11 A 10.13 –, juris.
[403] Hessischer Verwaltungsgerichtshof, Urteil vom 17. April 2013 – 9 C 179/12.T –, juris.

The plaintiffs[404]challenged the decision by the planning approval authority against the noise infringement. The specialty of her claim was that their community was designed by the planning authority mainly as an area of the residential place, especially famous for its great leisure and recreational value. Within this community located schools, residential and health facilities, hospitals, nursing homes, etc. Therefore, it would be an obstacle for future constructions of the new buildings for residential use if the planning was approved by the authority.

The court, after explaining why the plaintiffs were not entitled to prohibit the aircraft noise emissions, had defined the noise influence on this area as not unreasonable. In addition, the concrete noise strength was also listed as evidence in the court judgment, which recalled us the requirements by a federal court of justice in the 1986 case.[405] However, the court did not mention the special residential function of this area, which should be supposed with higher noise control standard.

In summary, the above cases had indicated that the landowner would have to bear a higher standard of tolerance and "burden of proof" in a change of flight procedure cases. It is understandable that the approval authority in such cases had relatively less duty of care, as the change of flight route would normally affect a large amount of land and people, who would more or less endure some disadvantages. Alternatively, changing the flight route and procedure would be impossible to interrupt nobody in an airport, which located inside a city. In such cases, both the residential area for leisure/recreation and the environmental impact assessment would not be a good cause.

3.4.3 The protection of birds and forest and other types of cases

3.4.3.1 The Munich airport case: protection of birds and environment

In some aircraft noise cases, the cause of action was the protection of birds and forests. Some of the above-mentioned cases also contained claims on the birds and forest

[404] The applicants are cities and municipalities whose respective areas are located north of Frankfurt Main airport on the Taunusrand. For reasons of noise protection, they oppose the redefinition of the approach procedure, which was designated as the northern counter approach to Frankfurt Main Airport in early 2011.

[405] BGH, Urteil vom 31. Oktober 1986 – V ZR 61/80 –, juris. Discussed in Chapter 3.2.1.1.2.

protection or the protection of other animals and plants. Some other cases take the birds and forest protection as the main claim, whose plaintiffs are usually the nature protection organizations.

At the federal level, the above-mentioned Berlin-Schönenfield airport case had also taken the protection of birds and forest as its cause of action. Another similar case was also tried by the federal administrative court of justice: the case of Munich airport.[406] This case also related to the protection of birds, the protection of the water, and the climate. The plaintiff was a famous environmental protection organization (as other similar cases), who sued the additional planning approval decision on the enlargement of the Munich airport to construct the third runways. This enlargement would endanger some rare birds, as well as the polluted the water, and intensify the climate change. However, the federal administrative court of justice found it not well founded.

The court first noted that the significance for the spatial determination to respect the bird protection area and its purposes. However, that was not its legal basis.[407] The court balanced the interest in environmental protection and aviation safety. Pursuant to the paragraph 45 subsection 7 sentence 1 No.4 of the federal nature protection act, the legitimate administrative authority under state law could be exempted from the prohibitions (by section 44 of the federal nature protection act) in individual cases, which is for the benefits of public security. The federal administrative court had pointed out that the approved project served for the interests of public security. The interests of public security contained not only its importance as an aviation infrastructure project to cope with the expected increase in the amount of air traffic at the Munich airport but also the improvement of the level of aviation security by addressing capacity constraints Risks for disruption of flight safety, especially during take-offs and landings. It was not necessary to carry out an appeal procedure for the Federal Administrative Court of justice to confirm the following facts. For the interest of public safety, there were, by all means, measures

[406] BVerwG, Beschluss vom 22. Juni 2015 – 4 B 59/14 –, juris.

[407] For the change of the protection regime from the Birds Directive to the FFH-Directive, it is sufficient that the bird protected area is spatially determined and the protection purpose is named. Whether the protected area designation complies with the substantive requirements under Article 4 (1) and (2) of the VRL (juris: EGRL 147/2009) or under Article 6 (2) FFH-RL (juris: FFHRL) with the protective measures to be taken is irrelevant.
Moreover, a potential FFH area may not be destroyed or otherwise adversely affected, so that it no longer qualifies for notification to the Commission pursuant to section 4 subsection 1 of the Habitats Directive.

to mitigate the risks of flight safety, which was evoked by the capacity bottlenecks and a consequent heavy flight sequence during take-off and landing.

For the rare birds, the court held that, the species Whitethroat, Feldschwirl, Marsh Catcher, and Cuckoo are widespread throughout Bavaria, so that the bird sanctuary 'Northern Erdinger Moos' did not impose on the conservation of these species.

In summary, in balancing the conflicts between the enlargement of the Munich airport and the protection of bird and environmental, the court actually faced the conflicts of public interests at both sides. The court took the aviation security (public safety) as a priority in this case.

3.4.3.2 Other types of disputes: the turbulence case

There is also another cause of actions on the environmental disputes between landowners and airports, such as the environmental impact assessment, the wake turbulence, and some others. Many of them could be regarded as a new way to protect the property.

In the wake turbulence case, for example, the Hessian high administrative court held that "unchallenged in this regard, defendants and invitees point out that so far worldwide there is no case of personal injury by detectable wake turbulence, and it should be likely to occur as infrequent events. Therefore, it is supported that, on the one hand, certain meteorological conditions - such as stable ground level air layers - must be present. On the other hand, wake turbulence does not regularly lead to uncontrolled flying around torn roof tiles but are raised according to the findings so far roof tiles. Although the episode would slide down the roof along the slope if they have lost their grip."[408] In addition, the court pointed out that the limitation for the operation of the aircraft would not be supported if the effects of the wake turbulence were only trivial in reality. Furthermore, "the danger to the life and health of persons and rooftops, and thus the ownership of the land due to wake turbulence, may be adequately addressed by the obligation to tile the bricks." As a matter of fact, the plaintiffs had also recorded the 14 times infringements in different streets of their community by the wake turbulence of the aircraft due to the operation of the northeast runways of the Frankfort airport.

[408] Hessischer Verwaltungsgerichtshof, Beschluss vom 29. Juli 2013 – 9 B 1363/13.T –, juris.

Actually, this is a case around the protection of the property, but the landowners choose environmental suit as a strategy to protect his enjoyment of property right. It is because in Germany, as discussed above, there are quite limited room and hope for the remedies within German Civil Code to fight against these reasonable or unreasonable infringements, which occurred in the name of public interest. As the popularity of the environmental protection and the maturity of its legal remedy regime, more and more landowners, as well as some environmental protection organizations, tend to use the environmental remedy to secure their enjoyment of the land and preserve the quality of life.

3.4.4 The German strategy from a comparative perspective

3.4.4.1 Airspace protection through environmental suit: why not popular in the US?

Different from the situation that in the US and China, the German landowner-airport disputes are always environmental suits. As introduced in the beginning of this Chapter, the leading case in the US on the airspace disputes between the landowners and the airports are the Causby case, which not only justified the right of airspace at the federal level (nationwide), but also sued for the noise infringement as an obstacle for the enjoyment of the land property. In this perspective, the aircraft should not infringe the airspace above the land at lower airspace in order to guarantee the enjoyment of the farmland of the Causbys. In other words, noise pollution is just a side-effect of airspace infringement, which is incompatible with the function of the land as a residential place and for chicken farming.

In the height limitation cases in the US, the height limit would be regarded as a kind of taking of airspace both at federal and state level. Actually, some cases are just to solve which part of the airspace should be justly compensated. All these cases had revealed that the airspace right has a relatively solid theoretical and practical foundation in the US, and therefore the noise pollution claim was just an additional choice. However, at the state level, the noise matters were regarded as nuisance or tort, but the remedy from environmental law seemed a rather far-reaching method to protect the real estate.

3.4.4.2 Airspace protection through environmental suit: rarely successful in China

3.4.4.2.1 Liu Yuhua v. Peking international airport

In China, for aviation noise matters, there are roughly no legal remedies. In addition, a recent case happened in Peking had illustrated the reasons. The plaintiff, Ms. Liu Yuhua, was a condominium owner near the Peking international airport. She sued the airport for the unreasonable noise pollution (reached 90 dB) since the erection of T3, which had caused her higher blood pressure, heart disease, and amblyacousia. Nevertheless, the local court of Shunyi district dismissed the case. The court had listed its ruling with the following words. “Liu Yuhua, the plaintiff, suffered from the aviation noise pollution by the aircraft flying over her apartment and sued the airport company to cease infringement, remove the east runways away. From a legal perspective, the runways of the airport belonged to legitimate building project. The questions on whether it could move away, in which manner and the decisions on the procedure of take-off and landing were beyond the scope of the people's courts.” [409]

The defendant appealed to the third intermediate people court of Peking by raising a claim of “objection to subject matter jurisdiction”, but the appeal court had recommended the explanation of jurisdiction and the judgment by the local court.[410]

3.4.4.2.2 Mr. Chen v. Hangzhou Xiaoshan international airport

In case Chen v. Hangzhou Xiaoshan international airport in 2017, the villagers sued an international airport in Hangzhou for the unreasonable noise pollution. The aviation noise had exceeded 75 dB during the take-off and landing in the aircraft. In some area, the noise had reached 90 dB according to the recorder by the villagers. Moreover, the aviation noise had accordingly caused severe harm to the health and properties of the villagers. Therefore, they sued for compensation of totally 64,000 RMB (about 8200 Euro).

In its judgment, the court had explained why such types of cases were inadmissible by the Chinse court. The legal basis for the inadmissibility of these types of cases based on section 62 of the “Regulations on the civil airport”. “The local government should, in cooperation with the local civil aviation administrative authority, deal with the relevant

[409] Liu Yuhua v. Peking international airport, case No.（2016）京 0113 民初 16057 号.

[410] Liu Yuhua v. Peking international airport (Appeal), case No.（2017）京 03 民辖终 4 号.

issues caused by the noise pollution from take-off and landing." [411]

Therefore, the noise issues, in this case, should be treated by the relevant administrative organ, but not within the scope of cases acceptable by the people's courts.

3.4.4.2.3 Cao Xiuli etc. v. Luokou International Airport of Nanjing

However, in some extreme cases, the victims of aviation noise finally get compensation through tort claims. Even in these successful cases, the legal bases are still normal tort on personal health, but not the infringement of airspace above their real estate. Nevertheless, there was also an environmental suit, named Cao Xiuli etc. v. Luokou International Airport of Nanjing.[412]

In this case, the plaintiff Cao Xiuli and her neighbors in her village had suffered from unreasonable aircraft noise for more than 15 years. She became nearly deaf, but only received 10 RMB (1.3 Euro) noise subsidy per month since 1999. As the high-speed growth of GDP in China during the past decades, the airplanes had gradually become one of the most frequent means of transportation even for ordinaries. Accordingly, the frequency of the airplanes, as well as the noise pollution were increasing, what remained stable was the noise subsidies. The plaintiff sued for more compensation for her personal injuries. The procedure was rather complicated. Ms. Cao had lost the trial case and the appeal case in the civil procedure, which usually meant the end of the case.[413] However, Ms. Cao had never given up. She had tried every possible way to get a remedy, including but not limited to petitioning (Shangfang, in Chinese "上访"), which is a typical Chinese way of seeking remedy.[414] In the end, a "civil adjudication supervision procedure" was started for her in the High court of Jiangsu Province. In this special procedure, the plaintiff had finally get compensation for her personal injury by the aircraft noise through

[411] Section 62 of the "Regulations on the civil airport" "The local government, where the civil airport located, should set and manage the boundaries of the areas for sensitive buildings. If there are some necessity to build up noise-sensitive buildings within this area, the building operator should take measures to alleviate the noise pollution from the aircraft. The local government, which the airport located, should in cooperation with the local civil aviation administrative authority, deal with the relevant issues caused by the noise pollution from taking off and landing."

[412] Cao Xiuli etc. v. Luokou international airport of Nanjing, by Nanjing intermediate court in Jiangsu Province, case No. (2015) 宁环民终字第 3 号.

[413] According to section 10 of the Chinese civil procedural law, "final after two trials" is the principle. "Section 10 When trying civil cases, the people's courts shall apply the collegial bench, disqualification, open trial and "final after two trials" systems in accordance with law."

[414] Li Lianjiang, Liu Mingxing and Kevin O'Brien (2012). Petitioning Beijing: The High Tide of 2003–2006. The China Quarterly, 210, pp 313-334

environmental stipulations.

3.4.4.2.4 Alternative litigation strategies for aviation noise in China

Some condominium owners would even sue the developers or the sellers for the aircraft noise as a misleading advertisement or breach of the sales contract, which functioned as an alternative for the aviation noise claims. However, many real estate firms would avoid this potential risk through asserting exemption clause into the formed purchase contract of the apartment, [415]which made the remedy even narrower for the victims of aircraft noise. On the other hand, pursuant to the new amendment of the Chinese environmental law in 2014, the "All China Environment Federation (ACEF)" would no longer solely monopolize the environmental public interest lawsuits. Any qualified environmental NGOs, which had no law violation records within five years, have the right to claim. [416] Since the new amendments of environmental law become effective, there are already 189 environmental public interest lawsuits in just two years. Nevertheless, the cases on noise pollution, especially the aircraft noise pollution is still very rare in China, which means there is still a long way toward the prosperity of environmental suits in China. Nevertheless, as noted above, the Chinese airspace right is normally limited within the condominium in disputes in legal practice. Therefore, in the field of aircraft noise cases, there are not so many remedies in Chinese airspace law. A tort claim on personal injury seems to be the only possibly effective remedy.

3.4.5 Short summary

From the comparative perspective in the US and China, we could safely draw the conclusion that the German lawyers had successfully protected their residential area and corresponding airspace through the environmental suit. It is quite meaningful for

[415] Liu Jiancheng v. Datang real estate agent Co., in Shuagliu County of Sichuan Province, 2014. Case No. (2014) 双流民初字第 5225 号。

[416] Article 58. For activities that cause environmental pollution, ecological damage and public interest harm, social organizations that meet the following conditions may file litigation to the people's courts: (1) Have their registration at the civil affair departments of people's governments at or above municipal level with sub-districts in accordance with the law. (2) Specialize in environmental protection public interest activities for five consecutive years or more, and have no law violation records.
Courts shall accept the litigations filed by social organizations that meet the above criteria.
The social organizations that file the litigation shall not seek economic benefits from the litigation.

Germany, where the private law protection of airspace had only limited effects (the obligation to bear and high standard of evidence). Therefore, protecting the airspace through both the public law and private law could be regarded as a characteristic of German legal mechanisms. Nevertheless, this approach is not rare in Germany. Similarly, the German property mechanism consists of both the protection from the German Civil Code and the protection from German Basic Law (Art. 14). Actually, the mixture of public law and private law are quite suitable for German legal soil, although recognition of the independent airspace right might provide better protection. Why is that?

Firstly, As illustrated in these cases, the noise suits had a time limit (night flight), however, in land/airspace dispute, while the Causbys did not have to prove such time-limit. Secondly, according to the ruling of some local courts, the residential space enjoyed better protection, while the commercial site was not included. Thirdly, public interest, the development of the local economy, there were always many reasons to justify the aviation use of airspace and making noises. Imagine if in the Causby case, the US authority would use military interest and state security as a justification, then Causby would not be so influential in the US. Fourthly, in some environmental cases, the surface landowner would lose the cases if there were no rare species, such rare birds, vulnerary environment, etc. All in all, from the perspective of surface landowner protection, the environmental and other administrative remedies in Germany only play a role as a substitute with limited effects.

Comparatively, the US would directly use the legal mechanism of airspace to provide direct protection. Although the airspace law is also accepted by the Chinese scholars, the scope of airspace is limited within condominium and land use right for construction currently. Therefore, the airspace law had little to do with aviation noise disputes. Moreover, the landowner-airport dispute is attributed to a matter of administration rather than a cause of action.

The Chinese aircraft noise victim has to negotiate with the government according to the special regulations. Accordingly, the victim has to seek alternative remedies in China. Nevertheless, they have to sue for compensation of their personal injury in tort law rather

than claims from real estate. Even worth, in most situations it was quite hard to prove the causation between the diseases and the aircraft noise pollution.

From the positive perspective, there are also sections in the Chinese tort law, which required a reverse burden of proof in such environmental pollution cases, and the environmental public interest lawsuits could also become a new way of remedy in the future.

3.5 The unsolved problem: reflections on airspace in the era of drones

3.5.1 From airplanes to the era of drones

All the above-mentioned cases deal with the disputes around the normal airport and its neighboring landowners. Currently, there are still technical limitations for the big aircraft to avoid making a loud noise, especially for Boeing 787, Airbus A380. In addition, they usually spend much time to take off or land over in the airport, which would easily disturb their neighbors. These cases had constituted the dominant aircraft noise lawsuits in this field. However, some small aircraft might not need an airport, no pilot, or even fly elegantly as a small bird, or even a butterfly, in the airspace. What would the airspace legal institutions become in such a situation? What if the new aircraft make little noise?

Some US scholars had already studied the city land use and disputes arose between helicopter airports and their neighboring landowners since the 1980s.[417] Obviously, different from the big airlines, the helicopter makes lower noise and takes less time to climb up in the airspace, and do not need long runways. In other words, the helicopter infringements might be much nearer to the problem of infringement of airspace. Because there are fewer other possibilities for the landowner to get remedy through environmental suits, e.g. aircraft noise, or night flight, or the change of flight procedure, etc. In Germany and China in legal practice, such cases are not so common.

Now the age of drone (unmanned aerial vehicle, UAV) had come. A drone with a camera could be just one or two kilos in weight but could see all the things happened in your

[417] *Williams*, 24 Cal. W. L. Rev. 379, p.382-388.

apartment through your window. The drones, without an airport, without much noise, without almost any normal infringements caused by the planes. However, it could severely affect our lives in a series of aspects. As summarized by Mark Blanks, the current application of the drones includes mainly six categories. These categories are remote sensing; industrial inspection; aerial filming and photography; intelligence, surveillance, and reconnaissance and emergency response; atmospheric information collection; applications requiring physical interaction with substances, arterials, or objects. [418] Concretely, during the chemical Explosion of Tianjin at August 12, 2015, the drones from Xinhua News Agency and other Media came to the most dangerous places and provided the newest and most accurate information as soon as possible.[419] Cooperating with the big data and artificial intelligence, the drone with a high-definition camera would surely provide much more convenience for us beyond imagination.

3.5.2 Regulating the civil drones: problems and dilemmas

However, there are also legal problems in modern countries for the private use of drones, especially in urban areas. As the price of the drone had tremendously decreased during these years, and thanks to E-commerce, even a teenager in China could afford for a drone and buy it through just a click on the website. Some of the teenagers would control these drones in their community as kind of toys, and infringe the privacy of their neighbors even without conscious.[420] Another problem in China about drones is that some drone user drives these aerial vehicles without licensing and without permission, which might cause the plane to crash near the airport. On May 12th of 2017, the Chongqing airport experienced a four-hour long drone disturbance, which caused 140 delays of flight, and 60 cancellations of the flight and 40 flight go back. During the whole month of May in 2017, there were totally 19 times of drone disturbance near the airport in different cities, and 326 flight was affected, in which 101 flight had to go back.[421] Therefore, the

[418] *Blanks*, in: Marshall/Barnhart/Shappee/Most, Introduction to Unmanned Aircraft Systems, 2016, pp.19-39.
[419] Drones from the Xinhua News Agency take pictures on the Tianjin Explosion, at website: http://www.xinhuanet.com/local/2015-08/15/c_1116263589.htm.
[420] *Li*, the "made in Shenzhen" drones' global popularity and its lack of regulation, especially for the privacy protection, in Yangcheng evening news, March 30th, 2015.
[421] *Li/ Song*, drones: say goodbye to "black flight", Economy & Nation Weekly, 14th issue, July 2017.

regulation of the drones in China seemed necessary.

Actually, the risk of the drone is now a worldwide problem. On August 9, 2016, a drone was only a few meters from a landing Airbus from the Lufthansa Company at a height of 1000 meter in airspace over the Munich airport.[422] Only four months before, a Drone hit British Airways plane approaching Heathrow Airport.[423] In October of 2017, a drone hit passenger plane for the first time in North America, which, fortunately, caused no personal injury. It happened at a height of 1500 feet (457.2 m) three miles from the Quebec airport in Canada.[424] Although there was still no recorded collision in the US, the FAA had recorded 583 dangerous situations of drone-commercial planes within only 5 months (from August 2015 to January 2016).[425] Therefore, the drone had posed a real threat to civil aviation worldwide, which need to be regulated. Additionally, it had great potential of infringing other's privacy.

3.5.3 Current legal framework on drones and some leading cases

Although some new legislation had classified the drone as a kind of aircraft, which belongs to the aviation law, such as Germany. Some countries had made special regulations, such as the Federal Aviation Administration (FAA) of the United States. Actually, in the US, not only the airspace right in the era of drones is under discussion, but also the drone zoning. Additionally, China had also made new legal rules to cope with this trend.

3.5.3.1 Drone regulation in the German context and the EU level

As German law is deeply influenced by the EU law. It worth firstly to mention the guidance on drones at the EU level. Early in 2015, the European Aviation Safety Agency had already made a document named "Introduction of a regulatory framework for the operation of unmanned aircraft", which included 27 concrete proposals for a regulatory framework and for low-risk operations of all unmanned aircraft irrespective of their

[422] *During*, Was passiert, wenn eine Drohne auf ein Flugzeug trifft?, Der Tagesspiegel, August, 9, 2016.
[423] This news was reported by the BBC, at the website: https://www.bbc.com/news/uk-36067591.
[424] *Miller*, Drone hits passenger plane for first time in North America, New York Post, October 16, 2017.
[425] *During*, Was passiert, wenn eine Drohne auf ein Flugzeug trifft?, Der Tagesspiegel, August, 9, 2016.

maximum certified take-off mass (MTOM).[426] This document was characterized by dividing the drones into three categories, says open category (low risk), specific category (medium risk), and certified category (higher risk). It had also set the basic principles for the drone laws, which included proportionality, operation-centric, risk-based, performance-based, progressive, and smooth. There were also some practical proposals in this document, such as the drawing of the roadmap, dividing zones for the operation of the drones, as well as keeping a reasonable distance from the uninvolved person on the ground, which could be regarded as the limitation for drones in the airspace.[427] What's more, according to this document, the drone pilot should also keep a reasonable distance from other airspace users.[428] According to these proposals, the drone pilot should also keep her drones from the uninvolved property, and the minimum safe distance in some highest-risk subcategory for the open category is 50 meters. This requirement was quite similar to the US legislation at the state level, in which the drones should not fly at a height below 150 meters.

Instead of making new laws on drones, the German lawyers preferred to employ the existing legal mechanism. They tried to insert drones into federal civil aviation law.[429] Therefore, there were firstly many amendments in the Civil Aviation Act, which had come into force in April 2017. In accordance with Section 1 of the Civil Aviation Act, "unmanned aerial systems are devices exclusively used for commercial purposes."

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[426] It was in parallel to the draft modifications to Regulation (EC) No 216/2008 (hereinafter referred to as the "Basic Regulation") included in the "Aviation Strategy to Enhance the Competitiveness of the EU Aviation Sector" (hereinafter referred to as the "Aviation Strategy"), published on 7 December 2015.

[427] Proposal 13: To reduce the risk to uninvolved persons on the ground for all unmanned aircraft in the "open" category, except for the "harmless" subcategory:

— flights over crowds are not permitted;

— the pilot is responsible for the safe operation and safe distance from uninvolved persons and property on the ground; and

— the minimum safe distance for unmanned aircraft in the highest-risk subcategory of the "open" category is proposed to be 50 m.

[428] Proposal 14: To separate unmanned aircraft from other airspace users for all unmanned aircraft in the "open" category, except for the "harmless" subcategory: ☐

only flights in direct VLOS of the pilot are allowed; ☐

an unmanned aircraft in the 'open' category shall have a system ensuring that it limits its performances to acceptable values, in particular that it cannot operate at a height exceeding 150 m above the ground or water. The pilot is responsible for the safe separation from any other airspace user(s) and shall give right of way to any other airspace user(s); and ☐

the pilot needs to have adequate pilot competence according to the performance of the unmanned aircraft.

[429] In order to insert the drones, the legislator had added one sentence in section 1 subsection 3 sentence 2 of the federal civil aviation law, "It is also considered as aircraft, say the unmanned aerial vehicles (UAV), including their control stations, which are not used for hobby or recreational purposes." This could also be regarded as the legal definition for drones.

Similarly, the German lawyers also set reasonable distance from the persons and buildings, flying height limitations, as well as requirement of certificate of knowledge for drones over 2 kg or flying over 100 meters. “over residential property, if the take-off mass of the device is more than 0.25 kg, or if the device or its equipment is able to receive, transmit or record optical, acoustic or radio signals, unless the owner or another authorized user whose rights are affected by the operation over the residential property has explicitly expressed his consent to the overflight.” [430]Alternatively, the drones with “eyes” can only make overflight under consent of the right holder of the land plot. Like the design in some states in the US, the consent of the landowner is required. What’s more, a case had already assured this mechanism in legal practice.

In a case by the local court of Potsdam in 2016, the plaintiff was a landowner, who had a garden with a wall of 7 meters. The defendant had driven his drone (with a camera) cross the plant wall into the above airspace of the garden without permission. The court held that the landowner had the right of a prohibitory injunction, when the defendant drove his drone (no matter with a camera or not) to fly over the plaintiff’s land, and record the landscape or the person inside. Such behavior, obviously, constituted an infringement of the “right of private sphere” of the landowner.[431]

From a perspective of airspace, the drones are a new stimulus. The land ownership would not be fulfilled without the right in the airspace. The drone should not infringe the landowner’s airspace without permission.

3.5.3.2 The “drone zoning” in the US

In July 2016, the U.S. Federal Aviation Administration (FAA) issued its final small Unmanned Aircraft Systems (sUAS) rules, adding Part 107 under Title 14 of the Code of Federal Regulations (CFR), integrating civil sUAS into the National Airspace System (NAS). Part 107, as the latest development of the U.S. civil sUAS legislation, provides detailed rules as to the remote pilot certification, preflight familiarization and inspection, flight restrictions and operating limitations, and waivers etc., for the operations of civil

[430] Section 21b subsection 1 No. 7 of the newly amended air traffic regulation (Luftverkehrs-Ordnung), BGBl. I S. 1617.

[431] AG Potsdam, Urteil vom 16. April 2015 – 37 C 454/13 –, juris.

sUAS within the United States.[432]

However, parallel to these rules, the protection of the airspace of the landowner is also enhanced in the US. On the one hand, a series of statutes were amended at the state level to enhance the landowner's right at lower airspace against drone infringement.[433] For example, in the California Civil Code, section 659, "land...includes free or occupied space for an indefinite distance upwards...subject to limitations upon the use or airspace imposed, and rights in the sue upwards." On the other hand, some states, such as Florida, Idaho, and North Carolina, had also prohibited the drone from gathering "evidence or other information" or conducting surveillance.[434] Some state legislation also emphasis the consent of the property owner. Therefore, the airspace right had gradually become a new key to solve the problems caused by drones in the US.

Now the main authority for drone regulation is the FAA. However, as some scholars noted that in the US, "the FAA, a centralized federal agency, lacks the information and resources to effectively regulate these inherently local drone use issues."[435] Therefore, a nationwide municipal and state-level regulation of drones seems necessary in the US.

According to Troy Rule, the federal government should uniform design and performance standards of the drones, built up the federal drone registration and tracking systems, and make restrictions on the drone use to protect federal assets and interests. Obviously, local regulation should be set within the framework of national regulations.

At the state level, the state government should enact privacy and safety rules to protect

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[432] 49 U.S.C. 106(f), 40101 note, 40103(b), 44701(a)(5); Sec. 333 of Pub. L. 112-95, 126 Stat. 75.

[433] CAL. CIV. CODE § 659 (West, Westlaw through 2016 Reg. Sess.) ("Land... includes free or occupied space for an indefinite distance upwards... subject to limitations upon the use or airspace imposed, and rights in the use of airspace granted, by law."). GA. CODE ANN. § 51-9-9 (2015) ("The owner of realty has title downwards and upwards indefinitely; and an unlawful interference with his rights, either below or above the surface, gives him a right of action."). MINN. STAt. § 360.012.2 (LEXIS through 2016 Reg. Sess.) ("The ownership of the space above the lands ... of this state is declared to be vested in the several owners of the surface beneath, subject to the right of flight...."). See Rule, supra note 143, at 179-86 (providing a recent analysis on this topic). Quoted from footnote 190 of Troy A. Rule, Drone Zoning, 95 N.C. L. Rev. 133 (2016).

[434] FLA. STAT. § 934.50(3) (2015) (prohibiting law enforcement agencies from using a drone "to gather evidence or other information"). IDAHO CODE § 21-213(2) (LEXIS through 2016 Reg. Sess.) (prohibiting a "person, entity or state agency" from using "an unmanned aircraft system to intentionally conduct surveillance of, gather evidence or collect information" about an individual, an individual's curtilage, or an agricultural industry, without written consent). N.C. GEN. STAT. § 15A-300.1 (2015) (prohibiting a "person, entity, or State agency" from conducting surveillance of a person or private real property without the person's consent, with exceptions for newsgathering and certain instances for law enforcement). quoted from footnote 173-176 of Troy A. Rule, Drone Zoning, 95 N.C. L. Rev. 133 (2016).

[435] *Rule*, 95 N.C. L. Rev. 133.

landowners, make clarifications of landowners' airspace rights, and build up a state registration and operator licensing programs. For the municipal government, they should access to local information, make longtime regulation of other airspace users, and unique capacity to craft location-specific rules.[436]

In fact, drone zoning is a combination of the regulation of drone operation with the local zoning technique. It makes use of the advantages of municipal to make detail rules for drone usage within a municipal.

3.5.3.3 Drone regulation in China

In China, the current drone regulation including airworthiness management, operational management, flight management,[437] pilot qualification management,[438] utilization management[439], and frequency management, etc., which had formed the basic regulatory structure of drones. Recently, China had made "provisions on the commercial operation of Unmanned Aircraft", which is mainly for the "drone logistic" promoted by Shunfeng (SF) Express and Jingdong.com. Inc.[440] Therefore, a new era of logistic had come. The drone logistic industry would save human labor and make the delivery to remote areas of China more convenient.

Nevertheless, more concrete legislation and legal studies are still in shortage, despite the new legislation of "the real-name system of", which mainly concentrates on the administrative matters of drone regulation. From a comparative perspective, Chinese law in this field is strong in administrative control but weak in the protection of personal rights and interests.

Up to now, there is only one case related to the compensation matter of drones in China, which is Xiamen Jianeng Electrical Technology Co., Ltd. v. Chen Yaxin by the Intermediary Court of Xiamen in 2014. In this case, the plaintiff, Xiamen Jianeng

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436 *Rule*, 95 N.C. L. Rev. 133.

437 Provisions for the Operation of Light and Small Unmanned Aircraft (for Trial Implementation) (the "UAS Operation Rules ") and were issued by previously China Civil Aviation Administration and became effective on 29 December 2015.

438 Early in 2013, the previously "China Civil Aviation Administration" had made "Interim Provisions on the Administration of Operators in the Civilian Unmanned Aircraft System", which is the first UAS regulation in China.

439 Provisions on the Administration of the Real-name Registration of Civil Unmanned Aircrafts enacted by China Civil Aviation Administration (now dissolved) in May. 16, 2017.

440 *Wen*, A subsidiary of Shun Feng Express had got the first license for commercial operation of Unmanned Aircraft, Beijing Youth Daily, March 30, 2018.

Electrical Technology Co., Ltd., is an electrical company. They frequently use drones for delivery. However, on September 25, 2012, one of the drones had a crash landing on the road, which was in collision with the driving car by the defendant, Mr. Chen. The evidence showed that Mr. Chen had braked the car but cannot prevent the collision. The plaintiff sued Mr. Chen to compensate for the broken drone, which was 2 meters multiply 3 meters in size. The court held that the drone operation by the plaintiff did not constitute "general aviation", and therefore needed approval. "General aviation means aviation activities other than military, police, and customs anti-smuggling flight and public air transportation flight. To conduct unmanned aerial vehicle flight activities, an entity or individual shall submit a flight plan application to the local flight control department before the flight, and may not implement the flight plan until it has been approved. Moreover, the entity or individual shall assume security obligation for the flight. Whoever without authorization conducts flight activities in open space in violation of regulations and fails to take effective security measures shall assume compensation liability for the infringement damage since he has major faults."[441] Therefore, the defendant was not responsible for the broken drone.

The crux of this case is the emphasis on the importance of legitimate operation of drones, which is the prerequisite of full legal protection. The drone driver should be responsible (at least partly) for the unapproved drone operations.

3.5.4 Short summary

The Drones take new challenges to both aviation law and private law, it seems that the administrative law is a good choice. However, the cost of enforcement on these rules is obviously quite high. The real-name register and the flying height limitation are not enough to prevent the operators from unfriendly usages. Therefore, the cooperation of the local zoning seems a better choice. Besides these regulatory strategies, the private landowner could also prevent the drones from flying over his land. As shown in the

[441] Xiamen Jianeng Electrical Technology Co., Ltd. v. Chen Yaxin (appeal case of dispute over compensation for property damage), Case No. (2014) 厦民终字第 3864 号.

German case, the owner could use the tort law to protect himself from drone infringement. However, similar to the “silver fox case”, the landowner should bear a high burden of proof. Concretely, the landowner should prove it is the private sphere, and such drone driving without permission is an infringement of privacy. Imagine if there is a property right on airspace/subsurface, there would surely be a property right to preclude the drone drivers from flying into the “private territory”. Therefore, the recommendation of property right on airspace/subsurface seems a good choice for the coming era of drones, which could not be solved by environmental suits (such as noise pollution, air pollution, change of flight route, protection of birds, etc.).

3.6 Summary of this chapter

This Chapter tries to clarify the legal boundary between the surface landowner and the aircraft operation (especially the airports), which mainly contain the surface landowner-airport boundary disputes, the height limitation, the specialty under circumstances of drones.

3.6.1 The surface landowner - airport disputes in three aspects

For the surface landowner-airport boundary dispute, there were mainly two approaches, the traditional approach is the landowner try to preclude unjust infringement of overflight through civil claims, and the second approach is through environmental suits. The first approach occupied a dominant position in the US (airspace claims), while the second is quite popular in Germany. China is in the middle, in other words, both civil disputes and environmental suits have some obstacles in China.

The Causby case is most influential in this field in the US, which could be regarded as a boundary for the surface landownership. The cases at the state level, however, still use the traditional civil method, to provide a remedy, which is proved not a successful way. The main obstacles in this field are the causation and evidence problem.

Germany had also some classic cases, in which the landowner tried to seek civil remedies but failed. The new refreshments of the airspace disputes are stimulated by a rise the environmental law in Germany. The surface landowner could sue through aviation noise,

night flight, change of flight route or flight procedure, the protection of birds, and the turbulence infringement, etc. In other words, the surface landowners are trying all kind of ways to protect their enjoyment of the land surface and airspace. However, as summarized in Chapter 3.4.5, such protections are not full protection, but it is a good substitute for Germany.

The reasons are that the administrative claims in this field were not popular in China, and the civil cases were not admissible to the court (such disputes were decided by administrative decision). Therefore, although there is a statutory basis for airspace/subsurface right (section 136) in China, the airspace right did not play a role as an umbrella to protect the surface landowner. The dilemma is that the administrative suits were generally not popular in China, which had both institutional and cultural-social-psychological reasons. Consequently, the surface land users' airspace right was neglected.

The height limitation is another perspective to the surface landowner - airport dispute. However, they rely upon different legal mechanism. This time, the surface landowner fight for the right to develop his airspace. As the height limitation means a burden on the surface land ownership and usage, it should always be justified. In the US, such matters are normally decided on a state level, and accordingly, some state regards it as taking, while others do not. It is a constitutional matter around property protection and taking. From this perspective, the taking theory is compatible and helpful to solve the problems from both the Causby side as well as the height limitation side.

While in Germany, as such cases have no deep root of civil claims, the main focus is still the justification of airspace use from the perspective of administrative law. Therefore, to some extent, the German cases had already dealt with the priority of using airspace, which based more on current social value than tradition. The Chinese situation is embarrassing because it even has some obstacles in the cause of action.

In summary, the surface landowner's right in airspace include both the right of defense (preclude from unjust infringement) and the right to develop (the freedom to build). The US had used airspace law and the taking theory to solve the most problems. Germany relied more upon administrative law, especially environmental law to solve the problems

from both sides, in which the balance of conflicting interests occupied a central position. The Chinese specialty is that the airspace suits happened among users (land and airspace are all state-owned), and they were widely accepted by the courts. Consequently, some of the airspace disputes were treated as normal tort claims, and it was quite easy to prove public interest in China (the private airspace is more venerable). Therefore, although there is already the statutory basis for airspace/subsurface in section 136 of the property law, they need to be applied in a wider scope and try to function systematically.

As the unwillingness of administrative suits in Chinese legal culture, civil suits seem the only possible way for Chinese surface land users to protect their legitimate right in the airspace. Consequently, there is a strong need to develop its airspace/subsurface law in China, and the US solution seems more helpful for the current Chinese situation.

3.6.2 Redefine the airspace in the era of drones

For the traditional cases of landowner-airport disputes, both the US and Germany have developed their own strategies. From the perspective of outcomes, both the minimum safe altitude and the material boundaries are similar. As analyzed in Chapter 2, between the minimum safe altitude and the normal height of surface land usage, there is a buffer zone to alleviate the conflict between the surface landowner and the aircraft operators (airports). This buffer zone functions well in most of the region except the vicinity of the airport. Therefore, most of the modern disputes around airports. Both the taking theory in the US and the administrative/environmental suits in Germany seems a feasible solution to solve the traditional problem.

However, imagine what would happen, if the buffer zones do not exist any longer? Imagine if many aircraft do not need airports anymore, and they make tiny noise. Would the ruling of Causby take effects? Would environmental claims matter? Alternatively, would the traditional solution survive in an age of drone? As pointed out by some scholars, it is a time to redefine the value of airspace.

The drones take new challenges to the traditional solution, and a small drone with a camera could easily observe what happened inside the room, which means the end of privacy. Accordingly, the drone drivers should not drive their drones into the private

sphere, which idea had already been accepted from the German Court through tort (privacy) suits. However, it requires evidently more elements to constitute a tort than mere infringement of a real estate. If we use the right of airspace, much problem would be solved, because, under such condition, the landowner would give permission or denial. Therefore, in the era of drone, the urban society have to face the crux of airspace right, just for the matter of privacy, the landowner should enjoy the sole discretionary power on some scope of airspace, which would beyond the reach of anybody. As the development of technology, the scope of exclusion would become bigger and bigger. That's why currently, many countries would prevent the drones from flying at night, and the drone should not go somewhere beyond the scope of the driver on the surface. In addition, in order to avoid collision between the drones and the commercial planes, there should normally fly under 150/100 meters. If the drones want more freedom, a boundary between the surface ownership and the drone in airspace should be clarified. There exists the possibility that some surface ownership would permit the drone drive within his airspace with charge, such a market might flourish in the future.

Therefore, the current taking theory and environmental suits have potential risks, there is a need to refresh the airspace rights. In other words, if there is a general property right on airspace/subsurface, the surface landowner's power would surely be enhanced.

3.6.3 Some indication for the Chinese as a late-comer

From the previous paragraphs, the buffer zone had played an important role between the surface landowner and aviation operator (airport). And the traditional solution from the US and Germany had both taken effects. However, in the era of drone, these solutions need to be reevaluated. Without the buffer zone, the development of modern technique had urged a direct approach on the right/obligation of airspace around the surface landownership.

China is a country adopting German property system and the US-style airspace/ subsurface perception (airspace/subsurface as real estate). However, both the ruling of the Causby case and the environmental/planning suits face obstacles in China. In addition, under the new challenges from drone driving, the traditional solutions (taking or

environmental) seems quite indirect to the crux of the problem. Therefore, it might be a good opportunity for China, as a late-comer, to develop airspace/subsurface law to alleviate both the traditional surface landowner -airport suits (with buffer zones) and the new surface landowner-drone drivers (without a buffer zone). In this sense, China needs to enlarge the application scope of section 136 of property law as a typical airspace/subsurface right, such goals could be reached through amplified interpretation and analogy. In addition, the legislation of Chinese Civil Code is still undergoing, it would be better to leave some space for a general Kongjian Quan (the general property rights on airspace/subsurface) with the book of property.

Chapter 4 Airspace and subsurface right in Condominium law

The importance of airspace in modern aviation had been discussed in Chapter 3, this Chapter deals with the problem of airspace and subsurface within the condominium, which could be regarded as a dominant modern dwelling form in urban society.

4.1 Short introduction

The high-rise, the skyscrapers are symbols of modern urban culture,[442] and accordingly, condominiums are the main form of residence in modern cities, especially in China. Additionally, the significance of condominium should not be ignored in the urban areas of Germany and the US.

From a historical perspective, the condominium right was one special branch of airspace right, which had endured a different development process in both legal theory and practice, especially in the common law system. Therefore, this Chapter would first search the legal roots of the condominium in Germany, US and China, through which a reflection on the legal nature of condominium would be drawn, as well as the relationship between condominium and the airspace and subsurface right. Then two typical phenomena within a condominium in current daily lives would be studied. One phenomenon is the use of exterior wall (e.g. the erection of an air-conditioner), does the condominium owner have such kind of right? In other words, to what extent will the condominium airspace right extended into common airspace. The other phenomenon is on the legal status and allocation of underground parking space, which would show the reshape of legal mechanisms by the modern lifestyle. Then comes the summary of this Chapter.

From the perspective of urbanology, urban airspace and condominium are also huge topics, as well as its sub-airspace and sub-subsurface problem. E.g. the use of exterior walls, allocation of underground parking space. The entire phenomenon had shown the

[442] Britannica Academic, s.v. "Skyscraper," accessed December 23, 2018, https://academic-eb-com.ezproxy.cityu.edu.hk/levels/collegiate/article/skyscraper/68143#.

rise of management (administrative) element in the modern real right.

From a comparative perspective, Germany cities have obviously less pressure from the side of "population-land conflict" as that in China and the US. However, the problems of urbanization and immigrant also exist in Germany. There is a big discussion on how cities can cope with the increasing number of new citizens as in Germany, which was discussed under the topic of "Wohnraumbeschaffung (procurement of housing)". Such discussion is more relevant with social laws than civil cases, which is because the authority would build up apartments with a lower rent for the people with less income. Therefore, although not densely populated, the cities in Germany also deals with the conflicts of dwelling more citizens.

According to the data from Federal Statistical Office of Germany (Statistisches Bundesamt), by the end of 2016, there were more than half of the household do not have the ownership of the real estate, which meant only 19.015 million of 40.003 million households are real estate owners. In addition, the one-family house had taken an overwhelming percentage of 30% of the whole household. However, the condominium buildings (Eigentumswohnungen) still played the second largest role, which takes 14% of the whole household.[443]

In the US, there was a special preference to live a single-family house in the suburb.[444] Moreover, the condominiums had a relatively short history as real property in the US, which was first adopted by National Housing Act 1961. However, it gradually obtained dominant popularity over its counterparts, e.g. cooperative. As illustrated by Frank Rief, "the cooperative housing corporation is a corporation organized for the purpose of constructing, maintaining and operating apartment units for the benefit of its stockholders. Each tenant stockholder's certificate carries with it the right to live in his particular apartment." [445] In 2015, there were 6.121 million condominiums in the US, while only 771 thousand cooperatives nationwide.[446]

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[443] See Federal Statistical office of Germany, Statistisches Jahrbuch 2016, p.156.
[444] *Hirt*, Zoned in the USA, 2014, pp.178-183.
[445] *Rief*, 21 U. Fla. L. Rev. 529.
[446] See data from American Housing survey, website:https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html#?s_areas=a00000&s_year=n2015&s_tableName=Table1&s_byGroup1=a1&s_byGroup2=a1&s_filterGroup1=t1&s_filterGroup2=g1.

China is an extreme case due to its huge population, in which over 80% of the household has lived in condominium rather than other living forms since 2010.[447] What's more, condominium apartments are also quite popular in rural China, which was deemed as a sign of "socialist new village" by many districts.[448] It is because condominium apartments could be found only in the towns or cities even in the 1980s, which were regarded by the peasants as symbols of urban culture and modern civilization.

Therefore, the condominiums are rather the dominant dwelling forms in modern cites among the three countries, which is essential to urban life.

4.2 A different history: condominium as a consequence of modern living style in the cities

From a historical perspective, the condominium had an early origin but was not accepted by the legislature of German and the US until WWII. In German law, the early form of a condominium can be dated back to the medieval urban lives, which had even obtained a legal position in the state code in southern Germany. However, the legislators of the German Civil Code, due to its complicated legal conflicts with the general theory and logic of real estate, denied it (detailed discussed 4.2.1). In common law, it can be dated back to Sir Edward Coke and the famous "upper Chamber cases", which had developed quite slowly in urban daily lives in the US during the 19th century and was finally recommended by National Housing Act of 1961. In China, due to cultural and political preference, condominium only appears after "Reform of planned economy" in the 1980s,[449] and finally, get its legal position in the property law of 2007. Nowadays, we have to admit that the condominium is a quite effective way to dwell the huge urban population, but why has the condominium endured so much hardship on its formation?

[447] See the relevant report of national statistics, at website: http://www.stats.gov.cn/ztjc/ztfx/sywcj/201103/t20110307_71321.html.

[448] See *Fan*, problems, model and strategies to the construction of "central village" of the socialist new village, development of small city & town, 2009 (11).

[449] In several southern provinces, such as Guangdong Province (1979), Zhejiang Province (1982), the condominium was firstly developed. Then the trend had spread to the whole nation. The first condominium community is "Donghu Community" in Guangzhou city, which was approved by the government in 1979 and finished in 1982. See *Zhu*, Donghu Xincun Community: the birth of Chinese condominium, the Beijing News, May 25, 2018.

4.2.1 the German situation: from “Stockwerkeigentum” to “Wohnungseigentum”

The floor ownership (Stockwerkeigentum), a kind of real right quite similar with condominium, had existed in south Germany for centuries before the birth of German Civil Code, which located in the territories of the current state Baden-Wüttemberg and Bayern. As introduced by Hans-Wolf Thümmel, the condominium was a product of life experience. For example, due to the increase of family members, a family may build one additional floor vertically. When the parents died, the inheritors of the family inherit different floors. Then, some of them might sell their floor to others, when they found a new residential place. Accordingly, different families lived on different floors of the house. The “floor ownership” had come into being.[450] In this legal mechanism, every family in different floor enjoyed one independent ownership. In addition, according to state code of Baden (Baden-Durlachische Landesordnung) of 1715, the division of the house into different floors in inheritance case and the mutual sale-purchase between inheritors were permitted. Moreover, in 1808, a horizontal division of the house between inheritors were prohibited (stadtwirtschaftlichen Gebäude). Under the influence of Napoleon Code (section 664), the 1809 state law of Baden (Badische Landrecht) had admitted the “floor ownership” (Stockwerkeigentum). However, the German Civil Code had denied the floor-ownership, because it was contradicting with the Pandectists’ belief.[451] In fact, formal arguments are used by legislators to avoid real arguments.

In France, however, Article 664 in the French Civil Code had been canceled in 1938, and a new condominium law was made as a special activity outside the civil code, with the name “An Act to regulate the status of co-ownership of immovables divided into apartments (Loi tendency à régler le statute de la copropriété des immeubles divisés par appartements)”. This act functioned as a model law for both Europe and Asia in this field.[452]

In the face of the destruction by WWII, German legislators had to adopt condominium in

[450] This can be regarded as the simplest form of condominium. Moreover, it was not only popular in south Germany, but also in France, Swiss, etc.
[451] *Thümmel*, BWNotZ 1984, 5, pp. 5-19.
[452] New legislations on condominium was made in 1965 in France, “fixing the status of the co-ownership of buildings (fixant le statut de la copropriété des immeubles bâtis)”.

order to create more dwelling space to shelter their citizens. This act was enacted in 1951, named “Act on the Ownership of Apartments and the Right of Permanent Residency (Gesetz über das Wohnungseigentum und das Dauerwohnrecht, WEG)”, which was rather a leap for German legislators, because condominium had been a challenge the traditional property legal system both theoretically and practically. According to the German Civil Code, the ownership of a piece of land comprises also the ownership of buildings erected on that land. For example, Person A owns one parcel of land and one three-story building on that land, A actually enjoyed one real estate right on land. The specialty of “Stockwerkeigentum” is that person A, B, C could each enjoyed one separate ownership of one floor. In contrast, in the condominium, A, B, C, D, E, F could enjoy one separate ownership for each, if the units are physically separated from each other. In addition, A, B, C, D, E, F would enjoy the land separately in percentage, therefore, there would be totally six independent condominium ownership in only one parcel of land, which is in contradict with the traditional German real estate theory. The legislator seems unwilling to accept the Stockwerkeigentum/condominium to harm the theoretical purity of the property by the German Civil Code.

4.2.2 Common law: The traditional case, the upper Chamber.

4.2.2.1 The upper Chamber as the origin of Condominium: the common law endeavor

The “upper Chamber” case had a British origin, which began during the time of Elizabeth I in the early training school of common law lawyers: The Inns of Court.[453] As many aristocracies preferred to study law at the time, but the Inns of the Court did not have enough rooms for so many students. Some rich students would use the airspace above to build “upper Chamber” for himself, as the Temple society was unable to finance such a building program. Then there were more and more “upper Chambers”, the early form of “condominium” had gradually come into being within British common law.

In Evans & Finch's case, “a chamber of any inns of court or chancery broke open may be

[453] *Wright*, the Law of Airspace, 1968, p.68.

said to be *Domus mansions* of him, who is the owner of the said chamber."[454] However, Sir Edward Coke had, on the one hand, set the "*cujus est solum, ejus usque ad cœlum ad infernos*" maxim in common law, which made a vertically unlimited surface landownership. On the other hand, Sir Coke wrote, "a man may have an inheritance in an upper chamber, though the lower buildings and soil be in another, and seeing it is an inheritance corporeal it shall pass by livery."[455] Moreover, as noted by Robert Wright, the case Doed. Freeland v. Burt had "established unequivocally that a room could be separately owned in England."[456] By noting that it would be "very extraordinary to contend that if a person purchased a set of chambers, then leased them, and afterward purchased another set under them, the after-purchase chambers would pass under the lease."[457] In modern word, this case in the 19th century made significate progress in its perspective on the possibility of separate use of different chamber of a building, which was also the origin of the idea of the condominium.

The rationale of the upper Chamber case had dominated the US courts for nearly a century. In case Loring v. Bacon, the court held, "...the parties consider themselves as severally seized of different parts of one dwelling house, yet, in legal contemplation, each of the parties has a distinct dwelling -house adjoining together, the one being situated over the other."[458] This judgment had taken the same perspective as the upper chamber in England. In the case, Mills v. Pierce, the New Hampshire court sentenced, "One person may own the lower apartments in a house; and another person, the chambers."[459] Which was, somewhat, like a repetition of Sir Edward Coke in his commentary of Littleton. The coming cases like Otis v. Smith in Massachusetts in 1830,[460] Aldrich v. Parsons Latham in New Hampshire in 1850, and Ottumwa Lodge v. Lewis in Iowa in 1867[461] are all followers of this belief. Actually, the US court had also gradually updated this belief. In the 1869 case McCormick v. Grogan, the court had applied this reasoning into a levy of

[454] Cro.Car. 474, 79 Eng. Rep. 1009(1637).
[455] *Wright*, the Law of Airspace, 1968, p. 69, which sentences had been quoted from Coke on Littleton 48b (1628).
[456] *Wright*, the Law of Airspace, 1968, p. 73.
[457] 99 Eng., Rep. At 1331.
[458] Loring v. Bacon, 4 Mass. 575 (1808).
[459] Mills v. Pierce, 8 N. H. Rep. 477.
[460] Otis v. Smith, March T. 1830. 9 Pickg. Mass. Rep. 293.
[461] Ottumwa Lodge v. Lewis, 34 Iowa 67 (1867).

execution.[462]

As the situation in Europe, the fire urged the legal development of the upper chamber.[463] Although the separate ownership of the upper chamber had been commonly accepted, it might be doubtful, whether the airspace conveyance still existed after a fire, by which both the upper chamber and the lower chamber were burned down. In Hahn v. Baker Lodge case, "When the building burnt, "there was nothing remaining upon which the defendant's conveyance could operate and its rights at once terminated."[464] In Pearson v. Matheson, "The aerial part of the lot lying above the lower rooms, but he apparently did not, and the way was left open for the subsequent contract on the skylights. Since the first contract provided that the buildings would be rebuilt on the same term and conditions, and since the later contract provided for skylights, then the contracts when read together permitted reconstruction of the skylights. As for the name to be given the rights which Pearson had in connection with the skylights, it was an easement in Matheson's dominion of the air above the fourteen-foot line."[465] In Townes v. Cox, this idea had been developed into a new stage, "Upheld the chancellor in participating the one-half undivided interest in the lot and the upper story which was separately owned. In its decision, the court stated that real property may be divided horizontally as well as vertically, each separate layer or stratum becoming a subject of inheritance, taxation, encumbrance, levy or sale precisely like the surface and that a building may be divided in the same way and the different floors or the different rooms be separately conveyed and owned."[466]

From studying all these above-listed cases, the progress of the US judges understanding the "upper Chamber case" had already been the "dawn of the condominium". However, the common law approach was much too slow, as it relied on a case-by-case method. Therefore, the real breakthrough on condominium was finally made by the legislature.

4.2.2.2 A new Epoch: The Condominium legislation

Historically, the US did not introduce the condominium from Europe until the

[462] McCormick v Grogan, (1869) 4 L.R. H.L. 82.
[463] The early modern cities had experienced frequent fire due to a series of reason: the architectural materials, the fire extinguishing technology, the widespread flame cooking among household, etc.
[464] Hahn v. Baker Lodge, 21 Ore. 30, 27 Pac. 166 (1891).
[465] Pearson v. Matheson (1915) 102 S. C. 377, 86. By agreement of the parties, an easement survived the destruction of the building by fire.
[466] Townes v. Cox, 162 Tenn. 624, 39 S. W. 2d 749 (1931).

condominium project of 1955 in Puerto Rico, which had gradually led to an amendment of Section 234 in the National Housing Act in 1961 at the federal level. For the first time, the condominium was legally adopted by the US. An interesting anecdote was that, when lobbying to accept condominium in the US, Mrs. Sullivan: "I am glad to hear about this [condominium] type of ownership. It is the first time I heard of it."[467] It reflected the lack of knowledge about this type of property right. In 1975, all the states in the US had their own condominium law. Shortly after this wave, a suggestion for the unification of condominium had begun. Nevertheless, up to now, neither of the two influential drafts of the "unification of condominium law" have obtained an overwhelming number of states.[468] Therefore, it would be inevitably to use the legal sources of state level, when deals with the matters of the condominium.

Some scholars had commented that "Unlike most Anglo-American concepts of property law, condominium ownership is based on statutory authority, not on common law concepts."[469] However, on the one side, when we dated back to the upper chamber case from England to the early US judgment, it was not hard to find that common law also have such a trend to accept condominium, especially in the matters of upper chamber ownership and airspace easement. Indeed, Leonard Smith made a more objective and accurate comment, "Although it resembles a tenancy in common in Anglo-American law, there is, in reality, no exact counterpart in the common law countries and it is neither feasible nor possible to define condominium by the use of commonly recognized words of art."[470] Therefore, the adoption of the condominium was not merely legal implantation from Europe to the legal context of the US, because the upper chamber case in common law legal history had already revealed the endeavor to use space vertically. In other words, condominium could be regarded as an anomaly in the real estate family for both common law countries and civil law counties.

On the other hand, legislation was no doubt a much more effective way than the common

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[467] Hearings on General Housing Legislation Before the Subcommittee on Housing of the House Committee on Banking and Currency, 86th Cong., 2d Sess. 248 (1960).

[468] See the map provided by official website of Uniform Law Commission, at the website; http://www.uniformlaws.org/Act.aspx?title=Condominium%20Act (newly visited at August 8, 2018)

[469] *Bennett*, 103 Law Libr. J. 249.

[470] *Smith*, 33 Pa. B. Ass'n Q. 513.

law approach. From a historical perspective, the force of a common law institution would sometimes spend centuries of time (e.g. writs and court system, tenancy etc.).[471]

In summary, from the normative perspective, a condominium in both Germany and US was post-war legal implantation led by the legislators, aiming at alleviating the shortage of available dwelling and promoting the living conditions, especially in cities. However, from the historical and functional perspective, the condominium was connected with the "upper chamber" and "Stockwerkseigentum", which had existed for centuries. No matter under which name, the condominium represented a social need to vertically use the land for construction. Similarly, the same trend could also be found in modern China. Therefore, the crux of the condominium is indeed life wisdom to alleviate the tension between increasing population and high land price. However, it is contradicting with both the traditional property legal ideas of common law as well as continental law. Its practicability cannot conceal its abnormality.

If we connected the hardship of condominium in history with the airspace and subsurface rights, we could easily find that the two obstacles (mentioned in Chapter 1.1) for airspace and subsurface is also applicable for the condominium, which had indicated the interrelationship between condominium and airspace and subsurface right. Why is that? It is because before the condominium legislation, the "Stockwerkseigentum" or "upper chamber" had existed as ownership of airspace or vertical easement in the airspace, which were actually parts of the airspace and subsurface law. However, after the condominium legislation, the previous mechanism of airspace and subsurface were replaced by the special law, and accordingly, the early condominium rule had separated from airspace and subsurface right, which had become a separate legal field. That's why the author traced back to the history of condominium law.

4.2.3 Condominium in China: a modern phenomenon

In ancient China, it was not so popular for the riches and the poor to build multi-floor buildings. There were a series of reasons.

[471] *Hudson*, the Formation of the English Common Law, 2018, pp. 200-205.

Firstly, this phenomenon might be partly illustrated by the preference of using wood rather than stones as architectural materials.[472] What's more, the normal residential buildings (by the majority poor) in ancient China was made of grass and mud, with a wood skeleton, which had strikingly limited its possibilities in height. It was impossible to use these building materials to create a real division for residence between lawyers.

However, the technical limitation was not an excuse. Because ancient China was also famous for building up the multi-floor Buddha towers, as well as four famous masons in ancient south China. e.g. Yueyang Tower (three floors of 19 meters) in Hunan, Yellow Crane Tower (five floors of 51 meters) in Wuhan, and Pavilion of Prince Teng (nine floors 57 meters), Stork Tower (inside six floors of 71 meters).[473] Therefore, the technical limitation was not the mere reason for the ancient Chinese to build multi-floor buildings.

Secondly, the rareness of multi-floor residential buildings in China could be partly illustrated by its high cost (which ordinary could not afford) and partly illustrated by some superstition beliefs in the Chinese folklore. If someone lived under the foot of others, he would be in bad luck. So, the rich people will not build multi-floor buildings as a residence (nobody wants to live downstairs, and only the upper floor could be used for residence), the poor would not afford its expense.

Third, a more persuasive reason exists in Chinese culture. The ancient Chinese believed only the Buddha, the gods and goddesses could live in high places. Accordingly, only the Kaiser had the privilege to live nearer to the gods and goddesses, while the ordinaries did not deserve a high residence. In addition, the number "nine" was believed to be the biggest number according to "I Ching" (《易经》).[474] Therefore, the palace of the Kaiser was not higher than nine meters, and the aristocracy should be certainly lower than the Kaiser, and the ordinary people are only allowed to build a humble house at a much lower height. These beliefs had gradually become legal institutions in the feudal society of China. As above introduced "Yingshan Ling" of Tang Dynasty, the height, the size, the style were

[472] *Ma*, The Wood Construction Technic of Ancient China, 1991, pp. 2-15.
[473] Among these four famous masons, the former two are primarily for military use build up in 2-3 century, the Pavilion is prince Teng's entertainment place built up in A.D. 652, but all of the three multi-floor buildings are later used for tourists and poets. It worth to note, the Stork Tower was rebuilt in 2002.
[474] The ancient Chinese divided the number into two categories: Yin and Yang, which was also the tow components of Taichi. Nine was biggest in Yang categories, which was accordingly believed to be the luckiest number.

all limited according to the social identity of the owners by the law in detail. [475]

Therefore, the ancient Chinese multi-floors building was mainly for religious, military, or tourism purpose, but very rarely for residence. Moreover, there was little chance for ordinary people to build up multi-floor buildings.

The earliest multi-floor residential buildings in China with bricks and wood could be found in Shanghai in the mid-19th century when it became a leased territory by the western countries. A quite early and famous one was the British Consulate (first build up in 1851) by Sir George Balfour KCB, who was the first British consul in Shanghai. That was a very elegant two-floor building, which could still be found in Shanghai. From 1843 to 1949, over 5000 multi-floor buildings in various western style were built up, but most of them were personally owned and used by a foreign businessperson, officials, as well as some Chinese celebrities.[476] Therefore, although these were multi-floor residential buildings, they were not used as condominium communities.

Therefore, as introduced in Chapter 4.1, the real wave for a condominium in China appeared in the 1980s (the first condominium was Donghu Community in Guangzhou City), when the commercialization of the residential apartment in socialist China occurred.[477]

4.2.4 Short summary

As shown in Chapter 3, the surface landowner-airport boundary has its own way of evolvement. In fact, every branch of airspace/subsurface right has its own history. However, both landowner-airport boundary and the condominium, as well as the mining law, their central concern is the same, which is the vertical use of land. Both the public law and private laws are trying to make out a solution to effectively use the limited land/airspace/subsurface resources. They tend to make full use of airspace and subsurface,

[475] In 832 A.D. of Tang Dynasty, according to the law named "Ordinance of Construct Accommodations (Yingshan Ling 营缮令)", the ordinary people were prohibited to build a building of two or more floors. In addition, the one floor house should neither bigger than the officials, nor higher than them. In other words, only the participants of central government could enjoy big house, decent life and its glory as royal servants. See *Wang*, Tang Huiyao, 1884, pp.14-15.

[476] See Gong Shi, Liu Gaofeng, the western-style building in Shanghai, places of interest, 2002 (9), pp. 43-45.

[477] See Ma Yuedong/Yan Xiaopei, studies on the vacancy problem in commercial housing: Guangdong city as an example, urban problems, 2002(2), pp. 32-36.

meanwhile respecting the surface land ownership to the most extent. The difference is that condominium concentrate on the vertical use of airspace for a dwelling.

In Germany, besides condominium, there are still right of residence in the Act of Apartment Ownership, which could be also regarded as a kind of breakthrough from its previous legal theory on real estate. The reality was that there was a great need of dwelling space after the war, which could not be solved under the previous “full ownership” model. Therefore, the property law should serve for the dwelling purpose and protect these interests like real estate. Instead of inserting the condominium into the German Civil Code, the German lawyers made condominium as a separate law, which seems that they hope the new special real estate (condominium) would not destroy their classic property theory.

Similar things happened in the US and China. In the US, as shown in the cases, there is a great need to protect the new form of real estate (upper chamber) in urban society. However, the complexity of common law logic become an obstacle, which finally leads to a big leap in federal legislation in the 1950s. The Chinese situation is that, since the Open and Reform Policy in 1979, China experienced a dramatic period of economic growth with rapid urbanization, the previously dominant “public housing” (provided by work unit) in cities cannot satisfy the ever-growing social needs. Therefore, commercial condominium became a necessity. However, the fight for private property and condominium lasted for nearly two decades, because previously, all kinds of dwelling form were called “residence” under the title of the legitimate personal property in GPCL of PRC. The condominium was finally accepted by the property law of 2007.

In summary, the condominium was erected in all the three countries through legislation rather than theoretical evolvement, which had revealed that neither the traditional common law nor the traditional civil law is friendly to the condominium. Alternatively, the traditional horizontal real estate law had encountered obstacles in making vertical extensions. Therefore, the condominium is a result of social practice and urban life, which represents the only viable solution to solve the conflict between land and population in urban society.

4.3 The nature of condominium: a typical way of using the airspace

4.3.1 Seeking the nature of condominium in German law

4.3.1.1 The logic and function of condominium law within German law

According to section 94 subsection 1 of the German Civil Code, the essential parts of a land plot includes the things firmly attached to the land, especially the buildings and the product of the land plot, as long as it is connected with the land.[478] According to this logic, the vertical divisions of the building are unacceptable, which is theoretically in accordance with the spirit of Latin Roman law proverb, "superficies solo credit".[479] Therefore, if a building is constructed on a land plot, there is usually only one ownership, which is land ownership (not ownership of building). Additionally, in those real estate cases, German lawyers tend to use the word "landowner (Grundstückseigentümer)" instead of the house owner. From this perspective, the Condominium could, however, be regarded as an anomaly, as it recommends the ownership of different apartments within one building, which is obviously distracted from ownership of the solely used land plot. Therefore, the condominium theory is quite revolutionary for the traditional legal theory and logic of the German Civil Code.[480]

Then why was condominium possible after WWII? The main reason was that the great need to rebuild, which led to massive public spending and the creation of a house owned by the cities. Under the poor post-war urban finance, many individuals did not have such opportunities to receive a credit to finance a newly built apartment. This led to a massive building boom, which was comparable to the building boom during the Chinese economic wonder since the 1980s. However, the condominium apartment ownership was not equal to "real estate" in the eyes of the ordinary German people, even after the Condominium act became effective. However, to dwell a huge number of people with limited resource in hand, the condominium seemed the only feasible way.

Although there was already some "social" clause within the German Civil Code for the

[478] *Schmidt*, in: Erman BGB (2017), Sec. 94, para.2-3.
[479] It means the surface yields to the ground.
[480] *Rapp*, in: Staudinger BGB (2018), Band I of WEG, introduction, para. 1.

landlord-tenant relationship, the condominium is in unreplaceable. It is because the ownership was unreplaceable both psychologically and practically. According to a recent case, the provisions on the rent amount under section 557, the Code had a series of mechanism to prevent the rent amount from rapidly increasing. Moreover, in the "leases for an indefinite period of time", "if termination of the lease would be, for the lessee, his family or another member of his household, a **hardship** that is not justifiable even considering the justified interests of the lessor." (Section 574). In addition, by the end of section 573, section 573a, section 573b, section 573c, section 573d, one sentence had repeatedly appeared, which was "A deviating agreement to the disadvantage of the lessee is ineffective." However, practically, the protection of lessee would never compare to property. For example, illness would only in the extreme situation be quoted as a "hardship" of section 574. In addition, the federal court of justice had even recognized the "rental of residential space" as kind of "property" under article 14 of the German Basic Law.[481] However, there were still many disadvantages to the tenant-landlord relationship,[482] when comparing with "ownership". Therefore, condominium ownership is irreplaceable in urban society.

Additionally, condominium means economic efficiencies. For example, buying a house would normally cost much money, which ordinaries might not be able to afford. The condominium is a compromise, which permits the people to own apartments within a building with less money. Therefore, condominium becomes a better choice to serve the mass, which point was also considered by the legislators.[483] Consequently, the legislation of the condominium act has also social care considerations to provide an affordable apartment for the majority.[484] In addition, a condominium can psychologically provide the owner with a sense of ownership of the apartment.

Therefore, under the huge pressure of rebuilt and limited resources, condominium became a choice of Germany. This choice was economically efficient and had provided the condominium owner some advantage over the lessee. Therefore, the condominium in

[481] See Chapter 2.1.3.2.
[482] For example, when the bank interest is low, real estate might be a good choice of investment.
[483] See Begründung zu dem Entwurf des Gesetzes über das Wohnungseigentum und das Dauerwohnrecht, Vom 15. Dezember 1950/26. Januar 1951 (BR-Drucks. 75/51).
[484] Baur/Stürner, Sachenrecht, 2009, p.374.

Germany was a result of social and public policy rather than theoretical logic.

4.3.1.2 The functional definition of “apartment (Wohnung)”

As noted in section 1 of the German condominium act, “title to an apartment [Wohnungseigentum] may be created in respect of apartments.” However, the definition of the apartment could not be found in this act, but it is defined by general administrative regulations. “Apartment is the sum of the areas, which enabling to run a household; it shall include a kitchen or an area for cooking and water supply, Basin and WC”.[485] This definition reflects the modern meaning of living place from the perspective of users. In contrast, they do not pay much attention to the land-building relationship. This functional perspective had its meaning in legal practice, which made the following areas out of the scope of apartments: the hobby room, the hotel room, the dooryard in front of two apartments, a separate Toilette.[486] This functional approach concentrated on the social effect of an apartment rather than its physical condition and identity within the traditional property logic in the German Civil Code. Additionally, “Wohnungseigentum” in German means the area is not used for the commercial or professional purpose (Gewerbeeigentum) but for residential purpose. However, the central argument for a connection with the traditional concept is that any owner of a condominium unit is also “owner” of a virtual percentage of the land. In case of a fire (assuming there is no insurance), the land ownership remains.

Therefore, in Germany, the condominium is different from the traditional property from its basic concept. Under the traditional land-building theory in Germany, it would be hard to imagine the several possession of land corresponding with separate ownership of an apartment at a different height.

4.3.1.3 The “mixed” legal nature of Condominium in German law

4.3.1.3.1 Three elements of condominium right

As prescribed in section 1 of the condominium act, “title to an apartment comprises the separate ownership [Sondereigentum] of an apartment together with a co-ownership share

[485] See Allgemeine Verwaltungsvorschrift für die Ausstellung von Bescheinigungen gem. §§ 7 Abs. 4 Nr. 2 und § 32 Abs. 2 Nr. 2 WEG (Abgeschlossenheitsbescheinigung) vom 19.03.1974, BAnz Nr. 58 v. 23.03.1974.
[486] *Keil* in: juris PK-BGB (2017), Sec. 1, para. 14.

[Miteigentumsanteil] of the jointly owned property [gemeinschaftliches Eigentum] of which it is an integral part." These words had revealed the mixed legal nature of condominium. Combining with the right of membership,[487] the definition of condominium had been illustrated by Johannes Bärmann as the classic "Trinity theory".[488]

Concretely, as prescribed in section 1 subsection 5, "Jointly owned property within the meaning of this Act shall be the plot of land as well as those parts, facilities, and installations of the building which are neither separately owned property [Sondereigentum (2)] nor property owned by a third party." Additionally, the jointly owned property had also mixed legal nature, as some facilities and installations might be immovable or movables.

Therefore, the condominium was a mixture of different elements. Although there were disputes around the inner relationship of these elements, it was enough to prove that condominium has a mixed legal nature. In addition, the German scholars tended to use the term "Raumeigentum (airspace ownership)" to note condominium,[489] which was quite helpful to illustrate its nature as an airspace law.

4.3.1.3.2 The three representative theories of Condominium: deconstruction

From a theoretical perspective, in Germany, there existed dualism theory, the unity theory (Einheitstheorie), as well as "Trinity theory (die dreigliedrige Einheit des Wohnungseigentums)". [490]The first theory regards the exclusive part and the common part at unequal level. For example, Weitnauer regard condominium as a special kind of "co-ownership by fractional shares" prescribed in 1008 of the German Civil Code.[491] Therefore, the exclusive part is the "fractional shares", and the common part is deductively its accessories (section 97) or its essential parts (section 94). The exclusive part is, therefore, an independent, (plot-of-land liked) main thing (Hauptsache), with vertically and horizontally limited boundaries, while the co-ownership shares of the plot

[487] Under section 10 of the German condominium act.
[488] *Rapp*, in: Staudinger BGB (2018), Band I of WEG, Einleitung, para. 2-4.
[489] Diester, NJW, 70, 1107.
[490] *Bärmann/ Seuß*, Praxis des Wohnungseigentums, 2017, Sec. 1, para.65.
[491] *Weitnauer*, JZ, 1951, 161, pp.161-166.

of land can be attributed as its essential part.[492] Therefore, according to this theory, the condominium is mainly ownership of the exclusive part. The other rights are just components of "ownership of exclusive part". Alternatively, through this theory, the condominium is within the scope of traditional real estate.

In contrast, the unitary theory does not see the exclusive part, the common part, and the membership separately. According to this theory, there is only one unitary relationship in the Condominium, in which there are only two main elements: the exclusive part and the community relationship (forged by law and agreements of the condominium owners). Through the registration will the exclusive part enrolled as special contents with real estate effects, but different from the normal property power of section 903 in German Civil Code, the common parts only have the function of a record factor in the Land Register (Grundbuch) and a helpful criterion for redistribution. According to this theory, the condominium becomes a unitary concept, containing the exclusive part as co-ownership by fractional shares, as well as the objectified membership rights, and from their separate legal nature, the corresponding rules would apply.[493]

The Trinity theory is a little bit different. It regards the exclusive part, the common part, as well as the membership as three equal elements of the condominium, which consists of a unitary condominium right. This theory is quite influential in Japan and China.

From the perspective of legal practice, the federal court of Justice (BGH) decision in 1968 roughly followed the first theory,[494] while the second theory was denied by the BGH in different cases.[495] The third theory had gained support at the state level of Germany, such as the high state court of Hamm (OLG Hamm) and Bavarian Supreme Court (BayObLG).[496]

In summary, although there still exists many disputes about the legal nature and its theoretical components, the condominium is clearly different from the traditional real estate rights. Further, all the theoretical endeavor by the German scholars is trying to

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[492]. *Bärmann/ Seuß*, Praxis des Wohnungseigentums, 2017, Sec 1, para.69.
[493] *Röll*, NJW 1987, 1049 pp. 1049- 1052.
[494] BGH, Beschluss vom 17. Januar 1968 – V ZB 9/67 –, BGHZ 49, 250-258 –, juris.
[495] BGH, Beschluss vom 24. November 1978 – V ZB 11/77 –, BGHZ 73, 145-150; BGH, Beschluss vom 17. Januar 1968 – V ZB 9/67 –, BGHZ 49, 250-258 –, juris.
[496] OLG Hamm (15. ZS), Beschluß vom 30. 5. 1983 - 15 W 101/83; BayObLG (2. ZS), Beschluß vom 9. 2. 1965 - BReg. 2 Z 276/64 –, juris.

harmonize the gap between condominium and traditional property rights (in the German Civil Code), but the result is not satisfactory. Because no matter how hard the scholars try to insert condominium into the traditional property system, the applicable rules (from German Civil Code) for condominium is very limited, that is why an independent condominium act is needed in Germany.

The deep reason for this theoretical dilemma is that the traditional legal institutions mainly concentrated on solving the problems on the land surface, which is the theme of real estate law for centuries. However, the condominium is in nature a type of airspace right. Therefore, traditional logic has to be changed.

Influenced by Germany, the Japanese lawyers had already made out a theory on the nature of condominium, which is that, the nature condominium is the ownership of the airspace within the four walls.[497] That is why according to Japanese lawyers, the airspace rights include mainly the superficies for underground or overhead space and condominium.

4.3.2 The US perception by the courts

In the US, as recognized by many of the condominium legislation at the state level, the condominium receives not many theoretical difficulties in becoming a real property. This is partly benefited from the open property concept; say the “bundles of right” theory. Firstly, the scholars had regarded the condominium as a kind of airspace right. Common to all condominium forms and central to all modern enabling statutes is “the allowance and protection for exclusive ownership of airspace, with essential concomitants of common ownership.” [498]

Secondly, this idea was repeated in legal practice. The condominium at state level changed one from another, but they have some basic consensus. As tried in a court of special appeals of Maryland, which clearly noted the nature of condominium. “All a condominium is a vertical, rather than a horizontal, subdivision of one of the incidents of

[497] 篠塚昭次, 空中権・地中権の法理--土地の新しい利用形態をめぐって, ジュリスト, Tokyo:有斐閣, 1971, pp.122～129.

[498] *Clurman/Hebard*, Condominiums and cooperatives, 1970, p.3.

real property, the airspace."[499] In other words, in the eyes of the judges, the condominium is, on the one hand, property right; on the other hand, a type of airspace right. As the courts later illustrated, "one must always remember that the condominium statutes did not create new real property, they simply created another way to own airspace." These illustrations are enough to show the US attitude towards condominium.

4.3.3 The Chinese situation

In China, condominium theory is popular since the 1990s, although the practice had begun in 1980s. As mentioned above, during the 1980s-1990s, China had endured a dramatic change both politically and economically. A wave of privatization of apartments in the urban areas occurred throughout China. However, the dominant theory of condominium is "imported" from Japan.[500]

4.3.3.1 Condominium: theoretical background

While the Japanese theory can also date back to Germany,[501] who believe a three-element theory (Trinität): the integrity of the exclusive parts (Sondereigentum), the common parts (Miteigentum), and the membership (Mitgliedschaftsrecht).[502] After the adoption of this theory by the Japanese lawyers, the trinity theory of Condominium was also accepted by the scholars in Taiwan and later recommended in mainland China. According to the Chinese legal theory of real estate, the house/apartment can be owned by a private individual, however, the land could only be owned by the state or the community. Therefore, the land and the apartment are separately owned in China. Consequently, the concentration of Chinese real estate law is the ownership of the apartment. Accordingly, land ownership was usually neglected because the state/community ownership has already been a set condition of Chinese law). Under such circumstance, the Chinese concept of condominium right has even forgotten to mention the allocation of land.

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[499] Sea Watch Stores v. Council of Unit Owners of Sea Watch Condominium, 347 Md. 622, 702 A.2d 260 (1997).
[500] *Chen*, On Property Law, 2010, p.162.
[501] As introduced by some Chinese scholars, the late J. Bärmann of Mainz University was the inventor of this theory, who see the three elements of Condominium equally in 1950s. Then some Japanese scholar had adopted this perspective since 1980s, which was believed to reflect the trend of modern condominium development. It is therefore followed by the Chinese scholars. See *Chen*, On Property Law, 2010, p.163.
[502] Westermann/Gursky/ Eickmann, Sachenrecht, 2011, Sec. 66, para. 8.

A repeat of the trinity theory can be also found in section 70 of the property law 2007. "Property owners shall enjoy ownership of the special parts within a building, such as the residential units and the units for business purposes and shall enjoy the right to share and jointly manage the common parts other than the special parts." Consequently, the Chinese scholars commonly believed condominium has a hybrid legal nature; it was the combination of property rights and the right of membership. Therefore, it is more complex than normal land or house ownership. However, at least the exclusive part is a right of airspace, because, under Chinese law, the condominium owner does not really own the whole walls, the whole floors or the ceilings, but only stretch to half of the depth of them because they have to share these parts structurally with their neighbors.[503] In other words, what the condominium owner really possess is the airspace within the four walls, above the floors and under ceilings. In addition, the "land use right for construction" of the ground of the building was owned by percentage, which was normally determined by the percentage of exclusive part separately.

Therefore, they believe the right of the exclusive part is a typical right of airspace.[504] The common parts are much more complex because they usually include a lot of commonly used equipment, such as gas lines, grassland, small paths inside the living community, and the parking lot, etc. From a wide scope, these common parts are also the right of airspace owned by the living community.

4.3.3.2 Condominium in legal practice

As introduced in Chapter 3, most of the Chinese cases on airspace/subsurface right happened in condominiums. In fact, some scholars claimed that condominium is an airspace/subsurface right in China. For example, Chen Geng had defined the special part of the condominium as the ownership of separate airspace.[505] Similarly, during the process of legislation, there was a debate on the concrete concept of the condominium. Wang Liming wrote, "Owners' Partitioned Ownership of Building Areas" was the most accurate name for condominium, because such a concept, especially "partitioned

[503] See *Cui*, real right law, 2017, pp. 193-195.
[504] *Chen*, On Property Law, 2010, p.166-167.
[505] *Chen*, On condominium, Chi. J. L.43, 1990 (5), pp. 43-45.

ownership" had clearly illustrated the complicated legal relationships among multiple owners, which was caused by the **physical division of airspace** inside the same building.[506] Such an idea was also supported by some court judgments.

In case Wang, Jinru v. Lu, Gang by the intermediate court of Yinbin City, the plaintiff, Mr. Wang, was a migrant worker, who owned a three-floor house in a village in Sichuan Province. Under the pressure of paying back the debt by the plaintiff from a rural bank, the plaintiff's old mother had sold the second and third floor of the house without her son's (Mr. Wang) permission to Mr. Lu.[507] Then the plaintiff's family and Mr. Lu's family had become condominium owners of different floors. However, when the plaintiff came back, he refused to recognize the deal at such a low price, and sue to the court. The court held that the contract was valid according to the principle of "apparent agency", including one of the terms in the contract, "the whole second floor would be sold, including the airspace right of the roof".[508] This case had revealed the Chinese social and legal ideas on the nature of condominium, which was a special type of airspace right. Similar cases could be found in Chapter 4.4.3. Therefore, the condominium as a right of airspace/subsurface is supported by both court decision and legal theories.

In summary, the nature of condominium is also regarded as the right of airspace in China. Such an idea of the condominium is understandable under the China circumstances because the condominium owner could not own (usage right with a limited period) the land surface of the building, as well as the exterior walls, and the building materials. Consequently, what condominium owners really enjoy seems merely independent space. In other words, Chinese condominium is special, because the land and most of the building structural substance were not owned by the condominium owner, but the independent airspace/subsurface.

However, the Chinese lawyers tend not to directly use the term "Kongjian Quan (literally space right)" to note condominium. It is mostly for the benefit of application of law (lex specialis derogat legi generali), because condominium is already an independent and

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[506] *Wang*, Mord. L. Sci., 2006 (5)

[507] As a migrant work, Mr. Wang was working in the city at that time.

[508] See Wang, Jinru v. Lu, Gang, Case No. (2001) Yi Min San Zhong Zi Di 47((2001)宜民三终字第 47 号).

special type of property right, while “Kongjian Quan” is normally used to note all these “airspace and subsurface rights without special stipulations (which had not become an independent legal field)”.

4.3.4 Short summary

As discussed above, the condominium has historical, theoretical and institutional preparation in both common laws “the upper Chamber”, and in civil law countries the “Stockwerkeigentum”. However, both Germany and the US had adopted the condominium through legislation, which means some theoretical endeavor towards the integrity of real estate law was still needed. Johannes Bärmann uses the trinity theory to explain condominium, which divided the condominium into three parts, the ownership of separate apartment, the ownership of the common area, and the right of membership. This trinity theory had a great influence in both Japan, the US, and China.

The US court had admitted the nature of condominium as ownership of airspace. Comparatively, the German lawyers also use the word “Raumeigentum” as the upper concept for condominium, the condominium is the airspace encircled by the ceilings, walls, and floors. From the traditional German legal perspective, the condominium is not a typical real estate right, but a land-plot-equal or land-plot-like property right; it is definitely a new member of the property rights family, and rather a breakthrough of section 94 (traditional perception of land and its buildings) of German civil code. In other words, it is an anomaly in the German civil code.

In China, the condominium is also regarded as a right of airspace in the property theories. Nevertheless, at the same time, they have no difficulties in recommending condominium as a normal real estate right. It is because although followed the German property theory, the Chinese Civil law has a relatively elastic concept of the thing (Sache), especially in the newest legislated of General provisions of the civil law of PRC (2017 enacted). Section 115 of the General provisions of the civil law of PRC[509] provides some

[509] Section 115 Property includes real property and chattels. Where the law provides that the rights are the object of the property rights, such provisions shall be abided by.

possibilities of airspace and underground rights in Chinese property law, furthermore, in the new legislation, they also inserted the data, virtual property (section 127) as well as personal information (section 111) inside the civil law rights. Therefore, the current Chinese property law is a dualism-system, which combines both the German concept of things (Sache) and the common law concept of property. Accordingly, the condominium is compatible in Chinese property system, either as kind of tangible real estate or the right of airspace/subsurface. In fact, as discussed above, the airspace/subsurface right is also a kind of real estate. Therefore, there were not many obstacles in adopting condominium under the context of Chinese property system.

The Chinese lawyers, deeply influenced by the Japanese civil jurists, regard condominium as a normal real estate right. This phenomenon is partly illustrated by the Chinese adoption of a relatively open attitude towards property concept, especially the immovable, which also recommended the “right to the use of land for construction” on the airspace or underground. It is partly due to the social reality, the mainstream Chinese living form is a condominium, and other forms are the house sparsely located in the suburb or the farmer house located in the rural area. What’s more, although land use rights are economic equivalent to property in western countries, the land could only be owned by the state or collective in China (landownership is outside the private property), and accordingly, condominium becomes the sole “real” estate in China. Finally, yet importantly, for a long time since the 1980s, the condominium has been appreciated as a symbol of urban culture and lifestyle in China. Additionally, compared to unit ownership, the management rights were quite trivial in the eye of the Chinese condominium owners. Alternatively, the management right is not so strong in China. Therefore, unlike the metaphor of “condominium owner = stockholders” in Germany or the US, China has a powerful individual-oriented-condominium right, it has played a dominant role in private real estate, but it is obviously different from the traditional perception of land and buildings of the continental legal dogmatic.

In summary, the condominium could be regarded as a modern way to efficiently and rationally shelter the majority and allocate the living space. It is much more meaningful

in urban areas, or regions like Japan and China, where are densely populated. Different from the traditional real estate, the legal nature of condominium is airspace right, but it is a very special type, which had developed its own rules. After all, knowing its legal nature is quite helpful to solve relevant problems within condominium: the airspace allocation within airspace (condominium).

4.4 The problem of exterior wall

Although the condominium right seems more like airspace/subsurface right in China than that in the US or Germany (like stakeholder), there were actually more problems on the use of common space within a condominium. To some extent, the real task for condominium is effectively allocated airspace within a living community. As discussed in Chapter 2.1.3.6.5, no matter big or small, there are problems around the administration of the condominium community.[510] Actually, all the disputes within condominium had some sense of airspace law, however, the most two types of cases were the use of the exterior wall and the allocation of the public parking lot.

4.4.1 The German perspective

In German condominium act, as discussed above, there are distinctions between common areas and special areas, but the German lawyers are not quite interested in discussing the airspace outside the exterior wall. However, the air conditioner cases and other similar cases using the airspace had appeared also in Germany, from which the attitudes of the court could be found.

4.4.1.1 Air conditioner installation without the committee's decision: the dominant role of the committee

A first question on the use of the exterior wall is that, who owns the exterior wall? Theoretically, it is a place for public use by the condominium community. However, does the condominium committee have the right to administrate the use of exterior wall?

[510] The need of an administrator for just two members. See LG Frankfurt, Beschluss vom 07. März 2017 – 2-13 S 4/17 –, juris.

Alternatively, should all the United owners also approve it?

A case by the high state court of Düsseldorf, which related to the removal of an air conditioner due to its bad smell as well as noise pollution at night (22:00-6:00). The court held that, considering the condominium act recommended the scope of discretion and **the administratively technological difficulties in its endeavor, the claim to remove the interference, therefore, did not contradict with legal administration**, as a prohibition of the operation of the air conditioner during nighttime had been justified.[511]

In a case by the local court of Gladbeck in 2013, the unit owner had permitted the tenant to commercialize the unit and install an air conditioner on the roof, but without the owner committee's permission. Both of them were judged by the court as disturber in the meaning of 1004 German Civil Code.[512]

In summary, the air conditioner (the usage for the airspace of the exterior wall as well) is within the scope of the committee's administration. The committee could claim for the removal of an air conditioner according to section 1004 of the German Civil Code.

A recent case by the local court of Essen, a condominium unit owner installed his air conditioner at the front side of the building, according to the decision by the unit owners' committee. The dispute arose by the air conditioner's size, color, and the way to install it. However, the court held that, **a decision by the committee is not effective, if it just permit the installation of the unit owner generally, without telling him which type of air conditioner and which position of the building for the installation in detail, is permitted, as well as in which way should it be installed.**[513]

In summary, the decision by the committee should be listed in detail, or it would not be effective.

In a case by regional court Hamburg in 2014, the unit owner's committee had recommended the one-unit owner to install an air conditioner on the flat roof of a building. However, the affected unit owner, whose unit was connected with the roof, sued to controvert this decision. The reasons by the plaintiff were that the air conditioner could

[511] OLG Düsseldorf, Beschluss vom 16. November 2009 – I-3 Wx 179/09 –, juris.
[512] AG Gladbeck, Urteil vom 25. Juni 2013 – 51 C 14/12 –, juris.
[513] AG Essen, Urteil vom 03. April 2017 – 196 C 288/16 –, juris.

also be installed at the unit owner's own balcony, but not the flat roof. The court held that the installation and operation of an air conditioner on the flat roof did not absolutely mean that there is no insignificant disadvantage for the co-owners. The criteria were as follows: (1) whether the air conditioner under the edge of the flat roof was quasi "hidden". (2) Whether the color of the air conditioner was in harmony with the roof. (3) Whether the cable passage was made by professionals and had left enough room for the recovery of the roof. (4) Whether the operational risk and bad smell were not to worry about. **The committee has the right to decide where to install such an air conditioner** because the **exterior wall is jointly owned and therefore not necessarily inform the affected unit owner**.[514]

In summary, according to the perception of regional court Hamburg, the installation of the air conditioner in the exterior wall is within the scope of committee administration, the affected unit owner would not able to sue because the exterior wall belongs to the condominium community rather than the affected individual unit owner.

However, in some circumstances, the affected owner's approval is decisive.

A case by high regional court Cologne related to the problem: whether the manager of a condominium could make decisions on the "structural change" of the building instead of the unit owners as a whole. In this case, a pharmacy was permitted by the decision of the administrator of the condominium to install cool keeping equipment in the cellar as well as some other parts in the deep garage underground. However, the court held that in this circumstance **the affected unit owner's opinion could not be replaced by the administrator's decision**.[515]

Similarly, a case by high regional court Cologne in 2003 related to the unit owner's duty to bear of a bistro in a condominium and the way to install in-and-out air equipment. The installation of the equipment was permissible **because the affected unit owner had also recommended the place as a kind of "Shop (Laden)" in the declaration.** Nevertheless, the court judgment had also emphasized that the bistro must choose the way with minimum harm, when there existed multiple possibilities but each of them was

[514] LG Hamburg, Urteil vom 06. Juni 2014 – 318 S 131/13 –, juris.
[515] OLG Köln, Beschluss vom 15. Oktober 2003 – 16 Wx 97/03 –, juris.

harmful.[516]

In summary, for the significant change of the condominium building, there needs the agreement of the unit owners. While for the normal change, the committee's decision is enough. In some severe circumstances (seriously infringed the interest of some unit owners), the approval of the affected unit owner(s) is decisive.

4.4.1.2 Committee decision v. approval of all the unit owners or affected unit owners

As there are not many cases by a federal court of justice in this field, the perception by the regional courts would inevitably differ from each other. In some district, the court would also emphasize the agreement of all unit owners.

In a case by the local court of Offenbach in 2014, the court held that **installing an air conditioner as kind of structural change in the meaning of 22 WEG, which needed the agreement of all unit owners,** if the general impression of the building, objectively, had been more than insignificantly changed.[517]

As illustrated by the local court of Offenbach, for some significant changes in the building, the agreement of all unit owners was needed. However, it had indicated that in ordinary circumstances, the committee's decision was enough.

A case by the high state court of Düsseldorf in 2006, which was about the installation and operation of the air conditioner. The court found that the air conditioner had been installed with a tap hole from maximum 50 mm in the exterior wall, and the plastic canal at the size of 6×9 cm on the white-colored exterior wall extended until the loggia of the defendant's attic flat. **The air conditioner could not be seen from outside, had constituted a structural change, but in lack of significant negative effects, and therefore not necessarily required the approval of all the unit owners.** For the bad smell pollution by the operation of the air conditioner, as well as the excessive noise during its operation at night, was foreseeable when the affected unit owner making the agreement, so there were no drawbacks from the legal sense.[518]

In Frankfurt regional court, there was also a case in 2017 related to the installation of an

[516] OLG Köln, Beschluss vom 28. Juli 2003 – 16 Wx 37/03 –, juris.
[517] AG Offenbach, Urteil vom 06. Februar 2014 – 325 C 24/13 –, juris.
[518] OLG Düsseldorf, Beschluss vom 28. November 2006 – I-3 Wx 197/06 –, juris.

air conditioner, which attributed the installation behavior to “modernization measures” based on section 555b of the German Civil Code. In German condominium act, in this situation, section 22 of WEG was applicable.[519]The court held that **it required a qualified majority, but not the approval of every unit owner.**

In summary, the above two cases had revealed that for the circumstances of “not so significant changes”, although the behavior might already constitute a structural change of section 22 of condominium act, the approval by all unit owner is unnecessary.

4.4.1.3 Structural change v. modernization measures

From the above discussion, it is obvious that whether the installation of an air conditioner constituted a structural change is a key to determining its legal effects. Moreover, the criteria for such a structural change could be seen in the following cases.

In a case by the regional court of Berlin, a tenant rented a room for commercial use and installed an air conditioner in the courtyard façade (Hoffassade) without the permission of the unit owner committee, which could be seen from outside of the building. The court held that the air conditioner as an inserted thing with temporary purpose, and could not be regarded as part of the building according to section 95 subsection 2 of the German Civil Code. The tenant’s behavior had **constituted a “structural change” (under section 22 of the condominium) act without permission of the committee, and therefore the air conditioner should be removed according to section 1004** German Civil Code, and accordingly the unit owner was also responsible for compensation according to section 823 and section 249 of the German Civil Code.[520]

Therefore, a structural change without the committee’s decision is unacceptable.

A case by high state court of Cologne, the rebuild of firefighting equipment, in an art according to the regulations of the committee, which affected both the special area as well as common area of the condominium, should be regarded as maintenance and improvement measures, but not “structural change” in 22 of WEG.

In the Regional court of Braunschweig, the consideration of the court on the tenancy installing an air conditioner was quite different, which believed the installation behavior

[519] LG Frankfurt, Urteil vom 13. Januar 2017 – 2/13 S 186/14 –, juris.
[520] LG Berlin, Urteil vom 25. November 2016 – 85 S 103/15 WEG –, juris.

include both structural change of 21 WEG and maintenance and improvement of the real estate of section 14 subsection 1 of the condominium act. Defining whether the unit owners had right to take measures according to 14 WEG, **the decisive balancing factor was whether the relevant unit owner was obstructed in commercially use the unit without the installation, and at the same time, whether the installation would cause a significant optical infringement.**[521]

In summary, the structural change should be distinguished from maintenance and improvement measures, a subjective criterion was whether the other condominium unit owners would benefit (not infringed) from the change. It encouraged the autonomous maintenance and improvement.

In a case by the local court of Darmstadt, the installation of the air conditioner was a modernization measure according to section 22 of the condominium act, even only one-unit owner was benefited from that.[522]

This was also an extreme case, as the court judged the nature of the installation of the air conditioner through its **real effects** (if the unit owner could benefit from that).

Again, a case by regional court Aachen in 2003 had set the criterions to distinguish the "structural change" and "maintaining and improving measures". The court held that the decisive factor was **whether** t**he measure would possibly become a technological improvement or economically meaningful solution, compared with the current situation.** What's more, concretely, the improving expectations of living comfort of the majority has become the substantial background of this case. The inside temperature obviously over 27℃ no longer meant a normal situation of this season, and therefore means a defect. Therefore, the installation of an air conditioner should be regarded as an improvement rather than a structural change.[523]

In this case, structural change or improving measures were also judged by the real social effects, whether it had improved the living conditions of the unit owners.

Actually, maintenance and improvement measures might also constitute "structural

[521] LG Braunschweig, Urteil vom 08. April 2011 – 6 S 521/10 (205) –, juris.
[522] AG Darmstadt, Urteil vom 24. Oktober 2014 – 313 C 187/14 –, juris.
[523] LG Aachen, Beschluss vom 06. März 2003 – 2 T 199/02 –, juris.

change” from an objective standard (the two categories are sometimes overlapped). However, as a kind of structural change, maintenance and improvement measures was beneficial and accordingly encouraged. Therefore, the court adopted a methodology of distinguishing: whether there was an improvement over the current situation if the unit owner had benefited from such measures.

4.4.1.4 Special cases: legitimate installation without the committee’s permission.

In some cases, the structural changes can also be justified if there is no real harm to the condominium community, or to the other unit owners.

A case judged by local court Aachen in 2014, in which the defendant was a tenant of a basement in a condominium building, and commercially used it as a shop. He made some architectural changes in order to make the room fit for his business, including installing an air conditioner in the backside of the building. As the court pointed out, this change undoubtedly constituted a “structural change” in the sense of section 22 subsection 1 of condominium act (WEG), as well as “change the state of the building” without the permission of the committee (section 3 subsection 1 of the community regulation). However, the court held that this change was different. It was because the defendant provided enough evidence to show that **this change did not actually lead to the disadvantages prescribed by section 22 subsection 1, section 14 subsection 1 of the condominium act, or section 3 subsection 1 of the community regulation, especially there is no harm to the visual appearance of the backside of the building.** In fact, the air conditioner was hidden under a balcony, and even could not be recognized at first sight, which meant it was not so obvious. Furthermore, the air conditioner was very unobservable installed and could not be imagined as an optical infringement of the building. In addition, the plaintiff provided **not enough evidence to prove that this air conditioner had caused other harms, e.g. bad smell, the noise**, etc. Therefore, the unit owner’s installation was lawful. The criteria for the above-mentioned relevant sections of condominium act, set by the **federal court of justice (BGH), was that whether, from the generally accepted standard (Verkehrsanschauung), a unit owner would in the same situation understandably feel infringed?** The behavior was supported by the

court due to its harmless to other unit owners.[524]

In summary, this case had discussed the legal effects of structural change, if a structural change did not cause harm to the condominium community (no matter the color, the style, the appearance, etc.), and made no harm to the unit owners (no noise, no bad smell, no night operation, etc.), it could be maintained. The community should not prohibit such a structural change.

4.4.1.5 Short summary

Therefore, in Germany, the exterior wall belongs to the condominium community rather the single condominium unit owner; the condominium committee is, therefore, responsible for such matters. From which we know that generally, the condominium committee is in charge of the airspace outside the exterior wall.

Take the air conditioner installation as an example. If the installation of the air conditioner would significantly change the whole building structure or seriously infringe some unit owner's interest, the committee's decision is not enough, the approval from the whole condominium owner or the approval from the relevant unit owner is required. This is the procedural matters.

For the material matters, the distinctions between "structural change" and "maintenance and improvement measures" are whether the change had led to an improvement from the current state, no matter economic improvement or just improve the living conditions. The measures are "maintenance and improvement measures" if some unit owner had benefited from that. In addition, in some extreme circumstances, the structural change should also be maintained, if it had caused no harm to the community as well as other unit owners.

From the perspective of the author, the above-mentioned German cases, especially those related to the distinctions between "structural change" and "maintenance and improvement measures", had revealed some policy considerations rather than pure logic, which functions as a tool to balance the freedom of the unit owners and the common interest of the living community. In summary, the jurisprudence behind these cases are the administrative element of the condominium community, when you want to achieve

[524] AG Aachen, Urteil vom 12. November 2014 – 118 C 62/13 –, juris.

the order and community uniformity, you have to sacrifice the individual freedom. Therefore, the condominium is different from the traditional house ownership, as community interest and procedural justice would always prevail in a condominium. The condominium owner could only obtain more freedom through measures better serving for the community interests.

4.4.2 The US case of the exterior wall and the use of its space

4.2.2.1 The relevant law in the US

In the US, there are little federal provisions on the use of the exterior wall. However, some of the condominium laws at the state level have already made such provisions. In Delaware, for example, in §2242, the condominium permits the unit owner to display flags of USA, "measuring up to 3 feet by 5 feet, on a pole attached to the exterior wall of the unit or the common elements proximate to the unit." In the following sections, they permit the unit owners to use the space outside the exterior wall to make "for sale" signs; but other uses are not mentioned in the condominium law. What's more, according to Georgia condominium law, in § 44-3-83 (b), "The location and dimensions of the exterior walls and roof of such structures" should be recorded in the plans, and it should be recorded prior to the first conveyance of a condominium unit.[525] In addition, the "certification by such architect or engineer to the effect that he has visited the site and viewed the property and that, to the best of his knowledge, information, and belief", which means the qualification of the architect, is also required. The later guidance by the legislator provides the reader with some insight into the horizontal extension possibilities of each unit.[526]In Iowa, the exterior wall is listed in "General Common Elements", "unless

[525] See the Georgia Condominium Act, which located in Chapter 3 of Title 44 of the Georgia Code, see Ga. Code Ann., § 44-3 provided by database "Westlaw Next", at website: https://1.next.westlaw.com/Document/N37D2E680C0AB11DA9D2D8FAACC61A6A1/View/FullText.html?navigationPath=Search%2Fv1%2Fresults%2Fnavigation%2Fi0ad7403600000165418c53f99b129803%3FNav%3DSTATUTE%26fragmentIdentifier%3DN37D2E680C0AB11DA9D2D8FAACC61A6A1%26startIndex%3D1%26contextData%3D%2528sc.Search%2529%26transitionType%3DSearchItem&listSource=Search&listPageSource=19d0dd3404845321106a5416eccd0281&list=STATUTE&rank=1&sessionScopeId=34a727ddd4d2d1007bc18fbbf502ba01dab9a3d0a5fde9efb70a35b8c63abb7e&originationContext=Search%20Result&transitionType=SearchItem&contextData=%28sc.Search%29. (Newly visited at August 8, 2018).

[526] In addition, each convertible space depicted in the plans shall be labeled as such by use of the phrase "CONVERTIBLE SPACE." Unless the condominium instruments expressly provide otherwise, it shall be presumed that, in the case of any unit not wholly contained within or constituting one or more of the structures, the horizontal boundaries extend, in the case of each unit, at the same elevation with regard to any part of such unit lying outside of

otherwise provided in the declaration or lawful amendments thereto."[527] In §515B.4-105 of Minnesota annotated Statute, "the composition and condition of exterior walls" should also appear in "a professional opinion prepared by a registered professional architect or engineer". In Nebraska Condominium Laws, [528] The NRS 116.2111 of the Nevada Condominium Statutes allows the unit owners conditionally to use the exterior wall and windows to "to improve the security of the unit or to reduce the costs of energy for the unit"[529] such as attach rolling shutters on these "which is a common element or limited common element". These examples are legislations at the state level especially related to the use and the exterior walls.

In summary, the exterior walls are normally regarded as a common element. However, the condominium owner could at least use her/his corresponding exterior walls for some purpose, such as improvement of the living safety, or expressing patriotism, or just providing the information of selling the house, etc.

4.2.2.2 Cases at the federal level

In legal practice, the most common cases in the US in this field is also air conditioner cases. As every state had condominium law in the US, the concrete norms change from state to state. Consequently, the cases at a federal level rarely deal with the concrete inner condominium relationships, such as the relationship between condominium unit owner and their committee. In contrast, the most common cases in this field happened at the federal level are insurance disputes.[530] Interestingly, a case by the federal district court

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such structures, subject to the following exception: in the case of any unit which does not lie over any other unit other than basement units, it shall be presumed that the lower horizontal boundary, if any, of that unit lies at the level of the ground with regard to any part of that unit lying outside of the structures. This subsection shall apply to any condominium created on or after July 1, 1980, or to the expansion of any such condominium.

[527] See Iowa Code 2015, Chapter 499B .2, Definition.

[528] Each co-owner shall carry out at his or her sole expense any works of modification, repair, cleaning, safety, and improvement of his or her apartment, without disturbing the legal use and enjoyment of the rights of the other co-owners, or changing the exterior form of the facades, or painting the exterior walls, doors, or windows in colors or hues different from those of the whole, and without jeopardizing the soundness or safety of the property, reduce its value, or impair any easement or access to or use of common elements;

[529] 4. An association may not unreasonably restrict, prohibit or withhold approval for a unit's owner to add shutters to improve the security of the unit or to reduce the costs of energy for the unit, including, without limitation, rolling shutters, that are attached to a portion of an interior or exterior window, interior or exterior door or interior or exterior wall which is not part of the unit and which is a common element or limited common element if: (a) The portion of the window, door or wall to which the shutters are attached is adjoining the unit; and (b) The shutters must necessarily be attached to that portion of the window, door or wall during installation to achieve the maximum benefit in improving the security of the unit or reducing the costs of energy for the unit.

[530] Unit July 30, 2018, there were 77 recorded cases in this field at federal level within database "Westlaw", among which over 70 cases were insurance cases.

had illustrated why that is.

The case “Lanier v. Association of Apartment Owners of Villas of Kamali’I” was tried by United States District Court for the District of Hawaii in 2007. The plaintiff was a condominium owner, who suffered from asthma. Her doctor had suggested her to install an air conditioner. However, in this condominium association, the apartments were sold at different types, including apartments with air conditioner, apartments prepare to install an air conditioner, and apartments without an air conditioner. The plaintiff, however, had purchased an “apartment without air conditioner” (obviously such type of the apartment is cheaper than that similar apartment with air conditioner). Therefore, she would have to get permission from the committee before installing the air conditioner. Moreover, there was a series of requirements for the installation of such an air conditioner. Such as, obtaining written permission from the committee, providing an architectural drawing. In addition, if the installation were not arranged by the committee, the plaintiff should guarantee the installation the same as that by the committee. The plaintiff regarded these requirements by the committee had constituted obstacles an in breach of a “federal fair housing act”, and therefore sued to the federal court. Interestingly, the committee had become the counter-plaintiff of the case.

The court held that the plaintiff had not provided enough evidence to show that she cannot afford the architectural drawing (at a cost of 300 dollars). On the contrary, she did not provide details on her personal property, such as bank account, real estate. Actually, she had owned two houses under her name, which worth more than 800,000 dollars. If she is so poor, how could she afford to purchase the air condition (500 dollars), as well as the lawyer’s fee? Therefore, the requirements of the committee had not constituted a real obstacle for her to enjoy the apartment. Additionally, she did not prove that her asthma had become worse than before. Therefore, there was actually no obstacle in the sense of the fair housing act.[531]

In addition, the court clarified, “Counterclaim Plaintiff's causes of action are purely state law claims (because the claim was mainly within the scope of). As Plaintiff's complaint

[531] Lanier v. Association of Apartment Owners of Villas of Kamali’I, F.Supp.2d, 2007 WL 842069, 34 NDLR P 148.

has been dismissed, there is no federal claim at issue." [532]

Therefore, this case had illustrated why there were little cases on the disputes between condominium committee and unit owners at the federal level. That kind of matter should end within the state level, as every state has its own condominium acts. Moreover, this kind of disputes is beyond federal jurisdiction. However, in some cases related to federal laws (such as the fair housing act in this case), the federal courts had jurisdictions on that matter.

4.2.2.3 Cases at the state level

4.2.2.3.1 Air conditioner under the bylaw of the condominium

In case "Board of Managers of Ocean Terrace Towne House Condominium v. Lent (1989)" by Appellate Division of Supreme Court of New York, the defendant (a unit owner) maintained an air conditioner through the exterior brick wall of their unit, which violate the by-law of the condominium.[533] "The plaintiff (Board of managers) asserted that the defendants' installation of the air conditioner was in violation of the condominium's by-laws which prohibit the condominium owners from obstructing or defacing the buildings' exterior walls. Despite the plaintiff's demands for the removal of the air conditioner, the defendants refused to comply." The Supreme Court of New York had affirmed the summary judgment on the defendant by the lower court and held that firstly, "Board of managers of a condominium is statutorily empowered to enforce its bylaws, rules, and regulations. McKinney's Real Property Law §§ 339–j, 339–dd." Secondly, "No evidence in the record supported condominium unit owner's claim that condominium association was acting in bad faith by enforcing bylaws, prohibiting the maintenance of air conditioners to the exterior brick wall of the unit, or that association had regularly waived that particular bylaw as it applied to other unit owners. McKinney's Real Property Law §§ 339–j, 339–dd."[534]

Therefore, prohibiting the unit owner from installing an air conditioner by the board of managers is legitimate. The exterior walls are actually under the control of the board of

[532] Lanier v. Association of Apartment Owners of Villas of Kamali'I, F.Supp.2d, 2007 WL 842069, 34 NDLR P 148.
[533] Bd. of Managers of Ocean Terrace Town House Condo. v. Lent, 148 A.D.2d 408, 538 N.Y.S.2d 824 (1989).
[534] Bd. of Managers of Ocean Terrace Town House Condo. v. Lent, 148 A.D.2d 408, 538 N.Y.S.2d 824 (1989).

managers, and accordingly should be used identically with the bylaws by the board of the managers.

4.2.2.3.2 The association’s good faith

In case Cabrini Villas Homeowners Ass'n v. Haghverdian (2003) by an appeal court in California State, the condominium association forced the unit owner to remove the air conditioner, which was inserted into the exterior wall of the condominium. In this case, evidence showed that the air conditioner had already harmed the integrity of the exterior wall.[535] Moreover, the court held that “Generally, courts will uphold decisions made by the governing board of a condominium owners association so long as they represent good faith efforts to further the purpose of the common interest development, are consistent with the development's governing documents, and comply with public policy.”

Therefore, as the exterior wall is not owned by private unit owners, but under control of the homeowner’s association, the association has discretionary power to decide whether the installation of the air conditioner is proper. In addition, their arrangement would normally be respected as long as they “represent good faith efforts to further the purpose of the common interest development”.

4.2.2.3.3 Installation inevitably caused harm

In a more recent case of 2010, the case “DiRienzo Mech. Contractors, Inc. v. Salce Contracting Assocs., Inc.”, the appellate court of Connecticut finds that it would be inevitably to “cut holes in the exterior of the building through which air conditioners would protrude”, in order to “installed these air conditioners on the balconies of the residential units”. Although this case mainly dealt with the liabilities of the condominium, the contractor and the subcontractor, it had also some aspects related to the use of airspace around the exterior wall of each unit.[536]

Combining with the previous cases, if the installation of the air conditioner would inevitably cause harm to the exterior wall, the unit owner normally would not get

[535] 111 Cal.App.4th 683, 4 Cal.Rptr.3d 192, 03 Cal. Daily Op. Serv. 7803, 2003 Daily Journal D.A.R. 9728. “Evidence was sufficient to support condominium association's determination that air conditioner which unit owner had installed in wall lessened structural integrity of the building; there was evidence that it was necessary to cut into a stud in order to install air conditioner, engineer testified that cutting into exterior wall would diminish to some extent the structural integrity of the lateral load resisting system and therefore degrade the quality of the building structure, and engineer stated air conditioner was installed through exterior wall without proper wall penetration detail.”

[536] DiRienzo Mech. Contractors, Inc. v. Salce Contracting Assocs.,Inc., 122 Conn.App. 163, 998 A.2d 820

permission from the condominium's committee. Therefore, there were always conflicts of interests within a condominium. In such situation, the unit owners were always seeking more living comfort, while the condominium committee wished the "lifespan" of the whole building would become longer (or reduce the cost of administration), which are substantial conflicts between personal freedom and the benefits of the condominium community in the long run.

4.2.2.3.4 Change of color of the exterior wall

It seems the condominium committee had always an authority on the change of the exterior wall. However, it depends on the allocation of power by the condominium act at the state level. In some state, such as Hawaii, the condominium committee had a relatively small power in such matters.

A recent case named "Brown v. Brent" dealt with the problem on repainting of the exterior wall, which provided more insights into the Hawaii condominium law. In this case, the board wanted to repaint the exterior wall of the condominium without the permission of the owner. Nevertheless, the court adopted a different approach. Although "the Board presented evidence from a real estate broker that the change in the exterior paint color had no adverse effect on the value of the Kuhio Shores condominium project or Brown's unit", it was not "sufficient to show the absence of any genuine issue of fact on **whether the change in paint color a nonmaterial alteration was**." [537] Because in Hawaii condominium law, the board approval was enough in deciding the "nonmaterial alteration of the common element" without owners' approval. However, for the material alteration, the unit owners' approval was required.

Therefore, the common elements were not totally controlled by the board in Hawaii; the owners have also powers over the matters outside the "nonmaterial alteration".

4.2.2.3.5 Installation of TV tables, electrical utilities, new windows on the exterior wall

Besides the air conditioner, there were actually some other typical causes of action, which related to the use of airspace of the exterior wall, e.g. TV tables, electrical utilities, new windows, etc.

[537] See Brown v. Brent, 138 Hawai'i 140, 377 P.3d 1058 (Table), 2016 WL 3418555.

In case “Dynamic Cablevision of Florida, Inc. v. Biltmore II Condominium Assoc., Inc.”, the dispute arose by fixing the cable TV on the exterior walls. The unit owner actually had only relative rights, but not absolute rights, to install its television cable of exterior walls. The condominium association prohibited the unit owner’s behavior due to the TV cable was quite unsightly. The unit owner believed this prohibition “violated the public policy of both the City of Coral Gables and of Dade County by denying unit owners access to the educational and municipal programming available on Dynamic's cable system.” [538] Nevertheless, the court held that. “Condominium association's refusal to permit exterior installation of cable television cable, which refusal did not prevent cable television company from providing desired services through acceptable means, did not violate public policy by denying unit owners access to educational and municipal programming available on the cable television system.”

It might also matter on the size of the satellite plate. In case “Jarrett v. Valley Park, Inc. “, by Supreme Court of Montana in 1996, [539] “Owners of lots and condominium units located in retirement community brought an action against developer and village association to enjoin enforcement of covenant that prohibited installation of television satellite receiving dishes within village except by developer or its designate.”[540] The court held that it was quite ambiguous in the case, on how large the satellite is, when it was too large, it might be better to install it on the ground or in the roof, rather than on the exterior wall of a unit.[541]

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[538] Dynamic Cablevision of Florida, Inc. v. Biltmore II Condominium Assoc., Inc. District Court of Appeal of Florida, Third District. December 9, 1986498 So.2d 63211 Fla. L. Weekly 2573

[539] 277 Mont. 333, 922 P.2d 485

[540] On August 1, 1994, Maurice Jarrett applied to the architectural committee for permission to install an eighteen-inch television satellite receiving dish on the exterior wall of his condominium unit. The architectural committee denied his request based on Section II(Q) of the Protective Covenants (Covenant II(Q)) which prohibits the installation of “television satellite receiving dishes” within the village of St. Marie except by Valley Park or its designate. Approximately three weeks later, he applied to install a television antenna and the architectural committee approved his request.

[541] He reverses, however, is true. As discussed above, the term “television satellite receiving dishes” is clear and unambiguous and Covenant II(Q) does not contain size, or other, limitations on the meaning of the term. In order to exempt the newer dishes from the prohibition contained in Covenant II(Q), it would be necessary to insert limitations regarding the size of, and/or manner of installing, television satellite receiving dishes which do not exist in the unambiguous language used in the covenant. Injecting such limitations would result in a covenant which, for example, prohibited the installation by anyone other than VPI or its designate of television satellite receiving dishes more than eighteen inches in diameter which are installed by placement on the ground or on a roof, but not on an exterior wall; such a judicially-revamped covenant, however, would bear little resemblance to the plain language of Covenant II(Q) prohibiting the installation of television satellite receiving dishes except by VPI or its designate. Like the neighboring landowners in Higdem, Jarrett clearly would have preferred a differently worded covenant had this “question later developing” with regard to smaller dishes installed in a manner similar to television and radio

Therefore, the condominium committee actually has the right to manage the condominium community from an esthetical aspect.

Actually, the disputes were not limited between the unit owner and the condominium committee, but might also relate to exterior companies. In Blinn v. Florida Power & light co. The case, eight electric meters affixed to the exterior wall of a one-family-unit by the Florida Power and light company. The homeowner brought an action against the electrical utility for trespass and nuisance after utility refused to remove eight electric meters from the wall of the home. After the homeowner voluntarily dismissed lawsuits, the homeowner appealed for the attorney fees. In the District Court of Appeal of Florida (Second District), the judge approved the homeowner. “Blinn did not unreasonably pursue his claims against FP & L at least to the point of the motion for summary judgment.” what’s more, “Blinn's expert offered unrefuted testimony that the tariff was only binding on Blinn and did not authorize the placement of the other seven smart meters on Blinn's property.” Therefore, “homeowner's claim was arguably supportable under the facts and law and was not frivolous, and thus did not warrant attorney's fees.”

Although the exterior wall normally belonged to the common areas (under the control of committee in the US), the corresponding unit owners still had some priorities in protecting the exterior wall from other’s infringements. The specialty of this case was that the condominium under dispute was a one-family-unit, accordingly the court used the word “on Blinn’s property”.

In Scarfone v. Culverhouse by District Court of Appeal of Florida (Second District.), condominium unit (Culverhouse) owner brought an action to enjoin construction of a window in an exterior wall of another unit of the condominium. Nevertheless, the defendant (Scarfone) appealed. [542] Actually, Scarfone was a new buyer of a unit

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antennas existed at the time Covenant II(Q) was written. However, we must strictly construe covenants and may not insert limitations not contained therein. Higdem, 536 P.2d at 1189-90. We hold that the District Court erred in **490 concluding that Covenant II(Q) is ambiguous and, on that basis, unenforceable.

[542] Scarfone v. Culverhouse, 443 So.2d 122 (1983). The Scarfones began construction of the window in the south wing wall of their condominium unit in the spring of 1981, after which Mr. Culverhouse filed a complaint against Mr. Scarfone requesting the court to enter an order requiring Mr. Scarfone to comply with the covenants of the Declaration of Condominium Ownership of the Pinnacle Apartments by restoring the exterior wall to its original condition. On October 25, 1982, the trial commenced and, thereafter, the trial judge entered an order granting a mandatory injunction. The trial court found the exterior wall of Penthouse Unit No. 1 to be a common element and further that the Board of Directors did not have authority to approve changes to the exterior of the building. The trial court also found that the Scarfones' estoppel argument, which was based upon certain changes made by the developer

neighboring Culverhouse and wanted to make some alterations of the apartment prior to moving in. What's more, he had the authority from the Board of Directors of the condominium association. But was sued by some other unit owner. The trial court held that "the exterior wall of Penthouse Unit No. 1 to be a common element and further that the Board of Directors did not have authority to approve changes to the exterior of the building."[543] The appeal court also found the "clear distinction between the remodeling of the Culverhouse apartment undertaken by the developer pursuant to the lease agreement and the remodeling that took place by the Scarfone after the purchase of their unit." By the end of the judgment, the appellate court pointed out the differences between this case and Schmidt v. Sherrill, 442 So.2d 963 (Fla. 4th DCA 1983). In the latter case, there were substantial necessities to take measures against a hurricane, and other unit owners had already make shelters or cloth to cover the balcony. Therefore, the court concluded in that case, "neither of these conditions is sufficient to stop the association or any of its members from seeking legal redress to prevent the extensive structural alterations involved here." However, the current case did not reach such an extent, so it deserves different treatment.

Therefore, if the unit owner wanted to make an alteration of the condominium unit, she/he should justify the necessity up to a persuasive extent.

In case "Council of Unit Owners of Sea Colony East, Phase III Condominium, on Behalf of Ass'n of Owners v. Carl M. Freeman Associates, Inc.", the unit owner claimed compensation from the Associates for the deficiencies by the glide glasses doors and windows, which were inserted in the exterior walls. Because he believed these things

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to the Culverhouse unit, was without merit. It is from that order that this appeal is taken.

[543] On appeal, the Scarfones challenge these two findings by the trial court and raise the defense of selective enforcement. We have examined the first two points and find them to be without merit. The Scarfones argue, in their third point, that the trial court abused its discretion in awarding a mandatory injunction when there was selective enforcement of the condominium documents and where the equities favored the Scarfones. In support of their contention, the Scarfones urge that evidence was presented at trial that both the Culverhouses and the Richardsons made alterations to their units which affected the exterior configuration of those units. As to the alteration of the Culverhouse unit, we are convinced, as apparently was the trial court, that there is clear distinction between the remodeling of the Culverhouse apartment undertaken by the developer pursuant to the lease agreement and the remodeling that took place by the Scarfones after the purchase of their unit. Section 20(g) of the Declaration of Condominium1 authorizes alterations of the type performed by the developer and, therefore, we do not address this point further. As to the Scarfones' claim that the issuance of the mandatory injunction against the Scarfones constitutes selective enforcement of the condominium documents because the modification of the Richardson unit was reviewed and approved by the Board at the same time as the modification made by the Scarfones was reviewed and approved, we cannot agree.

were an integral part of the exterior wall, which was part of common elements.[544] However, the court only supports the interfacing, "which aids in securing the door and window units to the exterior wall system, to be a common element and part of the exterior wall system."

In the above-listed air conditioner cases, TV table cases, electrical utility case, and new windows cases, the condominium unit owners had tried their best to define the airspace of the exterior wall as their own "estate" or should fulfill their usage as a priority. Ironically, in other fields, such as tax or compensation cases, the unit owners would try to prove the exterior wall was a common element. This was the destiny of exterior walls, which constituted an integral part of the building, but normally reserved by the committee for the common interests. If they leave it free for the unit owner, it would surely cause many problems, which could be found in China.[545] However, if the committee has too much power, the sense of "ownership" within a condominium would decrease. Alternatively, the condominium would not be so charming or abandoned by the land and house market.

Therefore, allocating power within a condominium is also a practical art, which revealed the element of "management" had obtained its importance in the new trend of real estate. In the US, the difference condominium act among different states has caused some confusions among the foreign scholars; however, such differences are also the starting point of "institutional competition" among states, which help the US scholars to compare and make a better model law. Therefore, it is also meaningful from an evolutionary approach.

4.4.3 The Chinese situation

As mentioned above, the condominium is regarded as a normal property right in China,

[544] "The Court finds that the Plaintiff lacks standing to bring into this case a claim involving the sliding glass doors, and the single hung windows, which are part of the individual condominium units. In addition, the Court finds the interfacing, which aids in securing the door and window units to the exterior wall system, to be a common element and part of the exterior wall system. The exterior wall system is a part of the Plaintiff's original complaint and is therefore a part of this lawsuit."

[545] See Chapter 4.4.3.3.

which mainly relates to the allocation of space.[546] As both the society and the scholars concentrate more on the unit owners, the proportional rights of the ground land are sometimes neglected. Although the "general" airspace right (as the US) has not been adopted by law, some courts had already advanced this theory into a quite revolutionary step. In some cases, the Chinese court directly uses the theory of "right in airspace and subsurface of the land" rather than employing condominium or property theory to set their judgment.

4.4.3.1 Airspace disputes within a condominium: reflection on the boundary of state ownership

The case "Panxinanqiaoxinyuan apartment owners committee v. Yang, Xianquan" happened in 2014 in Chongqing City. The condominium building had 24-floor with one floor underground. This building had 1,522.63 square meters on its first floor, but from the second floor above, every floor had only 944.76 square meters. The second floor was purchased by Ms. Xu, Hong, who intended to use the second floor (inside 819.89 square meters, outside 1028.90 square meters) to open a hospital named "Kangquan hospital". In addition, Mr. Yang, Xianquan is her sole investor. As written in the real estate purchase contract, "The natural space, such as the terrace, balcony, etc., which are naturally formed, belongs to the purchaser (except which airspace could only be used by neighboring apartment owners, belongs to the neighboring owners). For these spaces belong to the purchaser, others should not interfere, claim ownership, or claim usage."

After purchasing the second floor, Ms. Xu used all airspace above the roof of the first floor to operate her hospital, because she believed that, according to the contract, this airspace belongs to her and her neighbor in the first floor. However, condominium unit owners from other floor were not satisfied and believed that a large portion of the airspace, which Ms. Xu had used, belonged to all the unit owners. Consequently, the Panxinanqiaoxinyuan apartment owners' committee sued Mr. Yang (as the apartment was under his name).

The court held that Ms. Xu actually owned only a 944.76 square meters of the 1522.76

[546] *Bu*, Chinese Civil law, 2013, p. 220.

square meters airspace, but she used all the 1522.76 square meters for her hospital, which was obviously an infringement of airspace. However, this extra airspace also not belonged to the condominium community. **Actually, this airspace right was a kind of "vertical land use right for construction", and accordingly its ownership belonged to the State.** Therefore, the real estate developer had no right to sell the airspace (belong to the state) without the permission of the State. However, the state would also not use this airspace according to the current situation. In addition, as zoning law normally just limit the height and function of the buildings, it would be too concrete for zoning law to regulate the airspace within the condominium under Chinese context. Consequently, the best legal solutions were to endow this airspace to the owners' committee, rather than give it to some apartment owner. [547]

As a leading case in this area, which was published in the "People's Judiciary", the judges provided a sketch of allocation of the airspace rights. Firstly, the usage of the airspace should be decided by the apartment owners' committee. Secondly, the usage of the airspace should in accordance with the principle of proportionality. Thirdly, the contract of the unique use of the airspace between the real estate developer and some special apartment owners was ineffective.

This case shows how the Chinese judges define the airspace in a modern high building, and how they allocate the airspace among the State (landowners), estate developer, apartment owners, and their committee.

As far as I am concerned, the logic of the court is understandable but not perfect. From the perspective of the result, the court finally allocated the airspace to the condominium community by primarily claiming that the airspace under dispute was state-owned. However, such an approach had a side-effect. Although the land was state-owned in China, the airspace/subsurface could deductively belong to the state (concretely local government). However, land ownership is limited by the land use right for construction. Accordingly, the necessary airspace/subsurface for the effective operation of the condominium should be under the control of the land user rather than the landowner.

[547] Panxinanqiaoxinyuan apartment owners committee v. Yang, Xianquan, case No. (2014) Yu Yizhongfa Minzhong Zi Di 02001 Hao (渝一中法民终字第 02001 号).

According to the property law of PRC, the land usage right for construction should clearly write out a) the boundary and the area of the land; b) the space occupied by the buildings and structures and the facilities attached to them. In this case, the airspace under dispute is obviously with the scope of land use right for construction. Therefore, the disputed airspace should be firstly in charge of the developer, because the developer had obtained the land use right for construction from the local government by payment for the assigning and other fees. Therefore, the result is acceptable, but the logic is rather inconvincible. In my opinion, the social concern of the court is good, but it should not sacrifice the principles of legal logic and techniques of legal interpretation.

In summary, the approach by the court in "Panxinanqiaoxinyuan apartment owners committee v. Yang, Xianquan" is far from satisfactory. In my opinion, a possible and better solution for this case might be that, rather than enjoin Ms. Xu from using the airspace above the roof of the first floor, the court should encourage Ms. Xu to rent the airspace which did not belong to her. The committee would get the money from Ms. Xu for the benefits of all the condominium owners, which would fulfill the best profit margin in the land market. In addition, the apartment owner could also benefit from the airspace.

4.4.3.2 The use of condominium's exterior wall in China

More direct recognition of airspace right by the Chinese court happened in 2002, in the case of Sheng Feng v. MAODA Decoration Works Co., which related to the use of the external wall of the second floor of the building. The defendant had put an advertisement board on the external wall of the plaintiff's apartment on the second floor of the building under an administrative approval. However, the administrative approval was adjudicated as illegal. The defendant, under the request of the plaintiffs, erased the words of the advertisement but left the advertisement board in white and green color alone.

The court held that "**In the trend accelerated economic development and urbanization, the vertically use of airspace and underground has become a commonplace.** Accordingly, the use of the external wall of the buildings, especially, the buildings with street frontage, is very beneficial. **The debate on the usage of airspace is naturally a debate on property relationship between equal parties, which is, therefore, within**

the scope of civil law. The focus of this case is not a usual case between adjacent condominium owners, but who have the right to use the external wall outside the apartment of the plaintiff. Although we have no legislation on (general) airspace right currently, the court would make a judgment, in order to deal with the problems aroused by the usage of airspace. When the rules are not settled down, we can try the case according to the "*ex aequo et bono*" principle and the normal social standard. According to the **Chinese social common sense, the owners of the different apartment have the priority to use its corresponding external wall, which can exclude others from infringement**."[548]

The local court had boldly made a great leap in this case, which was trying to build up the airspace/subsurface law upon the basic principle of civil law and social common sense. In other words, the judges were creating new legal order through cases (Richterrecht). As introduced above, the rights of management in the condominium community are not so powerful in China, accordingly, replacing cold balcony into warm balcony is a common practice in northeast China. The condominium owners normally believe the balcony is under their own discretion. Additionally, using the airspace outside the balcony to grow flowers/ hang the laundry out is also commonplace among middle and big cities. Consequently, the usage of the corresponding airspace near the exterior wall would not become a dispute in many districts of China. Under such a circumstance, the court boldly made the custom of many different regions into judgments. Therefore, the condominium owner could reasonably (not hurt others) use the airspace corresponding to the exterior wall, which should not be disturbed by the condominium committee/community. That is the Chinese "customary law" by the folks and adopted by the court.

The court ruling of another case had proved the reasoning of the case Sheng Feng v. MAODA Decoration Works Co., which was also about the airspace of air conditioner within a condominium. In case Ma Zhongxiu v. Zhang Hongli,[549] Ma and Zhang were both condominium owners on the same floor, who lived in unit 602 and 603 separately.

[548] Sheng Feng v. MAODA Decoration Works Co., case No. (2002) Xi Minzhong Zi Di 704 Hao (锡民终字第 704 号).

[549] Ma Zhongxiu v. Zhang Hongli, (2017) Shan 0113 Min Chu 10399 Hao (陕 0113 民初 10399 号).

Zhang had installed iron anti-theft grille outside the window, which occupied the space outside the kitchen of unit 602 for installing air-conditioner. Ma had sued Zhang to remove the obstacle, which was supported by the court. The court held that Zhang had occupied Ma's airspace for air conditioner and infringed the plaintiff's legitimate right. In other words, Ma enjoyed the legitimate right to use the corresponding airspace in the exterior wall to install an air conditioner. This ruling had proved from the other side that using the exterior wall to install air conditioner is kind of customary law in China, which would not become a dispute in most of the districts.

To some extent, the legal logic of case Panxinanqiaoxinyuan apartment owners committee v. Yang was somewhat ideological, but the judgment had also expressed the embarrassment of airspace rights in China: the sole landowner (state) is the unique real owner of the airspace. For this single case, the unit owner's committee had won. In other words, the majority unit owner's right was protected. However, it might have a negative effect on the land and housing market. Imagine when the developer cannot make money from selling (state) airspace, they would gradually reduce the investment in airspace development. That is certainly not a good trend in the long run.

In summary, the Chinese courts were rather revolutionary in these cases, they had boldly made creative judgments to solve new social and urban problems around airspace, even before the legislation of property law of 2007. However, it worth to note that without a solid theoretical foundation and sophisticated technic of legal interpretation and development (Rechtsfortbuildung), judicial activism and creating (Rechtsschöpfung) would be quite venerable and facile. As shown in the above cases, the court would have to use common sense, the "*ex aequo et bono*" principle, the state ownership of airspace, etc., to make the "corresponding exterior wall and its airspace" under the charge of condominium owners. Such legal endeavors are perceptible as the apartments in China are the "only" immovable of the individual, which had endowed a special significance for the condominium owners and the judiciary. However, it would not be an excuse to use the general principles (2002 case), or by exaggerating the state ownership (2014 case) to solve the airspace dispute after the enactment of property law. There should be more

interaction between the legislator, judiciary and scholars in China, which might be a possible solution to alleviate the current dilemma.

4.4.3.3 Additional legal background and comment

As mentioned before, the property law of 2007 came later than some cases on airspace right. In a legal explanation on condominium disputes by the Supreme Court in 2009, in article 3 of that document, the legal position of the exterior wall is clarified. “The foundation, bearing structure, external walls, roofs and other basic structures of the building” shall be regarded as common area. This legal idea is also a summary of the legal practice. Additionally, in the following sections, the principle to use of the exterior wall is also set by the Supreme Court. “An owner's unpaid use of the roof or any other common part such as the external wall corresponding to his exclusive part for the purpose of meeting the reasonable demands of the specific functions of his exclusive part, such as his residential house or house used for business purposes, shall not be determined as a tort. Unless it violates any of the laws, regulations or the management stipulations or has injured the legitimate rights and interests of any other person.” Therefore, the use of the airspace of the exterior wall had its judicial basis.

Therefore, although the exterior wall was included within the common area, the apartment owner, as revealed in case Sheng Feng v. MAODA Decoration Works Co., has the priority to use “his” exterior wall airspace, which is also admitted by the judicial interpretations of the Supreme Court. The other side of the coin is that the condominium in China had comparatively made extraordinary full use of the airspace of the corresponding exterior wall. As the air conditioner (and other facilities) in the exterior wall had been commonplace in China, and nobody finds the appropriation of such installation. Compare to the German counterparts, which stress the importance of the optic entirety of the condominium community and civic landscape, the Chinese condominium owners had more freedom. However, such freedom might sometimes mean disorder.

4.4.4 Short summary

The usage of the airspace of the exterior wall (within condominium) is rather a touchstone,

which helps to clarify the airspace allocation in the common area of a condominium community in different countries. In general, the German style is community-oriented, the US style is court-oriented, and the Chinese style is individual-oriented.

The German style is community-oriented, which emphasized the order of the community and the uniformity. Accordingly, the condominium committee plays a central role. The condominium law in Germany emphasis the procedural requirements and agreement of the condominium's committee. Accordingly, only in some special circumstances (maintenance and improvement measures; very friendly structural change), a single condominium owner had the discretionary power to install the air conditioner. However, it would be hard to distinguish structural change and maintenance and improvement measures in legal practice. The main standard by the courts was mainly whether such change had caused harm for the other apartment owners. Under such conditions, some condominium committee has the power to prevent the apartment owner from putting the potted flowers on the iron support outside their exterior wall, and the reason could be esthetical or safety matters. However, in exceptional cases, the condominium owner had the privilege to install the antenna outside his exterior wall through constitutional claims. The most famous case is "Parabolantennen", in which the Turkish tenants had justified their erection of the satellite dishes within the lease agreement by the German Federal Constitutional Court. The court held that, as the relevant information on his state of origin could only be obtained via satellite dishes, the application of the leasing law should take into account the tenant's constitutional right of free access to information (Sec.5, Subsec.I, sen.1).[550] However, most of the time, the committee and the condominium owner collectively have the power to decide the use of airspace in common. Such an arrangement is in comparison with the full land ownership of a house, where the house owner would obviously have more power. Under the German condominium law, if the condominium owner wants to use the airspace of the exterior wall, he must try his best to preserve the common interest of the community, choose the least harmful way, and do it under due process.

[550] BVerfG, Beschluss vom 09. Februar 1994 – 1 BvR 1687/92 –, BVerfGE 90, 27-39–, juris.

In the US, although some types of usage are recommended by state condominium laws, the legal status of airspace of the exterior wall has some ambiguity. Accordingly, the court played a central role in privilege allocation, as the condominium owner would draw on the advantages and avoid disadvantages. Alternatively, the condominium owner would try to prove the exterior wall and its corresponding airspace belongs to the condominium owner when using the airspace; and try to prove them as common area when paying fees or tax. Accordingly, the condominium acts at state-level had more obviously become a mechanism of balance of interest and drawbacks. In other words, condominium law is a central facility to allocation airspace and corresponding fees and tax. The US example had to make something clear, even when sometimes there are no clear rules, but the equivalence of benefits and responsibilities. Another point is that having a general airspace law is useful when there are some loopholes even within the special branches of airspace rights (here is the condominium law).

The Chinese style is individual-oriented. In China, interestingly, the air conditioner cases were rare, because using the exterior wall and its airspace to install air conditioner was commonplace in many districts (customary law), which right was even recommended by some court rulings. Such a phenomenon could be partly explained by the psychological desire of “real” estate in China. Additionally, the reality of most of the Chinese people live in the condominium unit rather than houses should not be neglected. Again, the Chinese situation had shown the necessity of a general airspace law. Because Sec. 136 of Chinese property law is just a special rule in the “land use right for construction”, but not enough to prove that China has a general condominium law. Without a clear orientation, the courts in different districts would inevitably have much divergence in their judgments, and some court rulings were really misleading.

From a comparative perspective, the usage of the airspace of the exterior was most rigid in German law, in contrast, the unit owner enjoyed the most freedom under Chinese condominium law. The US condominium law is in the middle, due to its ambiguity, the airspace allocation as the nature of condominium is more obvious. The study of exterior wall airspace allocation is a good mirror for studying the allocation of airspace within a

condominium. From the experiences of the three countries, some conclusion could be drawn, the first is that the right of airspace in common areas is best to be certain by the law/condominium agreement, which would lower the possibility of the legal disputes. Secondly, there should be a balance of using the airspace and the corresponding burden (usage fee or tax), which would help the formation of the healthy market on airspace usage. Thirdly, if the law provided more flexibility, it would be beneficial to dig out the potential value of airspace. Fourthly, even within the condominium, the recognition of general airspace/subsurface right is a good supplement, when there are some loopholes related to undefined airspace usage.

In summary, the condominium is not the only airspace right in itself but also dealing with the allocation airspace in the common area. For the benefit of efficiency, the airspace law within a condominium should provide more possibility for evolvement. On the one hand, a clear stipulation on different airspace is required to avoid unnecessary disputes, however, a rather complex and strict procedure might prevent the dynamics of further development. In addition, more freedom might cause disorder, while more limitation might prevent creativity. There should be a balance of conflicting aims, but the concrete strategy should be in accordance with the concrete circumstances. All in all, the recognition of general airspace/subsurface right is a good supplement, which is a quite helpful tool to achieve these aims.

4.5 The problem of underground garage

In coping with the high speed of urban life, automobiles could be regarded as another sign of modern lifestyle. There have been over 1.28 billion cars on the road worldwide since 2015,[551] which number would amount to 2 billion in 2035.[552] As the condominium had become a typical way of residence, there are a more and more underground garage or underground parking space to coordinate the vertical use of residential space. In many

[551] In 2015, around 947 million passenger cars and 335 million commercial vehicles were in operation worldwide. See the website of statistica, https://www.statista.com/statistics/281134/number-of-vehicles-in-use-worldwide/, visited at Feb.19,2018.

[552] (3) Title to a unit is the separate ownership of non-residential areas of a building together with a co-ownership share of the jointly owned property of which it is an integral part.

modern big cities, the condominium developers tend to build underground garages to make full use the high-priced land and its valuable airspace. However, it had also arisen many disputes in allocating the underground garage or parking space within the condominium community, especially those located in the common area.

4.5.1 The German cases

4.5.1.1 Three obstacles for underground parking space

In German law, there are theoretical obstacles to defining the underground parking space as an independent property right. The first obstacle is that it serves not for the human habitation, which would usually be regarded as "title to units (Teileigentum)" pursuant to section 1 subsection 3 of the German condominium act.[553] Nevertheless, sometimes it could also be regarded as an integral part of residential space, which is under the concept of "title to an apartment".

The second problem is the self-containment (Abgeschlossenheit) requirement for separate ownership by section 3 subsection 2 sentences 1 of the German condominium act.

The third problem is quite practical, say the allocation of underground parking space among the condominium owners, which had constituted the majorities of the debate. In my opinion, it is not a theoretical problem within the interpretations of relevant legal norms, but to a large extent, a problem of social policy.

4.5.1.1 The division of title to an apartment and title to units

The perception of the legal position of an underground parking place had experienced a relatively long time in legal practice. In German condominium act, there are roughly two kinds of condominium rights, the first one is the title to an apartment [Wohnungseigentum], which may be created in respect of apartments; and title to units [Teileigentum], which may be created in respect of non-residential areas of a building. The superordinate concept for the "title to an apartment" and "title to units" is, by the German scholars, "title to space (Raumeigentum)",[554] which word is used by academics

[553] (2) Separate ownership should only be granted where the apartments or other areas are self-contained.
[554] *Diester*, NJW 1970, 1107, p. 1107.

but could not be found in the existing laws and statutes. The distinctions between the two are determined by the subjective usage purpose and structural design,[555] such as it was expressed in the building up of the title to units. Therefore, there exists the unity that if some buildings were not compatible with the objective requirements of the apartment, it could not be registered as the title to an apartment.[556]

In a 1986 case by the Bavarian highest court (Bayerisches Oberstes Landesgericht),[557] the plaintiff had an apartment in a residential condominium building and an underground parking space (partial ownership). He ordered for a right of residence at the apartment including the garage. At the same time, he authorized a restricted personal easement in the land register to secure the right of residence. However, the register had denied. The Bavarian highest court held that, "at an underground parking space, which is registered independently as title to unit, a right of residence according to section 1093 of the German Civil Code (right of residence) cannot be justified, but only a right from section 1090 of the German Civil Code (restricted personal easement)." Therefore, it seems that the underground parking space could only be kind of "title to units", and would be registered as a restricted personal easement.[558]

However, as the German lawyers noted, the concept of "title to an apartment" could also include some other spaces, which located outside the apartment, but it should be commonly shared, such as the cellars, storage rooms, ground garages or underground parking spaces.[559] These spaces could not be regarded as essential elements of the "title to an apartment" either if they have the characters of "separately owned property" (sondereigentumsfähig) from themselves (garages, underground parking space). Even in such situation, the unity of the title to an apartment, coping with the underground parking space with the characters of "separately owned property", could be registered together as the title to an apartment in the land register due to the dominantly residential purpose.[560] However, this flexibility is quite limited, according to the court rulings, the necessary part

[555] *Diester*, NJW 1970, 1107, p. 1108.
[556] *Rapp*, in: Staudinger Kommentar zum Bürgerlichen Gesetzbuch (2018), Band I of WEG, section 1, para.7.
[557] The Bavarian highest court (Bayerisches Oberstes Landesgericht) is an old court (dated back to 1625), which was built up earlier than the German Empire (1871).
[558] Bayerisches Oberstes Landesgericht, Beschluss vom 30. Oktober 1986 – BReg 2 Z 6/86 –, juris.
[559] *Rapp*, in: Staudinger BGB (2018), Band I of WEG, sec. 1, para.6.
[560] *Rapp*, in: Staudinger BGB (2018), Band I of WEG, sec. 1, para.6.

of the apartment, such as toilette, the pre-hall (Vorflur), or the kitchen, could only be registered together with the other parts as “title to apartment”, but not as an independent “separately owned property”. In a recent case by high regional court Karlsruhe, the plaintiff, the condominium owner, sued the building owner for changing the purpose to use the adjoining space. The court held that “the development of such adjoining rooms for residential purposes is only permitted if expressly permitted by the owner in the community regulations.”[561] It was also applicable if in the distribution plan for these ancillary space’s designations such as "cellar", "hobby room", etc.

4.5.1.2 Understanding underground parking space in three pillars

Therefore, the legal status of underground parking space in the German condominium act is rather complex, if not misleading. Firstly, the parking space is obviously not designed for residence purpose, so it was not “title to an apartment”, but “title to units”. Roughly, many rules applicable to “title to an apartment” could also be applicable to “title to units”. However, they are divided from concept at the very beginning of the German condominium act.

Secondly, according to the conception of German condominium act, the “title to an apartment comprises the separate ownership [Sondereigentum] of an apartment together with a co-ownership share [Miteigentumsanteil] of the jointly-owned property [gemeinschaftliches Eigentum] of which it is an integral part.” The differentiation between title to an apartment and title to unit relates to the use of the part of a building. In order to have its own rights, any such part must be clearly separable (“sonderrechtsfähig”). Therefore, it becomes important if a part is used for living purposes (e.g. toilet is necessary) or not. In contrast, separability is the remaining condition. This is the key to the German condominium system.

Thirdly, the underground parking place could also be regarded as secondary spaces serving the main “tile to an apartment” and register together with the other parts under the name “title to an apartment”. It could also be regarded as above-mentioned independent “title to units”, or specifically with the name “Hobby space”, “cellar”, or just

[561] OLG Karlsruhe, Urteil vom 28. Oktober 2016 – 9 U 14/15–, juris.

change its purpose of usage by express permission of other condominium owners under the rules of this condominium.

Therefore, the complexity in definition, in legal theory, as well as land registry, would constantly cause more disputes in this field in Germany. From a sociological and historical perspective, it also reflected that the social needs had been changing during these decades in Germany (since 1951), and sometimes the legislation had lagged behind the social reality.

In fact, this rather creates flexibility for the (collective) owners of a building or in praxis rather the notary who creates such separation.

4.5.1.3 The problem of self-containment (Abgeschlossenheit)

Another problem with the underground parking place is self-containment. According to section 3 of the German condominium act, “(2) Separate ownership should only be granted where the apartments or other areas are self-contained.” It would not be a problem for the separate underground garage with doors, which would naturally satisfy this requirement. However, the garage in a condominium is normally without doors, and sometimes only drawing white lines on the ground. Then the problem of self-containment appears.

From another perspective, this problem could also be regarded as a challenge to the definition of airspace. The right of airspace and subsurface is built upon the air column, but it could be accepted as kind of real estate only if it could be distinguished and could be recognized by the mass. And in the context of condominium, which is mainly built upon the modern constructional technique, “self-containment” is also required.

From the perspective of legal practice, there had been a large number of cases about the independent ownership of parking space in Germany since the 1970s. Although it is not limited to the underground parking space, most of the effective rule would naturally applicable to the underground parking space. Now the self-containment is feigned (fingiert) for the parking space and other objects with space nature (Raumeigenschaft) if its surface was permanently marked and located in a self-contained space, which should

at least show an entrance barrier.[562] Nevertheless, for the parking place not located within one closed space, it would not be regarded as self-contained or be independently owned. Such as the parking place with open garage roof,[563] open land space, or side opening carport, which can be solved via Sondernutzungsrecht. Much of the cases in Germany happened in Hamm,[564] Frankfurt,[565] Karlsruhe,[566] and Dusseldorf,[567] which indicated that the cities are leading the new lifestyle and reshaping the perceptions of the independent ownership (Sondereigentum) among German lawyers. As a civil law tradition, the legislator had added the following sentence after this subsection (2) of section 3 of the German condominium act as a newly amendments in 2014, "Parking spaces in a garage shall be deemed to be self-contained areas where their surface area is identifiable through permanent markings." This amendment had just partly solved the problem, and partly justified the airspace as a kind of special real estate.

4.5.1.4. Underground parking space under section 5 of the condominium act

What's more, the more special rules for an underground parking place is under section 5 of the German condominium act. Firstly, when the parking spaces function as ancillary space of the apartment, it could also be regarded as independent ownership in condominium law, if it satisfied the requirements by section 3 of condominium law, e.g. the permanent marking. In legal practice, in many cases,[568] it could possibly have various identities, such as the above mentioned separate "title to units", the element of "title to an apartment", or "parking space as independent usage right", "garages together as title to units", as well as "co-ownership by shares on title to unit with independent usage right".[569] The lawyers (or the notaries) can construct the legal basis for the specific use, there exists flexibility, which is quite uncommon in property law elsewhere. Secondly, for the underground parking space, the title to an apartment could not possibly to build up in some situations. For example, the approval pursuant to section 22 of German

[562] *Rapp*, in: Staudinger BGB (2018), Band I of WEG, section 3, para.20. See also *Hügel*, ZWE 2001, 42, pp.42-47.
[563] *Ruge/Röll* in: Schreiber, Handbuch Immobilienrecht, 2011, Kapitel 9: Wohnungseigentum, para. 114.
[564] OLG Hamm, Beschluss vom 26. Januar 1998 – 15 W 502/97; OLG Hamm, Beschluss vom 22. Mai 2003 – 15 W 98/03; OLG Hamm, Beschluss vom 18. September 2006 – 15 W 259/05–, juris.
[565] OLG Frankfurt, Beschluss vom 20. Juni 1984 – 20 W 602/83–, juris.
[566] OLG Karlsruhe, Beschluss vom 27. Januar 1972 – 11 W 53/71–, juris.
[567] OLG Düsseldorf MittRhNK 1978, 85–, juris.
[568] Such as OLG Karlsruhe OLGZ 1978, 175–, juris. See also *Hügel*, ZWE 2001, 42.
[569] *Rapp*, in: Staudinger BGB (2018), Band I of WEG, Sec. 5, Para.11.

Building law got a negative outcome, and therefore there was a search for the substitute solution in legal practice.[570] The substitute solution is that the land plot would be divided accordingly, and then the separate apartment would solely be featured as independent usage right, with the independent ownership of underground parking space, which was called “underground parking space model”.[571]

4.5.1.5 The allocation of underground parking space

Although the German condominium act spent too much time designing the first two problems (discussed above), there are not so many disputes arose around the allocation of the underground parking space. In practice, the underground parking lot would be allocated as early as they form such a condominium community. There are many possible identities for an underground parking space, such as independent title to units, the element of “title to an apartment”, or co-ownership, etc. As a result, the right to underground parking space is usually clarified after making land register. Therefore, a transparent register system had avoided the many disputes in the Chinese underground parking place (discussed below.) Therefore, a good register system might help to reduce the ambiguity in legal theories.

However, there are still some uncertainties in legal practice, especially when the third party in condominium appears, say the administrator and its administrative assets, which was ruled under the subsection (7) of section 10 of the German Condominium Act.[572] In some cases, it could be very hard to define the administrative assets from the title to an apartment or title to units, especially in the case of a retirement home, shopping center and the likes, or the technical equipment like web cable, or fire alarm inside an apartment. So it was quite hard to make a general statement on the list of administrative assets, and it required a technical and generally accepted standard to judge the value of the relevant

[570] *Rapp*, in: Staudinger BGB (2018), Band I of WEG, Sec.5, Para.16.

[571] Model of caller and model of underground parking space are two models on this problem. See *Rapp*, in: Staudinger BGB (2018), Band I of WEG, Sec.5, Para.16.

[572] Section 10 General Principles

(7) The administrative assets belong to the Community of Apartment Owners. They consist of the things and rights created by law and acquired in legal transactions in connection with all aspects of administration of the jointly owned property, as well as any obligations which have arisen. The administrative assets include in particular the claims and powers based on legal relations with third parties and with apartment owners, as well as moneys received. If all the apartment ownership rights are united in one person, the administrative assets shall pass to the owner of the plot of land.

part with a temporary purpose or not.[573] What's more, according to the sprite of a recent court ruling at state high Court of Justice of Berlin (Kammergericht Berlin), the underground parking space could also be part of the building, even if it was a so-called "cross-border encroachment (Grenzüberbau)".[574]

4.5.2 The US cases: a glimpse

The US situation is much better because they do not have much difficulty in the sense of conception (advantages from "bundle of rights"), although the condominium law in the US existed in the form of statute mainly at the state level. As noted in the previous chapter, many US lawyers had focused on the efficiency of the use of common space in a condominium. Moreover, middle-class families tend to live in a house rather than a condominium if they can afford them. Therefore, underground parking space is not a hot topic in the US.

In case Tivoli Condominium Ass'n v. Rodin Parking Partners, L.P.,[575] the developer intended to develop 114 Residential Units in the Tivoli with a two-section parking unit: one section of the unit was enclosed, and the other section of the unit was outdoors. This parking unit was identified as the 'Garage Unit.' The unit consists of 121 parking spaces underground and approximately 90 additional parking spaces above ground.

The Condominium association brought an action against the developer, seeking a declaratory judgment as to ownership and control of "garage unit" of parking spaces not conveyed to unit owners.[576] The Commonwealth Court of Pennsylvania found that declaration noted that portions of each parking level "will consist of Limited Common Elements for Residential Units whose purchasers elect to purchase a parking space, while the remainder of each level will be part of the Garage Unit." Accordingly, the court held that the condominium declaration adequately described "Garage Unit" boundaries, and

[573] KG Berlin, Beschluss vom 23. Juli 2015 – 1 W 759/15–, juris.
[574] KG Berlin, Beschluss vom 23. Juli 2015 – 1 W 759/15–, juris.
[575] Tivoli Condominium Ass'n v. Rodin Parking Partners, L.P., 109 A.3d 344 (2015).
[576] Defendants [Appellees/Declarant] intended to develop 114 Residential Units in the Tivoli with a two-section parking unit: one section of the unit is enclosed, and the other section of the unit is outdoors. This parking unit was identified as the 'Garage Unit.' The unit consists of 121 parking spaces underground and approximately 90 additional parking spaces above ground.

the garage unit was validly created at time condominium declaration was recorded. Therefore, it seems that the court tends to respect the declaration between the developers and the condominium owners.

Disputes also happened between condominium owners and the condominium associations. In case 334 Barry In Town Homes, Inc. v. Farago,[577] Condominium association brought an action for declaratory and injunctive relief to preclude owners of one condominium unit from continuing to use area adjacent to their allotted parking space in underground garage. Appellate Court of Illinois held that "space behind and adjacent to the parking area for condominium unit was not "limited common element" under condominium declaration, and thus condominium owners were not entitled to exclusive right to use that property for additional parking." Again, the declaration became a basis for allocating of parking space. The declaration of condominium could be regarded as a constitution of allocating parking space.

The zoning regulations could be an exception to the previous principle. In case Taylor v. Eureka Inv. Corp.,[578] Owners of condominium units brought declaratory judgment action against owners, developer, and manager of adjacent condominium, contending that they were entitled to park without charge in the underground garage of the adjacent condominium. The court held that "condominium owners were entitled to park without charge in the garage of an adjacent condominium under terms of "accessory parking covenant" which had granted such parking privileges in exchange for a zoning exception." Therefore, the US situation is quite clear. On the one hand, as there exists a clear condominium declaration, the disputes were extremely few. On the other hand, the court would not take a social concern on the condominium owners. In other words, the market had played a central role in allocating underground parking lots.

4.5.3 The Chinese case

Unlike Germany, which concentrates on the conception of the underground parking space,

[577] 334 Barry In Town Homes, Inc. v. Farago, 205 Ill.App.3d 846 (1990).
[578] Taylor v. Eureka Inv. Corp., 482 A.2d 354 (1984).

the legal identity of the underground parking space is the biggest problem in Chinese condominium law. However, after paying extra money for a parking lot, the form contract between the developer and the condominium owner would clarify which parking lot (on the ground or underground) belongs to the condominium owner. However, the contract would normally not clearly write which parking lot is for common use. There was also no transparent register system like that in Germany. Therefore, there were always disputes between the developer and the condominium owners on the parking lot.

Both the scholars and the lawyers hope the allocation of the parking lot could be deducted from the theory of condominium. Currently, there are roughly five representative theories to allocate the underground parking space in China, including allocations according to the size of dwelling area among the unit owners, the co-operation among condominium owners, a determination by contract, developer ownership, and the state ownership.[579] The disorder of underground parking space in China is mainly caused by the disconformity in the theoretical basis of the condominium, coping with an outdated land registry system.

From a normative perspective, there are already special rules for the garage within the condominium law, which is stipulated in section 74 of the Chinese property law 2008. The main character of this rule is that it set the needs of the condominium owners as the best priority.[580] However, in practice, the developers usually do not sell all the parking space to the condominium owners, but leave some amount of money for future selling.[581] As the real estate is expensive in China and most of the young families would buy the apartments rather than rent them.[582] Therefore, the condominium owners normally

[579] *Shen/Zhang*, J. L. Appl. 114, 2018(1), p.114.

[580] Article 74 The parking spaces and garages that are within the building area and planned for parking cars shall be used to satisfy, above all else, the needs of the owners. The ownership of the parking spaces and garages shall be stipulated by the parties concerned by way of selling, complementary using or leasing, etc. The parking spaces occupying the roads or other fields commonly owned by all owners shall belong to all the owners.

[581] The developers would also leave some grounds for the future development, consequently, some big condominium communities might consists of the first phase, the second phase and the third phase. Such commercial practice is understandable, because the developer had already spend much of money in buying the "land use right for construction", and accordingly have no much spare money to develop the whole land in a short time. However, after they get the money from selling the first phase, they have the money for the second phase and third phase.

[582] There is an interesting saying in China that "China's housing prices are fried up by the wife's mother", because the mother-in-law would normally not permit their daughter to marry a man without a condominium ownership. It is not a joke, but the social reality, which could explain why there were so much condominium owners in China. See *Ye*, how much does it cost a man to get married in China? Clue: it involves a flat and wads of cash, China Morning Post, Feb. 20, 2017.

presume that all the remaining parking spaces (expecting these had already been bought by other unit owners) are properties within co-ownership, which should naturally have been commonly shared by the condominium owners, while the developer would sell them to others for a higher price. Alternatively, the scope of the common area within a community is not clear in China. As the apartments price consists mainly of two parts: the first part is the usable area, and the second part is the public area to be shared. However, in commercial practice, the calculation of "public area to be shared" is not possible.

Therefore, the claims to ensure the owner of the parking space is quite common in China. For example, in a case by the secondary intermediate court of Shanghai in 2007, the condominium developer, Xinhai real estate development Co., had sold all the parking spaces of the first floor and the underground, over 3800 square meters in total, to Saiyuan Co., and then registered these parking spaces in front of the land registry. The condominium owners' committee sued the developer in an administrative procedure for withdraw of the parking space registry. However, this case was dismissed by the court. The court held that the Xinhai Co. had reserved the right of all parking space before selling the condominium unit, which meant Xinhai Co. was still the legitimate owner of the parking space, and whether Xinhai Co.'s behavior is appropriate in the sense of civil law, especially the principle of good faith, is not the task for administrative proceeding.[583]

The above case happened in 2007, which was the first year of the Chinese property law became effective. At that time, many condominium owners could not afford an automobile outside big cities like Shanghai, Beijing, etc., and the parking space was normally a gift if you buy the apartment quite ahead of time.[584] However, as a matter of fact, very few Chinese families own a personal car at that time. Therefore, the potential value of a parking lot had not been recognized. In this case, Xinhai Co.'s behavior was just to make some extra money for a real estate transaction.

Now, one-third of the families in China have cars, the total car number had reached 0.29

[583] Condominium owners' committee v. land registry, case No. (2007) HU 2 Zhong Xingzhong Zi Di 131 Hao (沪二中行终字第 131 号).

[584] *Zhang*, would the price of parking lot decrease? Why the parking space so expensive in Peking? China Youth Daily, June 24, 2017.

billion,[585] the parking space is much more important, and its price is sometimes higher than a domestically produced car. Moreover, in some districts, the price of parking space per square meter could be much higher than the square price of the apartment.[586] It would be hard to attribute the parking lots as a supplement of the apartments. Even in such circumstance, the condominium owners still sue for the old question: the priority of condominium unit owner in the allocation of parking space. Such disputes were mainly stimulated by two factors: the ambiguity of real estate advertisement (commercial tricks of the developer)[587] and the social psychology of the consumers (free rider). In this context, the Supreme Court tried to orient the parking space in its judicial interpretation of 2009 but had achieved only a limited effect.[588] According to Article 5 of this judicial interpretation, "The builder's disposal of parking spaces and garages to owners in the form of sale, gift or lease according to the designated proportion shall be deemed as to "satisfy, above all else, the needs of the owners" as mentioned in Paragraph 1 of Article 74 of the Real Right Law. The term "designated proportion" as mentioned in the preceding paragraph refers to a designated proportion between the parking spaces and garages designed for parking cars within the building are and the number of premises." What's more, in Article 6, "In addition to those that are within the building area and planned for parking cars, the parking spaces that occupy any road or any other place commonly owned by owners shall be the parking spaces as mentioned in Paragraph 3 of Article 74 of the Real Right Law."

The Chinese dilemma is that, if there were still some remaining parking space, most of the condominium owners tend to share them together for free of charge. Although the

[585] Data from Chinese statistics of 2017.

[586] *Zhou*, parking space dearer that the car, and higher in price than the apartment per square meter, report of Jiangmen News, May 18th of 2017, p. B01.

[587] In case Zhang and others v. Beijing X real estate developer, the real estate developer had sold all the parking space to Xinxing company and registered in the land registry, which had also purchased 50 apartments as the employees' dormitory. However, Xinxing Company could only free use of parking space for its employees, but not other condominium owners in this residential community, and the latter had to pay 15 RMB per day (nearly 2 Euro) to park their cars. But according to section 8 of the previous apartment sales contract between Mr. Zhang, as well as his neighbors and the real estate developer: "The developer should provide the condominium owner underground parking space." And the court judged that it is justified for Xinxing Company to earn the parking fees from its own parking space, but the real estate developer had breached the contract with Mr. Zhang and his neighbors, therefore should pay all the parking fees for Mr. Zhang and his neighbors.

[588] Interpretation of the Supreme People's Court on Several Issues Concerning the Specific Application of Law in the Trial of Disputes over Partitioned Ownership of Building Areas (2009), No.7 [2009] of the Supreme People's Court.

remaining parking space is not enough, they did not care. Later, they found some of their rich neighbors had already bought two or more parking spaces, and some of the parking space holders even come from neighboring residential communities, while the condominium owners in their own community encounter more difficulties, then there was public outrage. Accordingly, the unit owners or their committees would employ the clause "serve the needs of the condominium owners as the best priority" maxim to seek legal remedies.

In order to alleviate the "market failure" in this aspect, some cities had made local planning rules especially for this problem, such as that in Nanjing City, the rule is that the developer should leave at least 15% of parking space especially served for the needs of the condominium owners with this residential community.[589] According to the newly revised "Rules on the designation of urban residential planning" in 2016, the minimum percentage for condominium owners should no lower than 10%, and the local government had the power to set the concrete criteria. However, these administrative norms had caused more problems in legal practice.

In case Xinghan condominium owners' committee v. Xinghan real estate Co. (developer) by the Gulou district local court of Nanjing in 2013, the developer had constructed some extra parking lot (without planning approval) to sell them to non-condominium owners. The court held that relying on this local planning rule, the court would allocate six of the permitted parking lot, as well as another 23 "overbuilt (without planning approval)" parking lot to the owners in total. Nevertheless, this "judicial intervention" was quite limited in China, which was under criticism by some Chinese scholars. [590]

However, in recent years, there are more cases by the regional court in different provinces throughout China, respect the apartment sales-purchase contract as a basis of judgment. Such as the cases happened in Anhui Province in recent years. [591]In other words, there

[589] Section 6 of the "rules on Nanjing house and condominium apartment transaction".

[590] Xinghan condominium owners' committee v. Xinghan real estate Co., case No. (2013) Gu Minchu Zi Di 1656 Hao (鼓民初字第 1656 号).

[591] Zhongding condominium owner's committee v. Zhongding real estate development Co., case No. (2017) Wan 18 Minzhong 1648 Hao (皖 18 民终 1648 号). In this case the court had judged that "the ownership of the underground parking space under dispute had already been clarified by the Zhongding real estate development Co through additional contract, and it therefore belong to the Zhongding real estate development Co., whose property right should also be respected by the court."

are more and more “liberal” judges in China now, but the key problem is still the ambiguity of the basic design as well as the disorder of land registry.

4.5.4 Short summary

The underground parking lot in common area is another popular topic in a condominium. The German model spent too much energy in clarifying the legal nature of underground parking lot, while China is in lack of a good register system, the US underground parking space did not encounter many theoretical obstacles and mostly rely on the market.

It seems that there are always conflicts between the developer and the condominium owners in China. Why is that? Because the condominium purchase contract normally clarifies the special ownership, but leave the common areas unclear, which lead to enormous disputes. The condominium law in China was expected to answer who is the justified owner of the underground parking lot, and should the remaining underground parking lot still in charge of the developer when the whole buildings were already sold out? In legal practice, the Chinese condominium owners would fight for their common ownership on the unsold underground parking lot, even there were contradict statements in the condominium purchase (form) contract. In some regions, the court would support the condominium owner for social considerations, which had, to some extent, encouraged such disputes. Additionally, the different strategies between different regions are quite harmful to the rule of law, as China is not a federal but a unitary state, and the law was expected to equally be applied throughout the country.

Considering the German and US situation, most German cases happened within the scope of the legal nature of the underground parking lot. In other words, if the parking lot could not satisfy the self-containment requirements, the lawyers would not regard it as an independent part within the condominium. However, the amendment of the condominium law in 2014 had changed this situation. The lesson from Germany is that the strictness of property and real estate has caused much inefficiency.

Both Germany and the US had set the condominium declaration as a basis for allocating underground parking space and other common facilities, which is a cure for alleviating

disputes. In other words, such regimes relied more on market mechanism and private autonomy rather than the social concerns of the judiciaries. From this aspect, it might be an unreasonable load for the condominium law and the court to allocation the underground parking space. On the contrary, they should play a role as a protector of the condominium purchase contract and the declaration. For the benefit of both the developer, the condominium owners, and their committee, a much clearer declaration on the whole space and facilities (especially the common area) of the condominium seems a better solution for the Chinese current chaos.

4.6 Summary of this chapter

Different from Chapter 3, which concentrates on the negative side of airspace right, this Chapter concentrates on the positive side of airspace, “the allocation of airspace”. The rules and values seem dramatically different. Generally, this Chapter had mainly dealt with the problem of airspace/subsurface in a condominium. The discussion was divided into three layers.

Firstly, a condominium is a special type of airspace right. Like mining right, the main difference between a condominium and other airspace rights is that condominium/mining apply to special rules. In contrast, the general airspace/subsurface right would have to rely on property law, e.g. section 905 of the German Civil Code, or section 136 of the Chinese property law of 2007. Historically, the primary forms of condominium could even be found in Sir Edward Coke’s time. Accordingly, the interactions between the British “upper chamber” case and the US condominium law, the interrelation between Stockwerkeigentum and Wohnungseigentum should not be neglected. The spirits and concentrations of the “upper chamber”, the “Stockwerkeigentum” and the modern condominium are quite similar. However, within the common law and continental law, enormous endeavors were made to achieve a “condominium effect”. How did these cases of “upper chamber” and the “Stockwerkeigentum” work? Obviously, they worked under the intuitive ideas on airspace usage rather than a special and abstract condominium law. Even currently, “airspace right”, “Kongjianquan (airspace/subsurface right)”,

“Raumeigentum” is still used by the US, the Chinese and German lawyers to note condominium, which had reflected the historical, theoretical, and conceptual interaction between the condominium and the ancient “upper chamber” and the “Stockwerkeigentum”. From this sense, general airspace right and its modern branches are actually the relationships between mother and children, as the condominium, mining rights were born from the airspace/subsurface rights, and gradually forms their special rules. All in all, the general airspace/subsurface right and its branches share some same characters at least in nature.

However, the German lawyers might not fully accept that the condominium is in nature a kind of airspace/subsurface right. It is because at least the land was owned by the condominium owners. In contrast, the Chinese condominium owners do not have ownership of the surface land, the main structure of the building, most of the exterior wall, the elevator, etc. What did they have? The airspace inside these areas. The nature of condominium (especially apartment ownership) is more obvious in China. Therefore, many Chinese lawyers and layman would accept the idea that condominium is in nature the right of airspace.

Secondly, not only the condominium is a kind of airspace right in natural, but also it deals with the allocation of airspace, especially in the common area. For example, the use of the exterior wall and the allocation of underground parking space. These two problems are rather airspace right problem within an airspace right (condominium). For the use of the exterior wall, the US mainly relied on concrete legislation. The US condominium act at the state level are very detailed, some even mentioned about the permitted flags to be used on the exterior walls. However, as shown in the cases, for the use of airspace of the exterior wall, the condominium owners would it is under special area, and would try to prove it as a common area in case of taxation or fees. In contrast, the German lawyers emphasized the procedural matters and the decision of the condominium’s committee. For a series of reasons, the condominium administrator had the power to prohibit the condominium owner from hanging flower pot on the exterior wall bracket, or prevent condominium owner from installing air conditioners. The exception is that the

condominium owner is making improvement rather than structural change. Additionally, the management of condominium should not infringe the constitutional right, such as the freedom to information (Parabolantennen). In China, most of the regions would not regard the use of airspace of the exterior wall by the condominium owner as a problem. On the contrary, some court had also officially supported the installation of the air conditioner. Why? Because most Chinese people would regard condominium as full ownership of real estate, as in China, condominium seems the only real estate. Therefore, there were conflicting interests between individual freedom and the order of the condominium community.

The underground parking space is more interesting. In order to combine the condominium with their traditional real estate legal theory, the legal nature of parking space is very complex in German law, especially the self-containment of the parking space, where most legal/theoretical disputes occurred. While the clear condominium declaration is an advantage in Germany, which had reduced the ownership disputes between condominium owners and developers. However, the underground parking lot might be the hardest problem in condominium law. Due to the ambiguity in the stipulation, "...underground parking space... should... serve the condominium owners as a priority", and the outdated land registry system, the underground parking space had experienced rather a harsh time in China. In my opinion, the Chinese problem is primarily caused by the unclear condominium declaration, nevertheless, the deep reason is that Chinese lawyers endowed too much task for the condominium law, which might be better done by the market (like that in the US). The openness in their property system, and the reliance on the condominium declaration had greatly reduced legal disputes in this field. Therefore, a clear declaration and an open property system seem a good choice for the underground parking space.

Thirdly, from the perspective of the modern city, condominium, air conditioner on the exterior, underground parking space, in combination with the high-rise building, are just the symbol of the urban lifestyle. As shown in the German cases and the US cases, the condominium committee had played a key role in operating the condominium. The

administrative power within the condominium, this private-administrative power, aiming at improving the efficiency of the use of airspace, which is far from the orthodox theory of the property right. However, it represents a future trend: to keep a large city in order, you need a powerful city government; to keep a multifamily condominium in order, you need an advanced technique for private administration (management). Therefore, the condominium owners' committee would become more and more important in the community living.

Fourthly, the recognition of general property rights on airspace/subsurface right would surely a supplement when there are loopholes inside the law. As shown in the cases of the exterior wall and parking lot, if the relevant countries recognized a general airspace/subsurface right, many loopholes inside the condominium, especially the common airspace, could be solved by the general rules. With these rules, many dilemmas could be avoided.

All in all, the condominium is a kind of airspace right in nature, and it mainly deals with the use of airspace/subsurface, especially in the common area. No matter the usage of the exterior wall, or the allocation of the underground parking lot, some rules seem helpful to cease dispute and improve the efficiency of airspace usage and allocation. The first is the clearness of the condominium declaration, which is the best way to help market work. The second is the cost and fees should be corresponding to the benefits, which could also be regarded as a market method. Thirdly, there should be a good balance between the freedom of the condominium owner and their committee, the committee's role in management would become more and more important. However, the market and private autonomy should also be set under the constitutional framework and relevant public law regulations.

Conclusion

I. Understanding the airspace and subsurface in a systematic way

Airspace and subsurface law were roughly a modern phenomenon, although its origin could already be traced in the Roman construction law (quite fragmented), and in the common law cases (tried by Sir Edward Coke). In pre-modern history, airspace and subsurface were limited by at least two factors. The first was, as discussed in Chapter 1.2, an idea of land with limited vertical stretches (**Condition I**), and the second was, the recognition of subsurface and airspace as kind of property parallel with its surface ownership (**Condition II**), as there would be no possibilities for airspace and subsurface right if the land would extend from the sky to the center of the earth. According to these criteria, ancient Rome, ancient China, Germany, France, Netherlands, and Britain are all in lack of one or both elements. Accordingly, general property rights on airspace and subsurface had endured enormous obstacles before the industrial revolution. Consequently, the airspace and subsurface right become a modern phenomenon, especially in urban areas.

As summarized in Chapter 2, there are three layers of airspace/subsurface right. **The first layer** is the general vertical legal order of airspace/subsurface. In modern cities, the airspace and subsurface provide a stage for modern transportation (aircraft, railways, subways, bus, automobile, bicycles, etc.), modern infrastructure (sewerage, power cable, hot water and gas pipelines, etc.), modern dwelling (typically condominium and the affiliate such as air conditioner, underground parking lot), as well as renewable energy (wind energy, solar energy, geothermal energy, etc.). All these aspects need to use some airspace or subsurface. As introduced in Chapter 2, the mining law underground, the aviation law in the airspace and the real estate law on the land surface. Additionally, the current real estate law could still be divided into traditional real estate law and condominium law (branches of airspace/subsurface law). Therefore, from the perspective

of the current legal system, the law of airspace/subsurface is very comprehensive and somewhat fragmented. Nevertheless, such a reality did not preclude the possibility to treat the airspace/subsurface problems from a systematical way. This dissertation is not so revolutionary and ambitious to overthrow all these existing legal fields and change them into a unitary airspace/subsurface law, but try to clarify many disputes arose in different legal field might be caused due to the negligence of the airspace/subsurface rights. For example, the disputes aroused between landowners and aircraft operators is not merely a dispute in aviation law, which related to the minimum safety altitude and the buffer-zones. Such disputes also related to the freedom of surface landowner and airspace owner (if there exists such right holder). Alternatively, such disputes are related to the general legal vertical order of airspace/subsurface, which means a mixture of property law and relevant public rules. Therefore, keeping the general vertical legal order of airspace/subsurface in mind would help us to solve a series of problems in modern urban society.

The second layer is the general property rights on airspace/subsurface, which related to the rules on airspace/subsurface ownership, register, and transfer, the airspace/subsurface rights mainly deal with the following problems. As the US had defined the airspace/subsurface as real property, many traditional real estate rules are applicable to airspace/subsurface. Although the Model law of Airspace is an independent law, many common law rules on real estate were adopted, which could be regarded as a supplement of real estate law. Therefore, the general property rights on airspace/subsurface is not a revolution, but an update of the traditional airspace/subsurface right. Therefore, airspace/subsurface law does not necessarily mean an independent law outside the civil code, in the continental legal family, the general property rights on airspace/subsurface can also be added into the code by some amendments of the current stipulations. However, there were no general property rights on airspace/subsurface, and only theories and judgments of that in China, which had caused much difficulty in both boundary setting (Chapter 3) and common space allocation within a condominium (Chapter 4).

The third layer is the private airspace/subsurface law in branches. Currently, the main branches are the condominium, superficies for underground and overhead space, and

development right (TDR). However, the only condominium is widely adopted around the world. In contrast, the superficies in Germany has no special meaning in airspace/subsurface. Furthermore, the nature of condominium as airspace/subsurface right is also under disputes in Germany. However, the three countries had faced common problems in urban daily life. For the disputes raised by the allocation of common airspace and subsurface within a community and the competing usage of airspace and subsurface, the general property right on airspace/subsurface right is quite helpful, especially when there are some loopholes.

The three layers of airspace/subsurface rights are quite helpful to illustrate why there are always so many public rules. Furthermore, a combination of public laws and private law in airspace/subsurface disputes is inevitable. In contrast, another conclusion from this dissertation is that although, currently, the general property rights on airspace/subsurface could be compensated by a developed public law system, the general property rights on airspace/subsurface is still irreplaceable, especially for the future challenges and the supplement of the current loophole within different branches. In order to illustrate this judgment, this dissertation selected two examples in different layers and branches.

The first example is the boundary setting cases. From the historical and social perspective, the legal position of airspace and subsurface had dramatically changed by the advent of aircraft at the beginning of 20th century, and a new theory for airspace is intensively urged by the gradual popularity of aviation, especially the air travel as equal means of the trains and long-distance bus. In other words, modern technology and the modern way of transportation had changed our perception of real estate and its airspace and subsurface. The most difficult problem is how to draw an appropriate line between the navigable airspace and the height in airspace for full enjoyment of the land or the building on it according to its functions. In dealing with this matter, a combination of property law and various public laws (aviation law, environmental law, constitutional law, etc.) had become necessary.

The second example is the common space allocation within a condominium. Similar as the landowner-airport disputes, another revolution of special airspace and subsurface right

happened in the multifamily buildings, which had already been a dominant urban residential form, especially in China and big cities in the US and Germany. The condominium is a revolution in the concept of real estate, and there are still more sub-airspace and subsurface problem within it, especially in the common area. The air conditioner installed in the exterior wall, the underground parking spaces, both have increasing value in the modern lifestyle. How to allocate them efficiently, fulfill the needs of condominium owner, and at the same time, keep the whole buildings in order become another branch of modern airspace and subsurface law. In addition, the emphasis of private-administrative power seems necessary, which is a new area inside the real estate concept but had slept for quite a long time in legal history.

Therefore, the aircraft-landowner disputes, the use of airspace in the exterior wall and allocation of the parking lot within a condominium, if we saw all these cases altogether, we would find that they were under the same legal topic: airspace and subsurface right in different layers. Although they related to the totally different legal field in current law, the awareness of the system of airspace and subsurface law is unavoidable in dealing with the relative legal matters. In addition, the advantages of directly using the jurisprudence of the airspace/subsurface seem obvious. On the one hand, more direct protection on airspace/subsurface would be possible, as people do not need always to fight for their airspace/subsurface right through the environmental suit. On the other hand, if we recognize the airspace/subsurface right as kind of real estate, we could surely stimulate the efficiency of airspace/subsurface allocation and the potential market value. In addition, airspace/subsurface law would help us adopt a systematic perspective on all these matters of vertical airspace/subsurface land use, the current fragmented situation would be alleviated, then some general strategies could be made. Therefore, the airspace/subsurface right is quite beneficial in dealing with the airspace/subsurface issues in both branches and in general.

From the case study in Chapter 3 and Chapter 4, the airspace and subsurface right mainly deal with the following disputes: the boundary setting, the allocation among co-owners, the alleviation of competing for usage. In dealing with these matters, different principles

are applicable. Concretely, for the boundary setting, the technology is a central concern, the private property must be respected (expropriation only at justified public interests), and the public remedy for private right seems a solution for civil law countries. For the allocation among co-owners, both the theoretical deduction, efficiency, and modern lifestyle should be equally cherished. For the alleviation of competing for usage, the social value and the new ideal urban ideas should be considered.

Therefore, the theory of airspace and subsurface had grown up with the industrial revolution and the development of modern cities, as well as the change of modern lifestyle and social values. It provided the basic living form, important transportation, as well as the infrastructure and facilities for the city. Therefore, no matter in the aviation law, the property law, or the mining law, no matter the disputes happened within one special law or related to both private law and public law, if it related to the use of airspace/subsurface of a land plot, taking a systematic perspective of airspace/subsurface right, and applying the jurisprudence from both the negative side and positive side would always be beneficial

II. A property law with vertical concerns: the built of a general property right on airspace/subsurface

Airspace/subsurface right had also provided us with new insight into the nature of property right, its modern challenges, as well as the future orientations. However, the vertical use of airspace appeared as a modern phenomenon, when the mining law and the aviation law became a commonplace (from the traditional land law). In fact, the three layers of airspace/subsurface law are very broad, especially the first layer. It is because nearly all activities could be included within the first layer. Nevertheless, it would be quite impractical to use a comprehensive airspace/subsurface law (in the three layers) to replace all the current laws. However, a property law with limited vertical concerns seems still an attainable destination.

In my opinion, the main task of property law with limited vertical concerns is the recognition of the general property right on airspace/subsurface (the second layer). Why is that? It is because, on the one hand, the general property right on airspace/subsurface

could stimulate the airspace/subsurface market, which is parallel with the land surface market. On the other hand, the general property right on airspace/subsurface is quite useful to achieve the general vertical legal order of airspace/subsurface (the first layer; Chapter 2.2), especially the boundary setting cases (Chapter 3). In addition, with a general property right on airspace/subsurface, many difficult cases in branches, such as in condominium law, could be solved (Chapter 4.4, Chapter 4.5). Furthermore, adopting the general property right on airspace/subsurface is also helpful to protect the surface property owners in the era of drones, which could surely not be solved by administrative laws (Chapter 3.5). Last but not least, recommending the general property right on airspace/subsurface is also helpful for the green economy. Therefore, the general property right on airspace/subsurface is quite useful in both legal theory and legal practice, which could not totally be replaced by public law rules.

For the contents of property law with limited vertical concerns, besides the land surface, how could the airspace/subsurface be owned, registered and transferred. In this aspect, the US had already developed a system of general property rights on airspace/subsurface in its legal practice, which could be regarded as a good example. As introduced in Chapter 2.3.2, their experience was recorded as the Model Airspace Act of 1973, and accepted by states in different forms. Their strategy was quite simple, the first step was to define the airspace as real property, and then many basic common law rules on real property would be applicable. The creation, transfer, register, apportionment, division, and taxation were all similar to other real estates. Their second step was to set special rules on airspace, such as “limitations with respect to Highways, roads, streets, alleys, and bridges” (sec.10), and cooperation of authorities and joint exercise of powers by authorities (section 11).[592] In other words, what they had made was just a legal recognition of the daily practice in airspace transaction and operation in urban areas. Therefore, in the US, the airspace right was nothing revolutionary but a vertical “updated version” of the traditional real estate law.

The situation might be different in Germany because it was theoretically very hard to

[592] Model Airspace Act, 8 Real Prop. Prob. & Tr. J. 504 (1973).

prove that there are general property rights on airspace and subsurface. From the example of the underground parking lot, the difficulties of proving the self-containment of the airspace/subsurface right had been revealed, which was not solved until the amendment of Apartment ownership Act in 2014. Imagine if there were a general property right on airspace/subsurface in Germany, the judges would surely feel better in dealing with the disputes connecting with this new phenomenon. In contrast, many of the airspace/subsurface problems were solved by public laws or even constitutional laws in Germany. However, as shown in Chapter 3.4, sometimes the public laws were not enough. Therefore, the recognition of the general property right on airspace/subsurface could be a future choice for Germany, although they have to deal with the systematical problem within property law. However, as introduced in Chapter 2.3.1 there were already many property rights outside the German Civil Code, and the number will be increasing in the future, which means a reduction of the scope of the code. As the modernization of the law of obligation, in someday, there would surely be a need for German lawyers to summarize the modern phenomenon of property law (E.g. the virtual property, the information, the airspace/subsurface right), and there should be a chance for the general property right on airspace/subsurface.

The Chinese problem is that the airspace/subsurface right was recommended by the property law of 2007, but the stipulation is too “special” (only section 136). As discussed in Chapter 2.3.3, although a general “Kongjian Quan (airspace/subsurface right)” supported by scholars and local courts in many regions of China, the underground unit could even not be registered in many cities of China. Therefore, property law with limited vertical concerns in Chinese law means a more practical property law and a modernized land registry system. In addition, under the Japanese influence, China did not adopt the general property rights on airspace and subsurface. However, the drawbacks of this choice had revealed in legal practice. The ambiguity of the legislators had already caused confusions in different regions (Chapter 2.3.3.3). In addition, as the property law, especially the condominium law, is not quite detailed in China, a general property right on airspace and subsurface is always required as a supplement. In fact, the current

“property-Sache” dualist system is a good soil for the adoption of general property right on airspace and subsurface. Therefore, as China is making the new Civil Code, many modern elements were added under the German-style background, it is also a good opportunity for China.

In summary, as a modern challenge for the traditional property law, the airspace/subsurface right had required a vertical concern. Firstly, the vertical concern means the openness of the property system, which would be friendly to the acceptance of airspace/subsurface right. Secondly, the vertical concern means the recognition of a general property right on airspace and subsurface. Thirdly, the vertical concern means the respect of airspace/subsurface right in the different branches. In addition, although the airspace/subsurface is a real estate, its specialty should be respected. For example, the Chinese scholars encouraged the registry to register the airspace/subsurface with the concrete location, height, width, shape, etc. (Chapter 2.3.3.2). Although from the German perspective, the airspace/subsurface right might just be a burden of the land surface, the recognition of the airspace/subsurface right would definitely stimulate the potential of airspace/subsurface right. Fourthly, from a German perspective, the property law, especially the airspace and subsurface right, could not succeed without the help of public laws, which dealt with the modern real estate issues, especially in the urban areas. Concretely, the private law set the skeleton and the administrative law formed the fleshes. This judgment is basically right, but we cannot ignore that the general property right on airspace and subsurface is not replaceable.

III. New opportunities for airspace/subsurface in the green economy

As shown in chapter 3.5, although the German law could use the public law method to solve the airspace/subsurface disputes, the environmental/administrative legal remedy would not function well in the era of drones, which would cause little noise, bad smell, but would do huge harm on the individuals. Furthermore, the US scholar held that “The sky holds some of the most promising solutions to the world’s toughest energy challenges… incorporating options or liability rules into laws regulating airspace is a

useful way to promote wind and solar energy while still respecting landowners' existing airspace rights."[593] In the meantime, the German lawyers had also found the connection between airspace and the wind or solar equipment. For example, some German jurist had also compared the wind energy use as a new kind of natural resources (Bodenschatz), some other scholars even discussed the applicability of German federal mining law (BBergG) on wind energy.[594] In China, some legal scholars had also recognized the significance of airspace in making the regenerated resources, but their concern was mainly around the "renewable energy law of PRC", which focused on the industrial structure, market orientation and subsidies for renewable energy, regardless the potential dynamics and tension of airspace law. However, this is just a new field, not too many concrete institutions and judgments. But the value of airspace/subsurface right in the future green economy, in the time of drones, had revealed. Therefore, the airspace/subsurface right would become more important in future urban society. In other words, the real estate law should sooner or later make arrangements on the update of airspace/subsurface rights.

IV. Indication for the future "Chinese Civil Code"

The US and Germany had both their own ways of dealing with airspace and subsurface. The US way is to treat airspace and subsurface right independently, and building up the airspace and subsurface right primarily mainly through case law, and later in combination with legislation at both federal and state level. The airspace and subsurface law had also changed over time, and the development right is a new trend. The disadvantage is that the follower could not easily build up similar airspace and subsurface right through quoting the US cases, although the US lawyers had also admitted the legislature would become the main creator of airspace law in the future. Comparatively, the German dogmatic seems also powerful, rather than making up new special laws on airspace and subsurface, they use the existing norms in various law to build up the airspace and subsurface law in each

[593] *Rule*, 59 UCLA L. Rev. 270, pp. 270-275.
[594] *Schmidt-Eichstaedt*, LKV, 2018, 1, pp. 1-3.

branch, which is also indicated for the civil law countries with codification. The compromise strategy in airspace/subsurface adopted by Japan and the "Taiwan District" seems absorbed the advantages from both sides, which is also quite influential in current Chinese property law. What should China do to face modern challenges?

The special dilemma of China is that China had adopted a German civil legal system, but trying to build up general property rights on airspace/subsurface. How could the theoretical conflicts be solved?

As introduced in Chapter 1.6, China is now legislating its own civil code. However, too much academic interests are attracted to "debating personality rights protection" in China,[595] which seemed to be questioned with a political color rather than purely academic. According to the most recently published draft, there is a very little breakthrough in airspace and subsurface law. One of the newly added rights is the "residence right (like "Wohnrecht" in Germany)". In contrast, the airspace and subsurface stipulation remained unchanged (a repetition of section 136 of the current property law), which mainly concentrated on the "the right of construction land use". Many Chinese scholars criticize the current draft for its simplification and unsystematic.[596] In addition, Chinese legislators should not ignore the endeavor and development of airspace and subsurface right by the local courts, especially in the field of the condominium. Consequently, the scope of airspace and subsurface law should be broadened.

Firstly, China should broaden the scope of airspace/subsurface law. The current airspace and subsurface rights in China are only a special "section" rather than a legal system, which is not enough to stimulate the potential value of airspace/subsurface in the real estate market. Additionally, in lack of a general property right on airspace/subsurface, the current stipulations caused more confusion in legal practice. Therefore, a systematic arrangement in the Chinese Civil Code is required.

Rather than the one "section" design, "bigger" airspace and subsurface law should be adopted by the legislature. The legislator could firstly broaden the scope of the object of property. As the current general part of Chinese Civil Code is trying to insert the virtual

[595] *Chen*, 26 ERPL 31, pp. 31–35.
[596] *Liu*, G.S. Soc. Sci. 153, 2018(2), pp. 153-158. *Fang*, Tsinghua L. J., 2018 (2), pp. 59-73.

property and personal data, a change in the law of the traditional legal object is unavoidable. China should take this opportunity to adopt the airspace and subsurface right in different layers, which would surely make the Chinese Civil Code friendlier to modern challenges. Therefore, the first step is to broaden the legal objects and make an open property system.

Secondly, China should recommend the general property rights on airspace/subsurface law. As illustrated in the previous paragraphs, there were a lot of advantages in the adoption of the general property rights on airspace/subsurface. The Chinese local courts would no longer be confused about whether there is a general property right on airspace/subsurface. What's more, many loopholes in branches could be revised. In addition, under the state-ownership on the land surface, airspace/subsurface, the enormous potential value of airspace/subsurface market would be realized. The advantages of the current "property-Sache" dualistic property system would also be revealed. Therefore, China should surely take this opportunity in the new legislation. In the corresponding part, especially the book of property law adding a series analogy section for airspace and subsurface in register, transfer, rent, etc. At the same time, the specialty of airspace/subsurface should also be respected. Then a property legal system with vertical concerns is built up.

Thirdly, China should respect the reasonable co-operation between public and private law, a sole property law approach is not enough to face modern challenges. Although China has not adopted an ordinary/ special court system as that in Germany, there were divisions on different legal matters within a court (e.g. civil division, criminal division, administrative division, etc.). What makes things worse is that the civil divisions of courts tend to use purely civil law to deal with the cases there, while the administrative divisions of courts tend to use administrative rule solely.[597] Accordingly, there was not much opportunity for the formation of airspace and subsurface right in a mixed legal field (a mixture of private and public law). Nevertheless, due to the shortage of constitutional

[597] Shi & Zhou v. Planning Bureau of Hangzhou City, Case No.: (2011) Hang Xi Xing Chu Zi Di 56; Wang Qifang v. Wang Qiang & Kuang Shangmin, Case No.: (2016) Min 0181 Min Chu 3778. The details of these cases see Chapter 2.3.3.

remedy and undeveloped administrative law, it is very hard to follow the German method (building up new law through a combination of existing rules in the different legal field and creative legal interpretations) in China. Therefore, building up airspace/subsurface law through legislation in the book of property seems the only effective way currently. Accordingly, civil legislation should make room for the application of public law, such work should also be done within the legislation.

Fourthly, relevant legislation should also leave space for the new branches of airspace/subsurface law (the third layer). E.g. drone driving, the green economy. It means that there should be a large room for legal interpretation. As the airspace and subsurface right is characterized for its changing nature, much space should be left for the judges, in order to make the airspace and subsurface right to keep pace with the urban and social development. Additionally, it should not be ignored that the general property rights on airspace and subsurface had a nature of regeneration. For example, the mining right and the condominium right are both airspace/subsurface right in a “wide” sense. However, when they become “mature”, they separated from the airspace and subsurface right family, and the new special law becomes applicable. In the future, other airspace and subsurface rights in various branches might “leave” the family of airspace and subsurface law, but the general vertical legal order of airspace/subsurface, and the general property right on airspace/subsurface would be still quite helpful.

As discussed above, the era of drones, solar energy, and wind energy are all relevant to the importance of the airspace/subsurface right. However, the US and Germany had already its own approach to the new phenomenon, which could also be called “path dependence”. However, for China, everything is new. The current property law includes both the German and the US elements, and structural change could still be made before the accomplishment of the Chinese Civil Code, say the “latecomer advantages”. Therefore, China should take the opportunity to reset the traditional property system, as it has already trying to make the new property law compatible with the virtual property, data, etc. Airspace/subsurface right is definitely a new opportunity for the Chinese Civil Code.

All in all, the use of airspace and subsurface is old in origin, but the formation of airspace/subsurface in general and in different branches is a modern phenomenon, which makes it an “anomaly” in the category of real estate. In the US, great endeavors were made to change from “*cujus est solum*” principle to the recognition of “airspace right”, and currently the US scholars tend to use the term “regulatory property” to note TDRs. Comparatively, in Germany, great hardship for airspace and subsurface existed in the strict property concept in private law. In China, the airspace and subsurface endured an obstruction in the “public ownership of land”. However, despite these theoretical and practical difficulties, the airspace and subsurface law had become a reality, especially in different branches (especially the vertical superfices and condominium). China should grasp the opportunity to codify airspace/subsurface right and other modern new phenomena in the new Chinese Civil Code.

Dating back to the legal history, nearly every new legal institution would endure some hardships, because it represents a new trend of legal evolution. The emergence of airspace and subsurface law is largely a result of modern urban development and modern living style, the individuals in the urban society would surely benefit from a property law with vertical concerns. Therefore, the airspace/subsurface rights could be regarded as the dawn of modern property.