

# Market Power, Economies of Scale and the Role of Knowledge for Economic Growth

by

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## Abstract

This dissertation studies the empirical relevance of R&D based growth theories. In previous research on this topic, investigators have typically employed the Solow residual approach to study the impact of knowledge and spillovers on productivity. Yet, relying on the assumptions of perfect competition and constant returns to scale, this framework is not in line with R&D based growth theory, which implies that knowledge creation as the driving force of economic growth is inextricably linked to market power and economies of scale. In this study, a cost function and factor demand system is employed to investigate the empirical relevance of R&D based growth theory with a new version of the OECD STAN dataset covering two-digit manufacturing industry data from Canada, France, Germany, Italy, Japan and the US. In contrast to the conventional Solow residual, this framework allows the researcher to investigate economies of scale, market power and the role of knowledge creation and spillovers for productivity growth in an integrated approach. The empirical investigation reveals that in line with R&D based growth theories, there are indeed economies of scale and mark-ups in nearly all of the investigated industries. Excess returns to R&D are found in four relatively R&D-intensive sectors. In addition to this, knowledge spillovers enhance productivity growth in many industries. International intra-industry spillovers seem to be the most important source of knowledge externalities. R&D intensity is low and there is little or no productivity growth in the few industries where no significant impact of R&D can be found. In all the other cases, knowledge variables are found to explain a good part of the observed productivity growth and they are a source of economies of scale, as theory would suggest. In contrast to competing growth theories, R&D based models imply that mark-ups, economies of scale and a productivity enhancing role of knowledge variables should be found in the data. The empirical investigation in this dissertation suggests, that R&D based growth models seem to pass this empirical test very well.