
Abstract

This thesis examines various forces that affect aggregate performance. In particular, it focuses on competitive pressures and analyses their determinants. It also analyses the importance of the human capital portfolio composition for aggregate performance. Specifically, in the first chapter, it offers an endogenous growth framework, where it models knowledge (patent) licensing among high-tech firms. In such a framework it evaluates how different types of competitive pressure can matter for innovation in high-tech industries. In the second chapter, it offers empirical evidence that the country-wide uptake of telecommunication technologies increases competition in services and goods markets. In turn, in the third chapter, it defines two types of human capital and suggests how the human capital portfolio matters for long-run growth and welfare.

In the first chapter, I present an endogenous growth model, where the engine of growth is in-house R&D performed by high-tech firms. I model knowledge (patent) licensing among high-tech firms where licenses are essentially permits for licensees to use the knowledge of the licensor in the R&D process. I show that if there is knowledge licensing, high-tech firms innovate more, and economic growth is higher than when there are knowledge spillovers, or there is no exchange of knowledge among high-tech firms. Conditionally that high-tech firms innovate, I show that increasing intensity and toughness of competition in the high-tech industry increases innovation. When there is an exchange of knowledge among high-tech firms, in terms of licensing or spillovers, increasing the number of high-tech firms also increases innovation. However, when there is no exchange of knowledge, the relationship between innovation in the high-tech industry and the number of high-tech firms has an inverted-U shape.

Finally, endogenizing the number of high-tech firms I show again that when there is knowledge licensing, high-tech firms innovate more and economic growth is higher than in the latter two cases. However, the number of high-tech firms is lower.

In the second chapter, co-authored with Anna Kochanova, we use evidence from 21 EU countries to investigate the relationship between the country-wide uptake of high-tech goods such as telecommunications and the level of product market competition in services and goods markets. We find that the uptake of telecommunication technologies significantly increases the level of product market competition. Our result is consistent with the view that the use of these technologies can lower the costs of firm entry. This result contributes to the ongoing debate about the impact of telecommunication technologies, as well as information and communication technologies on aggregate performance. In particular, since competitive pressures matter for allocative and productive efficiency, our results imply that the benefits from a particular type of ICT, telecommunication technologies, may come not only from direct use (e.g., email

vs. mail) but also from higher competition.

In the third chapter, co-authored with Evangelia Vourvachaki and Sergey Slobodyan, we propose a new way to differentiate horizontally across skill types in order to analyze the impact of human capital composition on aggregate economic performance. As in the existing literature, we exploit the cross-occupational differences with an exception that our definition derives from cross-industry heterogeneity in the production function: We differentiate human capital skills according to their "industry specificity." In particular, we define two types of human capital: "specific" and "general." As specific human capital, we define a set of skills that are required for production in few industries. As general human capital, we define a set of skills that are required for production in a broad set of industries.

We use Czech labor survey data to summarize the facts regarding the employment and education levels of the two types of human capital for the Czech economy. We find a rather uniform level of skills across the specific and general types of human capital that agrees with our horizontal differentiation of skills. Moreover, we find that in 2007 approximately 36 percent of total labor input was comprised of specific human capital. Our evidence also suggests that this share has been steadily falling since the mid-90s.

To provide an explanation for this trend and illustrate how it can matter for long-run growth and welfare, we build up an endogenous growth model, where education and R&D are costly activities. In the model, both general and specific human capital are used in final goods production, while only specific human capital can serve as input into the educational sector and R&D. We also explicitly take into account the complementarity between basic R&D and the education process and positive externalities in R&D. In this respect, the model implies a positive relation between specific human capital intensity and economic growth. This suggests that there can be long-run welfare costs involved in the falling share of specific human capital as observed in the Czech data. We also discuss optimal educational policies in the presence of market distortions.