Essays on Access to External Finance, Acquisitions and Productivity

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My thesis has been motivated by my interest in gaining deeper, empirical based understanding of several classical questions in the financial and industrial economics. The thesis is divided in three chapters, which, although each dealing with one separate question, have a common theme of determinants and consequences of access to financing and productivity of firms. Specifically, the first chapter investigates whether more developed financial markets make it easier for firms to raise external finance when they need it. The second chapter studies the role of productivity in the firms' decision to participate in acquisitions, and whether acquisitions lead to productivity gains. Finally, the last chapter studies the impact of market liberalization on the productivity of network service industries in Europe.

1 Článok je zhrnutím dizertačnej práce s rovnakým názvom, za ktorú získal autor tretiu cenu v súťaži o cenu guvernéra NBS pre študentov vysokých škôl za najlepšiu prácu v oblasti ekonómie.

In the first chapter, co-authored with my dissertation thesis advisor Jan Bena, we study whether financial market development facilitates the efficient allocation of resources, one of the primary channels from finance to growth suggested by the theory. We assess that if more developed financial markets allocate capital more efficiently, it must be that they are able to identify firms with growth opportunities and to channel external finance towards these firms when they need it. The existing literature studies this question without observing the quantity of external finance raised by firms, resorting instead to aggregate industry-level data on investments. In our contribution, we take a more direct approach and utilize cross-country firm-level balance sheet data to calculate an explicit firm-level measure of external finance use. We do so for a large sample of manufacturing firms operating in a set of European countries that, as of mid-nineties, differed significantly in their level of financial market development.

Employing the identification approach based on interaction of country-level institutional characteristics and industry-specific growth shocks , we find that financial development improves the allocation of capital by channeling external finance to firms that operate in industries with better growth prospects. Our result is obtained using two alternative proxies for the global industry-specific component of growth opportunities: (i) industry value-added growth in the U.S. and (ii) the change in the global industry price-to-earnings (PE) ratio. Both proxies rely on the assumption that a global component exists in industry-specific growth opportunities caused by demand and productivity shifts. For this reason, we focus our analysis on the manufacturing sector of a homogenous set of European countries with highly synchronized product markets and regulation, where the key underlying assumption of common shocks to industry growth is arguably most likely to hold. When we proxy growth opportunities by the growth of U.S. industries, the additional assumption is that firms in the U.S. are relatively financially unconstrained and are able to materialize the growth opportunities they encounter. When we proxy growth opportunities by the global industry PE ratio, we assume that financial markets are integrated to the extent that the common component of growth opportunities is priced into global industry portfolios.

Our results also suggest that it is especially the small and young firms – presumably more constrained in their access to public financial markets and more dependent on domestic financial markets – that benefit from financial development by being able to raise more external finance in response to growth opportunities. This supports the view that domestic financial markets development alleviates the financial constraints of small and young firms by more. We also find that the degree of domestic financial markets development is a much more important determinant of the ability to raise external finance for firms with highly concentrated ownership structures, when compared to firms with dispersed ownership.

In the second, solo authored, chapter; I examine the role of productivity in the firms' decision to participate in acquisitions and whether acquisitions lead to productivity gains. I reconcile conflicting results in the existing literature by showing that the role of productivity in the firms' selection into acquisitions and the post-acquisition productivity gains are very different in horizontal and vertical deals. The key insight that motivates the separation between horizontal and vertical deals is the different nature of synergies among potential acquisition participants. Firms that operate in the same industry, and thus are potential candidates for horizontal takeovers, are all familiar with the technology of that industry. Thus, within the industry, the firm-specific intangible capital of one firm is easily re-deployable on the physical assets of the other firm, in line with the underlying assumptions of the standard Q-theory of mergers of Jovanovic and Rousseau (2002). The predictions of this theory that unproductive firms are acquired by the relatively productive ones in order to ex-

perience subsequent productivity gain, are thus most likely to hold for the horizontal acquisitions.

For the class of mergers between firms operating in industries tied by strong supplier-producer vertical linkages, however, the complementarity between intangible assets may be more relevant. Vertically related firms that choose to engage in productive relationship are facing the risk of a hold-up because either firm can threaten to quit and to search for another partner. According to the property rights theory of the firm, if the firms' intangible assets are complementary, so that both partners are essential for the realization of output, the possibility of hold-up mitigates incentives for ex-ante investments leading to output loss. The hold-up problem can be mitigated by vertical merger. The search and matching model of mergers and acquisitions developed by Rhodes-Kropf and Robinson (2008) incorporates these insights and predicts that under additional, reasonable assumptions, the equilibrium selection into vertical acquisitions can be characterized by the positive assortative matching in which firms merge with partners of similar productivity.

Based on these theoretical insights, I examine the role of productivity in vertical and horizontal acquisitions using a large sample of domestic acquisitions among public and private firms in Europe over the period 1998-2008. Using the approach based on matching on firm industry and size, I find that first, targets are under-performing before engaging in horizontal acquisitions; second, there is positive assortative matching in productivity for firms engaging in vertical acquisitions; and third, economically and statistically significant productivity gains exist only for targets acquired in horizontal acquisitions. Thus, the results for horizontal deals are consistent with the Q-theory of mergers which assumes asset substitutability. The results for vertical deals are consistent with the search and matching model built on the property rights theory of the firm, which assumes complementarity.

Overall, my results suggest that to understand the sources of productivity gains, it is important to first understand the underlying incentives to merge and second, given the differing incentives, to investigate separately the different categories of mergers as predicted by the underlying theory.

The third chapter of my thesis, which is co-authored with Jan Bena and Evangelia Vourvachaki, is an empirical investigation of the impact of market liberalization, e.g. the removal of state monopolies and entry barriers, on the productivity of utilities, transport and telecommunication services in European countries.

In view of their potential to strongly affect economy-wide performance, the European Commission extended its Single Market Program from traditional goods industries also to services in a decade starting at the end 20th century. In this process, the Commission commanded the liberalization and harmonization of services regulation among the EU member countries. The reforms were first implemented in network service industries: telecommunications and post, transportation, and utilities. Such a policy priority stemmed from the fact that network services were highly regulated and often monopolized in the EU. As services provided by network industries are essential inputs to other industries, the European Commission envisaged a large scope for gains throughout the economy from increased competition. While a single market for services is currently incomplete and subject to active policy debates, the scope for productivity gains from such regulatory efforts remains largely unknown.

In our work, we seek to evaluate the productivity benefits of liberalization within services industries themselves. Specifically we ask: What is the impact of liberalization on the productivity of European network service firms? Has liberalization improved the allocation of resources across firms by bringing gains into the production scale of the relatively more productive firms?

Our main identifying assumption is that liberalization has been driven by EU-wide harmonization efforts as part of the EU Single Market Program rather than by the local industry-specific conditions. Exploiting the variation in the timing and degree of liberalization efforts across countries and industries, we find that liberalization has increased firm-level productivity but has had no reallocation impact. Based on our estimates, the average firm-level productivity gain from liberalization amounts to 38 percent of the average within-firm productivity gain in network industries over 1998-2007. The magnitude of our estimates of within-firm productivity gains is in line with earlier findings in the literature that examines the impact of trade liberalization on the productivity of firms operating in liberalized markets. In particular, since our study concerns eliminating regulatory barriers in output markets, our estimates can be compared to estimates of output tariff reduction in manufacturing. As an illustration, Amiti and Konings (2007) or Topalova and Khandelwal (2011), among others, suggest corresponding estimates on the order of 9.5% and 3.5%, respectively. To our advantage, since network services are mostly non-tradable, import competition has a limited scope to bias our results.

We also find that within-firm productivity gains attributable to liberalization are higher for firms with low pre-liberalization productivity. This result is in line with existing theories that stress the role of competition in the reduction of managerial slackness. This may be particularly relevant in our case given that at the beginning of the liberalization process, network service industries largely featured state monopolies where managerial slackness concerns are likely to be important.

Turning to the policy implications, our findings suggest that the regulatory reforms for network services were successful in increasing the threat of competition for incumbents and thus inducing them to become more productive. Our results are in support of the European Commission's demand to extend liberalization to other market services.