



**ROYAL INSTITUTE
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Heterogeneous Innovation and Labour Mobility

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Abstract

Knowledge is a necessary and critically important factor in generating growth and increased prosperity. The extent to which such effects are materialized depends however on its diffusion and how it transcends into innovation, entrepreneurship and growing firms. This doctoral thesis consists of four papers that examine how labor mobility and innovation strategies influence the performance at the firm level with respect to new ventures, firm level growth and innovativeness. All the analyses are based on a detailed Swedish employer-employee matched data-set that comprises all Swedish firms.

The first paper provides empirical support of the validity of the knowledge-based spillover theory of entrepreneurship by employing a detailed database comprising on more than 19 million observations in the period 2001–2008 at the level of individuals, firms and regions in Sweden. The results indicate that both inter-regional labor inflows and intra-regional labor mobility exert a strong positive effect on entrepreneurship, while inter-regional outflows negatively affect entrepreneurial entry.

The second paper examines the influence of the labor mobility of knowledge workers (i.e. those involved in research and development) on innovation at firm level. New evidence are provided that reveals a positive and significant impact of labor mobility on firms' innovations measured as patent applications. The effect is particularly strong for knowledge workers that have previously worked in a patenting firm (what is referred to as the learning-by-hiring effect), but also firms losing a knowledge worker are shown to benefit (i.e. the diaspora effect), albeit the impact is considerably weaker.

In the third paper the influence of labor mobility between multinational enterprises (MNEs) and other firms on innovation is investigated. Looking at firms having different owner structures, empirical evidence are provided that between 2001 and 2010 particularly domestically owned MNEs generate strong knowledge spillovers to non-MNEs that translates into innovations.

The fourth paper examines the relationship between innovation and firm growth. We implement a classification of innovations based on whether they are explorative or exploitative. The more radical explorative innovations are shown to have a persistent growth effect in long term, while exploitative innovation increases the labor demand in short term.

Keywords: labor mobility; knowledge spillover; organizational learning; entrepreneurship; heterogeneous innovation

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*“As heaven maintains vigor through movements,
a gentle man should constantly strive for self-perfection.
As earth’s condition is receptive devotion,
a gentle man should hold the outer world with broad mind.”*
– from ZHOUYI.

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List of appended papers

- Paper I Braunerhjelm, P., Ding, D., & Thulin, P. (2015), Labor as knowledge carriers: How increased mobility influences entrepreneurship, Accepted: *The Journal of Technology Transfer*.
- Paper II Braunerhjelm, P., Ding, D., & Thulin, P. (2014), Does labor mobility foster innovation? Evidence from Sweden, Revise and Resubmit: *The Scandinavian Journal of Economics*.
- Paper III Ding, D., (2015), Learning from multinational enterprises: Knowledge flows through labor mobility.
- Paper IV Braunerhjelm, P., & Ding, D. (2015), Does innovation lead to firm growth? Explorative versus exploitative innovations.

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1 Introduction

The impact of the economic crisis – “the great recession” – that started in 2008/09 continue to hamper economic activity in large parts of Europe. The unprecedented loose monetary policies in EU and a number of other countries has not sparked the expected turnaround in Europe, partly due to the parallel austerity measures that has had the opposite effect on aggregate demand. Supply side policies have been less emphasized, even though there is consensus that innovation is key for long-term competitiveness and growth. In particular, the nexus of entrepreneurship and innovation has increasingly been recognized as important drivers of economic growth (Braunerhjelm, 2011).

The dominant growth paradigm claims that knowledge is the crucial ingredient to spur economic development and to increase prosperity (Aghion & Howitt, 1998). The implicit assumption is that knowledge is distributed and diffused to economic agents, albeit in ways not well defined in current growth models, who will then use that knowledge to innovate and start or build firms. The objective of this thesis is to examine how mobility of labour may be one channel to magnify knowledge diffusion, thereby positively impact innovation, entry of new firms and growth of incumbents.

This thesis implements detailed employer-employee matched data, together with data on patent applications, to analyse the relationship between labour mobility on the one hand and innovation and entrepreneurship on the other. A number of controls at the individual, firm, industry and regional levels will also be used in the analyses.

Overall the results provide strong support for the hypotheses that labour mobility does have a positive impact on innovation and entrepreneurship. Hence, the interpretation is that knowledge embodied in labour becomes diffused and better exploited as labour move between firms. These results can be attributed to both networks and matching effects. We also find that regional aspects influence the results.

From a normative perspective, the results contain several important conclusions. In particular, more rigid and sclerotic labour markets would deter innovation and entrepreneurship and in the longer run also growth and welfare. The challenge for policy makers is thus to build institutions that enhance labour market flexibility simultaneously as a reasonable level of worker protection is maintained.

To summarize, this thesis consists of four essays implementing applied empirical analyses, where the common thread is to test how labour mobility influences innovation, entrepreneurship and firm growth. At the aggregate level there are obvious links to the endogenous growth models, but we would like to stress that it is not the growth model itself that is the object for our empirical analyses.

1.1 Inter-Firm Labour Mobility and Entrepreneurship

The relationship between knowledge, entrepreneurship and innovation has received increasing attention during the last decades, theoretically and empirically (Cohen & Klepper, 1992; Feldman & Audretsch, 1999; Audretsch & Thurik, 2001; Audretsch & Thurik, 2004; Ghio et al., 2015). The knowledge-based spillover theory of entrepreneurship (KSTE), which was developed by Acs et al. (2009), shows how entrepreneurs combine their own specific abilities with the existing societal stock of knowledge in order to invent new products and set up new firms.

Knowledge may contain codified and/or non-codified components (Audretsch & Kielbach, 2007; Carlsson et al., 2009; Acosta et al., 2011; Acs & Sanders, 2012; Steuzer et al., 2014), where the former can be coded and transferred via books or documents. That contrasts with non-codified knowledge, which is of a tacit nature and embodied in individuals. Hence, it cannot be easily transmitted. Rather the diffusion of non-codified knowledge relies on either geographical agglomeration where labour frequently interact in various ways, or through labour mobility whereby individual-specific knowledge is transferred as employees shift between employers.

Labour mobility as a knowledge spillover mechanism has also been shown theoretically (Fosfuri et al., 2001; Glass & Saggi, 2002) as well as empirically (Agrawal et al., 2006; Kaiser et al., 2015). Hence, labour mobility can be expected to induce innovative and entrepreneurial activities. However, the evidence are still scarce and we lack a deeper understanding of the relationship between labour mobility and entrepreneurial activities in particular.

1.2 Inter-Firm Labour Mobility and Innovation

The relatively sparse studies on labour mobility and innovation confer a positive relationship between the two (Agrawal et al., 2006). The most investigated geographical area is probably Silicon Valley. Often previous analyses are either spatially restricted (clusters) or limited in terms of data availability. Thus, it has been demonstrated that mobile engineers (that are patent holders) and learning processes in receiving firms are positively correlated (Almeida & Kogut, 1999). Agrawal et al. (2006) found that knowledge flows contribute not only to the firm receiving employees but also to the firms that lose workers. The latter effect was explained by increased knowledge flows due to expanded social (knowledge) networks.

Previous literature also suggests that firms' patenting activity is higher in regions that are characterised by high labour mobility (Kim & Marschke, 2005). However, the impact and differences originating in intra- or inter-regional labour mobility on innovation has (to our knowledge) not been examined. On one hand, intra-regional

labour mobility may be expected to have a stronger impact on innovative performance compared to inter-regional labour mobility, since knowledge in dense areas may differ but still be in the same overall domain. Indirectly that is supported by findings showing that knowledge spillovers decline with geographical distance (Griliches, 1992). On the other hand, the opposite view has also been raised where it is argued that intra-regional labour mobility is less likely to yield new information due to the similarity of intra-regional knowledge (Essletzbichler & Rigby, 2005). It is important to separate between these two types of regional spillovers in order to understand the origin of knowledge that augments industrial dynamics, i.e. innovation and entrepreneurship.

Knowledge is composed of different components, including working experience as well as knowledge acquired through education. Even though these will be intertwined, we will separate between them in the analyses, and see whether the impact differ when we compare labour flows between domestic and multinational firms. In the theory of multinational enterprises (MNEs), firm-specific assets plays a central role in explaining MNEs' ability to internationalize and recoup costs related to operation at foreign markets. Such assets are assumed to be transferrable and utilized in the MNEs' foreign units (Dunning, 2012; Markusen, 1995). Specific MNEs knowledge could for instance be management/marketing strategy or technologies, which leads to a competitive advantages for the MNE (Kimura & Pugel, 1995).

Given that these specific assets can be utilized in foreign affiliates, it seems likely that they can also be transferred to other domestic firms through mobility of labour. When labour move from MNEs to non-MNEs, it can thus be expected that they contribute with new knowledge that improve innovation performance in non-MNEs. Balsvik (2011) found that workers with experience from MNEs can increase productivity for non-MNEs. Also, Görg and Strobl (2005) suggested that firms were more productive than other domestic firms if their business owners have experience from MNEs.

1.3 Innovation and Firm Growth

Even though it is widely recognized that knowledge and innovation is critically important in propelling economic growth, the insights regarding how knowledge in terms of innovation manifests itself at the firm level is not well understood. As firms exploit their knowledge to innovate and to strengthen their market position, they are likely to contribute to aggregate economic growth (Cohen, 1995). But will firms themselves grow and will all kinds of innovations generate firm-level growth? Thus, the micro-foundation of growth is less elaborated.

Most studies categorize innovation into two main types: product innovation and process innovation (Cohen & Klepper, 1996; Utterback & Abernathy, 1975). Whereas product innovation refers to a new or improved product or service, process innovation

refers to a new or significantly improved production process or delivery method. To examine how the different types of innovation influence growth at the firm level, previous empirical studies have basically used self-reported survey data. The overall results are quite consistent and imply that product innovation has a (weak) positive impact on firm growth, while process innovation tends to displace labour (Coad, 2009).

In an emerging empirical literature innovation has been defined in a similar but still different way: explorative and exploitative innovation. This classification refers to March (1991) who used these two concepts to separate between learning processes that aimed at either consider a new field (explorative), or getting deeper into an already known field (exploitative). Hence, explorative innovation can be viewed as searching for new knowledge to create new products and processes. Exploitative innovation on the other hand emphasizes a deepening of a firm's existing knowledge, technologies and products.

A firm that chooses an exploitative strategy is likely to increase its production efficiency, which may reduce its ability to discover new products and processes. Similarly, the explorative strategy implies that a firm a firm is likely to develop new products and services, which are important for survival and strengthening its market position, but may imply costly excursions into unknown fields (Nooteboom, 2000; Hagedoorn & Duysters, 2002). Previous studies have however not looked into how these two types of innovation affect firm growth.

To summarize, above we have referred to several issues that previous research at least to some extent has defined, but where lack of data has hindered more in-depth analyses of relevant problems. Due to access of quite unique and highly disaggregated Swedish data, we have a possibility to more thoroughly investigate some of the above raised questions.

2 Summary of the Thesis

2.1 Data

This dissertation consists of four self-contained empirical essays, which are related to entrepreneurship, innovation and firm growth. All of these essays use the same employer-employee dataset obtained from the Statistics Sweden's Business Register. This dataset covers all employment in the Swedish labour market and all firms across different industries. In some of the essays, additional data sources have been implemented and pooled with the SCB-data. In the analyses, innovation is defined as patent application which, admittedly, does not cover all innovation but is in our view a more preferable proxy in comparison with self-reported data for a limited number of observations and years, or patent which captures past innovations but not the present innovation activity.

Regression analysis is used in all four essays, albeit different techniques are implemented depending on the research question addressed. In Essay I, a logistic regression is chosen to fit the binary outcome of the dependent variable. It models the probability of a positive outcome given a set of regressors. In the essays II and III, negative binomial regression is preferred due to over-dispersed count data, i.e. the conditional variance exceeds the conditional mean. In Essay IV, the OLS estimator and the dynamic generalized method of moments (GMM) estimator are preferred. The latter one is developed by Arellano & Bover (1995) and Blundell & Bond (1998) for dynamic panel data analysis.

2.2 Summary of the Essays

Essay I, "Labour as knowledge carriers: How increased mobility influences entrepreneurship" (co-authored with Pontus Braunerhjelm and Per Thulin and published in *The Journal of Technology Transfer*), offers evidence on how knowledge flows that are embodied in labour affect entrepreneurship. We find that inter-regional labour inflows and intra-regional mobility levels have strong positive effects on entrepreneurship while inter-regional outflows have a negative effect on entrepreneurship. This finding implies that both direct (loss of knowledge) and indirect effects (knowledge networks) tend to weaken the knowledge endowment, thereby, decreasing the opportunity of new ventures. Our findings suggest that encouraging labour mobility can be a tool for increasing entrepreneurship. The policy implications of this essay are highly relevant for regions and countries that are searching for growth-inducing policies. By dismantling barriers to labour mobility, and in particular encouraging inflows of labour, the likelihood of more entrepreneurial opportunities would be enhanced.

Essay II, “Does labour mobility foster innovation? Evidence from Sweden” (co-authored with Pontus Braunerhjelm and Per Thulin, under revision and re-submission for a journal), offers new insights regarding the influence of labour mobility on firms’ innovativeness. First, we consider not only firms that have received a new knowledge worker (learning by hiring) but also the firms that lost a worker (the diaspora effect). Second, we use detailed measures of knowledge workers (education and job classification) which bolster the robustness of the results. Third, we emphasize the geographical dimension of knowledge flows (inter- versus intra-regional mobility) and their influences on innovation output. We find that not only the firm hiring workers can benefit from labour mobility but some time also the firm that loose workers. Our finding regarding the geographical dimension of knowledge flows implies that inter-regional labour mobility is more important than intra-regional labour mobility on innovation output. This finding has important and highly relevant policy implications. Our finding suggests that flexible labour market policies that enhances labour mobility could benefit for both the receiving firm and the sourcing firm.

Essay III, “Learning from multinational enterprises: Knowledge flows through labour mobility”, addresses how knowledge transfer through labour mobility from multinational enterprises (MNEs) influences non-multinational enterprises (non-MNEs). We find that workers in MNEs have higher wages than workers in non-MNEs. This finding implies the potential existence of firm-specific advantages that may in turn generate knowledge spillovers to other firms. We provide empirical evidence that hiring workers with MNEs experiences increases the innovation capability in non-MNEs, measured as the number of patent applications and citations. Furthermore, our findings show that hiring workers with domestic MNEs experience generates stronger spillover effect compare to hiring workers with foreign MNEs experience. The finding partly contrasts previous research where the overall conclusion seems to be that foreign MNEs account for most of the spillover effects. Our findings in third essays have interesting implications at both the policy- and firm-levels, regarding how to improve innovation capacities. We believe that the methodology employed in this essay offers a way to analyse the existence of different types of spillover.

Essay IV, “Does innovation lead to firm growth? Explorative versus exploitative innovation” (co-authored with Pontus Braunerhjelm), contributes to the empirical literature on the relationship between firm growth and innovation. Rather than separating between product innovation and process innovation, we make a distinction depending on whether innovations are explorative or exploitative (March, 1991; Akcigit & Kerr, 2013). Explorative innovation is defined as a patent application in a patent class where the firm previously has no patents. Exploitative innovation refers to firms applying for a patent application in the same patent class as before. Hence, we present a patent, or innovation, history for each firm in the analysis. Our finding shows that both exploitative and explorative innovations have significant and positive effects on firms’ employment growth. And explorative innovation has a stronger and more

persistent impact on employment growth as compared to exploitative innovation. Consequently, firm growth will depend on the type innovation which is an important finding with intriguing and challenging implications for policy makers. A large number of countries have stressed innovation policies to promote long-term growth and build a knowledge economy, but the growth aspect in terms of increasing employment may be closely tied to the type of innovation that takes place.

3. Conclusions

Policies during the last decade have been pre-occupied with the demand side of the economy, which is expected given the extent of the economic crisis that started about eight years ago. However, the supply side can and should not be neglected. This thesis has taken a micro-economic perspective with the objective to analyze how one specific factor may influence innovation, entrepreneurship and firm growth; mobility of labour, assuming that knowledge is embodied in individuals.

Irrespective of the issues addressed in the different essays, or the methods applied, a positive relationship between innovation and entrepreneurship on the one hand, and labour mobility on the other, is confirmed. As far as firm growth is considered, the effect seems to differ depending on type of innovation.

Given that innovation is commonly held as key to future sustainable growth and increasing welfare, it seems an important area for policymakers. Hence, while a more flexible labour market may hurt some individuals, our results suggest that the economy as such is likely to benefit. New and growing firms, based on innovative products and services, will help to foster competitive firms that are likely to increase their demand for labour and raise wages. That neatly illustrates the links between the demand and supply side of the economy and why it is important to consider both of them simultaneously. In addition, the results also contain results that are important at the firm-level. For instance, firms may gain from hiring employees from particularly multinational enterprises, and that there it is not only intra-regional, cluster-based, mobility that counts.

References

- Acosta, M., Coronado, D., & Flores, E. (2011). University spillovers and new business location in high-technology sectors: Spanish evidence. *Small Business Economics*, 36(3), 365–376.
- Acs, Z.J., Braunerhjelm, P., Audretsch, D.B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, 32(1), 15–30.
- Acs, Z.J., & Sanders, M. (2012). Patents, knowledge spillovers and entrepreneurship. *Small Business Economics*, 39(4), 801–817.
- Aghion, P., & Howitt, P. (1998). *Endogenous Growth Theory*. Cambridge, MA: MIT Press.
- Agrawal, A., Cockburn, I., & McHale, J. (2006). Gone but not forgotten: Knowledge flows, labour mobility, and enduring social relationships. *Journal of Economic Geography*, 6(5), 571–591.
- Akcigit, U., & Kerr, W. (2013). *Growth through heterogenous innovation* (No.28), Bank of Finland Research, Working Paper.
- Almeida, P., & Kogut, B. (1999). Localization of knowledge and the mobility of engineers in regional networks. *Management science*, 45(7), 905-917.
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29–51.
- Audretsch, D. B., & Thurik, A. R. (2001). What is new about the new economy: Sources of growth in the managed and entrepreneurial economies. *Industrial and Corporate Change*, 10(1), 267-315.
- Audretsch, D. B., & Thurik, A. R. (2004). A model of entrepreneurial economy. *International Journal of Entrepreneurship Education*, 2(2), 143-166.
- Audretsch, D. B., & Kielbach, M.C. (2007). The theory of knowledge spillover entrepreneurship. *Journal of Management Studies*, 44(7), 1242–1254.
- Balsvik, R. (2011). Is labor mobility a channel for spillovers from multinationals? Evidence from Norwegian manufacturing. *The Review of Economics and Statistics*, 93(1), 285-297.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143.
- Braunerhjelm, P. (2011). “Entrepreneurship, innovation and economic growth. Interdependencies, irregularities and regularities”, in Audretsch, D., Falck, O. and Heilbach, P. (eds.), *Handbook of innovation and entrepreneurship*. Camberley: Edward Elgar Publishing.

- Carlsson, B., Acs, Z.J., Audretsch, D.B., & Braunerhjelm, P. (2009). Knowledge creation, entrepreneurship, and economic growth: A historical review. *Industrial and Corporate Change*, 18(6), 1193-1229.
- Coad, A. (2009). *The growth of firms: A survey of theories and empirical evidence*. Camberley: Edward Elgar Publishing.
- Cohen, W. M., & Klepper, S. (1992). The trade-off between firm size and diversity in the pursuit of technological progress. *Small Business Economics*, 4(1), 1-14.
- Cohen, W. M. (1995). "Empirical studies of innovative activity", in P. Stoneman, ed., *Handbook of the economics of innovation and technological change* (pp. 182-264). Oxford: Blackwell.
- Cohen, W. M., & Klepper, S. (1996). Firm size and the nature of innovation within industries: The case of process and product R&D. *The review of Economics and Statistics*, 78(2), 232-243.
- Dunning, J. H. (2012). *International production and the multinational enterprise* (RLE International Business) (Vol. 12). New York: Routledge.
- Essletzbichler, J., & Rigby, D. (2005). Technological evolution as creative destruction of process heterogeneity: Evidence from US plant-level data, *Economic Systems Research*, 17(1), 25-45.
- Feldman, M. P., & Audretsch, D. (1999). Innovation in cities: Science based diversity, specialization and localized competition. *European Economic Review*, 43(2), 409-429.
- Fosfuri, A., Motta, M., & Rønde, T. (2001). Foreign direct investment and spillovers through workers' mobility. *Journal of International Economics*, 53(1), 205-222.
- Ghio, N., Guerini, M., Lehmann, E., & Rossi-Lamastra, C. (2015). The emergence of the knowledge spillover theory of entrepreneurship. *Small Business Economics*, 44, 1-18.
- Glass, A. J., & Saggi, K. (2002). Multinational firms and technology transfer. *The Scandinavian Journal of Economics*, 104(4), 495-513.
- Griliches, Z. (1992). The search for R&D spillovers. *The Scandinavian Journal of Economics*, 94 (Supplement), 29-47.
- Görg, H., & Strobl, E. (2005). Spillovers from foreign firms through worker mobility: An empirical investigation. *The Scandinavian journal of economics*, 107(4), 693-709.
- Hagedoorn, J., & Duysters, G. (2002). Learning in dynamic inter-firm networks: The efficacy of multiple contacts. *Organization Studies*, 23(4), 525-548.
- Kaiser, U., Kongsted, H. C., & Rønde, T. (2015). Does the mobility of R&D labor increase innovation? *Journal of Economic Behavior & Organization*, 110, 91-105.

- Kim, J. and Marschke, G. (2005). Labor mobility of scientists, technological diffusion, and the firm's patenting decision, *RAND Journal of Economics*, 36(2), 298-317.
- Kimura, Y., & Pugel, T.A., (1995). Keiretsu and Japanese direct investment in US manufacturing. *Japan and the World Economy*, 7, 481-503.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71-87.
- Markusen, J. R. (1995). The boundaries of multinational enterprises and the theory of international trade. *The Journal of Economic Perspectives*, 9(2), 169-189.
- Nooteboom, B. (2000). *Learning and innovation in organizations and economies*. Oxford: OUP Oxford.
- Steuzer, M., Obschonka, M., Sternberg, R., & Cantner, U. (2014). Regional characteristics, opportunity perception and entrepreneurial activity. *Small Business Economics*, 42(2), 221-244.
- Utterback, J. M., & Abernathy, W. J. (1975). A dynamic model of process and product innovation. *Omega*, 3(6), 639-656.