

DISSERTATIONES RERUM OECONOMICARUM
UNIVERSITATIS TARTUENSIS

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13

**LABOUR REALLOCATION IN TRANSITION
COUNTRIES: EFFICIENCY,
RESTRUCTURING AND INSTITUTIONS**

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TARTU UNIVERSITY
PRESS

THE FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION,
UNIVERSITY OF TARTU, ESTONIA

This dissertation is accepted for the defence of the degree of Doctor of Philosophy (in Economics) on August 24th 2005 by the Council of the Faculty of Economics and Business Administration, University of Tartu.

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The public defence of the dissertation is on November 7th 2005 at 15.00 in room
B306, Narva Rd. 4, Oeconomicum, University of Tartu.

The publication of this dissertation is granted by the Faculty of Economics and
Business Administration, University of Tartu.

ISSN 1406–1309

ISBN 9949–11–157–9 (trükis)

ISBN 9949–11–158–7 (PDF)

Autoriõigus Jaan Masso, 2005

Tartu Ülikooli Kirjastus

www.tyk.ee

Tellimus nr. 430

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A LIST OF THE AUTHOR'S PUBLICATIONS AND CONFERENCE PRESENTATIONS

I. Chapters in monographs

1. **Masso, J.**, Eamets, R., Philips, K. (2005); "Job Creation and Job Destruction in Estonia: Labour Reallocation and Structural Changes", forthcoming in Hannula, H., Radosevic, S. and Tunzelmann, N. von (Eds.), *Estonia, the New EU Economy: Building a Baltic Miracle?*, London: Ashgate.
2. **Masso, J.** (2002); "Ettevõtte riskikeskkond, riskide hindamine ja riskiturud" (Firm's risk environment, measurement of the size of risks and markets for risks). In Juhkam, A., Masso, J. (Eds.), *Riskid Eesti ettevõtetes ja riskijuhtimine* (Risks in Estonian enterprises and risk management), Tartu: Tartu Ülikooli Kirjastus, pp. 23–55
3. **Masso, J.**, Juhkam, A. (2002); "Ettevõtte avatus riskile ja selle hindamine" (Firms exposure to risk and its evaluation). In Juhkam, A., Masso, J. (Eds.), *Riskid Eesti ettevõtetes ja riskijuhtimine* (Risks in Estonian enterprises and risk management), Tartu: Tartu Ülikooli Kirjastus, pp. 56–84.
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5. **Masso, J.** (2005); "Innovativeness of the Baltic States Economies", in Teichmann, E. and Weresa, M. A. (Eds.), *Enlarged European Union and Its Eastern Neighbours. Initial Co-operation Experience*, Warsaw School of Economics, Warsaw, pp. 147–168.

II. Articles in international journals

1. **Masso, J.**, Heshmati, A. (2004); "Optimality and Overuse of Labour in Estonian Manufacturing Enterprises", *Economics of Transition*, Vol. 12, Issue 4, pp. 683–720.
2. Eamets, R., **Masso, J.** (2005); "The Paradox of the Baltic States: Labour Market Flexibility but Protected Workers?", *European Journal of Industrial Relations*, Vol. 11, pp. 71–90.

3. **Masso, J.**, Staehr, K. (2004); “Inflation Dynamics and Nominal Adjustment in the Baltic States”, *Research in International Business and Finance*, Vol. 19, Issue 2, pp. 281–303.
4. **Masso, J.** (2002); “Financing constraints as determinants of investment behaviour among Estonian firms”, *Baltic Journal of Economics*, Vol. 3, Number 1, pp. 8–30.
5. Eamets, R., Kallaste, E., **Masso, J.**, Rõõm, M. (2003); “How flexible are labour markets in the CEECs? A Macro level approach”, *TRANSFER* (Quarterly of the European Trade Union Institute), Vol. 9, Issue 1, pp. 101–121.

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1. **Masso, J.** (2003); “The State of “Informatization” in the Baltic States: A Comparative Analysis”, in Teichmann, E. (Ed.), *Nowe Porganicze Europy. Litwa, Lotwa, Estonia*, Szkola Główna Handlowa, Polskie Wydawnictwo Ekonomiczne, Warszawa, pp. 121–145.
2. Kiander, J., **Masso, J.**, Paas, T., Vaitinen, R. (2004); “Labour Market, Social Dimension, and the Eurozone Enlargement”, in Bolle, M. (Ed.), *Eurozone Enlargement. Exploring Uncharted Waters*, Berlin: Berliner Wissenschafts-Verlag, pp. 67–88.
3. Paas, T., **Masso, J.**, Rõõm-Hinnosaar, M., Schumann, C. (2004); “Income Inequality, Poverty and Unemployment as Main Social Consequences of Transition Processes in the Baltic States”, in Zukrowska, K. and Sobczak, D. (Eds.), *Strategy of EMU Enlargement. Background, Optimal Choices, Consequences*, Warsaw: Warsaw School of Economics, pp. 163–194.

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4. Paas, T., Eamets, R., Rõõm, M., Sellio, R., Jürgenson, A., **Masso, J.** (2002); “Labour flexibility and migration in the EU eastward enlargement context: the case of Baltic States”, *Ezoneplus Working Paper* No 11, September 2002, 79 pp. (www.ezoneplus.org).
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13. **Masso, J.**, Eamets, R., Philips, K. (2004); “Firm demographics and productivity dynamics in Estonia.” *University of Tartu (Estonia), Faculty of Economics and Business Administration Working Paper* No. 25.
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16. **Masso, J.**, Eamets, R., Philips, K. (2004); “Where Have All the Jobs Gone? Gross Job Flows in Estonia”, *University of Tartu, Faculty of Economics and Business Administration Working Paper* No. 28.
17. **Masso, J.**, Staehr, K. (2005); “Inflation Dynamics and Nominal Adjustment in the Baltic States”, *University of Tartu (Estonia), Faculty of Economics and Business Administration Working Paper* No. 35.

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2. Eamets, R., **Masso, J.** (2003); “Labour Market Flexibility and Employment Protection Regulation in the Baltic States”, in *Open Minds. Europe in Global World – blending differences. Conference for young academics*, 13–14 September, Lodz, Poland, pp. 225–228. CD-ROM, 39 pp.

3. **Masso, J.** (2003); “Public policy intervention in the Labour Markets: regional variation in enforcement of labour laws in Estonia”, in *Estonian Economic Policy on the way towards the European Union. Reports-papers of the XI scientific and educational conference* (Tartu-Värsk, 26.–28. June 2003), Berlin, Tallinn: Mattimar OÜ, Berliner WirtschaftsVerlag, pp. 346–356.
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V. Conference presentations

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2. **Masso, J.** The State of Informatization in the Baltic States: a Comparative Analysis. Scientific-Business Forum “The impact of the European integration on cooperation in the South-East Baltic Region” in Warsaw School of Economics, Warsaw, Poland, 27 November 2002.
3. **Masso, J.** Public policy intervention in labour markets: regional variation in enforcement of labour laws in Estonia. XI scientific and educational conference “Estonian Economic Policy on the Way Towards the European Union, Tartu-Värsk, Estonia, 26–28 June 2003.
4. **Masso, J.**, Heshmati, A. The Efficiency of Labour Usage in Estonian Manufacturing enterprises. Presentation in the summer school of the Faculty of Economics and Business Administration, Roosta, Estonia, 20–24 July 2003.

5. **Masso, J.**, Eamets, R. Labour Market Flexibility and Employment Protection Regulation in the Baltic States. Open Minds. Europe in Global World – blending differences. Conference for young academics. University of Lodz, Lodz, Poland, 13–14 September 2003.
6. **Masso, J.** The international mobility of firms and jobs: effects of FDI in Estonia. The Challenge of Mobility in the Baltic Sea Region. University of Gdansk, Faculty of Economics, Sopot, Poland, 23–26 October 2003.
7. **Masso, J.**, Eamets, R. Labour Market Flexibility and Employment Protection Regulation in the Baltic States. International Workshop Business, Law and Economics, Scandinavian Association of Law and Economics, Helsinki, Finland, 28–29 November 2003.
8. **Masso, J.**, Eamets, K, Philips, K. Job Creation and Job Destruction in Estonia. Presentation in the Workshop “Cross Border Cooperation in the Baltic Sea Region: Euro Regions and Region Building”, Tallinn, Estonia, 5–8 February 2004.
9. **Masso, J.**, Eamets, K, Philips, K. Firm demographics and productivity dynamics in Estonia. Presentation in the Workshop “Growth and Restructuring of a New EU Member”, School of Slavonic and East European Studies, University College London, London, 13–14 May 2004.
10. **Masso, J.**, Eamets, K, Philips, K. Job Creation and Job destruction in Estonia: labour reallocation and structural changes. Presentation in the Workshop “Growth and Restructuring of a New EU Member”, School of Slavonic and East European Studies, University College London, London, 13–14 May 2004.
11. **Masso, J.**, Eamets, K, Philips, K. Firm demographics and productivity dynamics in Estonia. Conference “Changes, Challenges and Chances. Conclusions and Perspectives of Baltic Sea Area Studies”, Humboldt-Universität zu Berlin, Berlin, Germany, 27–29 May 2004.
12. **Masso, J.**, Eamets, K, Philips, K. Job creation and job destruction in Estonia: labour reallocation and structural changes. PhD summer school of the Faculty of Economics and Business Administration, Pühajärve, Estonia, 20–24 July 2003.
13. **Masso, J.**, Eamets, R., Philips, K. Firm demographics and productivity dynamics in Estonia. 16th annual EALE Conference in Lisbon, Portugal, 9–11 September 2004.
14. **Masso, J.**, Eamets, R., Philips, K. Creative Destruction and Transition: the Effects of Firm Entry and Exit on Productivity Growth in Estonia”. PhD student conference “Innovation, Entrepreneurship and Growth” at Royal Institute of Technology, Stockholm, Sweden, 18–20 November 2004.
15. **Masso, J.** The Innovativeness of the Baltic States Economies. International Seminar “The Enlarged European and its Eastern Neighbours: First Experiences of Co-operation”, Warsaw School of Economics, Warsaw, Poland, 26 November 2004.

16. **Masso, J.**, Eamets, R., Philips, K. Gross Job and Workers Flows' Differences in Estonia. LoWER (European Low-wage Employment research Network) Conference, ZEW, Mannheim, Germany, 15–16 April 2005.
17. **Masso, J.**, Staehr, K. Inflation Dynamics and Nominal Adjustment in the Baltic States. The 3rd Helsinki – Tartu Symposium in Economics, Eurofaculty, Helsinki, Finland, 13–14 May 2005.
18. **Masso, J.**, Staehr, K. Inflation Dynamics and Nominal Adjustment in the Baltic States. 2nd Joint PhD Summer School of Hamburg-Tartu-Tallinn, Käsnu, 20–22 May 2005.
19. Vahter, P., **Masso, J.** Home versus host country effects of FDI: searching for new evidence on productivity spillovers. Workshop on National Innovation Systems and FDI in Central Eastern Europe: The Role of Technology Transfer, the Impact on Regional Development and Economic Convergence, Institut für Wirtschaftsworschung Halle, Halle & Freiberg, Germany, 30 June 30 – 2 July 2 2005.

INTRODUCTION

List of papers

The thesis is a collection of four original publications. The particular publications are referred to in the text below by their respective Roman numerals.

I Masso, J., Heshmati, A. (2004); “Optimality and Overuse of Labour in Estonian Manufacturing Enterprises”, *Economics of Transition*, Vol. 12, Issue 4, pp. 683–720.

II Eamets, R., Masso, J. (2005); “The Paradox of the Baltic States: Labour Market Flexibility but Protected Workers?” *European Journal of Industrial Relations*, Vol. 11, Issue 1, pp. 71–90.

III Masso, J., Eamets, R., Philips, K. (2004); “Creative Destruction and Transition: The Effects of Firm Entry and Exit on Productivity Growth in Estonia”, Institute for the Study of Labour (IZA), *IZA Discussion Paper No. 1243*, 42 pp.

IV Masso, J., Eamets, R., Philips, K. (2005); “Job Creation and Job Destruction in Estonia: Labour Reallocation and Structural Changes”, forthcoming in Hannula, H., Radosevic, S. and Tunzelmann, N. von (Eds.), *Estonia, the New EU Economy: Building a Baltic Miracle?*, London: Ashgate.

The importance of the topic

The PhD thesis analyses labour reallocation and changes in labour demand at the firm level during the later transition period in Estonia, the factors and institutions affecting these changes and the economic effects of labour reallocation. The reallocation of labour across firms involves, on the one hand, the entry and exit of firms, and on the other hand, variation in the sizes of continuing (incumbent) firms. The present study has not (and did not) aim to cover all aspects of labour demand, but is restricted to the following: 1) efficiency of the reallocation process and whether the reallocation has moved labour to its most efficient use; 2) the dispersion of efficiency levels of competing firms to see the potential for firm turnover to raise aggregate productivity through reallocation; 3) changes in labour hoarding; 4) how

different types of enterprises have performed in terms of changes in labour demand and productivity; 5) whether employment protection legislation (hereinafter EPL; regulations covering hirings and firings) has been favourable to enterprises and enabled them to efficiently end old employment relationships and create new ones, hence complementing labour reallocation, and whether the legislation is actually enforced.

It is especially important to study firm level labour reallocation during the transition from planned to market economy. Transition, being a kind of quasi-experiment, is a time to learn how the market economy works. In the Soviet economy the industrial structure was dominated by a relatively small number of large establishments, and with very low rates of firm entry and exit, while in market economies small and medium sized enterprises are typically more important and entry and exit are very frequent. Widespread labour hoarding common in the planned economy has been replaced with excess labour supply and resulting unemployment. Thus firms' entry process during transition occurs in a very different situation, where some industries are relatively underdeveloped and it is easier to find a niche for a newcomer, market economy institutions have not been necessarily established, entrepreneurs lack experience operating a business in a market economy, starting enterprises face many weaknesses and constraints in capital and labour markets, and under conditions of large, but misallocated, investments in physical and human capital, the task is to find more effective uses for available resources (EBRD 1995).

Micro-level development and enterprise restructuring is important for macro-economic development. For instance, Jurajda and Terrell (2003) noted that entrepreneurial activity is a critical source of growth in post-communist economies. Berkowitz and Cooper (1997) claimed that start-ups play an important role in determining the success of transition economies.

The adjustment of enterprises and industries to a market economy is shaped by the dynamics of the legislative and regulative environment, including labour laws, insolvency laws, competition laws, protection of property rights etc. We find it especially relevant to address the issue of employment protection EPL within CEE countries. Under a centrally planned economic system, workers enjoyed a high degree of employment protection in their jobs as well as guaranteed employment for life (full employment in fact protected workers from dismissals) (Kuddo 1995) that, combined with high wage compression, led to extreme labour rigidity and an inefficient labour allocation¹. Over the 1990s, the need for rapid structural adjustment of the transition economies after the introduction of economic and social reforms was reflected in drastic amendments to national EPL. In CEE countries EPL is not only relevant

¹ Other reasons for inefficient resource allocation include the fact that agents and organizations responsible for resource control lacked incentives to use them well, managers following personal objectives, and firms being directed to follow social or other state objectives at the expense of efficiency (Anderson and Kegels 1998).

because of employee (who are vulnerable partners in employment relationships) protection, but also because trade unions are rather weak and often absent in many enterprises². For these reasons we have analyzed EPL in the Baltic States in more detail.

We argue that although Estonia is a rather small country, it provides an interesting case for study. From the beginning of transition, Estonia has been a radical reformer, undertaking radical monetary reform through the introduction of a currency board, following stringent fiscal policies (implementing a balanced budget rule), undertaking fast reorientation of trade from east to west, rapid privatization through sales to strategic investors, creating an employer-friendly enterprise environment (incl. flexible labour markets, relatively low levels of corruption), and abandoning state subsidies (incl. for a long time the lack of any subsidies towards agriculture). All these developments contributed first to macroeconomic stabilization and thereafter to rather impressive growth performance. Eamets (2001) argued that Estonian economic development could be regarded as a unique experiment. Our goal is to analyse how rapid restructuring and growth has been related to labour reallocation and the creative destruction process, through which new and efficient production units replace old and inefficient ones.

Though the topics of the thesis papers mostly belong to the field of labour economics, the topic of firm entry and exit also belongs to the industrial organization field. However, our main motive is still to contribute to the transition economics literature. While earlier debates on transition processes focused on issues like liberalization and stabilisation, the speed and sequencing of reforms etc., this study focuses on more current research issues such as restructuring, growth and institution building.

The aim and research tasks

The aim of this doctoral thesis is to study labour reallocation, job mobility between firms and the changing firm demographic process in transition economies primarily using Estonia as an example, but also examining the other Baltic States, Latvia and Lithuania. Further, the role of employment protection legislation, an important aspect of the institutional environment, is investigated. We recognize that we do not cover all types of regulations relevant for firm dynamics or labour reallocation such as other labour market institutions, entry regulations, insolvency regulations etc. that is partly related to the scope of the thesis. Though the analysis focuses on the Estonian economy and Estonian enterprises, the aim is to contribute to the transition economics literature in general.

² Clarke and Borisov (1999) report that in Russia the existence of trade unions is less probable in firms that use illegal forms of employment.

The four distinct papers of the thesis accomplish the following research tasks:

The *first research task* is to empirically estimate the optimality and efficiency of labour usage among Estonian manufacturing firms together with the speed of adjustment at which firms attain their target level of employment and eliminate the gap between the optimal and actual levels of labour use (Study I).

The *second research task* is to assess the strictness of employment protection regulation and the degree of enforcement in the Baltic States (Study II).

The *third research task* is to analyse gross job flows in Estonia during the later transition period to find out whether the labour market has become more stable (as suggested by other flexibility indicators). We also study how structural changes and changes in firm size have shaped firm level employment changes (Study III).

The *fourth research task* is to analyse firm entry and exit, and employment changes among incumbent firms along with their productivity development to see whether the process of job and firm destruction ultimately is “creative”, i.e. results in the replacement of old relatively inefficient units with new more efficient ones (Study IV).

The data and methods used in the research

An analysis of firm dynamics, firm-level labour demand decisions and the process of firm entry and exit requires firm-level data. In Estonia, such data are gathered by the Statistical Office of Estonia and the Business Registry at the Ministry of Justice Centre of Registers. In addition, the Estonian Tax Board also has some data³.

Study I utilizes the database of Estonian manufacturing enterprises collected and compiled by the Statistical Office of Estonia. The data set includes up to 70 distinct items from firm-level financial statements. The items also include some general information on the firms, such as yearly average number of employees, form of ownership and industry classification. The version of the dataset used in the study includes 438 enterprises observed over the period 1995–1999⁴, so the very early transition period is not covered. Firms included in the sample account for about 70 per cent of the total sales of the Estonian manufacturing sector. Since proportionally more large firms than small firms are included in the sample, it is not representative of the population. While there are very few

³ Regarding the availability of firm-level data in Estonia, see also Eamets and Masso (2003).

⁴ At the time of writing, the database of the manufacturing firms of the Statistical Office of Estonia and the database of the Estonian Business Registry include data through 2003.

micro firms with less than 10 employees, small and medium-sized firms (those with up to 250 employees) still constitute over 90 per cent of all firms.

Studies III and IV utilize the company accounts of firms operating in Estonia that were obtained from the Estonian Business Registry⁵. At the time of the study we had available information on almost 52,000 firms operating between 1995 and 2001. However, for each distinct year the number of firms is much smaller due to frequent entry and exit. The database includes the firms' financial reports (balance sheets and profit statements) and some general information (location, ownership, legal form etc). Although the database has some weaknesses (missing employment data for many firms, firms are allowed to use two different profit and loss statement forms), it has many positive features. The dataset includes small and micro firms (unlike in the data of the Statistical Office of Estonia there is no size threshold) and we are able to reliably track firms' exit and entry to measure flows in the dynamic small firm sector (as noted by Haltiwanger et al. 2003, this feature is often missing in the transition economies' firm-level data). The Business Registry database includes firms from all economic sectors. This enables us to assess how firm dynamics affects productivity changes in all sectors of the economy, while, due to data constraints, most studies on firm demographics and productivity have focused on the manufacturing sector. The data also possess information on transactions (mergers, acquisitions, divestitures etc.), which is especially important in a study like this. Although, the presence of transactions in the data may be important for results (even if there are just a few of them, but these few transactions involve the large firms), it is often not possible to take account of these transactions in empirical studies.

Next we shortly present the methods used in the empirical analyses. In this study we employ a dynamic model of labour demand where both the long run optimal level of employment and the speed at which actual employment is adjusted to the optimal level are modelled as functions of several variables. Employing the model we deduce estimates on the speed of adjustment at which firms attain their target level of employment and on the efficiency of labour use (the ratio of the actual labour usage to the optimal (desired) labour usage at the firm level). In the second approach used in the paper, estimation of labour use efficiency is based on the residual from the labour requirement stochastic frontier model (see Battese et al. 2000) and inefficiency in this approach is defined as labour used in excess of the minimum amount required by the employed best-practice technology.

In study II we compute various indices of the strictness of employment regulations based on the methodology developed in various studies by the OECD (OECD 1999; Nicoletti et al. 2000). In order to analyse the enforcement of regulations, we use data from national labour inspections and courts, the survey of the European Foundation for the Improvement of Living and Working

⁵ For more information on the database, please see study III.

Conditions and the worldwide Executive Opinion Survey conducted by the World Economic Forum (Global Competitiveness Report 2001–2002).

In study III we calculate job creation and destruction rates, perform various decompositions of the creation and destruction rates and investigate job creation and destruction at the firm level by estimating firm growth equations. Among the potential econometric methods, the robust regression and the 2-step Heckman selection model are used. In study IV we investigate the variation of firm entry and exit and perform survival analysis of newly established firms by using the non-parametric Kaplan-Meier approach. Thereafter we calculate decompositions of aggregate (and industry level) productivity changes into components based on productivity growth within continuing firms (firms existing both in the base and reporting period), resource reallocation between continuing firms and the entry and exit of firms.

The contributions of individual authors

The following briefly describes the contribution of the dissertant relative to the other article authors. In study I, J. Masso wrote the majority of the text of the article (i.e. the set-up of the general problem and hypothesis, description of the background, modelling strategy, interpretation of results etc.), while the program used for empirical modelling was written by the A. Heshmati, who acted also as editor of the text and later as the corresponding author of the paper. Though A. Heshmati is noted as the corresponding author of the paper, in the later stage of the publication process J. Masso also handled communication with the publisher. In study II, Raul Eamets wrote the second section of the article (“Concept and Measurement of Labour Market Flexibility”), while Jaan Masso wrote the other sections. Naturally, both authors have edited all parts of the text. Raul Eamets was the corresponding author of the article, though Jaan Masso also had an active role communicating with the publishing house. In studies III and IV, J. Masso carried out all of the empirical analyses and wrote most of the text. J. Masso’s relative contribution (workload) is about 70% of the total. Raul Eamets and Kaia Philips acted as opponents of all earlier versions of the articles, edited the paper, provided expert advice on the academic writing style, the methods of empirical analyses, and general background of Estonian labour market. For all 4 studies, J. Masso has almost always (in more than 90 % of cases) been the presenting author of the articles in conferences, seminars and workshops.

Acknowledgements

Research work on the dissertation has benefited from the support of many persons and institutions. First of all I would like to thank my supervisors Raul Eamets and Otto Karma. I also owe special thanks to the co-authors of the articles, Almas Heshmati and Kaia Philips, for their readiness to cooperate with me and devote their scarce time to the joint articles. I also benefited from the proof-reading of the final version of dissertation done by Ken Smith.

Earlier versions of the four articles benefited from useful comments made by several people. In particular, study I benefited from comments by an anonymous referee, Adam Swallow, Jouko Kinnunen, Antonio Rodriguez-Andres, Karsten Staehr, Raul Eamets, Otto Toivanen, and Michael Funke. The 2nd study benefited from comments by two anonymous referees, Alena Nesporova, and Karsten Staehr. The 3^d study received comments from Wendy Carlin, Karsten Staehr, Tõnu Roolaht, Otto Karma, Rena Selliov, and Ken Smith. Finally, the 4th study received comments from Karsten Staehr, Tõnu Roolaht, Kadri Ukrainski, and Tomasz Mickiewicz. The last draft of the thesis benefited from comments by internal reviewers Karsten Staehr and Ott Toomet. Eda Tammelo proof-read studies I, II and IV and Ken Smith proof-read study III. I owe a lot of gratitude to all these people. I am also grateful to all the people who made comments on the papers at various seminars, workshops and conferences.

The financial support of the Faculty of Economics and Business Administration, University of Tartu as well as funding received from Eurofaculty, Helsinki University, the Estonian Ministry of Education and Research and the Archimedes Foundation has enabled me to participate in a number of courses and conferences abroad that afforded me educational opportunities in the areas of methodology and theory as well as the chance to receive feedback for works-in-progress. I also would like to acknowledge financial support from the following research projects: Estonian Ministry of Education and Research target financed project “Structural changes in the Estonian labour market: risks on sustainable development of the economy”, European Union 5th framework programme project “EZONEPLUS – The Eastward Enlargement of the Eurozone” and the EU 5th Framework Programme Project “Baltic Sea Area Studies – Northern Dimension of Europe” (BaltSeaNet).

Good research requires good data. I am thankful to Urmas Varblane from University of Tartu, Janno Järve from the Republic of Estonia Ministry of Economic Affairs and Communications and Indrek Künnapas from the Republic of Estonia Ministry of Justice Centre of Registers. I also thank the Estonian Labour Inspectorate, the Latvian Labour Inspectorate and the Estonian Ministry of Justice.

Sincere thanks go also to Andres Võrk, Anne Kuigo, Juta Sikk, Toomas Raus, Villem Tamm, Egle Tafenau, Jaanika Meriküll, Toomas Hinnosaar, Marit Hinnosaar, Anne Lauringson, Janek Uiboupin, Andres Juhkam, Alar Pandis and other colleagues for their support and advice during the whole research period.

I am especially thankful to prof. Tiiu Paas for providing a good research environment. I also owe a lot to many other colleagues and students of mine.

Finally, special thanks are owed to my family and friends for their continuous encouragement, patience and support during my doctoral studies.

Naturally, the author alone assumes responsibility for all possible mistakes and errors in the dissertation.

1. THE THEORETICAL AND EMPIRICAL BASIS FOR THE RESEARCH

1.1. Firm heterogeneity: theoretical explanations

1.1.1. Traditional economic theory versus stylized facts on firm heterogeneity

The neoclassical approach to the analysis of entry and exit into the market views both phenomena as adjustments towards the market equilibrium. Gort and Klepper (1982) review the different theories of entry like scale economies, technical change and shifts in optimum firm size, adjustment costs and technological change. The scale economies hypothesis assumes that there is some efficient scale of operations; thus the change in the anticipated equilibrium output (proxied by past change in sales) is also achieved by changes in the number of firms (rather than by the changes in the size of the firms). In Viner's theory (that dates back to 1932), since there is an optimum scale of operations determined by the long-run average cost curve, entry and exit occur in order to adjust the industry's production to the quantity demanded at the zero-profit price (Lucas 1978)⁶. The technical change theory postulates that due to the development of technology, the optimal firm size may change over the course of time (Gort and Klepper 1982). The adjustment cost theory implies that entry occurs when the growth rate of the market is higher than what would permit incumbent firms to capture the larger market without exceeding their optimal growth rates (determined by their managerial capacity). Technological change or a more rapid rate of innovations may increase market concentration and induce exits (Nelson and Winter 1978)⁷. These theories however do not explain simultaneous entry and exit (new firms replacing existing firms).

Though economic theory often exploits the paradigm of a representative firm, the empirical literature has convincingly documented wide heterogeneity in the behaviour of individual firms even within narrowly defined industries (Bartelsman *et al.* 2003). For example, the process of firm entry and exit is very

⁶ A counterargument to that statement is the observation that most changes in product demand result in changes in the size of individual incumbent firms, rather than through entry and exit (Lucas 1978).

⁷ The logic is that a successful innovator is expected to make supra-normal profits and hence to grow relative to other firms. If the firm is a successful innovator frequently enough or has a dominant innovation, a concentrated industrial structure may emerge.

common in a market economy (high entry rates are associated with high exit rates⁸). Establishment of a new firm is a risky (many of them fail, i.e. infant mortality is high), and firm performance is rather heterogeneous. Even in expanding industries many firms decline and in contracting industries, rapidly growing firms can be found. Conditional on survival, small entrants show higher growth rates than large ones (Gibrat's law that firm growth rate is independent of the initial size of the firm does not hold for entrants⁹). Concerning labour demand, changes in employment due to plant openings and closings are as important as changes due to expansions and contractions in continuing firms (Hamermesh 1993). The literature on job flows has well documented that job destruction (due to the exit of old firms or contraction of surviving firms) and job creation (either due to the entry of new firms or the expansion of existing ones) are largely simultaneous processes with a relatively modest change in total employment. Shifts in employment across individual firms are mostly idiosyncratic, with a relatively small proportion of movement explained by shifts between industries, firm size classes, and so on (Davis et al. 1997). Finally, although the standard approach is to assume that all firms in an industry use the same technology, the gradual application of the best practice technology is a more realistic view of the economy¹⁰.

The literature has shown that aggregate productivity growth occurs for reasons beyond technological and organizational changes. One such reason is the reallocation of production factors (resulting from entry and exit and the employment changes among continuing firms) from low-productivity production units to high-productivity units (see e.g. Ahn 2001). However, such reallocation also involves substantial costs and frictions. Due to specialisation of economic activities, this reallocation involves forgone production due to lost work time, the loss of human capital during non-employment and the break-up of long-term employment relationships (the costs being higher at the onset of the recession¹¹), and the earnings losses of the displaced workers.

⁸ As Caves (1998) notes, this evidence is inconsistent with the textbook model, namely that firms at efficient scale enter the industry when its equilibrium output grows and exit, when the industry output declines, but there is no simultaneous entry and exit.

⁹ A longer discussion on the Gibrat's law is provided in section 1.2.1. Firm growth.

¹⁰ Reasons for lags in the adoption of innovations include that firms may wait for adoption costs or uncertainty concerning the technology to decrease, firms may hesitate to incur the sunk adoption cost before product demand is high enough (Tirole 1995), learning may improve the performance of existing technologies (by switching to the new technology firm loses the accumulated expertise) and the vested interests could be present (switching to new technology may destroy rents for some subgroups) (De Groot et al. 2000).

¹¹ Hall (1995) summarizes that the loss of a regular job can lead to a subsequent sequence of low-pay interim jobs, before the worker gets back on the career path, because the formation of a new permanent employment relationship takes time due to the necessary experimentation needed to reveal the quality of a match.

Unemployment is the result of reallocation if there are frictions in the labour market such as long search processes. In addition to that costs exist related to worker retraining, the retooling of plants, installation of new equipment and the adoption of new technology (Davis et al. 1997, Böckerman 2001). The intangible inputs lost due to reallocation are the information capital (efficient matching of workers and jobs, long-term customer-supplier and debtor-creditor relationships between firms) and organization capital (embodied in sales, distribution and recruiting networks) (Davis et al. 1997). Additionally, Eliasson et al. (2004) showed that too frequent entry and exit might lower reliability of price signalling and result in consequent investment mistakes. Other losers of the process include the owners of obsolete businesses.

1.1.2. Innovation and creative destruction

We next review the most important theories offering explanations of the stylised facts reviewed in the previous section. The process through which new firms introducing new technologies and products (process and product innovations) trigger the exit of incumbent firms is usually termed “creative destruction” and ascribed to Joseph Schumpeter (Schumpeter 1983, first published in 1934). The main idea of creative destruction is that economic growth in a market economy involves reallocation because the growth coming from new products and processes requires the destruction of old products and processes (Davis and Haltiwanger 1999). Differently, Nelson (1981) summarizes that technological progress simultaneously destroys some industries, firms and jobs while creating new ones and such reallocation is a key factor in productivity growth¹². Technological upgrading is another way of adopting new technology as an alternative to creative destruction.

We have tried to summarize the main patterns of the creative destruction process in Figure 1. The arrival of innovations (new products, processes) makes old technologies and products obsolete (creative destruction). If new production units are more capable of adopting these, the result is the entry of new firms, the exit of incumbent firms and the reallocation of labour between different production units. However the entry process is surrounded with uncertainty. The advantages of the new processes or products (but also the managerial competence of the entrepreneur) are not known *ex ante*. The information is obtained after the entry through learning based on actual observable outcomes (like past profits). Thus many entrants may choose to leave the market after a while (selection), while those obtaining positive news grow. The whole process may be inhibited by factors like barriers to entry, weak competitive forces,

¹² In addition to the word “reallocation”, the word “selection” has been used as well in the literature.

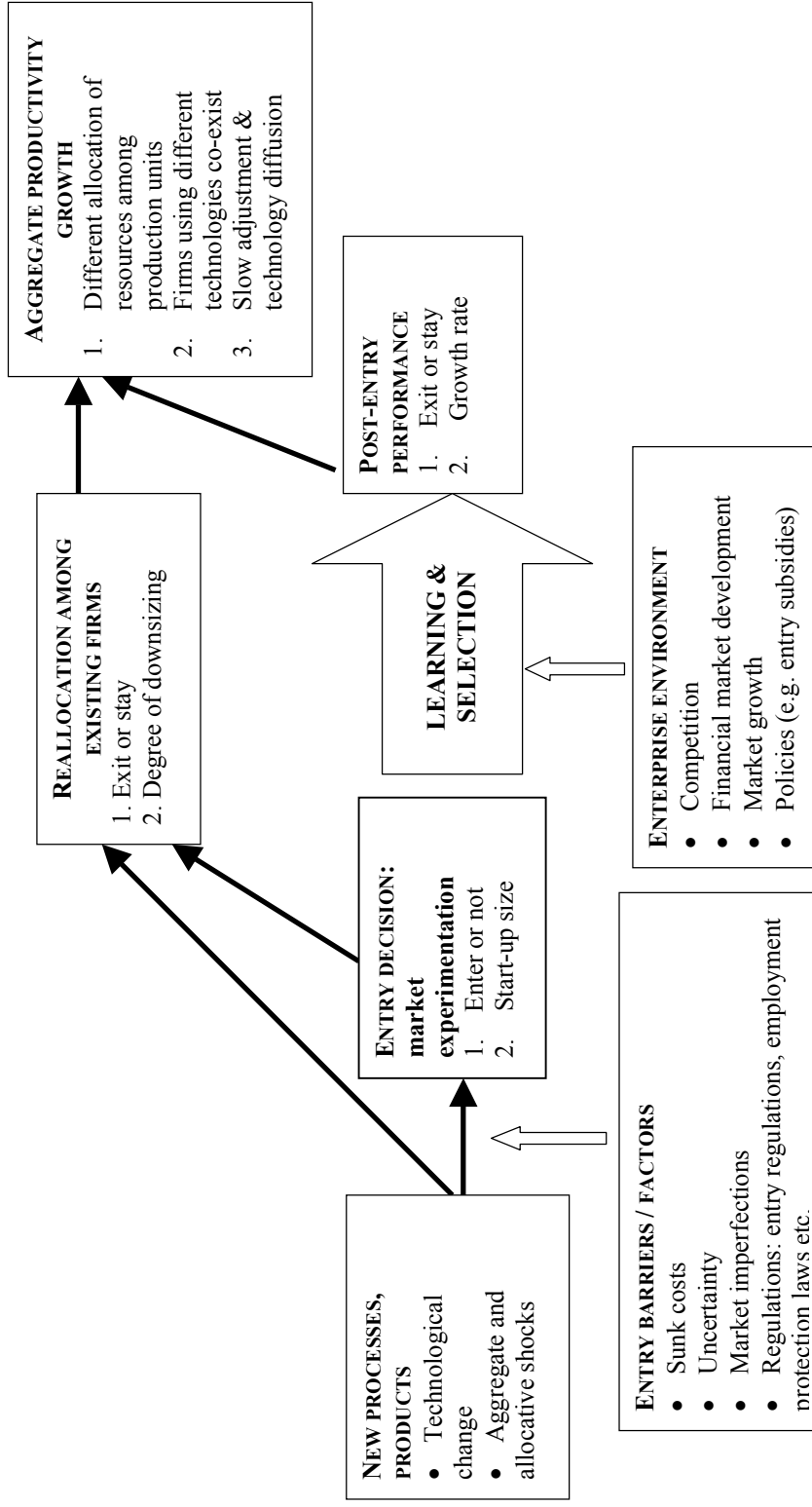


Figure 1. A scheme of the creative destruction process (compiled by the author).

imperfections in capital and labour markets (as the formation of new units assumes matching capital and labour resources). The aggregate effect of the change is productivity growth, but the restructuring may result also in underutilization of production factors (unemployment) due to reallocation frictions. Using the notions of Carlin and Seabright (2000), we can say that the creative destruction process thus contains an effective competition between firms that has not only incentive (inducing all firms to be effective) effects, but also selection effects (reallocating demand). Next we study a different aspect of that process in more detail, starting with the models of economic growth by Aghion and Howitt (1992, 1994) and Caballero and Hammour (2000).

Aghion and Howitt (1994) analyse labour reallocation in a model of economic growth with labour market frictions that cause a time-consuming matching process between workers and production units. Aghion and Howitt's (1992) main propositions are as follows: a higher rate of productivity growth is related to more job reallocation (that results in unemployment), the impact on the rate of unemployment being however ambiguous. On the one hand, the *creative destruction* effect reduces the duration of job match (as the firm's technology where the worker is employed may become obsolete and the plant will need to close down) and thereby raises the job destruction rate. This *direct creative destruction effect* is complemented by an *indirect effect*: higher growth reduces the lifetime of plants and creates faster profit decline during the lifetime, thus a lower benefit from creating a vacancy and a lower job creation rate. However, these effects are compensated by the *capitalisation effects*: an increase in growth rate raises the rate at which the returns from creating a firm grow over time, and hence also the capitalized value (present value) of these returns. The effect causes more firms to enter and thus increases the job creation rate. Thus the model explains the observance of a positive relationship between average unemployment rates and growth in industrial countries (Aghion and Howitt 1999). Increased growth is likely to result in higher job reallocation, which (as implied by job search theories) raises the natural rate of unemployment. Aghion and Howitt (1999) noted that this is consistent also with evidence from the job creation and destruction literature indicating that periods of high unemployment tend to be also periods of high firm-level job reallocation.

The model by Aghion and Howitt (1992) also implies that equilibrium growth could be either slower or faster than optimal. The growth could be too slow due to an appropriability effect (if skilled labour gets a part of the rent generated by innovation) or an intertemporal spillover effect (current innovators are not compensated for the benefit they provide for future innovators). The business stealing effect, on the other hand, can lead to excessively high growth if the innovators do not internalize the destruction of rents of incumbent firms due to their innovative activity.

Caballero and Hammour (1996) studied the timing and efficiency of the creative destruction process. In their model economy, the reallocation process

resulting from exogenous technical progress was inhibited by the existence of specific investments in labour (like investments in job-specific training or costs associated with hiring) as these create the appropriability problem (the employee may appropriate, *ex post*, the rents). They showed that synchronization of job creation and destruction is a sign of efficient labour reallocation (i.e. with the role of unemployment being then facilitating reallocation through lower search costs). Also, in an efficient economy both job creation and destruction are concentrated in recessionary periods when the opportunity cost of unemployment is low due to the low marginal profitability of production. However, the presence of the appropriability problem and contracting inefficiencies causes the destruction process to vary more cyclically than the creation process (as the sunk costs of firms and search costs for employees are not considered in the maximization problem of the joint economic surplus) causing too much job destruction and higher unemployment during recessions (the higher unemployment restrains the bargaining position of employees in the case of appropriability to sustain the profitability of investment). The role of unemployment is to reduce the search costs of creation and evolve as an equilibrium response to the aforementioned problems.

Gort and Klepper (1982) studied firm dynamics in relation to the product life cycle, particularly the diffusion of production innovations in terms of the changes in the number of firms producing the new product. Using data on the historical development of new products, they found that the product cycle can be divided into five stages based on net entry. Entry and exit rates achieve their maximums respectively in the second and fourth stage. Thus the number of firms increases till stage 3 and then starts to decline. In the final stage there are no consistent trends in net entry. They also found that technical change is most rapid in stage 2 where innovations of a relatively fundamental nature originate from new entrants (being most easily made by them¹³), and stage 4 where existing firms make less radical innovations (improvements in existing products through learning by doing). Decreases in external innovations, the increasing importance of learning by doing, and declining rates of return explain declines in entry rates.

Agarwal and Gort (1996) showed, using US firm-level data, that product cycle stage related factors (the rate of technical change and the nature of innovations) affects the entry and exit rates, as well as the survival of new firms. Jovanovic and MacDonald (1984) developed a model where at the beginning of the product life cycle firms use the same technology but thereafter a new technology emerges increasing the optimal scale and forcing some of firms to

¹³ An argument noted by Gort and Klepper (1982), is that if the sale of information on the new product is difficult, the innovator (firm in technologically related market, the producer of equipment) has to enter the market in order to gain the value of the innovation.

exit, while those staying in the industry increase their output due to new technology adoption.

Another factor influencing why the performance of individual firms may differ so much in terms of labour demand, optimal labour use, the use of technologies and productivity performance, is the slow diffusion of information about available production and managerial technologies and product market conditions. Nasbeth and Ray (1974) document that there are rather long lags in the diffusion of knowledge about new technologies between firms producing similar products. Mansfield et al. (1981) report that product imitation involves long time lags and the costs of imitation may be not much lower than the costs of innovation¹⁴.

Vintage models of technological change¹⁵ are also used to explain observed patterns of enterprise dynamics. These models stress that new technology, as embodied in new capital (Boddy and Gort 1971), requires retooling of the production process (Cooper et al. 1997). Given this, existing plants may find it more difficult to adopt the new technologies as new entrants need not go through such restructuring¹⁶. Many theoretical models have specified (assumed or derived) that new technologies come from new firms (Mortensen and Pissarides 1994). Campbell (1998) shows, using US data, that observed fluctuations in entry and exit over the business cycle are determined by shocks to the rate of embodied technological progress. The coexistence of firms using both state of the art and older technologies is also explained by the existence of sunk costs (Bartelsman et al. 2004).

Davis et al. (1997) also stress that differences in the capabilities of managers (e.g. ability to adopt new products, organize production, adapt the organization to environmental changes) may explain the heterogeneous outcomes of firms (in terms of jobs, productivity growth etc). Lucas (1978) studies how the distribution of managerial talent affects the size distribution of firms.

The reallocation models usually postulate perfect capital markets. Barlevy (1999) provides a model in which the introduction of capital market imperfections causes the most efficient jobs to be destroyed during the recession and resources to be allocated towards less productive uses. Thus the outcome is contrary to the Schumpeterian view of reallocation.

¹⁴ Concerning other studies, see e.g., Oster (1982) for the steel industry, Kamien and Schwartz (1982) on the role of market structure, and Hannan and McDowell (1984) for the banking industry.

¹⁵ The idea of the vintage models of technological change is that technological progress is embodied in new equipment and the capital stock consists of machines of different ages or vintages. The first such model is due to Solow (1962).

¹⁶ Also the time of entry of different types of entrants may differ. Diversifying firms may enter later than de novo entrants due to risk avoidance (the risk of losing existing resources due to early entry), perceptual problems (failure to perceive opportunities as quickly as de novo entrants, excessive focus on existing customers), etc. (Helfat and Liebermann 2002).

1.1.3. Experimentation under uncertainty

Theories arising from Schumpeter's process of creative destruction state that new technologies and innovations are introduced by new firms, which, if successful, replace incumbent firms¹⁷. Incumbents may be resistant to adopt the new technology for various reasons. For instance, when incumbents have accumulated knowledge with conventional technology, they become less willing to take risks associated with adopting a new technology. The required retooling of production in existing plants in order to adopt the new technology may also trigger the entry of new firms (plants), if they do not need to go through such a retooling process. The presence of sunk costs may similarly cause the diffusion of the exploitation of new technology to come through new firms, so that different firms simultaneously exploit state-of-the-art and older production methods (Ahn 2001, Bartelsman et al. 2004).

Passive and active learning models (see respectively Jovanovic 1982 and Ericson and Pakes 1995) as well as real option models have emphasized that the entry process is fraught with uncertainty about whether the product or process will be successful as well as whether the person establishing the firm is a suitable entrepreneur. Market experimentation is necessary – in many cases the uncertainty can be only resolved through market entry. These theories explain how experimentation creates micro-level heterogeneity in firm performance. The size of the fixed (sunk) costs of entry (capital commitments) affect the time and information needed to “convince” an unsuccessful firm to exit. Experimentation under uncertainty affects also post-entry growth performance. Firms incur sunk costs when building production capacity. Due to sunk costs, entrants that are less confident about their success might rationally enter at a small scale even if the industry's technology implies a high minimum efficient scale. These firms thus experience higher growth rates when successful relative to larger entrants (Caves 1998). Caves (1998) noted also that we may need to distinguish between entrants who rationally limit the size of their initial commitment and those that are forced to do so due to factor market imperfections.

We study in more detail the passive learning model. In the model of Jovanovic (1982), the firm's objective is to maximize its expected discounted value of future cash flow. Firms do not know their cost function (that is assumed to be time-invariant), i.e. its relative efficiency at the time of entry, but they discover it through realized profits that contain information on the characteristics of the true cost function. Management then uses this knowledge to form a probability distribution of future net cash flows. Based on outcomes and its updated knowledge, the firm decides to expand, contract or exit. A feature of the model is that firms have no prior knowledge about their post-entry performance, thus the likelihood of survival is stochastic across firms.

¹⁷ Alternatively, we may imagine that old firms had an advantage because of being already in the business making it more likely that these firms adopt new technology.

Frank (1988) extends Jovanovic's analysis (1982) by allowing for heterogenous entrants and allowing firm size to affect the rate of learning. We briefly present the structure and main results of the Frank's intertemporal model¹⁸. A risk-neutral (maximising expected profit) and competitive (price-taking) firm enters the market at time $t=1$ and incurs a (non-recoverable) sunk cost C . For $\forall t, t=2,3,\dots,T$ (T is, e.g., the retirement age of the entrepreneur) the firm must decide whether to exit ($b_t=1$) or not ($b_t=0$). Firm re-entry after exit is ruled out. If exiting, the value of an outside option U_t is U for every period $(t, t+1)$ (the value of staying at the old job before becoming an entrepreneur). If the decision is to remain, the level of effort L is chosen from $[0, \dots, \bar{L}]$, that determines together with luck (i.e. a productivity shock, ε_t , $\varepsilon_t \sim N(0, 1/h_\varepsilon)$) and talent α the firm's revenue, $R_t = \alpha \cdot L + \varepsilon_t$. The cost of undertaking effort L is $V(L)$, where $V'(L) > 0$ and $V''(L) > 0$. The firm's talent is unknown to the firm itself, and at time t the entrepreneur's knows only that α is drawn from a normal distribution, $\alpha \sim N(m_t, 1/h_t)$, where m_t and h_t can change over time. Under this assumption, the firm's best guess (in terms of the minimum expected squared error) of α at time t is $m_t \equiv E_t \alpha$.

The essential feature of the model is that the productivity parameter α is not known to the firm and, due to the existence of stochastic ε_t , it cannot be calculated from the values of R_t, L_t . At the moment $t+1$ the estimate of α is updated based on the values of R_t and L_t according to Bayes' theorem¹⁹. The revised estimate of α will be also normally distributed with mean, $m_{t+1} = (h_t m_t + h_\varepsilon L_t R_t) / (h_t + h_\varepsilon L_t^2)$ and variance $1/h_{t+1}$ with $h_{t+1} = h_t + h_\varepsilon \cdot L_t^2$ ²⁰. Thus, new information is obtained if $L_t > 0$ (if $L_t = 0$, $m_{t+1} = m_t$ and $h_{t+1} = h_t$). R_t is positively correlated with m_{t+1} and higher L_t increases the estimation precision while higher luck variance (lower value of h_t) slows down the rate of learning on α arising from realizations of R .

The firm's objective is to maximize the sum of the future expected discounted profits, Π_t . For this maximum, Π_t , the following holds:

¹⁸ Though this is not the standard reference in the literature (the most common one is Jovanovic 1982), we have chosen Frank (1988) for more detailed review, as the derivation of the central results is relatively straightforward.

¹⁹ Bayes theorem states that for any 2 events A and B, the probability $P(A|B)$ (posterior probability) can be written as the product of prior probability $P(A)$ and the term $P(B|A)/P(B)$, i.e. $P(A|B) = P(A) \cdot P(B|A)/P(B)$. The updating of probabilities in this manner is called Bayesian learning in probability theory.

²⁰ For the derivation, see e.g., DeGroot (1974).

$$\begin{aligned}
\Pi_1 &= \max_{b_1, L_1} \{U_1 b_1 + [E_1 R_1 - V(L_1) - C](1 - b_1) + \beta E_1 \Pi_2\} \\
(1.1) \quad \Pi_t &= \max_{b_t, L_t} \{U_t b_t + [E_t R_t - V(L_t)](1 - b_t) + \beta E_t \Pi_{t+1}\}, \quad t = 2, \dots, T \\
\Pi_{T+1} &= 0
\end{aligned}$$

We recall that for $t = 2, \dots, T$ b_t is 0 or 1 only if $b_i = 0 \forall i < t$, otherwise $b_t = 1$ and therefore

$$(1.2) \quad \Pi_t = \sum_{i=t}^T \beta^{i-t} U_i .$$

The solution of the model is obtained by backward induction and is then as follows. For any period $T - S$, $S \in [1, T]$ the optimal value of effort \hat{L}_{T-S} is implied by

$$(1.3) \quad m_{T-S} - V'(\hat{L}_{T-S}) + \beta \frac{\partial [E_{T-S} \Pi_{T-S+1}^C]}{\partial L_{T-S}} = 0$$

The first term is the marginal expected value of extra effort, while the second one is the cost of effort. The third term captures the discounted value of the impact of marginal effort on the sum of the future expected discounted profits from the next period onwards via information on α . The values for b_{T-S} satisfy

$$(1.4) \quad b_{T-S} = \begin{cases} 1, & \text{if } \sum_{i=0}^S \beta^i U_{T-i} > m_{T-S} \hat{L}_{T-S} - V(\hat{L}_{T-S}) + \beta E_{T-S} \Pi_{T-S+1}^C \\ 0, & \text{if not} \end{cases}$$

Thus, firms exiting at the moment $T - S$ have relatively low m_{T-S} . Generally, Frank (1988) notes that before exit a firm has declining values of m_t and accordingly declining values of effort \hat{L}_t . The model has the following implications. A higher sunk cost C implies that the entrant has higher expected ability, m_t , at the time of entry (in order to be able to cover the sunk costs ex ante). Thus in this case it takes more time for sufficiently bad shocks (luck) to induce exit. The prediction that follows is that since it takes time to confirm low level ability, the number of exits is low initially, but grows thereafter, and starts to decline eventually after inefficient firms have exited. This prediction is supported by empirical evidence (called the ‘‘liability of adolescence’’ hypothesis) as we will see below.

Helfat and Lieberman (2002) criticize Jovanovic’s approach (and generally the importance of post-entry learning). Helfat and Lieberman note that in Jovanovic’s model entrants learn about their capabilities only by entering the market, while their extensive survey of the literature on entry shows that the decision to enter or not, the success of entry and the selection of entry mode are dependent on how the potential entrant’s pre-entry resources (knowledge,

financial capital, marketing etc.) match the required profile of the market. They further argue that firms' pre-existent observable resources play a dominant role over learning after entry. They also argue that entrants' unrealistic optimism concerning their abilities explains high failure rates.

In Ericson and Pakes' (1995) active learning models, the difference is that a firm actively investigates its economic environment and invests in order to enhance its ability to earn profits in a competitive environment (competitive factors arising from inside and outside the industry). As opposed to Jovanovic's (1982) model, the value of the unknown profitability parameter changes over the time as a response to stochastic outcomes of the firm's own investments and the investments of other firms in the same market. Again, based on market performance, unsuccessful firms downsize and exit, while successful firm stay and grow.

The reviewed stylized facts produced by empirical work are consistent with the experimentation under uncertainty view, e.g. the evidence that entry and exit occur very frequently, many entrants fail to succeed in the market while successful entrants demonstrate rapid growth²¹. Concerning different forms of learning, Pakes and Ericson (1998) assert that the US evidence indicates active learning explains firm dynamics in the manufacturing sector while passive learning explains firm dynamics in the retail sector. Doms et al. (1995) interpreted the evidence that capital-intensive and advanced technology using plants had higher growth and survival rates consistent with active learning models with capital intensity serving as a proxy for unobserved sources of efficiency. In terms of the policy implications of the noisy selection model, Santarelli and Vivarelli (2000) argue that in the case of market selection and learning, subsidizing entry is risky as subsidies may weaken market selection (less efficient firms do not exit), cause deadweight loss effects (the beneficiaries would have survived and grown even when not receiving the subsidy) and distort the entrepreneur's interpretation of market signals.

According to Lambson (1991), even when there are no motives for experimentation with new products or production methods, uncertainty about future cost or demand conditions (factor and product prices) motivates firms to differentiate the choice of current products and technology (in order to position themselves optimally), and the fact that firms use different technologies reflects different predictions about future market conditions at the time of technology choice.

In sum, a great number of reallocation theories have been developed to explain the observed stylized facts. The need for reallocation results from the continuous occurrence of allocative shocks causing some existing

²¹ Other explanations could be that large firms can smooth out idiosyncratic disturbances affecting smaller units as they are more diversified than small firms, and that large firms often use more specialized human capital that strengthens the durability of employment relationships (as summarized by Böckerman 2001).

establishments to become unprofitable and triggering the arrival of new high productivity establishments. The reallocation of factor inputs between firms is hindered by frictions like moving costs, search costs, sunk investments etc. Thus the (short run) costs have to be weighed against the long run gain resulting from growth.

1.2. Overview of selected empirical studies on firm dynamics

1.2.1. Firm growth

We next review empirical evidence on job reallocation and firm dynamics, starting with the *post-entry* performance of firms, i.e., firm growth and survival after entry. Job creation and destruction occurs at the firm level and thus determines the firm's growth over time. Empirical studies of corporate growth suggest that rates of growth vary over time and across firms much more than other measures of corporate performance (Urga et al. 2002).

A well-known relationship is noted in the literature on firm growth – Gibrat's Law (or the proportionate effect hypothesis). Raised first by Gibrat in 1931, the Law states the following: if firm growth rates in a fixed population (i.e., entry and exit are ruled out) are independent of initial size (i.e., no tendency for small firms to grow faster than large firms), the variance of growth rates shows no heteroscedasticity with size and there is no serial correlation in growth rates, then the variance (and the degree of concentration) of the size distribution of firms will necessarily increase over time (Caves 1998)²². If there were a negative relationship between firm size and growth then the variance may remain constant or fall over time so that convergence occurs. The resulting size distribution of firms is then lognormal. Though this is purely a statistical model, some theoretical models have also incorporated the features of this statistical model.

²² Following Sutton (1997), the argument is the following. If the firm size at time T is denoted as s_t , and the proportionate growth rate between t and $t-1$ is ε_t , then $s_T = s_{T-1}(1 + \varepsilon_T) = s_0(1 + \varepsilon_1)(1 + \varepsilon_2) \dots (1 + \varepsilon_T)$. For short period ε_t is small, and then $\ln(1 + \varepsilon_t) \approx \varepsilon_t$. Taking logs of both sides, we get $\log s_T = \log s_0 + \varepsilon_1 + \dots + \varepsilon_T$. By assuming that the growth rates are i.i.d. normal variables with $\varepsilon_t \sim N(m, \sigma^2)$, we get that as $t \rightarrow \infty$, the distribution of $\log s_T$ approaches a normal distribution with parameters mt and $\sigma^2 t$ (because $\log s_0$ is small relative to $\log s_t$). If the variance of the size distribution is rising over the time, then the arithmetic mean of s_t (\bar{s}_t) is will be rising faster than the $\log s_t$, the relationship between the two is $\bar{s}_t = \exp(mt + \sigma^2 t/2)$.

Empirical work has resulted in the following stylized facts regarding the validity of Gibrat's model. First, although the early evidence suggested that firm size and the average growth rate are independent from one another, later evidence indicates this holds for relatively large firms, though several studies have rejected this relationship for small firms²³. Evans (1987) concluded that Gibrat's law is not an unreasonable assumption for very large firms which contribute most to industrial output, but it is not reasonable for smaller firms that account for the vast majority of firms in most industries. Mean reversion (a negative relationship between size and growth) implies that all firms will converge to the same size in the long run, but estimates of convergence speed typically suggest that this is an extremely slow process. Secondly, the variance of firm growth is not independent of size but decreases with it (at least if the largest firms are excluded, Caves 1998). Thirdly, firms' growth rates may be serially correlated, either due to the error correction process (negative autocorrelation) or due to the gradual response of firm size to some good or bad news about a firm's competitive position (positive autocorrelation).

There are estimation issues that complicate the testing of Gibrat's law when there are transitory components in firm size or errors in variables. In particular small firms may be observed to grow faster as the negative transitory component is reversed over the period for which the growth rate is calculated (Davis et al. 1997). They showed that the seemingly negative relationship between firm size (measured by employment) and growth could be removed by using the average of the firm's employments in the current and previous period. Further, the problem could be due to measurement error in the lagged firm size.

Empirical findings indicating firm growth is roughly independent of firm size have led to the development of a number of industrial organization theories in which Gibrat's law is either taken as an assumption or an implication (Evans 1987). The capital adjustment theory by Lucas (1967) predicts (as a consequence of the constant returns to scale technology assumption) that Gibrat's law holds for the complete size distribution of firms. Simon and Bonini (1958) assume that firm growth is independent from firm size for firms that are larger than the level of minimum efficient scale (determined by the minimum of the average cost curve). Nelson and Winter (1978) report simulation results indicating that firm growth increases and then decreases with firm size for firms older than 20 years. Jovanovic's (1982) theory implies that firm growth is

²³ Often the following model is used to discuss the dynamics of firm size. Let s_t be the size of firm at time t , that evolves over time according to the following equation: $\Delta s_t = \beta s_{t-1} + \alpha + \varepsilon_t$, where ε_t is a sequence of independently and identically normally distributed random variables (white noise process). Applied to a cross section or panel of firms, the observation that $\beta < 0$ indicates the existence of mean reversion and is a necessary condition for a decrease in the variance of the log of the firm size over time. If $\beta = 0$, then firm size evolves according to a random walk with drift, known in the corporate growth literature as Gibrat's law.

negatively correlated with firm age but is independent of firm size for mature firms with Cobb-Douglas technology exhibiting decreasing returns to scale. Further theories have been developed explaining departures from Gibrat's law. Cabral (1995) offers a theoretical model explaining the negative relationship between firm size and growth. His model assumes that firms must incur sunk costs in building production capacity. Since small entrants have a higher probability of exit, it is optimal for them to invest more gradually, and thus experience higher growth rates when successful.

1.2.2. Entrants' Survival and Subsequent Growth

An important strand of research on firm dynamics has focused on determinants of the post-entry survival of entrants. The stylized fact that has emerged from the literature is that many of the entrants close down within a few years after entry. For example, Bartelsman et al. (2004) concluded, based on the evidence from 24 countries, that about 20–40% of entrants fail within the first 2 years. Concerning hazard rates (the probability of failure at certain time conditional on survival until that time), studies have shown either a negative duration dependence or an inverse U-shaped hazard function. The decreasing hazard is explained by experimentation with the market by entrants and the selection of best performers. The U-shaped hazard function corresponds to the “liability of adolescence” hypothesis (Mahmood 1997) stating that during the first short period after entry hazard rates are low due to the stock of initial resources at start-up. Agarwal and Gort (1998) argue that the industry's life cycle could have a dominant impact hazard rate dynamics over time (e.g., hazard rates increase over time for early entrants as the industry matures).²⁴

We next focus on whether survival of a particular firm is predictable given its characteristics or is random. Audretsch et al. (1999) distinguish between “Deterministic” and “Stochastic” approaches regarding firm post-entry performance in the literature. Concerning the former, the theoretical model of “noisy selection” introduced by Jovanovic (1982) suggests that the likelihood of survival should be random across all firms. Studies belonging to the deterministic tradition of post-entry performance suggest that survival probability is not random across firms but, rather shaped by characteristics specific to the firm. Dixit (1989) and Hopenhayn (1992) both argue that the higher sunk cost levels in an industry lead to lower exit rates and higher growth rates of surviving firms. Audretsch (1991 and 1995) has provided empirical evidence on

²⁴ The organizational ecology literature in sociology relates the high failure rates of new organizations to internal issues (like their members not having yet created trust between each other, the time needed to develop roles and routines) as well as environmental relations (new organization need to create relations with existing organizations that supply them resources) (Hannan and Freeman 1989).

these phenomena. Other theories (Audretsch 1995) suggest that the post-entry performance of firms is influenced by the degree of scale economies in an industry, e.g., in industries with high minimum efficient scale the general small size of new-firm start-ups implies that the post-entry growth rates of the surviving firms will be high, while those not able to grow will be forced to exit resulting in a relatively low survival likelihood. Empirical evidence for the United States (Audretsch, 1991; Audretsch and Mahmood, 1995), United Kingdom (Dunne and Hughes, 1994), Portugal (Mata and Portugal, 1994), and Germany (Wagner, 1994) support the theory that the likelihood of survival tends to be lower in industries characterised by a greater degree of scale economies. It has been hypothesized and found that high innovation-opportunity industries attract less risk averse entrepreneurs affecting firm post entry growth if successful and leading to higher failure rates (Audretsch 1991).

An important determinant of survival is firm start-up size. A stylized fact is that firms enter an industry at different initial sizes (Caves 1998). The explanation could be that initial size reflects the firms' expectations about their unknown (untested) capabilities – the less confident potential entrepreneurs enter at a smaller scale (make smaller sunk resource commitments) even if they then have a cost disadvantage relative to the incumbents due to scale economies in the industry. This rational behaviour also affords opportunities to invest and grow if the news on their abilities proves positive. This explanation has been supported by empirical evidence indicating that entrants' survival chances decline with their initial size (Audretsch and Mahmood 1995) and that different pre-entry abilities (entrepreneurs' previous related work experience or schooling) lower the failure rates. Diversified entrants (multi-plant entrants) have been found to have lower failure rates than single plant entrants due to better information regarding ability to operate in a given market etc. (see e.g. the literature review by Caves 1998).

We now explore a few other explanatory variables of firms' post-entry survival used in empirical studies. First, an important determinant of survival is competition level that could be a screening device sorting out successful firms and forcing less successful firms to exit. The proxies used have been, e.g., the entry rate of the industry (Özler and Taymaz 2004), market concentration measures like the Herfindahl index, and import and export penetration rates (Brown and Earle 2000). Secondly, firm ownership may affect survival chances. Foreign firms may be less rooted to the domestic economy and thus be more likely to close down production following a negative shock. Conversely, foreign firm may have superior technological and managerial skills, enabling them to develop successful entry strategies and improve pre-entry assessment of market conditions thus improving survival probabilities (Özler and Taymaz 2004). Foreign presence in the market may reduce domestic establishments' survival probabilities (Özler and Taymaz 2004). Foreign ownership also may affect survival through initial size. Özler and Taymaz (2004) argued (and showed empirically for Turkey) that foreign firms have greater initial size, because they

are likely to have better information about firm capabilities and have fewer problems raising capital for new investment.

Entrants' high rate of mortality is combined with fast post-entry growth. Bartelsman et al. (2004) note that due to the exit of smaller entrants and rapid growth of survivors, the average size of the entering cohort approaches the efficient scale quickly. The growth rates of entrants however decline over the course of time (e.g. Evans 1987) supporting the passive learning model stating the younger the firm is, the more each observation of firm performance contributes to knowledge about its costs. Dunne et al. (1988) found for United States that the combined market share of the entrants of a given cohort declines over time. Most studies have shown that entry and exit are simultaneous processes (Caves 1998), and that exit rates are more responsive to entry rates than vice versa (see e.g. Lay 2003). Troske (1996) found that exiting firms experienced declining (and negative) growth rates for years before their exit. Still, exiting firms are relatively large compared to their competitors (Caves 1998).

1.2.3. Turnover, productivity and efficiency

If firm turnover is to raise productivity, more efficient firms (with higher productivity) must crowd out less efficient firms. The contribution of firm entry, exit and the mobility of jobs across incumbent firms on industry-level productivity growth has been quantified in the literature with different decomposition formulas. There are a few alternative methodologies for measuring the contribution of firm turnover and production resource reallocation on productivity growth. A good discussion of the benefits and problems of different methods is presented in Baldwin and Gu (2002). Overviews of the results of different studies can be found in Ahn (2001) and Davis and Haltiwanger (1999). The main findings have been the following: 1) it is not only the growth of individual firms' productivity that determines the productivity growth for an industry, but the contribution of reallocation is important as well; 2) the effect of entry is often small due to the low productivity of entrants (especially when the change is measured over a relatively short time period); 3) reallocation tends to be more important for the growth of total factor productivity than labour productivity; 4) the contribution of firm demographics tends to be larger during recessions.

A different, but related line of research investigates the productive efficiency of individual production units where dispersion of efficiency levels across competing firms provides the potential for firm turnover to raise the aggregate productivity through reallocation (Caves 1998). Thus mobility should reduce the dispersion of efficiency levels, while an increase in dispersion should increase turnover. Research on productive efficiency has shown that the gap between industry average and best-practice productivity reveals "the sources of opportunities for productivity-raising turnover, just as the evidence on turnover

shows the strength of the forces keeping productive inefficiency in check” (p. 1974). In one study, Baldwin (1995) found that in Canadian manufacturing faster technical progress increased productive inefficiency (due to firms that did not adopt new technologies) and also prompted firm turnover to displace them. Conversely, Dunne (1994) found that, contrary to vintage models of technological change, old plants were also able to adopt advanced production technologies, so that plant age and technology use were relatively uncorrelated.

1.2.4. Variation of firm dynamics over the business cycles

Finally, there are some studies on the variation of firm entry, exit and job flows over the business cycle. Caballero and Hammour (1994) argue that reallocation should occur during recessions because the unemployment necessary for reallocation has the lowest opportunity cost at these times (due to lower marginal profitability of production). Empirical evidence from US labour markets indicates that entry is procyclical and exit countercyclical with the job destruction rate fluctuating more than the job creation rate over the business cycle implying cyclical asymmetry (Davis et al. 1997). Foote (1998) argued that the latter does not hold for growing sectors such as non-manufacturing industries (however the relative variance of job destruction declines with an industry’s trend employment growth). Also job reallocation (the sum of destruction and creation) increases during the recessions. On the other hand, job turnover has been acyclical in continental Europe (Garibaldi 1998). Davis et al. (1997) also note that dominant theories on business cycles do not adequately explain the empirical evidence on job flow dynamic as these focus on aggregate shocks affecting different firms broadly in the same way. We referred above to the study of Campbell (1998) who explained the cyclical variation of entry and exit rates by the shocks to the rate of embodied technological progress.

Davis et al. (1997) distinguish between three kinds of theories that try to explain the cyclical behaviour of job and worker flows. First, there are studies that assume that the economy is hit systematically by the allocative shocks that cause idiosyncratic variation in the profitability of different jobs, firms and worker-job matches (Davis et al. 1997). The cyclical variation in the allocative shock is used as an explanation for aggregate fluctuations. The second strand of literature explains how aggregate shocks interacting with allocative shocks and reallocation frictions (like the time consuming matching process in labour markets) affect the timing of reallocation. Different reasons include that shocks can shift declining firms over the adjustment threshold (see e.g. Caballero and Hammour 1996), the cost of reallocation can vary pro-cyclically, and that some firms may face credit restrictions during the recessions. The third strand of theories studies the role of costly information acquisition through search and experimentation on reallocation. Campbell and Fisher (2000) explained the fact that the job destruction rate fluctuates more than the job creation rate, through

the proportional plant level costs of creating and destroying jobs. Garibaldi (1998) explained the differences between US and Europe using a search-theoretic matching model. In the absence of firing costs but with costly hiring (as is typically assumed in the case of US) job creation tends to persist more during recessions than destruction during expansions leading to counter-cyclical turnover. In the case of high firing costs, job destruction becomes more persistent during expansions leading job turnover to become positively correlated with net employment changes. Though the general perception is that crises speed up restructuring, Caballero and Hammour (2000) argue that crises are an obstacle to the creative destruction process because of tight financial markets conditions (which decrease financing available for the creation of new firms).

1.3. The role of institutions in firm dynamics and reallocation: employment protection regulations

The size and the efficiency of worker and job reallocation is affected by government policies and institutions such as labour laws, product market regulations, bankruptcy and insolvency regulations, administrative burdens to start a new business, regulatory barriers to international trade and investment, etc.²⁵. Given that our primary focus is on labour market aspects of reallocation, we concentrate next on employment protection legislation (hereafter also EPL) (regulations covering hirings and firings). *Inter alia*, reallocation involves breaking old employment relationships and creating new ones, thus the strictness of EPL (how free are employers to hire and fire people at their will) is crucial. Employment protection regulation is one of the most relevant aspects of the multidimensional concept of labour market flexibility²⁶. It includes employee protection against dismissal, limitations on the use of temporary forms of employment (fixed term contracts, temporary agency employment), and regulation of working hours, but in a broader sense also such aspects of employment as health and safety and protection of employees working under hazardous conditions. Employment protection increases per worker employment costs (if we understand EPL to include broader labour standards), though more often the focus is on EPL's impact on employment adjustment costs (Addison and Texeira 2001). Freeman (1993) refers to two opposing perspectives on EPL as "institutionalist" and "distortionist". The former emphasizes that labour regulations are needed to circumvent the weak bargaining power of employees

²⁵ The term "institutional infrastructure" has been used in order to refer to "practices, rules and organizations that guide and govern economic activities" (Transition report 1995, pp. 48).

²⁶ The concept of labour market flexibility has been studied e.g. in Eamets et al. (2003), Hahn (1998), Nickell (1997), and Berthold and Fehn (1996).

in employment relationships, due to inadequate insurance against the risk of unemployment, and to moderate effects of downswings in aggregate demand and to enhance investments in human capital (and thus productivity growth) as better skilled workers may also increase internal (functional) flexibility. The distortionist view emphasizes the advantage of market processes and argues that strict Employment Protection Legislation (EPL) increases dualism of the labour market by favouring insiders (workers with unlimited duration contracts), increases effective labour costs, discourages hiring and impedes adjustment to economic shocks.

Different indicators have been used in the literature in order to measure the rigidity of EPL. The best-known detailed measure is Lazear's size of the statutory compensation in case of no-fault individual dismissal for economic reasons (Lazear 1990). Summary indicators that compress the information of detailed indicators into a single flexibility number have been constructed in many studies. To gauge aggregate flexibility, both ordinal and cardinal approaches have been used. In case of the latter the relative weights of different individual indicators have been either arbitrarily specified (OECD 1999) or deduced by using statistical methods like factor analysis (Nicoletti et al. 2000). Bertola et al. (2000) stress that shortcomings exist in indicators as these indicators neglect atypical forms of employment and ignore the links between different forms of labour market flexibility.

If we consider the tightness of a country's employment protection legislation as a proxy for labour market flexibility, we can see that Western European countries have relatively inflexible labour markets (Bertola, 1990; Grubb and Wells, 1993). Also Latin-American countries have high levels of job security provision (as documented by Heckman and Pages 2000). On the other hand Anglo-Saxon countries (United Kingdom, US, Canada, Australia) have the lowest levels of employment protection (OECD 1999).

The impact of EPL on labour market outcomes has been studied within theoretical models. Bertola (1999) has provided a literature survey covering theoretical work on the impact of EPL on labour market performance. First, the imposition of adjustment costs reduces hirings during upturns and firings during downturns, so that aggregate employment fluctuates less over the business cycle than in the absence of employment protection (Nickell 1986, Bertola 1990), though the effect on the average unemployment level is unclear. Risager and Sorensen (1997) extend the model of Bertola by allowing the return on capital to be reduced by higher labour turnover costs resulting in lower investment in capital, lower labour demand and thus lower employment and higher unemployment.

We next shortly illustrate the impact of EPL using the Bertola's (1999) approach. The marginal productivity of labour employed by the representative firm is $\pi(l_t, Z_t)$, where l_t is the amount of labour employed at time t and Z_t is the term representing all possible exogenous determinants of labour demand.

We assume that $\partial\pi/\partial l_t < 0$ (diminishing marginal productivity of labour) and $\partial\pi/\partial Z_t > 0$. Let V_t denote the marginal contribution of labour to the sum of future expected discounted profits (value of firm). For simplicity it is assumed, that Z_t and l_t are sufficient statistics for future variables, thus $V_t = V_t(l_t, Z_t)$. Firing and hiring costs are denoted respectively as F and H . When making employment decisions, effects on future profits need to be considered due to the presence of F and H (thus they add the dynamism to the decision making problem). Suppose the term Z_t fluctuates between the states Z_B and Z_G ($Z_G > Z_B$; we may think of G and B as standing for “good” and “bad” respectively) with symmetric transition probabilities p . We assume the corresponding employment levels are l_G (for $Z_t = Z_G$) and l_B (for $Z_t = Z_B$). Similarly, $V_t = V_B$ for $Z_t = Z_G$ and $V_t = V_G$ for $Z_t = Z_G$. Let r denote the discount rate applied to future cash flows and \bar{w} be the constant wage cost. Labour’s contribution to expected present discounted profits equals the contribution in the current period plus its expected contribution from the next period onwards, the latter discounted at rate r . Therefore the values of V_G and V_B satisfy the recursive relationships

$$(1.5) \quad V_G = \pi(l_G, Z_G) - \bar{w} + \frac{1}{1+r} [(1-p)V_G + pV_B]$$

and

$$(1.6) \quad V_B = \pi(l_B, Z_B) - \bar{w} + \frac{1}{1+r} [pV_G + (1-p)V_B].$$

The value maximizing employment process requires, that at the margin $V_B = -F$ and $V_G = H$. Let us assume that hiring costs equal zero, $V_G = H = 0$. Then, as V_B and V_G are sufficient statistics for labour demand policy, the particular values of l_G and l_B are determined from the following recursive relationships:

$$(1.7) \quad \pi(l_G, Z_G) = \bar{w} + \frac{p}{1+r} F, \quad \pi(l_B, Z_B) = \bar{w} - \frac{r+p}{1+r} F.$$

The interpretation of the first equation is as follows. During the good state ($Z = Z_G$) wage costs are increased by the expected discounted value of future firing costs to be paid in the next period (the probability p that demand improves times the size of discounted firing costs). Therefore labour demand is reduced (relative to the case where $F = 0$). The second equation implies that for $p = 0$, the cost of continued employment for the marginal worker is the flow cost (w) minus the value of saved firing costs $rF/(1+r)$. If the probability, p , that demand improves increases (so that the marginal worker may contribute to the firm more in the next period), then the incentives for

labour hoarding are increased. Then in good states less people are hired and in bad states less fired, and thus employment fluctuations are smaller.

At the same time, the difference between the two optimal marginal productivity levels is

$$(1.8) \quad \pi(l_G, Z_G) - \pi(l_B, Z_B) = \frac{r + 2p}{1 + r} F,$$

and thus the fluctuations in marginal productivity are larger if labour demand fluctuations occur more often (p is higher).

Other studies focus on how EPL affects wage bargaining, i.e., whether it restrains wages (some of the costs of EPL are shifted back to employees in the form of lower wages) or increase wages (if the stricter EPL raises the bargaining power of insiders, Lindbeck and Snower 1989). General equilibrium models study how changes in the workers' and firms' behaviour induced by the EPL affect the labour market performance e.g., in terms of unemployment or employment. The OECD (1999) notes that these models have mostly neglected the possible benefits of stable employment relationships and the positive effects of EPL on internal flexibility, while focusing on the negative impact of EPL on external flexibility.

Next we review empirical evidence of EPL's impact on labour market performance. The question of whether and to what extent job security regulations adversely affect labour market flexibility remains a matter of continuing controversy.

The impact of firing costs on employment and labour market flows has been analysed in a number of studies, and though stricter EPL has been blamed e.g., for the poor performance of labour markets in Europe compared to the USA, generally studies have shown that more stringent employment protection has an ambiguous effect on the general level of employment or unemployment²⁷, but reduces labour flows and labour turnover with tenures in unemployment lasting longer, i.e., the empirical findings are strongest for dynamic effects (Gregg and Manning 1997; Jackman et al. 1996; OECD 1999; Bentolila and Saint Paul 1992; see e.g. OECD 1999, and Addison and Texeira 2001 for literature review). The OECD (1999) concludes that stricter EPL might benefit prime-age male workers at the expense of more vulnerable groups such as young and female workers (in terms of unemployment and employment rates). The OECD has attempted to link the degree to which countries have followed their prescriptions for labour market deregulation with the extent to which structural unemployment (the NAIRU) has declined (OECD 1999). Baker et al. (2002) constructed, from OECD sources, an index of the extent of labour market deregulation in the 1990s and showed that there is no meaningful relationship between labour market deregulation and shifts in the NAIRU. Elmeskov et al.

²⁷ By preventing layoffs during downturns, strong job security provisions reduce employers' willingness to hire during upturns and thereby the net effect on unemployment could be ambiguous (OECD, 1999).

(1998) found that country-specific effects rather than “institutional factors” accounted for nearly all changes in structural unemployment rates between 1990 and 1995. Concerning the frequency of different forms of employment contracts, the OECD (1999) provided robust evidence on the positive impact of EPL on self-employment, while, contrary to theory and some prior studies, no connection was found with the share of temporary employment.

One possibility is that the labour market is not so much affected by the institutions themselves (“the pure institutionalist view”) but rather the interaction of institutions and economic shocks. Blanchard and Wolfers (2000) contend that their results provide support for the view that the combination of macroeconomic shocks from the 1960s to the 1990s along with rigidity in some countries’ labour markets helps to explain both the general increase in unemployment over the last three decades and variation across countries. Conversely, Nickell et al. (2005) provide evidence that shifts in labour market institutions explain unemployment changes in OECD countries whereas the interactions of institutions and shocks play no significant role.

When estimating EPL’s effect on labour market performance, it is to be borne in mind that EPL does not work in isolation from other institutional features of the labour market. For example let us consider the wage setting. If the employer can freely adjust wages, they may push wages down below the employee’s reservation wage in order to induce voluntary exits potentially undoing the economic effects of employment protection legislation. As a second example, empirical data (e.g., for EU countries presented in Boeri et al. 2002) suggests the presence of a trade-off between unemployment insurance coverage and the strictness of overall EPL as measured by the OECD index. Indeed, both EPL and unemployment insurance are designed for a similar purpose, i.e., to protect individuals against otherwise uninsurable unemployment risk. Protection against job loss is even more desirable if unemployment insurance coverage is low while weak job security makes extensive unemployment insurance more desirable.

Another group of studies has tried to estimate the impact of labour (and product market) regulations on firm and productivity dynamics (firm dynamics is a primary focus of the following papers – especially studies III and IV). Hemmings et al. (2002) found that in OECD countries both product and labour market regulations negatively affect the entry of new firms. Scarpetta and Nicoletti (2003) find that excessive regulation slows down aggregate productivity growth. Bartelsman et al. (2004) show that there is greater heterogeneity among entrant firms in the US relative to Europe. New US firms are smaller with lower productivity. However, if successful, the entrant firms grow more rapidly perhaps implying greater experimentation with the market in the USA. Young US firms exhibit a greater dispersion of productivity than European firms. It could be that under conditions of stringent labour or product market regulations, new firms are less eager to experiment with different production and marketing strategies. Oviedo (2004) showed, using cross-country data on

regulations and enterprise dynamics, that the radical deregulation process (particularly of entry regulations) in Eastern Europe has had a positive impact on firm dynamics. Different kinds of regulations had a negative effect on the dispersion of entrants relative to incumbent firms, indicating that they may reduce incentives for market experimentation and weaken the creative destruction process. Klapper et al. (2004) found using the AMADEUS database,²⁸ that regulations especially hamper entry in industries with naturally higher entry rates. However regulatory entry barriers had no effect in corrupt countries. Schivardi and Torrini (2003) studied whether strict EPL in Italy explains the country's relatively small average firm size as firms may choose to stay small as dismissal regulations are stricter for large firms. They found some modest quantitative evidence in favor of that hypothesis.

We finally summarize the evidence on EPL's job flow impact. While theory predicts that strict EPL reduces gross job flows, empirical studies have generally failed to find a link. For instance, despite strict employment protection legislation, job creation and destruction rates are remarkably similar across European and North American labour markets. That evidence undermines also the claims that stricter regulations may slow down productivity growth by lowering reallocation. One explanation, due to Bertola and Rogerson (1997), is that countries with strict EPL are also countries with centralized wage bargaining (leading to rigid wages and low wage dispersion) and the rate of job reallocation could be a decreasing function of wage dispersion, i.e., wage compression increases the job creation and destruction rates because, if the firm's relative wage cannot change in response to changes in its business conditions, the shock is accommodated through changes in employment rather than through wages²⁹. Other explanations for equally high job reallocation rates in both countries with stringent job protection and countries with weak regulations are, according to Addison and Texeira (2001), as follows:

- Stricter EPL leads to a higher proportion of short-term jobs whose holders compete with unemployed persons, thereby reducing the latter's job-finding possibilities and job turnover (Boeri 1999). In less regulated markets there are higher unemployment flows and in more regulated markets more job-to-job flows.
- The inter-country differences in quarterly data need not show up in annual data (Blanchard and Portugal 2001), if EPL regulations smooth short-term fluctuations but are less effective in preventing flows that come from permanent shocks.

²⁸ AMADEUS is an international firm-level database that includes larger European firms (firms employing more than 100 employees with total assets over USD 16 million or operating revenues over 8 million). It is provided by Bureau van Dijk, Electronic Publishing SA, Belgium.

²⁹ In fact econometric tests could easily control for that.

- Job turnover could be counter-cyclical in unregulated labour markets while pro-cyclical in regulated labour markets (Garibaldi 1998), which may impact the cross-country relationship between strictness of labour laws and job flows.

This verifies that at least to some extent institutions matter for firm-level dynamics. Gomez-Salvador et al. (2004) found evidence for 13 European countries indicating job reallocation was negatively affected by employment protection, duration of unemployment benefits, the degree of wage-setting coordination, and the tax wedge. Employment subsidies had a negative effect on destruction and a positive effect on creation.

Micco and Pages (2004) argued that earlier studies failed to find the link between EPL and job reallocation due to omitted variable problems (like the size of shocks in each country). By controlling for industry-specific employment reallocation needs (e.g., due to different shock variances, technological differences, and the use of job-specific labour) they found that more stringent EPL slows down reallocation.

1.4. The role of enterprise dynamics in economic transition

It is fruitful to study labour reallocation, enterprise formation and firm post-entry performance during the transition from planned to market economy. Transition, being a kind of quasi-experiment (Brown and Earle 2000; see Meyer 1994 for natural and quasi-experiments in economics), provides an opportunity to learn how the market economy works. In the Soviet economy the industrial structure was dominated by a relatively small number of large establishments (related to the limited number of production units that the central planning based economic system could control for, Kuddo 1995) with very low rates of firm entry and exit. Conversely in market economies small and medium sized enterprises are typically more important and entry and exit are very frequent. The sectoral structure of the economy was also different from that existing in western countries with the shares of industry and agriculture being inflated while the service sector was compressed. The allocation of production factors was often shaped by ideological factors. Inefficiently high employment levels (labour hoarding) were wide-spread (Campos and Coricelli 2002)³⁰. According to some estimates, plants in the former Soviet Union used to employ as many as 50 to 150% more workers than similar plants in the West (Kuddo 1995). Inefficient labour use and enterprise overstaffing were common for the following reasons (Kuddo 1995):

³⁰ While the reason for labour hoarding in a market economy might be turnover costs, in a planned or transition economy it is rather the lack of market incentives among state firms (incl. soft budget constraints).

- The equal remuneration policy distorted worker incentives reducing workplace effort;
- Limited labour mobility (combined with a certain degree of “job assignment”), pre-determined available labour resources and low pay motivated enterprises to request excess labour in order to avoid the labour shortages and guarantee plan fulfilment;
- Full employment policies protected workers from dismissal;
- In addition to (or instead of) efficiency concerns, enterprises also had social objectives.

Thus, due to the above factors, at the onset of transition many production processes became obsolete as the environment changed (price liberalisation, existing trade relations collapsing, state subsidies ending, etc). An important aspect of microeconomic reform was the commercialization and privatization of former state enterprises in order to improve corporate governance. However this must be combined with enforcement of discipline in financial contracting (abolishment of soft budget constraints).

Thus the firm entry process during transition occurs in a very different situation, where some industries are underdeveloped, market institutions have not necessarily developed, the economic environment is immature, entrepreneurs lack business experience, starting enterprises face many weaknesses and constraints, etc. Reallocation between sectors and between the firms of a given sector is necessary. Given this, McMillan and Woodruff (2001) argue that firm-level learning is more important during transition than in mature market economies because there is greater uncertainty concerning costs and demands, and through experimentation entrants provide information on how to do business that could become common knowledge allowing others to observe the outcome of the experiment. Further, the EBRD (1995) emphasizes that small and medium sized enterprises generate positive spillovers in that small firms contribute to experimentation with new products and ideas, and such effects are stronger in transition than in advanced market economies³¹. Figure 2 outlines the main changes in enterprise dynamics occurring due to the transition.

Another peculiarity of the firm dynamics process during transition is that while in market economy typically supply shocks (arrival of new technologies, innovations, etc.) are assigned the role of triggering the enterprise adjustment process, during transition, demand shocks (e.g. related to opening up to foreign trade, consumer demand shifts away from products offered by incumbent firms to products offered by new private enterprises, etc.) can play a relatively more important role³². However, we maintain the view that innovations and

³¹ The EBRD (1995) notes that SME transfer the products and processes offered in the West with adjustments and amendments needed due to requirements of local consumers.

³² The author is grateful to Karsten Staehr for drawing attention to this particular issue.

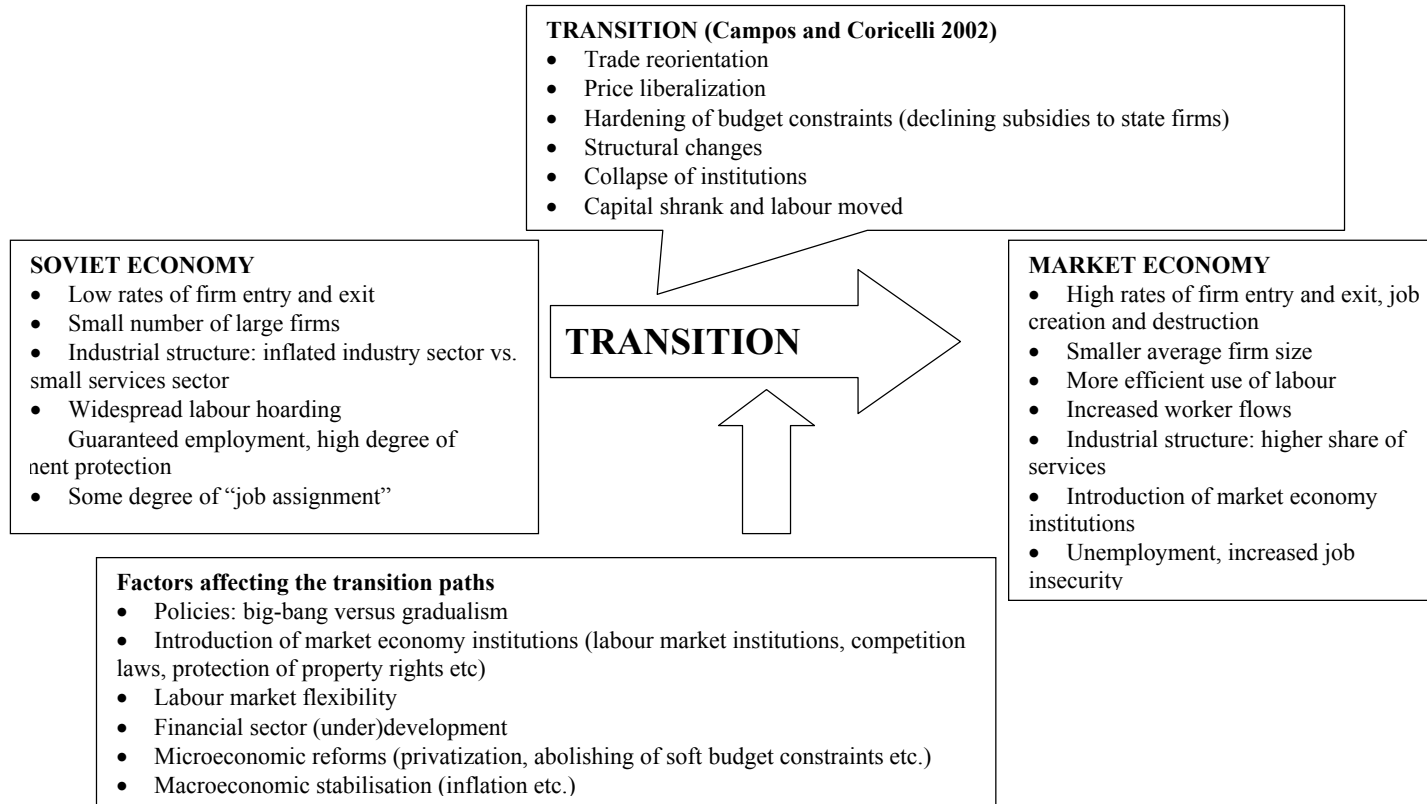


Figure 2. The impact of transition on firm dynamics (compiled by the author).

technological change triggering the Schumpeterian creative destruction process (reviewed in section 1.1.2.) can be successfully applied to describe firm dynamics during the transition. The EBRD (1997) argued that in transition countries the contribution of innovations is especially important as, under conditions of inherited large, but misallocated, investments in physical and human capital, the task is to find more effective ways to utilise available resources involving a market-driven process of search for new products and processes, organizational practices and creating new market based relationships.

Detailed evidence on firm dynamics in transition economies is relatively scarce. Bartelsman et al. (2004) document the main features of firm demographics data across 24 countries. They note that firm creation and destruction in transition countries is more active than in mature market economies. Using Estonian and Czech data, Jurajda and Terrell (2002) showed that only 3 years after transition, new firms accounted for 40% of employment in construction and 60% in trade. Jurajda and Terrell (2003) also noted that the rapid entry of new firms has occurred not only in growing, but also in declining activities (such as manufacturing). New firms are small-and medium sized enterprises and mostly de-novo firms, though many are also spin-offs of former state enterprises (Berkowitz and Cooper 1997). Different authors have regarded the entry of new firms differently, but mostly agree they play an important role in transition. The theoretical and empirical analysis of Blanchard and Kremer (1997) suggests that the entry of new firms alleviates the output fall associated with transition resulting from the breakdown of bargaining between firms connected with specific relations³³. Berkowitz and Cooper (1997) state that while in countries like Poland and Czech Republic, new firms have made important contributions to growth and provide high quality goods, in CIS countries new firms charge high prices for low quality goods. In order to explain the phenomenon, Berkowitz and Cooper derive a dynamic model to explain the possibility of two different equilibria – a high development equilibrium where start-ups provide high quality goods and low development equilibrium where start-ups provide low quality goods. The EBRD (1997) argues that new private firms are the most important potential source of output recovery and growth providing increased competitive pressure on existing firms (hardening their budget constraints), mitigating employment losses due to restructuring, improving corporate governance, and finding new combinations of resources. Other papers have touched on the issue of how privatization of state firms affects the entry of new firms. Aghion et al. (1994) argue that slow privatization encourages start-up's originating from the state sector to restructure prior to privatization. Murrel and Wang (1993) argued in favour of delayed privatization so that start-up's coming from state owned firms would

³³ Konings and Walsh (1999) studied the “disorganization” of Blanchard and Kremer (1997) using enterprise-level data from Ukraine. Roland and Verdier (1997) postulate another theoretical model of this sort.

not absorb scarce investment resources that instead would be available for more efficient de-novo firms.

Concerning firm survival in transition economies, Bartelsman et al. (2004) noticed higher survival rates in transition economies (Slovenia, Latvia, Estonia, Hungary) as new firms have filled in new market niches enjoying, especially in the early years of transition, less competition. As market forces strengthen, stabilization of entry and exit rates and increased failure rates result. Konings and Xavier (2002) studied the growth and survival of Slovenian firms from 1994–2000. They found that the survival probability was positively correlated with firm size, financial health (the lack of financial constraints), and initial profitability, while the importance of sunk costs in an industry appear insignificant. Brown and Earle (2000) studied the effect of competition on firm survival in Russia using a probit model. They found that competition had a negative effect on survival (competition acts as a screening device), while industry and regional growth as well as initial size had positive effects. Foreign joint ventures were found to have a lower survival probability. Rizov and Mathijs (2001) studied the survival of individual farms in Hungary, finding that older and larger farms are more likely to survive.

Empirical results on job flows (job creation and destruction) are reviewed next. Several papers studying job flows in transition economies have been published (e.g. Konings et al. (1996) about Poland, Brown and Earle (2002) about Russia, Rutkowski (2003) about Lithuania). The main findings of the literature, as summarised by Haltiwanger et al. (2003), are that: (1) in early transition, job destruction dominates job creation, though later job destruction and creation roughly equalise; (2) large increases in worker flows occur in early transition (the flows of workers between labour market states); (3) small and new private firms are disproportionately responsible for a large share of job creation, while most of job destruction is associated with state-owned firms (firm size is negatively correlated to employment growth due to the small size of new entrants and the need of large firms to downsize)³⁴; (4) there is considerable heterogeneity in job creation and destruction within narrowly defined industries, but even so between-industry reallocation is more important in transition countries than in western economies. Regarding different explanations to observed job flow patterns, a few theoretical studies have used the optimal speed of transition theory (due to Aghion and Blanchard 1994) to evaluate the impact of institutions on job reallocation or the optimality of different transition paths (Jurajda and Terrell 2003). Johnson et al. (2000) explained the dynamic job growth in CEE countries relative to CIS countries as arising from relatively well-defined property rights among CEE countries rather than through the availability of external financing.

³⁴ Faggio and Konings (2003) showed that large firms in more advanced transition economies downsized faster than in the less advanced economies.

Previous job flow studies of transition economies contain relatively little information on the relationship between job flows and productivity. Studies from transition countries include Brown and Earle (2002) who have analysed this relationship for Russia and Ukraine and De Loecker and Konings (2003) who have studied Slovenia (both studies analyse the manufacturing sector). Both studies assert that economic transition has led firms to engage in more restructuring and job reallocation (simultaneous destruction and creation of jobs) contributing to firm-level productivity growth. Brown and Earle (2002) showed that while in Soviet Russia reallocation rates were low and had limited relation to relative labour and multifactor productivity across firms, post-reform, increasing reallocation has contributed to aggregate productivity growth. Despite limited reforms in the 90s, reallocation has enhanced productivity in the Ukraine as well though to a smaller extent than in Russia where reforms were more extensive. Orazem and Vodopivec (2003) showed for Slovenian manufacturing, that competitive pressures sorted out the most inefficient firms and the entry of efficient new private firms was the major source of total factor productivity (TFP hereafter) gains. De Loecker and Konings (2003) calculated that more than 40% of average productivity growth in Slovenian manufacturing was due to firm entry and exit. Bartelsman et al. (2004) showed for CEE countries (Hungary, Latvia, Estonia, Slovenia) that the resource reallocation process has become more effective over the course of transition and shifts resources to more productive firms. Warzynski (2002) showed that more intensive job reallocation in Polish industry was connected with higher productivity growth and reallocation was associated with a competitive market structure. Dimova (2003) found for Bulgaria and Romania that productivity changes were influenced by the mobility of labour across firms rather than other firm characteristics and industry-level factors.

Another piece of evidence on the positive effects of firm entry on economic growth during transition was provided by Berkowitz and DeJong (2003) who found that the number of start-up firms across Russian regions was positively correlated with per capita GDP growth rates and that large-scale privatisation impacted growth via new enterprise formation. McMillan and Woodruff (2001) concluded, based on a review of studies on China, Vietnam, Russia and Poland that new start-up firms have been created at a striking rate in the transition countries and they have been important creators of new jobs, suppliers of new consumer goods, and imposed market discipline on existing firms (state and privatized firms). They also argued that differences in entrepreneurial development could explain differences in economic growth among these countries.

It is worth noting that aside from the positive effects, the social costs of reallocation can be very high in transition countries, if, for instance, a large non-viable enterprise is the only (or only major) employer in a specific region with limited outside employment opportunities available (as is often the case).

There also have been a few studies investigating job reallocation during the economic transition in Estonia. Jurajda and Terrell (2003) studied job

reallocation in Estonia and the Czech Republic using labour force survey data. They observed that in both countries small start-up firms were engines of job creation, especially in the early transition. In early transition, job reallocation rates were much higher in Estonia due to massive job destruction in post-communist firms and due to higher job creation rates. Job destruction from 1989–1995 was especially high in Estonian agriculture. Trade experienced considerable job destruction during this period though also enjoyed a very high level of job creation. Jurajda and Terrell (2003) interpreted the within-industry growth of small start-up firms as being consistent with the convergence of firm size distribution towards the Western standard. They also documented relatively higher wages among new firms and explained this finding with efficiency wage arguments. Haltiwanger and Vodopivec (2002), using Estonian Labour Force Survey (ELFS) data, show a rapid increase in both worker and job reallocation in the early 1990s, with the annual worker reallocation rate exceeding 35% by 1993. In Estonia, transition rates of workers between sectors and labour market states were very high in the early years of transition, but since 2000 the labour market has become more stable and flow rates have declined (Eamets 2004). According to Lehmann et al. (2005), displacement (job loss) in Estonia increased during the early transition period (up to 13% in 1992) and declined thereafter to levels comparable with Western countries. The primary costs of job displacement were associated with the risk of non-employment rather than reduced wages in a new job (consistent with findings of Jurajda and Terrell (2003)). Since the job destruction and creation rates were not synchronized during the early transition (in 1992, the job creation was much lower than job destruction, while in 1994 the creation rate exceeded the destruction rate), the reallocation process exhibited some inefficiencies.

An overview of studies on labour demand in the CEE countries can be found in Svejnar (1999). Basu et al. (2000) estimated dynamic labour demand models for five CEE economies using data from pre-transition and early transition years. Konings and Lehmann (2002) estimated static labour demand equations for Russia for 1997. Some papers have estimated dynamic labour demand equations on the basis of firm-level data in order to test for defensive (cost-reducing) restructuring (e.g., Domadenik et al. 2002). Tarjani (2004) studied changes in the relative demand for skilled and unskilled labour due to skill biased technological change through capital-skill complementarities using Hungarian data. A few authors have tested for labour hoarding by investigating separately how employment has responded to positive and negative demand shocks (e.g. Bishop and Mickiewicz 2003, Körösi 2002). Many of these studies have been particularly interested in how employment behaviour differs between firms belonging to different ownership categories such as privatized firms, state owned companies, insider controlled firms, de novo firms, etc. Still it seems that none of these studies has specified nor estimated the target for optimal employment, though some estimates on the amount of excess labour have been obtained from employer surveys (Commander and Kollo 2004). Brada (1989)

performed an estimation of factor utilization efficiency in CEE countries before the onset of transition using frontier production functions. Brada concluded that the decline of industrial production growth rates was caused by declines in factor utilization efficiency and not declines in rates of technological progress.

We next focus on the regulation of employment termination in CEE countries. Institutional infrastructure might impact the incentives of firms and impede experimentation and factor mobility (EBRD 1997). Previously mentioned evidence on the superior performance of new firms and the importance of reallocation raises questions on a regulative environment conducive to start-ups and reallocation, including (but not limited to) the EPL. By using the EPL index based on the methodology of the OECD (1999), Cazes and Nesporova (2003) documented that employment protection rules differ across CEE transition countries, but on average the strictness of EPL is close to the average of “old” EU member countries. However, looking only at an index characterizing strictness of formal legislation could be misleading if we neglect factors influencing the actual enforcement of these regulations. Even strict labour laws may have little influence on the economy if economic agents violate them, if law enforcement agencies are weak or if these laws cover only a small proportion of the total workforce. For instance, Denisova et al. (1998) report that in Russia, 50% of labour disputes related to unfair dismissals are not concluded within the deadline stipulated by law. Based on survey evidence, Clarke and Borisov (1999) state that, contrary to popular belief, the use of informal or illegal forms of employment is quite rare in the Russian new private sector and that such forms of employment are not used for enhancing labour market flexibility. Even though illegal forms of contract are rare, different violations of labour legislation (like health and safety regulations) may be frequent. In a somewhat different, but analogous, area of research, Pistor et al. (2000) study legal change in shareholder and creditor rights in transition economies and arrive at the conclusion that legal transplants and extensive legal reforms are not sufficient for the evolution of effective legal and market institutions.

Few studies examine the economic impact of EPL in CEE countries. Cazes (2002) found, using cross-country regression analysis, the effect of EPL strictness on unemployment rates in a group of 8 CEE countries to be very small and statistically insignificant while employment protection was positively correlated with labour force participation rates among CEE countries. Svejnar (2002) draws attention to the lack of correlation between the EPL index and GDP growth during the 90s in CEE transition countries and suggests that labour market flexibility is not an issue comparable to imperfections and regulations in other areas such as housing markets, capital markets, corporate governance and so on. Burda (1998) argued that the impact of employment regulations is especially adverse during the transformation for small enterprises and start-ups. Thus small enterprises’ ability to evade these rules can be regarded as positive. By using cross-country data on regulations and enterprise dynamics, Oviedo

(2004) has shown that the radical deregulation process (particularly entry regulations) in Eastern Europe has had a positive impact on firm dynamics. Cazes and Nesporova (2003) argued, based on cross-country data, that among CEE countries, stricter EPL (particularly a strict definition of unfair dismissal) lowered labour turnover but increased job tenure and the duration of unemployment only slightly. Consistent with theory, the effect on temporary employment was positive.

We can conclude that firm dynamics plays a central role in the transition process in terms of improving efficiency, restructuring and subsequent economic growth. Available (in some respects scarce, but growing) evidence has recorded increasing worker flows after the onset of transition related to structural changes, elimination of labour hoarding and convergence in the size structure of industries. These developments have occurred in an environment where legally provided employment protections may be ineffectual due to employer violations and trade union weakness. The following four studies present analyses of these issues from a different angle and thereby contribute to the literature on enterprise restructuring and labour demand during transition.

2. PUBLICATIONS

**Study I The Optimality and Overuse of Labour
in Estonian Manufacturing Enterprises**

Masso, J., Heshmati, A. (2004)
The Optimality and Overuse of Labour
in Estonian Manufacturing Enterprises.
Economics of Transition,
Vol. 12, Issue 4, pp. 683–720.

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**Study II The Paradox of the Baltic States: Labour
Market Flexibility but Protected Workers?**

Eamets, R., Masso, J. (2005)
The Paradox of the Baltic States:
Labour Market Flexibility but Protected Workers?
European Journal of Industrial Relations,
Vol. 11, Number 1, pp. 71–90.

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**Study III Creative Destruction and Transition: The
Effects of Firm Entry and Exit on Productivity
Growth in Estonia**

Masso, J., Eamets, R., Philips, K. (2004)
Creative Destruction and Transition:
The Effects of Firm Entry and Exit on Productivity Growth in Estonia.
IZA Discussion Paper No. 1243.

**Study IV Job Creation and Job Destruction in
Estonia: Labour Reallocation and Structural
Changes**

Masso, J., Eamets, R, Philips, K. (2005).
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Labour Reallocation and Structural Changes.
forthcoming in Hannula, H., Radosevic, S. and Tunzelmann, N. von (Eds.),
Estonia, the New EU Economy: Building a Baltic Miracle?,
London: Ashgate.

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3. CONCLUSIONS

3.1. The main findings

The thesis focuses on the creative destruction process in the enterprise sector during the transition process in Estonia, particularly on factors affecting changes in firm-level demand for labour and the economic effects of reallocation. The study does not cover (and does not aim to cover) all aspects of labour demand, but only the following: 1) reallocation process efficiency and whether reallocation has moved labour to its most efficient use; 2) changes in labour use efficiency such as the extent of labour hoarding; 3) enterprise performance in terms of changes in labour demand and productivity; 4) whether employment protection legislation (an important component of the regulatory environment) has been favourable to enterprises.

The theoretical background literature reviewed comprised mostly mainstream theories explaining enterprise dynamics in a market economy. The reviewed theories were mostly based on Joseph Schumpeter's idea of "creative destruction", by which economic growth in a market economy involves reallocation because the growth coming from new products and processes requires the destruction of old products and processes. If new production units are more capable of adopting these, the result is the entry of new firms, the exit of incumbent firms and the reallocation of labour between different production units. During the transition process, large-scale reallocation is needed in order to correct the distortions of the command economy, such as distorted factor allocation between sectors, inefficient labour use, overly concentrated industrial structure, etc. Undoubtedly, during the transition process, peculiarities of the creative destruction process might be expected, such as the underlying forces triggering reallocation (for example demand shocks could be relatively more important), the important role of new firm entry, the high social costs of rapid reallocation, etc. However the idea that innovation and technological change trigger the Schumpeterian creative destruction process applies to the economic transition process as in the case of expedient reallocation of available resources to more efficient uses.

We next summarize the main results of the four empirical papers comprising the thesis. Paragraph titles below correspond to the respective papers.

The optimality and overuse of labor in Estonian manufacturing (study I)

The topic of the first study is labour use optimality, labour hoarding and efficiency (relative to the best-practice technology) among Estonian manufacturing firms from 1995–1999. The main results from estimation of an econometric dynamic labour demand model are as follows:

- Long-term employment is most responsive to wages, followed by value added and capital. The mean elasticity of labour demand is fairly high by international comparison, so employers make strong workforce adjustments in response to labour cost increases. Capital elasticity estimates are decreasing over time, so that fewer jobs are created due to capital accumulation, and the production process becomes more capital-intensive.
- Technical change is generally labour-saving, and the effect has strengthened over time (attributable, e.g., to the impact of the Russian financial crisis). While pure technical change is labour-saving, the non-neutral change is labour-using, largely due to labour-using scale-biased technical change. Across all years and groups of firms, we observe increasing returns to scale perhaps indicating the suboptimal size of many small firms. The degree of sub-optimality is, however, declining thanks to learning-by-doing and a comprehensive restructuring process.
- According to our quantitative estimates on optimal labour usage, on average, labour use exceeds by 3.5% the firm-level optimal labour use while labour overuse relative to best-practice technology is 9.1% in the sample. According to the first (second) measure, the degree of labour overuse has slightly increased (decreased) over time. This implies that, due to labour and technological change adjustment, employed labour has increased to catch up with the firms' own optimal level and labour overuse compared to best-practice technology has decreased. Smaller firms in particular use less labour than their own optimal level, and labour overuse relative to best practice technology is negatively correlated with the firm size (excluding firms with more than 500 employees).
- Adjustment speed estimates show that average firms adjust 19 per cent of their deviations from the equilibrium during one year. That is a surprisingly low estimate compared to other studies' findings indicating high labour market flexibility in Estonian labour market. Adjustment speed is highest in services and textiles and lowest in mining.

Employment protection and labour market flexibility in the Baltic States (study II)

The Baltic States' employment protection legislation is fairly well aligned with international labour standards and EU labour regulations. The general rigidity of EPL is close to the average of older EU member states (EU15). Relative to the EU15, individual and collective dismissals are strictly regulated and the use of

temporary forms of employment loosely regulated. However, though formally it seems that Baltic State employees are as well protected as those in the EU15, the reality is that state regulations are often disregarded in the private sector. Workers' complaints to labour inspectors are frequent and often are found to be well grounded. Considerable evidence exists on the use of extraneous agreements waiving some employee rights including the use of verbal contracts and wages paid unofficially (as the latter reduce the severance payment the worker is entitled to in case of dismissal). Further, a relatively high proportion of workers in non-traditional forms of employment increase flexibility. The discrepancy between formal legislation and enforcement may diminish in the future if labour dispute resolution improves and as the role of trade unions in labour relations becomes more important.

Gross job flows in Estonia (study III)

Estonian gross job flow rates are rather high (by international comparison) and have not decreased during the later transition period (so the phenomenon may not be a peculiarity of the transition process). Relatively equal destruction and creation rates indicate efficient restructuring, high labour market flexibility and economic development. Small firms have played a crucial role in labour reallocation by contributing a disproportionately high share of both job creation and destruction. We argue the developments are connected to the aspects of the transition process, such as convergence to the western European firm size distribution. Following Jurajda and Terrell (2003), these newly established firms have many advantages over incumbent firms (privatized firms, former state-owned enterprises). Changes in economic structure have notably shaped the job destruction and creation processes. Although idiosyncratic factors dominate labour reallocation, inter-sectoral mobility has been high relative to western countries – an aspect of ongoing structural changes. A favourable institutional environment has supported the advantageous reallocation developments. This suggestion is supported by theoretical and empirical evidence indicating a positive impact of higher flexibility and change on growth. Concerning different ownership categories, relative to state firms or domestic private firms, foreign firms are much more dynamic with respect to job creation (even when controlling for factors like firm size, location, age, etc.). Stronger foreign firm performance was especially visible during the Russian crises. One reason might be circumvention of various size disadvantages associated with small firms or reduced uncertainty related to launching a new establishment that is geographically diversified. This study's policy implications indicate that a flexible enterprise environment should be maintained in Estonia to encourage economic growth and job creation.

The entry and exit of firms (study IV)

The fourth study focuses on firm entry and exit, the post-entry performance of firms and the impact of reallocation on productivity. The study shows an active

firm entry and exit process relative to international standards, but one that declines over the period considered as the transition process comes to an end. As observed in other countries, both start-up firms and exiting firms are small compared to incumbent firms. However, oddly, the average size of entrants is well below that of exiting firms decreasing average firm size and reflecting a change in industrial structure and firm-size distribution. The creative destruction process is more active in urban areas and in the private sector. Lower turnover among foreign firms is expected as they are diversifying entrants, while domestic firms are likely to be de novo entrants. High survival rates for new firms and their rapid growth could be explained by structural changes and openness of the economy, i.e., firms fill market niches and enter previously underdeveloped sectors finding it easier to grab market share and, hence, to survive. In manufacturing, the proportion of within-firm labour productivity (total factor productivity) growth is somewhat lower (higher) in Estonia than in OECD countries. The entrants (exiting firms) generally have productivity above (below) the levels of incumbent firms. The impact of both net entry and between effects in total factor productivity growth are higher in agriculture and services likely due to the fact that these sectors have respectively contracted and expanded while manufacturing has been more stable. Foreign firms have made an especially strong contribution to aggregate total factor productivity, while domestic firms contribute more to labour productivity growth. Thus, the “survival of the fittest” hypothesis is confirmed and the destruction process is creative, i.e., the destruction of outdated models of business is complemented by the creation of new firms using superior production processes and supplying new products.

Policy implications

In terms of potential policy implications connected with our findings, given the goal of economic growth and net job creation, Estonia should continue with the “firm-friendly” policy approach followed thus far. This entails ensuring low administrative barriers to entry, improvements in insolvency legislation, availability of financing for start-ups, developing venture capital markets and reducing various “red-tape” costs that inhibit businesses. However, it is more difficult to argue in favour of start-up subsidies. Subsidizing entry is risky as, under conditions of noisy selection (random firm survival) and market experimentation, subsidies may weaken market selection (less efficient firms do not exit), cause deadweight loss effects (the beneficiaries would have survived and grown even when not receiving the subsidy) and may distort the entrepreneur’s interpretation of market signals³⁵. Estonia might also consider easing employment protection laws. Easing EPL, apart from increasing economic efficiency, should be socially more acceptable now as the introduction of the unemploy-

³⁵ Santarelli and Vivarelli (2000) developed these arguments.

ment insurance system in Estonia (in 2002) has increased protection against unemployment risk.

2.2. Suggestions for future research

We begin this section by referring to some of our works in-progress and tentative looks at some related issues. First, one explanation behind differences in job and worker flows dynamics is provided by the concept of churning flows (worker flows over and above those necessary to achieve a desirable employment change). The two components of churning flows are worker quits and replacements, and/or simultaneous firing and hiring by enterprises. Further empirical work indicates churning flows in Estonia are fairly low compared with estimates from either developed or transition economies, and that churning flows have been declining over the course of time (Masso et al. 2005). Several potential explanations are provided (improving average job match quality, improving working conditions, etc.), which require further testing.

In another paper (Masso 2003) we analyse labour dispute resolution across Estonian counties using labour dispute commissions and court data³⁶. The only other study on regional-level labour law enforcement variation we are aware of is the one by Macis (2000) covering Italian regions. At the regional level, evidence indicates that there is a positive effect of unemployment and the proportion of decisions favourable to employees on the number of litigations per employee. In the case of more difficult local labour market conditions, employment protection enforcement may be more stringent (e.g., because judges and labour dispute public employment service officials may become more sympathetic to workers). In our data, unemployment was not found to be associated with how favourable labour dispute commissions' decisions are for employees. Selection bias may affect the results as cases only reach trial when a firm's position is relatively strong and the firm is relatively sure that, in case of appeal, the court will not decide in favour of the dismissed employee. The data on labour dispute resolution in courts shows that unemployment positively affects the number of court cases but negatively affects the percentage of cases favourable to claimant (usually the employee) though this may be again due to the aforementioned selection bias. In future work, it would be beneficial to have more data, e.g., on the efficiency of local administrative and judicial systems

³⁶ Labour dispute commissions are not labour courts, but rather a unique arrangement for solving labour disputes. The commissions are made up of employee and employer representatives as well as a chairman of the commission appointed by the minister of social affairs. The commissions are a first step in the settlement procedure and can in fact handle collective labour disputes as well. Their introduction was motivated by the slow treatment of cases in regular courts. The number of the cases in labour dispute commissions has been much higher than in courts. For more details, see Masso and Philips (2004).

and, in case of unfair dismissal, how workers are indemnified (e.g., how often it is through reinstatement and how often through compensation).

We next address how future research may benefit from better data as current research suffers from several data limitations. Firstly, available databases have no information on the characteristics of workers whose jobs were destroyed or created. A matched employer-employee dataset including both firm and employee characteristics would allow much more in-depth study of labour reallocation. Unfortunately such data are not available so far for transition countries, unlike in some Western-European countries (for a summary of the matched employer-employee databases in different countries, see Abowd and Kramarz 1999; on the application of such data on the analysis of jobs and worker flows see, e.g., Ibsen and Westergaard-Nielsen 2005). Establishing such a database would require connecting different registers or surveys that are kept by different institutions. Thus agreements between the owners of different databases would be required and various legal and technical issues would need to be resolved. Given this, constructing such a dataset may be a very time-consuming process.

Another data limitation we faced was the lack of information on the skill level, education or occupation of employees. A decomposition of labour into skilled and low-skilled categories would be beneficial, e.g., concerning the focus of study I. For example, the adjustment of the low-skilled and skilled workforces towards their optimal levels is probably rather different with the latter likely having a more costly adjustment. Another benefit of data containing educational categories is that the nature of skill-biased technical progress could be analyzed more thoroughly. Krillo (2005), using macro-level data, attempted to look at the issue of skill-biased technical progress and substitution of different categories of labour and capital.

Another related area is the impact of innovations (either product or process innovations) on employment growth. While we recognize that the arrival of new business methods triggered job reallocation, we did not analyse the impact of this process on net employment growth. Generally, product innovations are more likely to have favourable employment effects than process innovations (Katsoulacos 1986). The direction of the process innovation impact depends on two offsetting effects. Increasing labour productivity reduces employment in the short-run (*displacement effect*) while resulting cost reductions lower prices and potentially increase product demand (depending on the price elasticity of demand and competition) thus enhancing labour demand (so-called *compensation effect*, Peters 2004). Such studies might use available firm-level innovation databases (like the Community Innovation Survey).

The relatively rich dataset we have (Estonian Business Registry database) provides an opportunity to continue studying determinants and consequences of the firm churning. For instance, to mention a few possible topics, one may continue with an in-depth study of the determinants of industry-level firm entry and exit rates, different factors affecting firm start-up size could be analyzed,

entry and exit through control changes like acquisitions and mergers (for what purpose the Estonian data we used is especially suitable). Secondly, aggregate level study could be complemented with case studies of firms and with studies of specific industries.

Concerning policy measures, it would be interesting to study the effectiveness of state business support measures (various kinds of state aid targeted to start-up enterprises) on firms' survival and post entry growth (the amount of new jobs created) by using the appropriate matching techniques (difference-in-difference estimators). Examples of such studies are Santarelli and Vivarelli (2000), Crepon and Duguet (2003), Girma et al. (2003). Concerning the observed intensive market selection process among start-up firms, subsidizing entry could be risky for various reasons (Santarelli and Vivarelli 2000). We need to specify which market imperfections subsidies towards start-up firms correct for, e.g., the inability to raise financing due to liquidity constraints.

The research on the role of EPL in transition countries can be extended in several directions, as well. Firstly, we hope to study the interactions of labour and product market regulations, as they might affect employment rates, wages and job security (Nicoletti et al. 2000). Secondly, variation in law enforcement may be analyzed over time and space to see whether poorer labour market conditions lead to decisions more favourable to workers implying endogenous EPL enforcement (Boeri et al. 2002). Finally, it would be interesting to observe how legislative reforms targeted at increased flexibility (e.g., the adoption of a new labour code in Slovenia) have influenced the economy by comparing labour market performance pre and post reform (e.g., Bentolila and Saint Paul 1992, used that approach to analyze the Spanish case).

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SUMMARY IN ESTONIAN – KOKKUVÕTE

TÖÖJÕU ÜMBERPAIKNEMINE ÜLEMINEKURIIKIDES: EFEKTIIVSUS, RESTRUKTUREERIMINE JA INSTITUTSIOONID

Töö aktuaalsus

Käesolevas dissertatsioonis analüüsitakse tööjõu ümberpaiknemist ja tööjõu nõudluses ettevõtte tasemel aset leidnud muutusi hilisemal üleminekuperioodil Eesti näitel, neid muutuseid mõjutavaid tegureid ja institutsioone ning tööjõu ümberpaiknemise majanduslikke tulemusi ja efektiivsust. Tööjõu reallokatsioon ettevõtete vahel tähendab muutusi üksikute ettevõtete nõutavas tööjõu koguses, ja selle võib jagada ühelt poolt firmade loomiseks ja väljumiseks ja teiselt poolt kasutatava tööjõu hulga muutusteks tegevust jätkavates ettevõtetes. Uurimus katab järgmisi tööjõu nõudluse aspekte: 1) tööjõu ümberpaiknemise (reallokatsiooni) protsessi efektiivsus, kuivõrd on reallokatsiooni tulemuseks olnud tööjõuressursside suunamine nende kõige efektiivsemasse kasutusvaldkonda; 2) konkureerivate ettevõtete tööjõu kasutamise efektiivsuse tasemete hajumise määr, tegemaks kindlaks, milline on ettevõtete dünaamika potentsiaal tõsta ettevõtete tootlikkust reallokatsiooni kaudu; 3) muutused tööjõu varumises (*labour hoarding*); 4) kuidas eri tüüpi ettevõtted (väike- ja suurettvõtted, kodumaisele ja väliskapitalile kuuluvad firmad jne) on edenenud tööjõu nõudluse ja tootlikkuse dünaamika mõttes; 5) kas hõive kaitse regulatsioonid (töölevõtmise ja töösuhte lõpetamise regulatsioonid) kui oluline ettevõtluse regulatiivse keskkonna komponent on olnud ettevõtetele soodsad ja on võimaldanud neil efektiivselt lõpetada vanu ja luua uusi töösuhteid, ja kas seaduste formaalse ranguse juures neid ka tegelikult täidetakse.

Eriti viljakas on uurida tööjõu ümberpaiknemist ettevõtte tasandil majandussüsteemis, kus toimub üleminek plaanimajanduselt turumajandusele. Siirdeprotsesside uurimine aitab tundma õppida turumajanduse toimimist. Nõukogude Liidu plaanimajanduses domineerisid igas majandusharus suhteliselt väikearu- lised suurettvõtted, ettevõtete loomise ja sulgemise määrad olid väga madalad, samas kui turumajandussüsteemiga riikides väike- ja keskmise suurusega ettevõtted moodustavad valdava enamuse kõigist ettevõtetest ning ettevõtete loomine ja sulgemine toimuvad väga aktiivselt. Plaanimajandusriikides laialt

levinud tööjõu varumine (*labour hoarding*, ettevõtete kalduvus palgata antud tehnoloogia ja tegurihindade juures optimaalsest enam tööjõudu) on asendunud tööjõu ülepakkumisega ja selle tulemusena tekkinud tööpuudusega. Niisiis toimub firmade loomine üleminekuperioodil spetsiifilistes tingimustes, kus mõned tööstusharud on alaarenenud (ebaproportsionaalselt väikese osakaaluga majanduses) ja uutel sisenejatel on üsna lihtne leida tegutsemisnišš, turumajandus-institutsioonid vajalikul määral veel ei toimi, ettevõtjatel puudub kogemus äri juhtimiseks turumajanduses, füüsilisse ja inimkapitali tehtud suurte (kuid valesti paigutatud) investeeringute juures on tarvilik leida viise olemasolevate ressurside efektiivsemaks kasutamiseks, allokatsiooniks (EBRD 1995) jne.

Makromajanduslikuks arenguks on olulised mikromajanduslikud ümberkorraldused, sealhulgas ettevõtete restruktureerimine. Nii näiteks on Jurajda ja Terrell (2003) märkinud, et ettevõtluse areng on kriitilise tähtsusega majanduskasvu tegur postkommunistlikes majandustes. Berkowitz ja Cooper (1997) on väitnud, et uued loodavad ettevõtted mängivad olulist rolli üleminekuriikide edukuse määramisel.

Ettevõtete ja majandusharude kohanemine turumajandusega on seotud muutustega õiguslikus ja regulatiivses keskkonnas, mis sisaldab seaduste eri aspekte, nagu tööseadustik, pankrotiseadustik, konkurentsiseadustik, omandiõiguste kaitse jne. Dissertatsiooni autor leiab, et eriliselt oluline on pöörata tähelepanu hõive kaitse regulatsioonide temaatikale Kesk- ja Ida-Euroopa üleminekuriikides. Tsentraalse plaanimajanduse oludes olid töötajad üsna hästi kaitstud töösuhte lõpetamise eest ja evisid garanteeritud tööhõivet (täistööhõive tegelikult kaitses töötajaid vallandamise eest) (Kuddo 1995). See, kombineerituna palkade jaotuse kokkusurutusega (vähediferentseeritud palgad), põhjustas tööturu äärmise jäikuse ja ebaefektiivse tööjõu allokatsiooni³⁷. 1990. aastatel peegeldus siirderiikide kiire struktuuralse kohanemise vajadus pärast reformide algust suurtes muutustes eri riikide tööseadustikus. Kesk- ja Ida-Euroopa riikides on hõive kaitse regulatsioonid töötajate kaitsmise seisukohast eriti olulised seetõttu, et ametiühingud on suhteliselt nõrgad ja enamuses ettevõtetes puuduvad hoopiski³⁸. Neil põhjustel on dissertatsioonis lähemalt analüüsitud hõive kaitse regulatsioone Balti riikides.

Kuigi Eesti on väga väike riik, on see mitmel põhjusel käesoleva uurimise objektina huvitav. Pärast üleminekuprotsesside algust on Eesti paistnud silma radikaalse reformijana, viies läbi radikaalse rahareformi valuutakomiteesüsteemi kasutuselevõtmisega, järgides ranget fiskaalpoliitikat (tasakaalus eelarve reegli rakendamine), säilitanud majanduse avatuse koos väliskaubanduse kiire

³⁷ Muude põhjustena ressurside ebaefektiivselt allokatsiooniks on välja toodud ressursse kontrollivate agentide ja organisatsioonide stiimulite puudumine ressurside efektiivselt kasutamiseks, ettevõtete juhtide orienteeritus isiklike eesmärkide saavutamisele, ettevõtete suunamine sotsiaalsete ja muude riigi poolt etteantud eesmärkide saavutamisele efektiivsuse asemel (Anderson ja Kegels 1998).

³⁸ Clarke ja Borisov (1999) näitasid, et Venemaal on ametiühingute olemasolu vähem tõenäoline ettevõtetes, kes palkavad töötajaid ebaseaduslikke töövorme kasutades.

ümberorienteerimisega endise idabloki riikidest lääneriikidele, viinud ellu kiire privatiseerimise valdavalt ettevõtete müügiga strateegilistele investoritele, loonud ettevõtjasõbraliku ettevõtluskeskkonna (sealhulgas tööturu paindlikkus, suhteliselt madal korrupsiooni tase), kaotanud ettevõtete riigipoolse subsideerimise. Kõik need arengud on avaldanud positiivset mõju makromajanduslikule stabiliseerimisele ja hilisemale teiste üleminekuriikidega võrreldes suhteliselt kiirele majanduskasvule. Eamets (2001) on märkinud, et Eesti majandusarengut võib pidada unikaalseks eksperimendiks. Dissertatsiooni üheks ülesandeks on uurida, kuivõrd Eesti kiire restruktureerimine ja majanduskasv on olnud seotud tööjõu ümberpaiknemisega ja vanade ebaefektiivsete tootmisüksuste asendamisega uute ja efektiivsetega.

Kuigi dissertatsiooni põhiosa moodustavate artiklite teemad kuuluvad eelkõige töö-ökonoomika valdkonda, siis ettevõtete loomise ja sulgemise (ettevõtete demograafia) teema võib arvata ka kuuluvaks struktuuriökonomika (*industrial organization*) alla. Siiski on dissertatsiooni eesmärgiks panustada eelkõige üleminekuprotsesside ökonomika (*transition economics*) alasesse kirjandusse. Kui varasem üleminekuprotsessiidealne diskussioon fokuseerus eelkõige sellistele küsimustele nagu hindade liberaliseerimine, makromajanduslik stabiliseerimine, reformide kiirus ja järjestus jne, siis käesolev uurimus on fokuseeritud pigem hiljem populaarseks saanud uurimisprobleemidele, nagu restruktureerimine, majanduskasv ja turumajanduses vajalike institutsioonide loomine.

Uurimuse eesmärk ja ülesanded

Doktoritöö eesmärgiks on uurida tööjõu ümberpaiknemist, töökohtade mobiilsust ettevõtete vahel ja ettevõtete demograafiaprotsessi siirdemajandusriikides Eesti näitel. Samas uuritakse hõive kaitse regulatsioonide kui ettevõtluse institutsionaalse keskkonna olulise komponendi rolli ka teiste Balti riikide (Läti ja Leedu) näitel. Viimase juures tuleb märkida, et töö mahu tõttu pole kaetud kõiki ettevõtete demograafiat või tööjõu ümberpaiknemist mõjutavaid regulatsioone, nagu muud tööturuinstitutsioonid, ettevõtete loomisega seotud regulatsioonid, pankrotiseadustik. Kuigi empiiriline analüüs on fokuseeritud Eesti ja Balti riikide majandustele ja ettevõtetele, on eesmärgiks olnud panustada üleminekuriikidealasesse majandusteaduslikku kirjandusse üldiselt.

Dissertatsiooni aluseks oleva nelja artikli poolt täidetavad uurimisülesanded on järgmised.

Esimene uurimisülesanne on hinnata ökonomeetriliselt tööjõu kasutamise optimaalsust ja tööjõu ülekasutamist Eesti tööstusettevõtetes, samuti kiirust, millega ettevõtted saavutavad oma eesmärgiks seatud tööhõive suuruse (I artikkel).

Teine uurimisülesanne on hinnata hõive kaitse regulatsioonide rangust ja nende jõustamise määra Balti riikides (II artikkel).

Kolmas uurimisülesanne on analüüsida töökohtade voogusid (töökohtade loomist ja sulgemist) hilisemal üleminekuperioodil, leidmaks kinnitust, kas tööturg on muutunud stabiilsemaks (millele viitavad muud paindlikkuse indikaatorid). Samuti uuritakse, kuidas muutused majanduse harustruktuuris ja ettevõtete jaotuses suuruse järgi on mõjutanud tööhõive muutusi ettevõtete tasandil (III artikkel).

Neljas uurimisülesanne on analüüsida ettevõtete loomist ja sulgemist ning muutusi tegevust jätkavate ettevõtete tööjõu nõudluses ja nende tootlikkuse arengutes, tegemaks kindlaks, kas töökohtade ja firmade ringlusprotsess on n-õ loov, s.t kas selle tulemuseks on vanade ja ebaefektiivsete majandusüksuste asendamine uute ja efektiivsetega (IV artikkel).

Doktoritöö teoreetiline taust ja varasemad empiirilised uurimused

Doktoritöö teoreetiliseks taustaks on mitmesugused teooriad, mis seletavad ettevõtete demograafiat, nende loomis- ja sulgemisprotsessi, töökohtade liikumist ettevõtete vahel, ettevõtete erinevat efektiivsust, reallokatsiooni majanduslikke mõjusid, institutsioonide mõju tööjõu ümberpaiknemise protsessile. Neoklassikalised lähenemised, mis vaatlevad ettevõtete loomist ja sulgemist kui liikumist turutasakaalu poole (näiteks kui ettevõtete sisenemise ja väljumise kaudu toimub majandusharu tootmismahu kohanemine nullkasumiga vastava hinna juures nõutavaga), ei seleta üldiselt mitmesuguseid arvukate empiiriliste uurimuste põhjal kujunenud stiliseeritud fakte, mis oleksid lühidalt järgmised (vt ka näiteks Caves *et al.* 1998).

- Turumajandusriikides on ettevõtete loomine ja sulgemine väga sagedased.
- Nii ettevõtete kui töökohtade loomine ja sulgemine toimuvad samaaegselt, töökohtade loomise ja sulgemise kõrgete määrade juures jäävad tavaliselt muutused üldises hõivetasemes suhteliselt tagasihoidlikuks.
- Uue ettevõtte rajamine on riskantne (paljud neist suletakse mõne aja möödudes), samas paljud ellujäävad ettevõtted kasvavad kiiresti.
- Hõive liikumised ettevõtete vahel on seletatavad valdavalt ettevõttespetsiifiliste teguritega, vaid väike osa sellest on seletatav liikumistega tööstusharude, ettevõtete suurusklasside jms vahel.
- Mingis majandusharus kasutavad eri ettevõtted mingil ajahetkel erinevat tehnoloogiat, parim tehnoloogia (*best-practice technology*) võetakse kasutusse järk-järgult.

Mis puudutab töökohtade mobiilsuse (reallokatsiooni) majanduslikke mõjusid, siis senine analüüs on ühelt pool näidanud selle positiivset mõju majanduskasvule, sest tootlikkus kasvab lisaks tehnoloogilistele ja organisatsioonilistele muutustele ka tootmistegurite liikumise tõttu madala tootlikkusega harudest ja

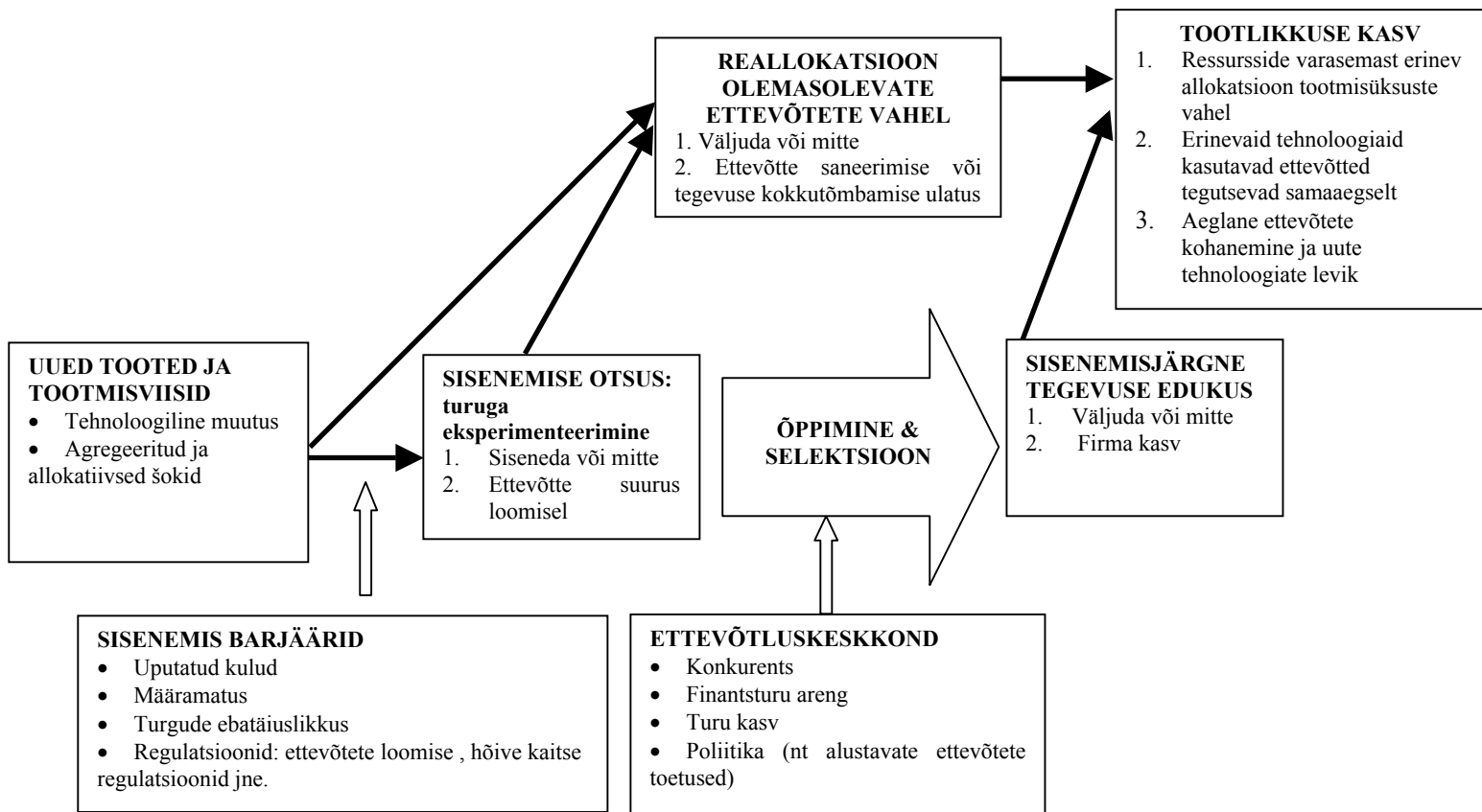
ettevõtetest kõrgema tootlikkusega harudesse ja ettevõtetesse. Samas on ka reallokatsioon seotud oluliste kuludega, nagu tootmistegurite alakasutamine (tööpuudus) seoses reallokatsiooni raskendavate teguritega (töötajate otsimise kulud, vabade töökohtade ja tööotsijate sobitamise kulud, vanadesse töökohtadesse tehtud investeeringud kui uputatud kulud jne), tootmistegurite alakasutamise seotud toodangu kaotus, inimeste vahepealsete töötusperioodidega kaasnev inimkapitali kaotus ja pikaajalise töösuhte katkemine, töötajate ümberõpetamise ja uue kapitali installeerimisega seotud kulud, ettevõtte ja selle partnerite (nt pankade, tarnijate) vaheliste pikaajaliste suhete katkemine.

Teooriad, mis selgitavad ettevõtete demograafiat ja seovad seda majanduskasvuga, tuginevad üldiselt Austria majandusteadlase Joseph Schumpeteri n-ö loova hävitamise³⁹ (*creative destruction*) protsessile (Schumpeter 1983, esimest korda ilmunud 1934). See on protsess, mille kaudu uusi tehnoloogiad kasutavad ja uusi tooteid pakuvad (protsessi ja tooteinnovatsioone juurutavad) uued ettevõtted toovad kaasa olemasolevate ettevõtete tegevuse lõpetamise või kokkutõmbamise. Selle põhiliseks ideeks on, et turumajanduses kaasneb majanduskasvuga tootmistegurite reallokatsioon, kuna uutest toodetest ja protsessidest tulenev kasv nõuab vanade toodete ja protsesside kadumist (Davis and Haltiwanger 1999) ja selline reallokatsioon on olulise tähtsusega tööviljakuse kasvu seisukohalt.

Joonisel 1 on toodud loova hävitamise protsessi peamine struktuur. Innovatsioonide (uute toodete ja tootmisviiside) saabumine muudab senised tehnoloogiad ja tooted iganenuks. Kui uued ettevõtted on võimelisemad või rohkem valmis innovatsioonideks, siis on tulemuseks uute ettevõtete sisenemine, mis toob kaasa seniste ettevõtete väljumise (või tegevuse kokkutõmbamise) ja tööjõu ümberpaiknemise majandusharude vahel.

Turule sisenemise protsess on seotud määramatusega, sest uute toodete või tootmisviiside potentsiaal (või ka ettevõtte juhi enda võimekus ettevõtjana) ei ole üldiselt täpselt ette teada, vaid vastav informatsioon saadakse pärast tootega turule sisenemist (või uue tootmisviisi kasutama hakkamist) tegelikult vaadeldavate tulemuste põhjal (nagu eelmiste perioodide kasumid). Niisiis võivad paljud sisenejad otsustada mingi aja pärast turult lahkuda (seleksioon), samas kui ettevõtted, kes saavad positiivseid uudiseid oma võimekuse kohta, jäävad turule ja laiendavad oma tegevust. Sellist sisenemisega seotud määramatust ja oma potentsiaali tundma õppimist on analüüsitud passiivse ja aktiivse õppimise mudelites (vt vastavalt Jovanovic 1982 ning Ericson ja Pakes 1995).

³⁹ Sellist terminit on kasutatud ka Inglise-eesti-inglise majandusteadussõnastikus (<http://toomas-marit.hinnosaar.net/dictionary/>). Kalvet ja Kattel (2002) on kasutanud mõistet "loominguline hävitusprotsess".



Joonis 1. Loova hävitamise (*creative destruction*) protsessi skeem (autori koostatud).

Reallokatsiooni tugevust (töökohtade ja ettevõtete loomise ja sulgemise sagedus) ja suunda (millistesse ettevõtetesse töökohad liiguvad) mõjutab ettevõtluse institutsionaalne keskkond, nagu sisenemisbarjäärid, konkurentsi tugevus, tööjõu- ja kapitalituru ebatäiuslikkus, tööseadustik, pankrotiseadustik jne. Reallokatsioon sisaldab muu hulgas ka vanade töösuhete lõppemist ja uute loomist, niisiis hõive kaitse regulatsioonide (töölevõtmise ja vallandamise regulatsioonide) rangus on selle seisukohalt oluline. Teooria ütleb, et tööjõu käibekulude olemasolul on hõive kõikumine üle majandustsükli väiksem kui hõive kaitse regulatsioonide puudumisel (sest nt majanduskasvu ajal on tööjõunõudlus väiksem, kui ratsionaalsed ettevõtted arvestavad uue töötaja palkamisel lisaks jooksvatele tööjõukuludele ka kaasnevate oodatavate vallandamiskuludega). Samas pole mõju hõive keskmisele tasemele nii üheselt selge. Arvukate töölevõtmis- ja vallandamiskulude mõju tööturule uurinud empiiriliste tööde tulemusi üldistades võib öelda, et uuringud ei ole näidanud rangema tööseadustiku ühest mõju üldisele hõive või töötuse tasemele, vaid pigem on täheldatavad dünaamilised efektid, nt rangem tööseadustik vähendab töötajate vooge tööturuseisundite vahel ja pikendab töötuseperioodide kestust. Ranged regulatsioonid võivad vähendada ka ettevõtete loomise ja sulgemise protsessi aktiivsust. Samas pole alati suudetud leida ka hõive kaitse regulatsioonide ja töökohtade voogude seost. Mitmetes töödes on uuritud ka tööturu institutsioonide ja makromajanduslikke šokkide koosmõju tööturule ning hõive kaitse regulatsioonide ja teiste tööturuinstitutsioonide seoseid.

Eriti viljakas on uurida tööjõu ümberpaiknemist ja ettevõtluse dünaamikat üleminekul plaanimajandusest turumajandusse. Üleminekuprotsesside käigus on vajalik suuremahuline tootmistegurite ümberpaiknemine, korrigeerimaks käsumajanduse põhjustatud moonutusi, nagu moonutatud ressursside allokatsioon eri sektorite vahel, ebaefektiivne tööjõu kasutamine, tootmise väga tugev kontsentreerumine eri tööstusharudes suhteliselt väikesesse arvu ettevõtetesse jne. Nimetatud moonutuste põhjustena võib muuseas märkida niisuguseid asjaolusid nagu ideoloogiliste tegurite mõju allokatsioonile, tööjõu tasustamise vähene diferentseeritus, täistööhõivest tulenenud kindlus töökoha suhtes, mis takistas vallandamisi, ettevõtete juhtide piiratud stiimulid tootmise efektiivseks korraldamiseks jne. Kahtlematult on üleminekuprotsesside käigus reallokatsiooni ja n-õ loova hävitamise protsessil iseärasused, nagu reallokatsiooni tõukavad jõud (näiteks nõudlusepoolsed šokid võivad olla tähtsamad), uute loodavate firmade suurem roll, kiire reallokatsiooni suured sotsiaalsed kulud jne. Siiski võib väita, et skeem, mille kohaselt innovatsioonid ja tehnoloogiline muutus tingivad Schumpeteri loova hävitamise protsessi, on edukalt rakendatav ka üleminekuprotsesside analüüsiks, kuna valesi paigutatud ressursside korral on oluline leida efektiivsemaid viise olemasolevate ressursside kasutamiseks ja allokatsiooniks.

Andmed ja meetodid

Firmade demograafia (sh ettevõtete loomise ja sulgemise protsessi), ettevõtte tasandil tööjõu nõudluse muutuste ning tööjõu kasutamise efektiivsuse analüüs eeldab ettevõtte tasandi andmete kättesaadavust. Eestis koguvad selliseid andmeid Eesti Statistikaamet ja Justiitsministeeriumi Registrikeskuse poolt säilitatav Äriregister. Artiklis I on kasutatud Eesti Statistikaameti tööstusettevõtete andmebaasi, mis sisaldab informatsiooni umbes 430 ettevõtte kohta aastatel 1995–1999 (artikli kirjutamise ajal); seda andmebaasi iseloomustab see, et sinna kuuluvad suhteliselt suuremad ettevõtted (kuigi väike- ja keskmise suurusega ettevõtted moodustavad enamuse), mis annavad enamuse Eesti töötleva tööstuse toodangust. Artiklis III ja IV on kasutatud Äriregistri andmebaasi, mis sisaldab üldkogumi Eestist registreeritud ettevõtetest perioodist 1995 kuni 2001 (artiklite kirjutamise ajal). Kuigi andmebaas sisaldab mõneti piiratud hulka informatsiooni (ettevõtete üldandmed, bilansi- ja kasumiaruanded), on selle eeliseks (võrreldes analoogilistes varasemates uuringutes kasutatutega) üldine kaetus (sh mikroettevõtted, erisugused sektorid jne), võimalus jälgida korrektselt ettevõtete loomist ja sulgemist (tänu andmebaasi üldisele kaetusele, ettevõtte identifikaatori unikaalsusele, informatsiooni olemasolule ettevõtete ühinemiste ja ülevõtmiste kohta jne). Mõlema andmebaasi (nii Eesti Statistikaameti kui Äriregistri) puuduseks on varasema üleminekuperioodi (enne 1995. aastat) väljajätus. Siiski võib öelda, et käesoleva dissertatsiooni artiklite teema seisukohalt olid Eesti kohta kättesaadavad hetkel parimad võimalikud andmed.

Töö artiklites on empiiriliselt analüüsitud eelmainitud küsimusi statistiliste ja ökonomeetriliste mudelitega. Artiklis I on hinnatud dünaamilist tööjõu nõudluse mudelit, kus nii pikaajaliselt optimaalne tööjõu nõudluse tase kui ka kiirus, millega tegelik liigub optimaalse poole, sõltuvad mitmetest muutujatest. Töös on hinnatud tööjõu kasutuse efektiivsust ühelt poolt tegelikult ja soovitatavalt kasutatava tööjõu suhtena ettevõtte tasandil kui ka tegelikult kasutatud tööjõu suhtena minimaalse kogusega, mida on vaja parima kasutatava tehnoloogia korral (*best-practice technology*; viimane on tuletatud stohhastilise piirtootmisfunktsiooni hindamisest).

Artiklis II on arvatud mitmesuguseid hõive kaitse regulatsioonide jäikuse indekseid, tuginedes erinevates uuringutes arendatud meetodikatele (OECD 1999; Nicoletti *et al.* 2000). Seaduste jõustamise analüüsiks on kasutatud Balti riikide tööinspeksioonide ja kohtute, Euroopa Elu- ja Töötingimuste Parandamise Sihtasutuse (*European Foundation for the Improvement of Living and Working Conditions*) jne andmeid.

Artiklis III on arvatud töökohtade loomise ja sulgemise määrad, neid dekomponeeritud ning uuritud töökohtade loomist ja sulgemist ettevõtte tasandil firma kasvu regressiooni hindamise kaudu. Artiklis IV uuriti ettevõtete loomise ja sulgemise määrade varieeruvust, tehti uute firmade elukestusanalüüs lihtsa mitteparameetrilise Kaplani-Meieri lähenemisega ning tootlikkuse (produktiivsuse) kasvu dekomponeerimine. Dekomponeerimisel uuriti tootlikkuse

muutust tootmistegurite ümberpaigutamise, firmade sisenemise ja väljumise ning tegevust jätkavates firmades tootlikkuse kasvuga seotud komponentidest sõltuvalt.

Ülevaade artiklite tulemustest

I. Masso, J., Heshmati, A. (2004). Optimality and Overuse of Labour in Estonian Manufacturing Enterprises, *Economics of Transition*, Vol. 12, Issue 4, pp. 683–720.

Artiklis teemaks on n-õ numbriline tööturu paindlikkus, s.t ettevõtete võime muuta töötajate arvu vastavalt vajadusele, ja sellega seotud tööjõu kasutamise efektiivsus ja optimaalsus. Mitteoptimaalset (nt võrreldes kasutatava tootmistehnoloogia ja toodangu nõudlusega liiga suurt) tööjõu kasutamist võivad tingida jäigad tööturuinstitutsioonid (ametiühingud, tööseadused) ja kapitali- või tööjõuressursi vähesus ning kasvavad töölevõtmis- ja vallandamiskulud. Kasutatud on dünaamilist tööjõu nõudluse mudelit, kus nii pikaajaliselt optimaalne tööhõivetase kui ka kiirus, millega tegelik hõive viimasele läheneb, pole fikseeritud üle aja või üle ettevõtete, vaid sõltuvad mitmetest muutujatest. Mudeli hindamiseks on kasutatud Eesti Statistikaameti ettevõtete paneeländmeid 1995.–1999. aastast 438 ettevõtte kohta. Ökonomeetrilise mudeli hindamise tulemused näitasid, et pikaajaliselt reageerib ettevõtte nõutav tööjõu kogus enim palkadele, millele järgnevad ettevõttes loodud lisandväärtus ja kapital. Nii tegeliku tööhõive kohanemise kiirus kui ka tööjõu kasutamise efektiivsus ja optimaalsus varieeruvad palju enam firmade kaupa kui ajaskaalal. Aja jooksul on täheldatav nii tööjõudu säästev tehnoloogiline progress kui ka tööjõu kasutamise efektiivsuse suurenemine. Võrreldes varasemates uurimustes teiste riikide kohta leituga on antud uurimuste tulemuste järgi tegeliku hõive vastavusse viimine pikaajaliselt optimaalse tasemega olnud Eestis suhteliselt aeglane. Keskmiselt on ettevõttes tegelikult hõivatud tööjõud väiksem tema enda tootmistehnoloogiaga võrreldes optimaalsest tasemest. Samas on keskeltläbi ettevõttes tööjõu kasutamine ülemäärane, võrreldes kõige efektiivsemat tehnoloogiat rakendava firmaga.

II. Eamets, R., Masso, J. (2005). The Paradox of the Baltic States: Labour Market Flexibility but Protected Workers?, *European Journal of Industrial Relations*, Vol. 11, Issue 1, pp. 71–90.

Artiklis hinnatakse hõive kaitse regulatsioonide rangust ja nende tegelikku makspanekut Balti riikides. Sellel eesmärgil kasutatakse informatsiooni nii kehtiva seadustiku kui ka seaduste jõustamise kohta praktikas (nagu töövaidluste lahendamine kohtutes ja töövaidluskomisjonides, eri tüüpi töölepingute suhteline sagedus jne). Ühelt poolt ilmnes, et hõive kaitse regulatsioonide üldine rangus on Balti riikides võrdlemisi lähedane Euroopa Liidu vanade

liikmesriikide keskmisele ja üsna hästi kooskõlas Euroopa Liidu regulatsioonidega; individuaalsed ja kollektiivsed vallandamised on samas suhteliselt rangelt ja ajutised töötamise vormid nõrgemalt reguleeritud. Samas suurendab tegelikku tööturu paindlikkust see, et seaduste täitmisega on paljudel juhtudel probleeme, ja on palju tõendusmaterjali selle kohta, et seaduste sätteid rikutakse ettevõtetes: töötajate sagedased ja tihti edukad kaebused tööinspektsiooni, probleemid töövaidluste efektiivse lahendamise, töölepingute lisatingimused jms. Samuti on Balti riikides ajutise iseloomuga tööhõive kõrgem Euroopa Liidu keskmisest tasemest, millest johtub suurem paindlikkus.

III. Masso, J., Eamets, R., Philips, K. (2004). Creative Destruction and Transition: The Effects of Firm Entry and Exit on Productivity Growth in Estonia. Institute for the Study of Labour (IZA), *IZA Discussion Paper No. 1243*, 42 pp. Artikli teemaks on firmade demograafia Eestis, sealhulgas firmade loomine ja sulgemine, uute firmade elukestusanalüüs ning tootlikkuse (produktiivsuse) kasvu dekomponeerimine. Dekomponeerimisel uuriti tootlikkuse muutust tulenevalt sellistest komponentidest nagu tootlikkuse kasv tegevust jätkavates firmades, tootlikkuse kasv tootmistegurite ümberpaigutamise tõttu tegevust jätkavate firmade vahel ning firmade sisenemine ja väljumine. Töös kasutatud ettevõtete individuaalandmed on pärit Eesti Äriregistrist ja hõlmavad kõiki aastatel 1995–2001 Eestis registreeritud firmasid, sealhulgas on esindatud ka väikeettevõtteid ja erinevad majandussektorid.

Analüüsitaval perioodil on firmade asutamise ja sulgemise määrad (loodatavate ja suletavate ettevõtete suhe ettevõtete koguarvu) olnud Eestis rahvusvahelises võrdluses kõrged, mida on soodustanud madalad institutsionaalsed sisenemisbarjäärid ning väikese- ja keskmise suurusega ettevõtete sektori laienemine. Rahvusvahelises võrdluses on olnud uute Eesti ettevõtete ellujäämise (*survival*) määrad suhteliselt kõrged, samas ellujäänud ettevõtted on näidanud võrdlemisi kiiret kasvu. Firmade kiire kasv on tingitud uute firmade kõrgemast tootlikkusest, võrreldes vanade ettevõtetega, ja majanduse sektoraalse struktuuri muutumisest. Tootlikkuse kasvu dekomponeerimisel ilmnes, et Eesti ettevõtete üsna kõrge tootlikkuse kasv on tulnud enamasti tootlikkuse kasvu tõttu pikka aega tegutsevates (vanades) firmades (nt uute tootmistehnoloogiate kasutusele võtmise, organisatsiooniliste muutuste, parema tootmistegurite kombinatsiooni tulemusel), samas on mänginud väga olulist rolli ka tootmistegurite reallokatsioon (eriti just madala tootlikkusega ettevõtete tegevuse lõpetamine ja kõrge tootlikkusega üksuste loomine). See näitab, et reallokatsioon ning ettevõtete demograafia protsessid on toetanud Eesti kiiret majanduskasvu. Viimasest tulenevalt peaks Eesti autorite arvates jätkama senist ettevõtjasõbralikku poliitikat koos firmade madalate sisenemisbarjääride ja tööturu paindlikkuse säilitamisega.

IV. Masso, J., Eamets, R., Philips, K. (2005). Job Creation and Job Destruction in Estonia: Labour Reallocation and Structural Changes, forthcoming in Hannula, H., Radosevic, S. and Tunzelmann, N. von (Eds.), *Estonia, the New EU Economy: Building a Baltic Miracle?*, London: Ashgate.

Artiklis uuritakse Eesti Äriregistri andmebaasi abil töökohtade voogusid ning nende mõjureid Eestis aastatel 1995–2001. Mainitud andmebaas hõlmab kõiki Eestis registreeritud äriühinguid (sealhulgas mikro- ja väikeettevõtteid), mille koguarv andmebaasis ulatub ligikaudu 52 tuhandeni. Andmebaasi põhjal on välja arvatud töökohtade loomise ja sulgemise määrad ning loodud ja suletud töökohtade püsivuse (*persistence*) määrad ettevõtete erinevate karakteristikute kaupa, tehtud nende dekomponeerimisi ning uuritud töökohtade loomist ja sulgemist ettevõtte tasandil firma kasvu regressiooni hindamise kaudu.

Artiklis tehtud analüüsist selgub, et töökohtade loomise ja sulgemise määrad on Eestis väga kõrged ja võrreldavad USAs leitudetega. Kuigi töötajate vood (liikumised tööturuseisundite vahel) on vähenenud, ei ole töökohtade vood aja jooksul kahanenud. Dekomponeerides tööhõive netomuutust ületavat töökohtade voogude osa, ilmnes, et viimase ettevõttespetsiifiline komponent on võrreldes lääneriikide andmetel tehtud uurimustes saadutega olnud Eestis mõnevõrra väiksema osakaaluga. Sellist tulemust seletab väike- ja keskmise suurusega ettevõtete tähtsuse kasvamine Eestis ning tööjõu kiire ümberpaiknemine erinevate majandussektorite vahel. Kõrge töökohtade sektoritevaheline mobiilsus on aidanud säilitada kõrgeid töökohtade voogusid. Samuti on kõrgeid töökohtade voogusid soosinud institutsionaalne keskkond, eriti olulised on siin uute ettevõtete madalad asutamiskulud. Uurides töökohtade loomist ja sulgemist firma kasvu regressiooni kaudu, ilmnes ettevõtte suuruse ja vanuse negatiivne seos kasvumääraga, eriti kodumaisele kapitalile kuuluvates ettevõtetes.

Analüüsi majanduspoliitilist järeltulekut, et Eestis tuleks püüda säilitada paindlikku ettevõtluskeskkonda, toetab teoreetilises ja empiirilises kirjanduses toodud tõendusmaterjal tööturu paindlikkuse ja ettevõttesektori dünaamika positiivsest mõjust majanduskasvule.

Soovitusi tulevasteks uuringuteks

Tööjõu reallokatsioon ja firmade demograafia ning erinevate institutsioonide roll selles väärivad Eesti ja teiste siirderiikide kontekstis edasist uurimist ja teatud osas toetab seda ka võrdlemisi heade andmete (Äriregistri andmebaasi) olemasolu (ehkki andmete piiratus mõnest aspektist mõjutas ka doktoritöös tehtud empiirilist analüüsi). Nii näiteks võib uurida põhjalikumalt erinevate majandusharude ettevõtete sisenemise ja väljumise määrade mõjureid, alustavate ettevõtete suurust mõjutavaid tegureid (vt nt Lay 2003), ettevõtete loomist ja sulgemist niisuguste tehingute kaudu nagu ühinemised, ülevõtmised ja eraldumised (Caves 1998). Siiski sõltuvad mitmetes suundades uuringu edasiarendamise võimalused kättesaadavate andmete täiendamisest. Dissertat-

siooni artiklites kasutatud andmebaasides polnud andmeid töötajate karakteristikute (nt haridustaseme, töökohta) kohta. Käesoleval juhul oleks eriti kasulik sobitatud tööandjate ja töövõtjate andmebaasi (*matched employer-employee data*) kasutamine, mis on olemas paljudes riikides (Abowd, Kramarz 1999), kuid mida Eestis pole siiani koostatud. Samas, kuna antud andmebaasi koostamine eeldab erinevate registrite ja/või uuringute andmete ühendamist, on see seonduvate õiguslike ja tehniliste küsimuste tõttu aeganõudev protsess.

Niisiis, täiendavate andmete kättesaadavaks muutmisel oleks võimalik analüüsi süvendada ja laiendada, näiteks n-õ valgekraede ja sinikraede eristamine oleks oluline ettevõtte poolt hõivatava tööjõu kohandamisel optimaalsele tasemele (I artikli teema), samuti võimaldaks erineva haridustasemega tööjõu eristamine uurida oskuste suunas nihkega tehnilist progressi (*skill-biased technical progress*; s.t tehnoloogiline progress, mis suurendab suhteliselt enam nõudlust kõrge kvalifikatsiooniga tööjõu järele). Dissertatsioonis käsitletud tööjõu reallokatsiooniga seotud valdkonnaks on ka innovatsioonide mõju tööhõive netomuutusele. Dissertatsioonis vaadeldi innovatsioone kui reallokatsiooni käivitavat jõudu. Milline on nende mõju hõive netomuutusele, jäi tähelepanu alt välja. Sellesuunaline uurimistöö võiks kasutada näiteks innovatsiooniuringute andmeid, nagu Euroopa riikides (sh Eestis) Euroopa Komisjoni ühtse metoodika alusel tehtud uuring (*Community Innovation Survey*).

Täiendavat uurimist nõuab ka institutsioonide, sealhulgas näiteks tööseaduste, jõustamise temaatika. Ühes teises artiklis (Masso 2003) on dissertant uurinud töövaidluste lahendamise varieeruvust Eesti maakondades, kasutades töövaidluskomisjonide ja kohtute statistikat. Osutus, et nii kõrgem tööpuudus kui ka töövaidluskomisjoni kaldumus teha töötajatele soodsamaid otsuseid on seotud töövaidluskomisjonisse esitatavate avalduste arvuga töötaja kohta. Samas seos tööpuuduse ja töötajate kasuks tehtud otsuste protsendi vahel praktiliselt puudus. Töölepingut puudutavate kohtuasjade arv oli samuti seotud positiivselt tööpuudusega, samas oli viimane seotud negatiivselt hageja (kes tavaliselt on töötaja) kasuks tehtud otsuste osakaaluga. Põhjuseks võib olla see, et kui kõrgema tööpuudusega regioonis tööandjad eeldavad kohtuotsuseid olevat suhteliselt soodsamad töötajatele, siis neis regioonides jõuavad kohtusse ainult asjad, kus tööandja positsioon on küllaltki tugev. Tulevikus oleks kasulik seda laadi uuringut täiendada, analüüsides kohalike õigussüsteemide efektiivsust ja seda, kuidas töötajatele hüvitatakse ebaseaduslikke vallandamisi. Samuti võib laiendada hõive kaitse regulatsioonide mõju analüüsi Kesk- ja Ida-Euroopa riikide andmetele, uurides näiteks tööturuseaduste reformide mõju.

Firmade demograafiaga mõneti seotud valdkond oleks selliste majanduspoliitiliste meetmete nagu ettevõtluse stardiabi meetmete tulemuslikkuse (nt nende mõju alustavate ettevõtete elukestusele, kasvule, töökohtade loomisele) analüüs, kasutades näiteks sobivaid sobitamise (*matching*) tehnikaid. Dissertatsioonis on lühidalt viidatud alustavate ettevõtete subsideerimisega seotud võimalustele ja probleemidele. Ühelt poolt võivad need korrigeerida turu ebatäiuslikkust, nagu alustavate ettevõtete piiratud ligipääs finantseerimisele.

Teisalt on alustavate ettevõtete toetamine riskantne nende seas aset leidva intensiivse selektsiooni protsessi võimaliku nõrgenemise tõttu, toetused võivad moonutada turusignaalide interpreteerimist ettevõtja poolt ja toetuste saajateks võidakse valida need, kes suudaksid ellu jääda ja kasvada ka ilma toetusteta (Santarelli ja Vivarelli 2000 on välja pakkunud need argumendid).

CURRICULUM VITAE

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Education:

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2001 University of Tartu, MA in economics (*cum laude*)
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English (very good), Russian (satisfactory), German (satisfactory), French (elements).

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2001– to date Research fellow, University of Tartu, FEBA (at the moment full time)
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Lecturing

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- 2001 – tänaseni Tartu Ülikooli majandusteaduskonna teadur (hetkel täiskohaga)
- 2002 Tartu Ülikooli majandusteaduskond, spetsialist (0,5 kohta)
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- 2003 Suvekool “The Baltic Sea Region 2010. Theories, Methods and Practicalities”, Alfried Grupp Wissenschaftskolleg, Greifswald, Saksamaa
- 2002 doktorantide kursus “Topics in Applied Microeconometrics”, Soome
- 2002 doktorantide kursus “Panel Data Econometrics”, Soome
- 1999 Kieli suvekool, Christian-Albrechts-Universität zu Kiel, Saksamaa

Õppetöö

- Rahvusvaheline rahandus (MA magistriõppele)
- Makroökonomika (bakalaureuseõppele)
- Kindlustusstatistika (bakalaureuseõppele)
- Operatsioonianalüüsi mudelid (bakalaureuseõppele)

Administratiivtöö ja muud tööülesanded TÜs

- 1999–2001, 2004–2005 Tartu Ülikooli majandusteaduskonna nõukogu liige
- 2004–2005 Tartu Ülikooli nõukogu liige

Peamised uurimisvaldkonnad

- Tööjõu nõudlus
- Tööseadustik
- Ettevõtete sisenemine ja väljumine
- Tööturu paindlikkus