

Charles University in Prague

Faculty of Social Sciences
Institute of Economic Studies



MASTER THESIS

On the limits of labour mobility within the EU

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Declaration of Authorship

The author hereby declares that he compiled this thesis independently and using only the listed resources and literature, and the thesis has not been used to obtain a different or the same degree.

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Prague, January 6, 2014

Signature

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Abstract

This Master thesis deals with labour mobility and aims to uncover the main drivers influencing the flows of workers within the European Union (EU). It first provides an extensive overview of labour market, labour mobility and legal framework in the EU. Then it discusses several theories and models dealing with labour mobility. The main part of this thesis consists in empirical analysis of labour flows within EU-25 countries. This analysis is meant to provide statistical evidence of relevant mobility drivers. Contrarily to similar works, this thesis takes into account not only economic and financial factors, but also social, psychological, linguistic and other non-tangible factors that might play important role in determining the labour flows within the EU. The thesis further focuses on specific mobility incentives of the Old and the New Member States. Based on results of the empirical model and the regression analysis, the thesis concludes by discussing the limits of labour mobility and suggesting a remedy aimed at enhancing it.

JEL classification: J61, J88

Keywords: European Union, Labour force, Migration, Mobility drivers

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Abstrakt (in Czech)

Tato diplomová práce se zabývá mobilitou pracovní síly a klade si za cíl určit hlavní faktory ovlivňující pohyb pracovních sil v Evropské Unii (EU). Práce nejprve nabízí obsáhlý přehled pracovního trhu, mobility pracovních sil a politiky zaměstnanosti v EU. Poté se zaměřuje na rozbor teorií migrace a modelů týkajících se mobility. Hlavní část této diplomové práce spočívá v empirické analýze pohybu pracovních sil v zemích EU-25. Tato analýza má za cíl určit na základě statistických výsledků faktory, které jsou pro mobilitu určující. Oproti podobným pracím se tato soustředí nejen na ekonomické a finanční motivy, ale bere v potaz i sociální, psychologické, lingvistické a jiné méně hmatatelné faktory, které mohou hrát důležitou roli v tom, jak se pracovní síla pohybuje v EU. Práce posléze analyzuje motivy specifické pro

staré a nové členské státy. Na základě výsledků regresní analýzy shrnuje limity mobility pracovních sil a navrhuje řešení, které by ji mělo podnítit.

JEL klasifikace: J61, J88

Klíčová slova: Evropská unie, Pracovní síla, Migrace, Incentivy k mobilitě

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List of abbreviations

EC	European Commission
ECSC	European Coal and Steel Community
EEA	European Economic Area
EEC	European Economic Community
ERASMUS	European Community Action Scheme for the Mobility of University Students
ESF	European Social Fund
EU	European Union
EURES	European Employment Services
GDP	Gross Domestic Product
MPL	Marginal Product of labour
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
UK	United Kingdom
US	United States of America

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Master Thesis Proposal

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Proposed Topic:

On the limits of labour mobility within the EU

Topic Characteristics:

This Master thesis will focus on cross-border mobility of labour in the European Union. Although the freedom of movement for workers is in place since the Directive on the right to move and reside freely came into force, the labour is hardly moving from one EU Member State to the other. In fact, there is just about 2% of labour force in the EU willing to work in another Member State which is considerably lower than, for example, in the U.S. Therefore, the question is: what makes the cross-border labour mobility in the EU so low? And is there any chance of making the situation better? These are the research questions that will be tackled in this thesis.

There have been several studies trying to explain why the European labour is reluctant to migrate. Conventional surveys expected to explain the incentive to move by economic reasons. However, the models presented in these surveys met with very low explanation value. This Master thesis will try to explain the low mobility of labour in the EU by the means of a thorough regression analysis. Using the data from 25 EU countries provided by Eurostat and OECD databases, it will analyse the main factors that affect the labour mobility in the EU and determine the factors of low-skilled labour mobility. Additionally, it will consider not only economic and pecuniary indicators, but will also take into account cultural, psychological and other intangible factors predetermining this issue.

Hypotheses:

1. The labour mobility itself has welfare generating effect and is to some extent positive for both source and destination countries.
2. Equalisation of wages in practice does not hold, so the labour mobility is hampered
3. The flow of labour force across the EU Member States remains very modest relative to other comparable economies (e.g. U.S.).

4. Factors affecting the low labour mobility in the EU are of both economic and non-economic nature.
5. There are still reserves and potential that might allow to make the rigid EU labour market more flexible and efficient.

Methodology:

First, the paper will discuss the actual benefit of labour mobility. Using a two-country model, it will try to demonstrate that countries are better off when the labour is free to move between countries.

Then, the paper will comment on the differences in wages amongst the EU Member States indicating that production factor (labour force) is not freely mobile.

The main value-added of the thesis will be the regression analysis of labour flows. It will use the data of 25 EU countries ranging from 2004 to 2012 and mapping the migration flows and the most important economic, cultural and social indicators. Provided with vast and solid data for a relevant analysis, the paper will seek to determine what factors affect the labour mobility by means of both OLS and SUR regression methods.

Finally, based on findings of the analysis it will indicate whether the labour mobility in the EU has reached its "natural" limits or whether there is still some potential to improve the labour market in terms of cross-border mobility.

Outline:

Introduction

The introduction will specify the field of interest of this paper, which is a poor cross-border mobility of labour force in the EU

Theoretical part

This part presents a theoretical background and a literature review on how the labour force migration is favourable as it is beneficial for both source and destination country. Also, in theory, free movement of labour would lead to price equalization, but in practice, there is nothing like that, so the mobility is somehow hindered.

Empirical part

The empirical part of the paper aims to answer the question what are the main factors affecting the EU labour ability. Regression analysis taking into account all sorts of factors should determine which ones play the most important role in cross-border labour mobility.

Conclusion

The conclusion will summarize our findings and suggest some measures that can enhance the cross-border labour mobility within the EU.

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Complete results of regression analysis

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Introduction

The European Union is an economic and political body consisting of 28 Member States that represents a historical milestone in the development of the European continent. The creation and further evolution of the EU tackles a myriad of issues. The list of Directorates-general¹ of the European Commission contains 33 specific policy areas: economic and financial affairs, foreign and security policy, taxation and customs union, trade, regional policy, employment and social affairs, human rights, education and training, research and innovation and others. There is hardly any field of human activity in the united Europe without a direct or indirect impact of EU institutions. Yet, the main reason of EU formation was economic and political unification of European countries.

After the World War II, European visionaries and leaders were seeking to find an efficient arrangement ensuring long-lasting political and economic stability. Their efforts lead to a creation of the European Coal and Steel Community, the predecessor of the EU as we know today. As of 1951, the ECSC managed to bring member countries closer together both politically and economically. In spite of critical and sceptical opinions and several turbulent moments in the past, the community persisted. It started merely as a six-nation international organisation, but developed in a Europe-wide union with supranational institutions, common policies, common currency and, most importantly, the common (or internal) market.

The creation of the EU's internal market, sometimes referred to as the Single market or the Common market, was a significant landmark in European economic, political, social and cultural integration. The market is designed to bring down all sorts of barriers, both tangible and intangible, and enable individuals, consumers and businesses to have a direct access to

¹ Directorate-general is an administrative department of the European Commission dedicated to a specific policy area

opportunities anywhere in the EU. Often cited as the "four freedoms", the common market guarantees a free movement of goods, services, capital and people.

The free movement of people is a fundamental right guaranteed by the Treaty on the Functioning of the European Union. It allows every EU citizen to live, work, study or retire in another EU country. EU citizens are entitled namely to:

- Look for a job in another EU country
- Work there without needing a work permit
- Reside there for that purpose
- Stay there even after employment has finished
- Enjoy equal treatment with nationals in access to employment, working conditions and all other social and tax advantages

The free movement of people is today stipulated in the Directive 2004/38/EC on the right to move and reside freely and came into force in April 2004 (Official Journal of the European Union, 2004). The Directive applies automatically to each EU citizen and extends also to close family members that might not be EU citizens. The Directive also aims to lighten the bureaucratic burden to those EU citizens and their families willing to move.

By continuously removing physical and institutional barriers, the EU keeps encouraging its citizens to move, settle and work in a foreign country. Yet, surprisingly, they are reluctant to work abroad and prefer staying in their homelands. Statistics and different studies clearly showed that labour mobility in the EU area remains on a very low level. At this point, several questions arise: Why does the labour mobility in the EU remain so low? Is the EU's effort to make its inhabitants move in fact futile? Have the EU bodies done anything wrong in tackling the labour mobility? What exactly makes the EU labour mobility so low? Are there any

chances of enhancing the labour mobility in the EU? These and similar questions constitute the *raison d'être* of this Master thesis that will deal mainly with the labour mobility. The main value-added of this Master thesis is a thorough analysis of labour mobility within the EU and determination of its main drivers. Based on result, the thesis suggests appropriate measures to spur it. It also comments on current efforts and arrangements by EU institutions dealing with this issue. Finally, it attempts to forecast the future development of labour mobility in the EU. According to our knowledge these issues have not been discussed in the research literature, neither have they been uncovered in the works of the authors working in the field of migration research.

The thesis is divided into four chapters. The first chapter focuses on the literature review and the research background in order to reveal the development and current situation of the labour force in the EU framework. The second chapter examines different theories and models dealing with labour mobility and decision-making process related to international migration. The third, empirical chapter, analyses different factors influencing labour migration flows in the EU taking into account not only economic, but also so-called “intangible factors of migration”, including the social and cultural aspects. The fourth, concluding chapter summarizes our main findings and provides the answers to the questions mentioned hereinbefore. In addition, it brings some policy implications that might be of some interest for EU policy-makers and labour market theorists.

Research background and state of the art

This chapter provides a thorough insight into the development of labour forces in the EU. It will talk us through its evolution from the early stages of the distribution of labour until complex and highly specialized labour force of nowadays. It will discuss also a formation, development and unique features of the EU labour market. Finally, it will familiarize us with the legislative framework and institutional bodies responsible for EU labour market and related policies.

Development of labour force and labour market: an overview

"Labour is the source of all wealth", once stated a German political philosopher and economist Friedrich Engels (1876) and he might not be wrong. Alongside the natural richness and raw materials, labour force is an essential source that can be employed to create wealth. However, the pathway to efficient use of labour was long and went through several stages.

Origins of labour

The first steps toward the origins of labour can be traced back in the Miocene. Most likely towards the end of this epoch, about five or six million years ago, a race of highly developed anthropoid ceased to use their hands to walk and adapted to move on their feet alone (Fleagle, 1999). Even though there are several hypotheses as to how, why and when the bipedalism evolved in those species, the indisputable result was that bipedalism freed the forelimb to make and use artefacts (Jolly, 1970).

By using different tools, human species showed a significant level of intelligence that made it different from other species. Making and using tools can be also considered as the first employment of labour as a primary factor of production. Hand in hand with the evolution of

man's mental and physical shape, the society he lived in developed as well. The Upper Palaeolithic revolution, as labelled by anthropologists, brought about important technical, social and cultural advances and drew a man closer to behavioural modernity (Diamond, 1999).

Along with the changes in human society and lifestyle, the role of labour force went through several stages as described in a work of John Macionis and Ken Plummer (2008). In hunting and gathering societies, the labour was used to collect eatable plants and berries and to hunt wild animals. These societies featured a sexual division of labour leaving men with hunting and women with gathering tasks. As the time moved on, ancient societies took more elaborate and efficient forms. Pastoral societies bred domesticated animals. Horticultural societies cultivated fruits and vegetables. In more technologically developed agrarian and feudal societies, farmers were able to cultivate larger areas and supply more food for themselves, for the lords and for a growing population. With every step in the development, these societies became more stratified, inequalities in wealth and power appeared too. The foundation of cities and usage of money as a medium of exchange allowed for further division of labour that progressed quickly and many various crafts appeared. People became focused mainly on the craft they handled the best and surpluses of own production were traded for other goods in towns. All the production was done primarily at an individual level. Craftsmen were not employed or hired to work and labour market did not exist at the time. Yet, the situation was about to change with the arrival of a new economic system in Western Europe - the capitalism.

The advent of capitalism was a revolutionary step that determined the economic, political, social and cultural development of humankind for many centuries. In its earliest form, capitalism began to emerge in the 16th century along the demise of feudalism that made many peasants unoccupied (Wallerstein, 1974). Crowds of them gathered in cities and, struggling to find a job, agreed on working for an employer as a wage-labourer. Wage-labour was a newly

born, truly capitalistic relationship between workers and employers. In this relationship, workers were no longer paid for what they produced but were paid on a regular basis for selling their labour (Steinfeld, 2009).

For the first time in history, we can apply the term labour in its modern sense. Within the capitalist system, human labour became a primary factor of production, not substantially different from any other factor, over which capital owners have control (Robinson, 2004). In the minds of capitalists, it represented another input that needed to be purchased and remunerated in order to contribute to the production process. And like for any other factor or good, a competitive market for it emerged - the labour market.

Specific features of labour markets

The labour market is a market similar to any other - it is a function of the forces of both demand and supply. The supply side relates to individuals and how they supply their labour; the demand side to how firms are prepared to package available work for producing their outputs (Williams, 2004). Workers maximize their utility, thus with an increasing wage, they generally supply more labour. Employers, on the other hand, maximize their profit and keep employing workers up to a point where the marginal product revenue and the marginal cost of a worker are equal. Therefore with an increasing wage, employers demand less labour. The labour market suits well the traditional supply and demand structure, however it has several unique features that make it different from an ordinary commodity market.

First, it is characterized by a significant heterogeneity on the side of both supply and demand. Diversity in the amount and type of skills possessed by workers is a central feature of modern labour markets (Heckman and Sedlacek, 1985). On the supply side, the differences occur in workers' education, experience, specialization, age, sex, domicile, mobility, linguistic and personal skills and many other aspects. On the demand side, heterogeneity is omnipresent. With the increased availability of micro datasets on firms and plants from the late 1980s and

1990s onwards, it became clear that there was in fact vast heterogeneity across producers within industries, in terms of size, productivity, capital and skill-intensity, and wages (Bernard et al., 2011). Then there is no surprise that making a perfect match between employers and employees requires a huge effort from both of them.

Second, labour wages tend to be inelastic, especially from below. Labour markets, in particular the European ones, are characterized by firing costs, generous unemployment benefits and strong unions that are perceived to contribute to sluggish labour market adjustments. Moreover, the collective wage bargaining process is seen to prevent wages from adjusting instantaneously, introducing a substantial degree of wage rigidity (Christoffel and Linzert, 2006). The sticky wages do not allow the labour market to clear swiftly and efficiently. As a result, there are long periods of unemployment, vacancies and idle human capital.

Third, the supply of labour is, contrarily to a commodity, hugely bounded by biological limits. Even if the demand for labour overlaps considerably the supply, workers can provide only a limited amount of labour a day as they need some time for recovery. The scope of regular working time and overtime is often guaranteed by the law². Moreover, the labour force cannot be easily reproduced and it takes a time and some means to form a worker.

Fourth, it is a generally accepted fact that, unlike a commodity market, the labour market's equilibrium is characterized by an existing level of unemployment. The so called natural rate of unemployment, pioneered in the works of Milton Friedman (1968) and Edmund Phelps (1967), suggests there is a sub-optimal labour market equilibrium resulting from imperfections, frictions and rigidities arising either in the labour forces or in the economy.

² To give an example, the EU has adopted a Working Time Directive that imposes maximum weekly working hours, minimum daily rest period and rest break and other measures to protect workers' health and safety.

Fifth, the labour market is heavily regulated market and is liable to labour legislation. Labour market regulation involves many aspects, ranging from how employers contract for the services of workers to the nature of the exchange, including terms of conditions of employment (Betcherman et al., 2001). Labour law generally defines rights and obligations of workers, employers, unions and governments and provides for relations between them. The principal aim of labour law is to promote productive and safe workplaces³.

Sixth, the labour market is subjected to political interference and employment policies as unemployment is a politically very sensitive subject. Unemployment affects not just the jobless person, but also his or her family and surroundings. It disseminates despair and frustration in society, promotes crime and violence and can eventually lead to riots and civil unrests, such as those we recently witnessed in Spain or Greece. To avoid these problems and loss of approval rating, politicians introduce stimulus packages, take job-creating measures, struggle to save existing jobs and otherwise interfere in the labour market.

New trends in labour markets in Europe and in the rest of the world

During the last decades, European countries underwent a rapid development in the social, cultural and economic domain. This transformation was even more intense in post-communist countries of Central and Eastern Europe. Thanks to progresses mainly in information technologies, European citizens had to adapt to a whole new system of labour organization and learn how to live in an information society⁴ (Beniger, 1986). In the United States, Canada, Western Europe and Japan, most of the wealth comes from informational goods.

³ In the EU framework, the EC engages heavily in health and safety at work through the Directive on the introduction of measures to encourage improvements in the safety and health of workers at work.

⁴ Information society is a post-industrial society characterised by information intensity in cultural, political, and social life of most citizens and which is based on the production and distribution of information

Digital citizens, those taking part in information society, are supposed to manage, use and distribute information in a productive way.

Companies in a fiercely competitive environment strive to adjust swiftly to a fast changing demand and business environment. Therefore, they prefer hiring multi-skilled, flexible employees that can make a real contribution in multiple fields. This strategy allows organisations to quickly respond to changes in products, production methods and technology since it enables to allocate employees where and when needed easily and without extra costs (Atkinson and Meager, 1986). Being specialized in one field only, is not enough. Workers are demanded to have more than one specialization and furthermore have solid computer skills and/or speak different languages.

Companies also want their employees to remain well-educated and in touch with the latest novelties in their respective fields. Therefore, many employees go through education and retraining. Adult education, the new trend in labour, refers to learning undertaken by adults after they have finished their initial education. The positive effect of adult education was shown in a study led by Feinstein (2004) who proved that adult education boosts individuals' productivity and can make a real long-lasting contribution to the company. No wonder top performers are lifelong learners. The study also found out that more educated workers are better paid. It claims that one year of extra schooling increases earnings by around 5-10%. Adult learning is one of the EU education policies. It contributes not only to EU-wide competitiveness and employability, but it also helps to solve other, mainly social and civil, issues.

Companies' labour tends to be more spatially dispersed. Concentration of businesses in large cities forces many employees to commute on a daily basis from their residence to place of work. As the urbanization rate in Europe increases steadily and cities grow larger over time, commuting from the suburbs and commuter belts is a common feature of urban labour

markets. As a result, spatial mobility of workers within cities increases over time (Simpson, 1992). Distance from residence to workplace is becoming indeed larger. Sometimes, employees commute from distant cities or even from neighbour countries to get to work.

Companies' labour tends to be spatially dispersed also because some employees work from home. In the EU in 2005, an average of 7.0% of employees worked from home at least a quarter of the time, and 1.7% did so almost all the time (European Industrial Relations Observatory, 2010). If the production process can be fragmented and distributed independently among employees, homeworking, sometimes referred to as teleworking, seems to be a suitable solution. Ceredian, one of the largest providers of human resource services in the world, provided the following list of the top ten benefits of home working (see Table 1) according to an internal survey.

Table 1: Benefits of working from home

Higher productivity, ability to work uninterrupted, especially on "project work"	Better work/life balance, "family friendly", fit with domestic arrangements
Skill retention, greater commitment from staff, greater loyalty	Continuity for our clients, better customer service
Happier staff, higher morale, more motivation, good staff relations	Creates a positive image for the company, dynamic, flexible
Office space and other facilities go further	Reduced overheads
Contributes to ability to offer flexible working conditions, hours	Lower stress for staff, greater well-being

Source: <http://www.ceridian.co.uk>

When evaluating employees' performance, more and more firms take into account the actual work being done rather than the time spent on workplace. As a result, several companies adopted a very liberal job attendance policies. American Netflix, world's leading Internet television network, offers unlimited vacation time for salaried workers. In the same way,

Motley Fool, a company providing financial solutions for investors, has no vacation policy. Its director of external communications, Matthew Trogdon, stated "We just want you to get your work done, however you're going to do it best" (McConnell and McPike, 2013). Therefore firms give their employees a significant level of temporal flexibility and the issue of working hours is agreed on an individual level. Staggered working hours permit to better manage time for work and family or recreation. A paper by Juliane Scheffel (2011), who studied the parental and working issues in Germany, demonstrated that flexibility in working schedules allows parents to spend about 30 % more time with their children and thus to reconcile family and work.

Over the last decades, the statute of women in the workforce has changed dramatically. Changes in demographic patterns, cultural perception of women, trends in lifestyle and policy measures allowed for their active participation in workforces. Based on a US Bureau of labour statistics (2013), labour force participation is significantly higher among women today than it was in the 1970s and a larger share of women are working full time and year round. Women's earnings as a proportion of men's earnings also have grown over time. In 1979, women working full time earned 62% of what men did; in 2011, women's earnings were 82 % of men's. Several policy measures have been taken to equalize the work opportunities for men and women. The European Commission, for example, has defended a highly controversial proposal for there to be at least 40% of women's non-executive directors in the boards of big listed companies by 2020.

Recently, a new trend in the recruitment process, the internal hiring, becomes frequent among large and medium-sized firms. Internal hiring, or internal recruitment, means filling a vacancy by an employee from within the firm. Based on Dan Schawbel's findings (2012) internal recruitment is cheaper and quicker compared to external hiring. It also shortens a training period and a risk of choosing a wrong candidate is heavily reduced, as every employer knows the candidates better.

Also, the youth unemployment is a hot issue in Europe. EU statistics show that the unemployment rate among young people in January 2013 was more than twice as high as the adult ones, reaching 23.6%. Youth unemployment attains critical levels in countries most hit by the economic recession. For example, the youth unemployment rate has hit a record of 53% in Spain. In Greece, the level is over 55%, but is close to attain 75% in some parts of the country.

Finally, the role of trade unions has gone through considerable changes. Since the early 1990s, unions have lost their influence and power in most of the EU countries due to tough global competition, outsourcing or legal constraints. Chris Wright (2011) points out that the propensity of employers to substitute union-based voice mechanisms for non-union ones indicates a belief among employers that union-only voice does not 'add value' to their business or organisational objectives. However, nowadays unions are no longer thought of as obstacles to flexible adjustment and companies' competitiveness. Sarah Podro (2011) suggests that in the context of this softening of attitudes, unions are to assert themselves as agents of conciliation and conflict resolution.

Along with economic progresses, changes in the labour were initiated also by the EU labour legislation, creation of a single market and early stages of common currency. Streeck and Schmitter (1991) claimed in their work that the creation of a single European market would lead to a decline in the national corporatist system. Similarly, Visser and Ebbinghaus (1992) argued that organized labour in Europe will have to become transnational or it will not be part of the future. Well, these statements, dating from the early 1990s, were made in the period of high optimism over the EU's ambitious single market project. Let's analyse what the EU labour market looks like nowadays, more than 20 years later.

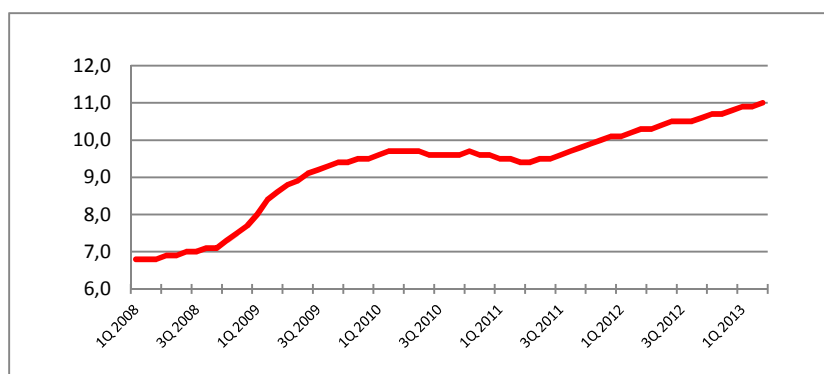
Strengths and weaknesses of the EU labour market

Earlier, we denoted the labour market as a nominal market where employers demand and workers supply labour. In this chapter, we are going to focus more closely on the current state of the labour market in the EU, especially on the functioning, efficiency, flexibility and its special features.

Stylized facts about the EU labour market

The current state of labour markets in the whole EU is hugely determined by the persistent economic crisis (Torres, 2013). Uncertainty about the future development as well as unsatisfactory macro data on European economies has a negative impact on employment. Not only were there massive layoffs, but the persistent deceleration of GDP growth dampens the job creation process. As a result, the overall EU unemployment rate has been rising fast (see Graph 1) and by March 2013, it attained 11%, which means that in the EU, more that 26.5 million people are currently job seekers.

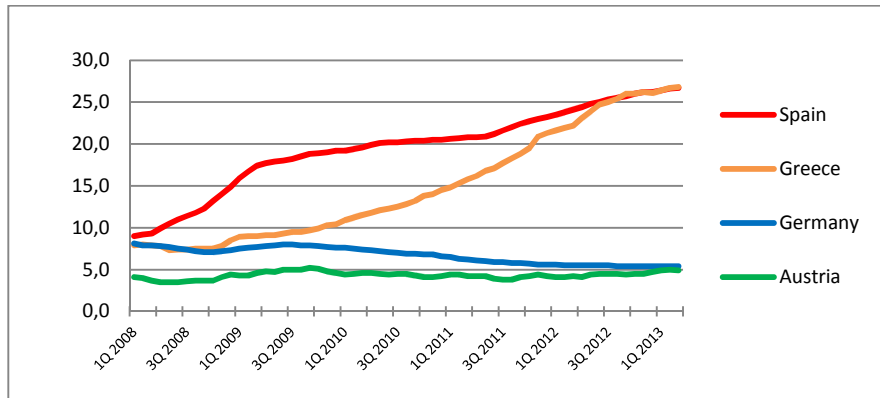
Graph 1: Unemployment rate in the EU (in %)



Source: Eurostat (2013), seasonally adjusted

Interestingly, the crisis does not seem to have an equal impact in terms of employment rates in all countries. In fact, since the onset of the crisis, labour markets within the EU are divergent. While in countries like Germany or Austria the unemployment remains steady or slightly decreases, in Spain or Greece, the unemployment rate rockets (see Graph 2).

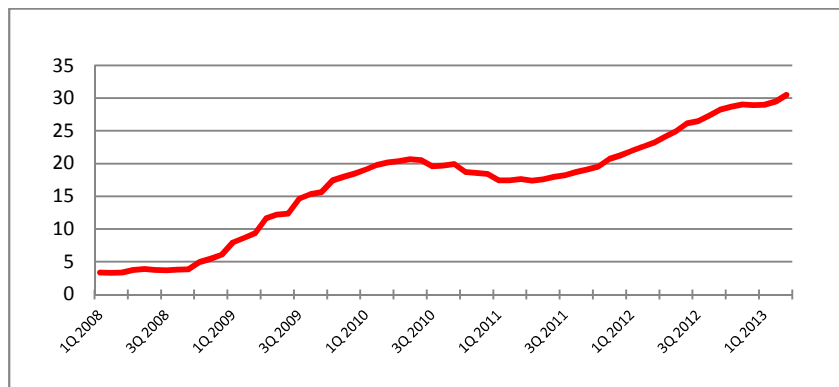
Graph 2: Unemployment rate in selected EU countries (jn %)



Source: Eurostat (2013), seasonally adjusted

Simple variance statistic of the unemployment rates in the EU confirms the asymmetry in economic shocks (see Graph 3) and the trend of diverging unemployment rates is likely to continue in 2014, according to the European Commission's 2013 European Economic Winter Forecast (EC, 2013)

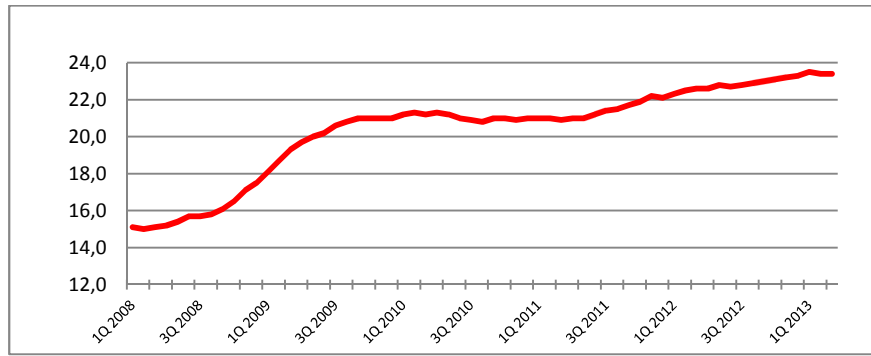
Graph 3: Variance of unemployment rate in the EU



Source: Eurostat (2013), own computations

The EU is highly concerned with youth unemployment that is steadily increasing over time (see Graph 4) and takes concrete measures to tackle its record levels. The Youth Employment Initiative, a €6 billion project launched by the European Council in February 2013, is supposed to help young people not in education, employment or training living in affected regions.

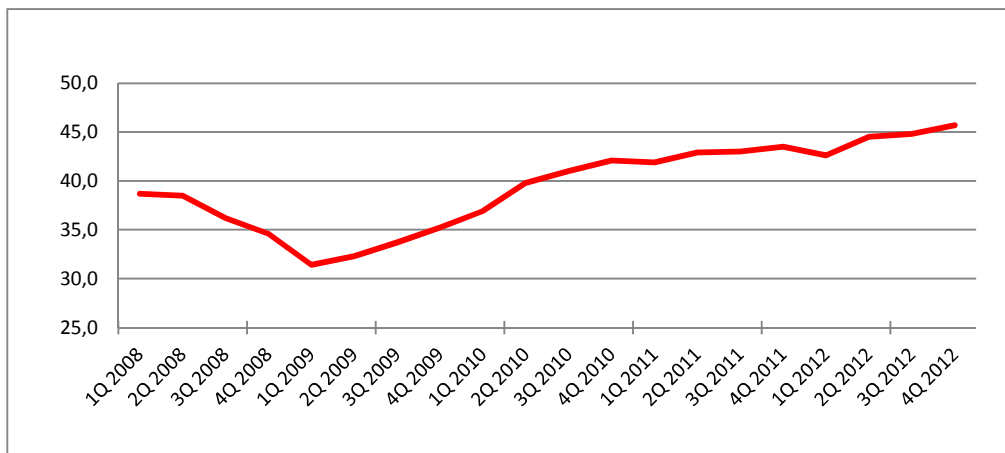
Graph 4: Youth unemployment rate in the EU (in %)



Source: Eurostat (2013), seasonally adjusted

There are more and more people who have been seeking a job for 12 months or more and are still out of work. The long-term unemployment becomes another sensitive issue of the EU labour market. Its levels within the active population and within the unemployed have been rising for several years (see Graph 5) and nowadays, it concerns 10 million Europeans.

Graph 5: Long-term unemployment as a share of total of unemployment in the EU (in %)



Source: Eurostat (2013)

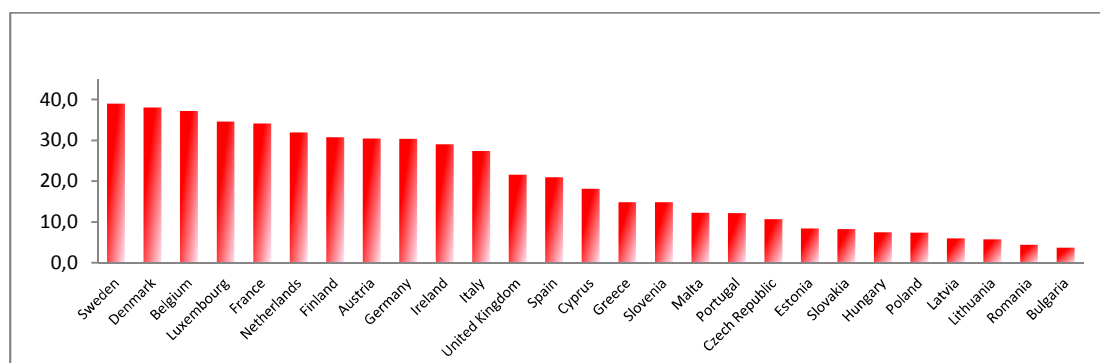
The EU is implementing policies⁵ to reduce skills shortages of long-term unemployed, retrain them or implement new forms of unemployment benefit systems to motivate long-term

⁵ European Employment Strategy, funded by the European Social Fund, aims to support and retrain the long-term unemployed, so they can return to the labour market.

unemployed to seek actively for a job. Despite this effort, the odds are that the long-term unemployment is going to remain considerably high.

Concerning the costs of labour, European countries show huge diversity in how much an employee costs. We can compare (see Graph 6) the total labour costs in industry, construction and services (except public administration, defence, compulsory social security) per hour worked in all EU countries for 2012.

Graph 6: Total labour costs in the EU (in €)



Source: Eurostat (2013)

While in Sweden a worker is getting paid about €39 per hour, in Bulgaria, he would cost more than ten times less - €3.70 only. However, these numbers should not be taken for country's competitiveness as there is historically no relation between the growth of unit labour costs and the growth of output⁶.

In terms of the labour market flexibility, the situation is also dissimilar in the EU countries. Labour markets differ a lot in the speed with which they adapt to changes in the society and the economy. Based on Nickell's (1997) findings, countries like Austria, Portugal or Sweden are not noted for the flexibility of their labour markets. Britain, on the other hand, has always had the most flexible labour market in Europe on standard measures. This ability to adapt is

⁶ This paradoxical phenomenon was first described by Cambridge economist Nicholas Kaldor, hence its name the Kaldor's paradox (Kaldor, 1978)

determined by many aspects, primarily by employment legislation, institutional environment, wage flexibility, geographical and occupational mobility of the population, infrastructure, education and (re) training.

The EU labour market suffers from a persisting gender pay gap in the average gross hourly earnings of men and women. The pay gap in 2011 amounted to 16.6% in the EU average, but in countries like Estonia or Austria it attained 27.3% and 23.7% respectively (Eurostat, 2013). The EU is heavily engaged in eliminating the gap. That's why it adopted a Directive 2000/78/EC on establishing a general framework for equal treatment in employment and occupation, thus preventing everyone from discrimination based on sex, race or ethnic origin, religion or belief, disability, age or sexual orientation.

Many EU directives seek to improve the conditions of the labour market. The EU has created a whole legislative framework that determines the labour environment in member states. Let's discuss a bit this framework in the following section.

Labour legislative framework in the EU

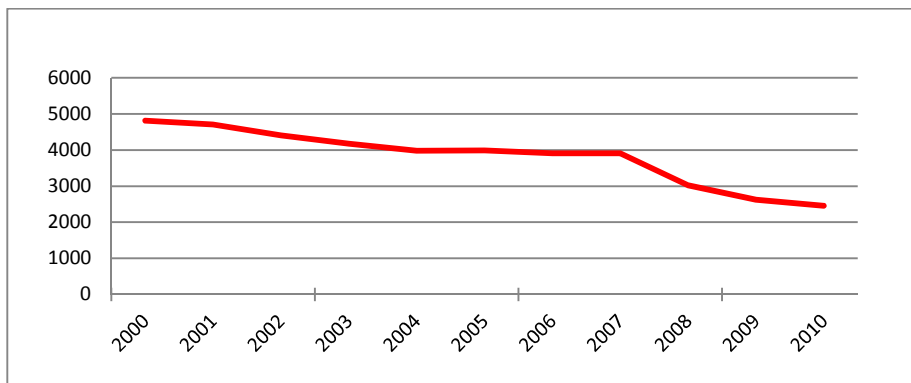
EU legislation dealing with labour law is supposed to clearly establish the rights and obligations of workers and employers in the workplace. By supporting and complementing Member States' labour policies, the EU legislation is heading toward guaranteeing high standards of employment, social protection and improved working conditions. The Community law is then transposed, implemented and enforced by national law.

The EU takes guaranteeing basic working conditions very seriously and is heavily engaged in this issue both in and outside⁷ of the EU area. For the EU area, it adopted the Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and

⁷Most recently, after the collapse of a building with garment factories in Dhaka, the EU pressed for an investigation into labour practices in Bangladesh. Also, the European commissioner for trade Karel De Gucht urged European cloth companies to take responsibility for conditions along their supply lines.

health of workers at work. It applies basically to all sectors of activity, both public and private. It establishes general principles dealing with the protection of safety and health, assessment, elimination and prevention of risks and sets employers' and workers' obligations to meet these goals. And it has been quite successful. Graph 7 depicts the number of accidents at work for the EU-15⁸ from 2000 to 2010.

Graph 7: Accidents at work in the EU-15 (in thousands)



Source: Eurostat (2013)

The truth is that accidents at work burden heavily both workers and employers and represent huge costs for the economy. A recent report for the Department of Enterprise, Trade and Employment by Indecon Consultants (2006) discovered that the overall share of occupational injuries and illnesses represent in a typical developed economy approximately 2-4% of national income. A substantial part of these costs falls on social security systems and consequently on public finance. Thence, the EU sets a target of another 25% cut in accidents at work in a so called EU Strategy 2007-2012.

The EU legislation is further reinforcing the employees' status in companies. The Directive 2002/14/EC establishing a general framework for informing and consulting employees in the European Community tries to spur the mutual dialogue between employers and employees. The duty of information and consultation covers mainly economic, financial and strategic

⁸ EU-15 is a term used to denote 15 EU Member States prior to the 2004 enlargement

developments. Involvement of employees in the decision-making seeks to better anticipate future problems and make the organisation of labour more flexible.

Council Directive 98/59/EC relating to collective redundancies obliges an employer considering collective redundancies to consult with the employees' representatives on reaching an agreement. This measure seeks to avoid or at least mitigate the consequences of collective redundancies. The solution often consists of redeploying or retraining of workers made redundant.

The Directive 2001/23/EC relating to the safeguarding of employees' rights in the event of a transfer of undertakings or businesses represents another effort to strengthen employees' rights. The Directive stipulates recognition of employees' rights and duties stemming from the employment contracts in a case of legal transfer or merger, regardless of the type of employment relationships.

There are other directives that the EU has adopted to secure and protect employees' rights, yet, they need not to be discussed in detail. The principal idea remains the same - EU is building a robust legal framework to assure that every employee, no matter whether he works in England or in Rumania, does enjoy equally high standards at work.

Yet, regulation of a labour market has also the darker side - it dampens the labour market flexibility. It prevents companies from swift reactions and just-in-time management. The fast world, we live in today, ever-changing consumer tastes and rapid technology progresses simply call for flexibility. Therefore, the EU is promoting a system of flexicurity – a system that ensures high level of social security without harming the flexibility of the labour market. The system is put through by the European social fund.

European Social Fund

The European Social Fund (ESF) is a part of EU's employment, social affairs & inclusion policy. It deals mainly with European human resources and employment opportunities. With an annual budget over €10 billion, it improves job prospects for youth, students, young graduates and job-seekers. The recent economic crisis has made the ESF a vital institution that helps the unemployed overcome the severe situation on a labour market and find a decent job. The ESF is not a substitute for placement offices at all. It merely provides a funding to diverse employment-related projects concerning principally three issues.

First, the ESF is financially engaged in supporting education and training of young people. The aim is to make sure they complete their education, get their degree and therefore become more competitive on the European and global market. The fund contributes also to a smooth shift from studies to work. It struggles to build up a closer relationship between university and business sectors. Not only the cooperation can be useful in putting theoretical and academic discoveries and inventions into practice, but it also contributes to a painless integration of graduates and academic staff into work.

Second, the ESF is struggling to integrate individuals in difficulties and disadvantaged groups and to get them skills to find a job. It is because a job gives employees a feeling of independence, social responsibility and belonging somewhere. Thus, by offering an equal chance to everyone, the fund is fighting against social exclusion of disabled, released offenders, ethnic minorities, etc.

Third, high unemployment levels across Europe and low mobility of the labour force are of the main concern of the EU. In general, the ESF supports projects aimed at creating new job opportunities and projects aimed to help job-seekers find a job. The ESF activities comprise of thousands of projects spread across the EU and over 75 million people took part in ESF

activities in many economic sectors. The ESF is also engaged in supporting labour mobility, an issue that is going to be analysed thoroughly in the following part.

Stylized facts of labour mobility in the EU

As we are going to refer to labour mobility quite often, it is useful to state clearly what this term includes. From now on, the labour mobility will refer to the ability or willingness of workers to

- Change of worker's domicile, for a
- Medium or long-term, for a
- Working purpose, while
- Crossing the state frontier is included

Workers can move for voluntary reasons - personal or economic - and coerced reasons - political, ethnic, social or religious. The term does not include regional mobility, mobility within a state, commuting (even from one state to another) or occupational mobility. So whenever in the text hereinafter the terms labour migration, labour mobility or simply mobility are mentioned, they refer to the definition stated here.

Human migration has a similar, though slightly different meaning as it refers to the movement of people in general. According to United Nations' understanding, the migration is a flow of persons who change their country of usual residence. So unlike labour mobility, the term migration includes also movement of students, retired or to nomadic lifestyle where people move continuously from one place to another.

The 2004 enlargement of the EU provided Central and Eastern European countries a huge opportunity to become part of the Common market. More importantly, workers from the New Member States were given access to fully or partially open labour markets in foreign,

principally Western, countries. This was an unprecedented occasion to enter relatively homogenous and developed labour markets enjoy higher salaries, better working conditions, broader experience and perhaps more interesting and challenging work. Did the New Member States grasp this opportunity? What attitude adopted the Old Member States to a threatening influx of immigrants? Let's discuss the development of labour mobility within the EU in the following part.

Development and current state of labour mobility

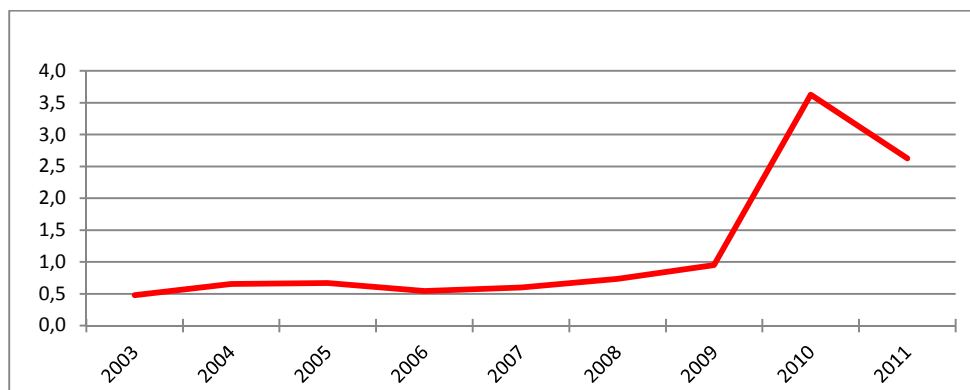
In the Old Member States (these is how the EU-15 is usually referred to), the enlargement of the EU was preceded by tense debates over the influx of immigration, labour market, unemployment and social consequences (Doyle et al., 2006). Deputies argued whether to open national labour markets to workers from New Member States at all and if so, to what extent. As no global solution was reached, some states allowed for free access to national labour markets while others implemented transitional restrictions.

Finally, out of the EU-15 countries only Sweden, United Kingdom and Ireland decided to allow an unlimited access to their national labour markets to citizens from Accession countries. Other states, concerned with a possible shock to national labour markets and to wage levels, imposed a transitional period ranging from 2 to 7 years in order to control the inflow of foreign workers. However, the rationale of these concerns is at least doubtful. A discussion paper of the National Institute of Economic and Social Research's study (Holland et al., 2011) estimated that since the 2004 enlargement, only about 1.8% of the EU-8⁹ population have moved to the EU-15 area. In macroeconomic terms, the workers' inflow of this scope is not very significant. The discussion paper estimated that due to the enlargement, the population in destination countries raised by 0.4% which is unlikely to make any considerable impact on national GDPs, employment or wage levels. Some source countries,

⁹ EU-8 is a term used to denote EU-10 countries excluding Malta and Cyprus

namely the Baltic ones, might experience a mild decrease in GDP (potential) due to emigration of labour force, even though remittances sent home by off-shore workers would outweigh the negative impact. The following graph depicts the percentage of labour force moving from Lithuania between 2002 and 2011. Especially towards the end of this period, the ratio is elevated.

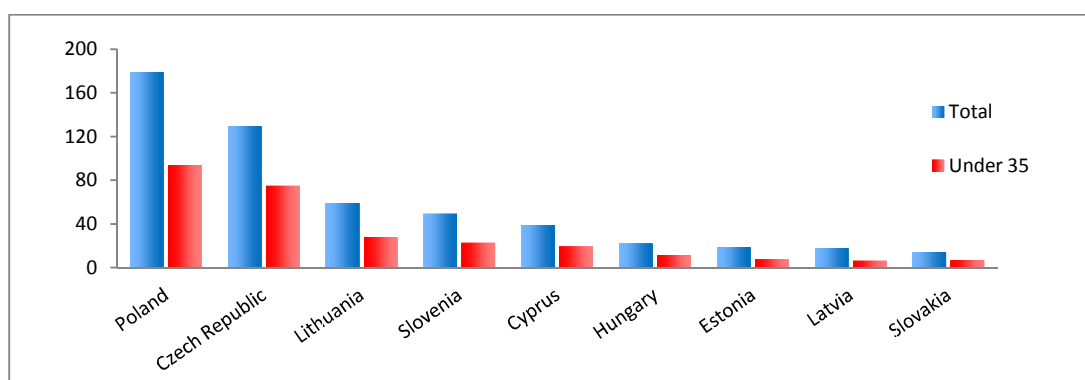
Graph 8: Labour force outflow from Lithuania (in %)



Source: Eurostat (2013)

Rather, the source countries may be concerned with long-term GDP per capita loss due to the fact that migrants are mostly well educated, young and perspective people (Özden and Schiff, 2006). The following graph depicts the emigration of young people aged between 20 and 34 years from EU-8 countries. Apparently, the New Member States might be threatened by the brain drain as young people represent on average 47% of all emigrants. In countries like Czech Republic or Poland, it reaches 58% and 53% respectively (Eurostat, 2013).

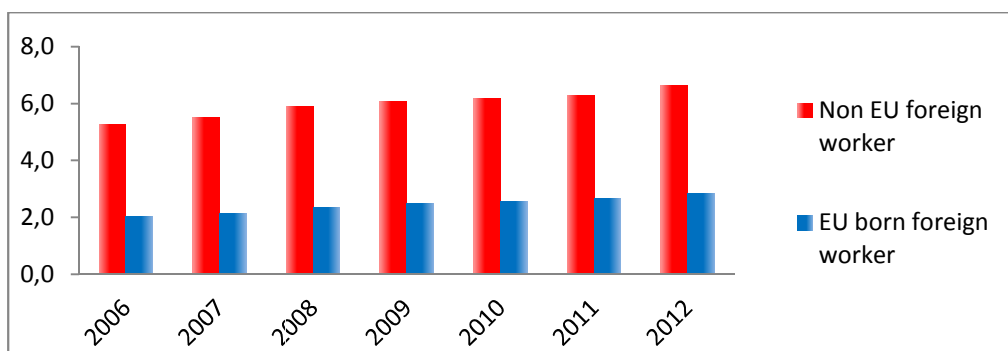
Graph 9: Emigration from Accession Countries 2004-2008 (in thousands)



Source: Eurostat (2013)

In general, if we abstain from geographical, age or education dimension, the labour mobility flows in the EU remain on a considerably lower level. Despite the EU's effort to allow the labour force to move freely, the mobility within the EU remains weak. The following graph depicts the share of EU-born workers who are now working in other Member State than the one of their origin. Obviously, the share remains below 3%. By way of contrast, the share of non EU-born workers working in the EU is more than twice as high and reaches 7%.

Graph 10: Share of foreign-born workers in EU (in %)



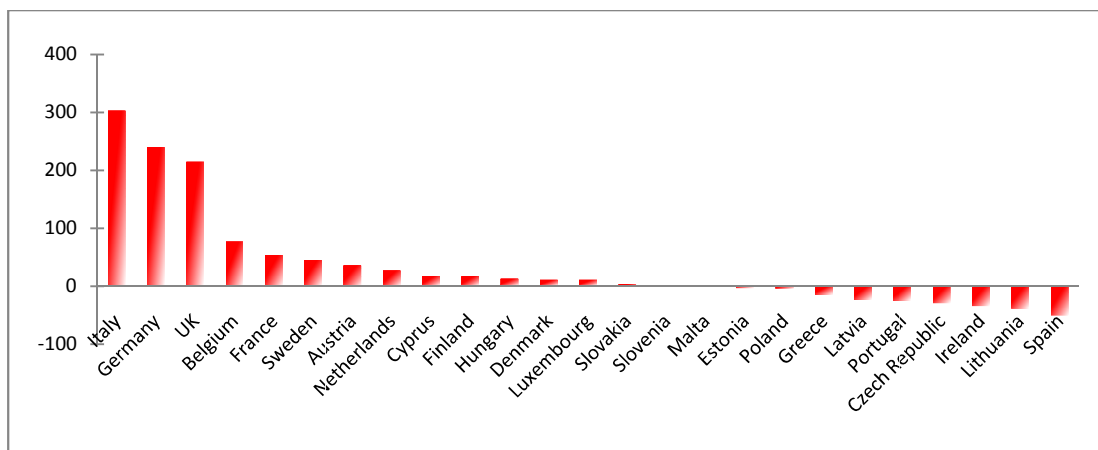
Source: Eurostat (2013), World Bank (2013), own computations

European Commission reached similar conclusions. Its report entitled Employment and Social Developments in Europe (EC, 2011) stated that around 3.4 % of EU-born workers work in a Member State other than that of their birth. A Eurobarometer survey of geographical and labour market mobility (Eurobarometer, 2010) showed that no more than

10% of Europeans have lived and worked abroad at some point in their life. Unfortunately, very modest levels of labour mobility are not likely to change as the immigration flow of EU-born workers to another EU country in 2011 was 0.2%.

In the EU, there are three countries, namely Italy, Germany and UK, that can be labelled net destinations. The Graph 11 depicts the net flow of workers in EU countries in 2011. Although Italy's first place might be a bit surprising, Germany and UK, stable and powerful economies resisting to economic recession, are attractive destinations. Net sources countries are of two types, these are either countries severely hit by the recession, like Spain, Ireland, Greece or Portugal, or accession countries like Lithuania, Czech Republic, Latvia, and similar ones.

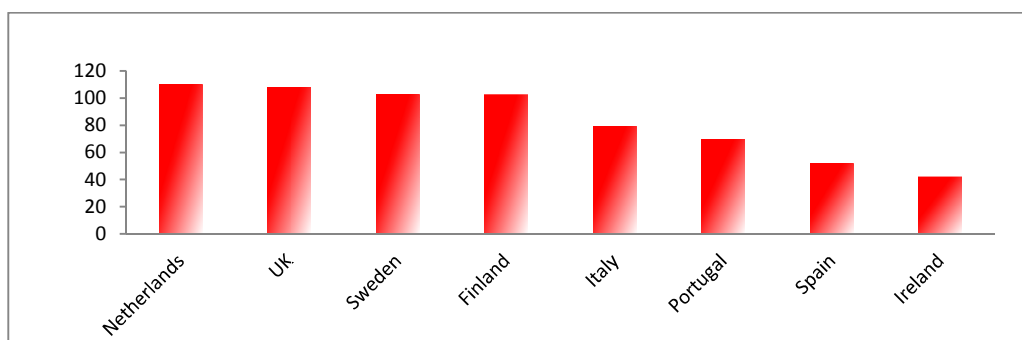
Graph 11: Net immigration in 2011 (in thousands)



Source: Eurostat (2013), World Bank (2013)

The financial crisis in Europe caused a sharp decline in the output of European countries, negatively affected the situation on labour markets and therefore altered the migration patterns. The following graph compares the levels of labour flow into selected European countries in 2007 and in 2009. Countries that were severely hit by the recession like Spain or Ireland, suffered a significant immigration drop, in some cases by over 50%. On the other hand, the labour immigration increased in countries with easily accessible labour market and/or in countries resisting to the economic downturn, such as the Netherland, UK or Sweden.

Graph 12: Total immigration 2009 compared to 2007 level (in %)



Source: Eurostat (2013)

Labour mobility stimulation: the practices used in the EU

Although in the short term, an excessive inflow of labour forces can destabilize the national labour markets (Triandafyllidou and Gropas, 2007) it is supposed to enhance the competitiveness, productivity and potential output in the long run, as we will see later on. Thence, along with the formation of the EU's internal market, European bodies struggled to eliminate all barriers to geographical labour mobility. Thanks to their effort, in 1985 five European countries agreed on abolishing border controls and by 1995 they created a borderless Schengen Area. The Area works as a single state with no systematic border checks and allows internal citizens to move freely. The idea was soon borrowed by EU bodies and incorporated into the union law. Today, 26 European countries, most of which are EU members, take part in the Schengen Area.

The ESF is not the only EU institution to support the labour mobility. The European Employment Service (EURES) is a public network intended for citizens in the whole European Economic Area (EEA). Its main task is to provide useful information and advisory and job-matching services to job seekers and employers throughout Europe. It runs a European job mobility portal that cooperates with all members' unemployment office and provides a wide supply of vacancies. Above that, it offers additional information concerning the living, working and employment conditions in all EU countries to make sure that

everyone who is willing to work abroad is well informed. Generally, by providing detailed guidelines on how to find a job and move abroad, it puts the EU's principle of free movement of workers into practice.

The EU aims at stimulating the labour mobility of European citizens in their younger age, even before they join the labour force. In order to do so, it manages and funds different programmes allowing for greater mobility of students around Europe. The Erasmus, for example, is an EU student exchange programme that further allows for student placements in enterprises and funds projects of many European higher education institutions. Thanks to Erasmus, more than 230 000 students a year are given a chance to study abroad. Such an experience gives them a notion of what living abroad involves in case they are thinking of working abroad.

Comenius, an EU educational programme, focuses on increasing the mobility of pupils across the EU and on enhancing partnerships between schools in different Member States. The EU legislation acts in concert with these programmes as EU citizens' children are entitled to attend school in any Member State under the same conditions as nationals of that state. The EU is aware of the fact that a moving of a worker involves often moving of his children too. Different programs supporting student and pupil mobility across Europe, makes it easier for worker with a family to settle abroad.

Comparison of labour mobility in the EU and other countries

So far, we have learnt that despite the legal right to move freely, European citizens do not exploit this opportunity and thence the labour mobility remains low. Let's see whether the situation is somehow different in other comparable economics. As an example, we compare the labour mobility in the US and Canada.

Let's first consider the situation in the US. Statistics of labour flows witness that the internal mobility is significantly higher in the US than in other advanced economies. Raven Molloy's

(2011) survey unveils that roughly 1.5% of the population moves between two of the four Census regions (Northeast, Midwest, South, and West) annually, and about the same number of individuals (roughly 1.3% of the population) move to a different state within the same region. In addition, roughly 3% move across counties within the same state. It is important to stress that these statistics display annual levels of migration.

If we consider the lifetime migration levels, the statistics become even more distinct from European levels. The above mentioned study states that as of 2009, approximately 17.5% of the population at least once in the lifetime migrated to another region and 31.0% of the population migrated across the state border. Then, given that the EU and the US economies are relatively comparable and the average areas of a state in the EU and US are not dissimilar, the statistics point out the striking difference in the labour mobility in those two economies.

In case of Canada, the situation is not dramatically different from the EU, yet, the migration levels are still higher. Canada is divided into 13 territorial units (10 provinces and 3 territories) where an average territorial unit is about 4.5 times larger than an average EU state. Despite large distances between these units, levels of cross territorial migration have remained quite high, around 1% annually (Bendiner, 2013). In other words, every year more than 337,000 Canadians move from one territorial unit to another and settle there. In terms of long-life migration, a study by Ross Finnie (1999) states that nearly 7.4% of population changed a domicile province or territory during a life, which is three times the EU level.

Obviously, when putting the statistics of labour mobility of comparable economies next to each other, the levels in the EU are substantially lower. Surprisingly though, European citizens consider the possibility of free movement of people to be one of the most positive feature of European integration. A Eurobarometer survey stated that 60% of Europeans believe mobility is good for European integration and nearly 50% of them are persuaded that it is a good thing for an individual (Eurobarometer, 2010).

Then, given that EU population is granted the right to move and work freely in the EU and in general finds it positive, why the mobility levels remain so low? This is the question we are going to tackle in what follows. We are going to search for the roots of modest labour mobility within the EU. The next chapter will lead us through a theoretical background of migration.

Theoretical background

This chapter analyses thoroughly motives of workers' migration. It examines economic, social and cultural background and incentives to moving from one country to another. It will consider several migration theories and a couple of models.

Migration theories

There exist several theories dealing with labour mobility. Economists have been interested in the migration since always and came up with different theories struggling to explain the incentives and scope of labour mobility. The first and most straightforward theories were conceived by classic economist back in the 19th century. In the course of time, simple theories were complemented by more complex and sophisticated ones. In this part, we will go through them.

Neoclassical theory

Neoclassical theory of migration is perhaps the oldest and most straightforward of migration theories. Its main features were formulated by John Hicks (1932), but its roots go back all the way to the works of Adam Smith. This theory simply states that workers' incentives to move arise from differences in the supply of and demand for labour force in various places. According to this reasoning, workers move from areas abundant in labour force, where the market equilibrium wage is low, to areas that lack it and where the equilibrium wage is consequently high. The wage differential is therefore the main force that makes rational and utility-maximizing workers move. The flow of workers will continue until the wages equalize and the incentives of moving fades out.

The theory was formalized into a behavioural model by Michael Todaro (1969) and later developed for two countries (Borjas, 1990). The model includes following variables:

- $V(0)$ stands for the expected net real income gain from migration over the time horizon n
- r stands for the discount rate
- $C(0)$ stands for the initial migration costs
- $Y_S(t), Y_D(t)$ stand for income wage in the source (S) and destination (D) countries at time t
- $p_S(t), p_D(t)$ stand for the probability of being employed in the source (S) and destination (D) countries

The neoclassical theory anticipates migration if the discounted net present value $V(0)$ given by

$$V(0) = \int_{t=0}^n [p_D(t)Y_D(t) - p_S(t)Y_S(t)] e^{-rt} dt - C(0)$$

is positive. In other words, the migration takes place if the expected discounted income gain outweighs the migration costs.

No matter how powerful and compelling this theory might be, it became an object of numerous challenges. Many critics objected to the theory as too simplistic, not reflecting the reality and building upon unrealistic, neo-classical assumptions. Also, empirical testing proved that the theory was not able to explain migration patterns in a satisfactory manner. It was therefore extended or entirely replaced by other theories.

Human capital theory

Human capital theory of migration extends the neoclassical point of view by including non-formalistic and non-pecuniary issues, whilst the rationale is similar to the previous case. Human capital theory was summarized by Sjaastad (1962) stating that an individual considers

moving to a foreign country as a sort of investment of his human capital and weighs therefore potential gains and losses stemming from migration.

The human capital theory is important, because it explicitly assumes that migration incentives do not rely solely on wage differentials and employment probability. It focuses on the costs of migration and it takes into account not only financial costs, but also the human side of migration. Issues like psychological costs, destination preferences, job searching costs and non-pecuniary gains and losses stemming from migration have considerable impact on the decision-making process.

From this perspective, workers would prefer to move to countries with generous social security system, high standard of living, low criminality level, etc. The overall attractiveness and the subjective perception of a destination country may therefore play an important role in the decision making. It may, in certain cases, make the migration costs negative and consequently even a negative earning differential would not necessarily discourage workers from moving.

Collective decision migration

Previous migration theories considered a migration from an individual point of view. Unlike these, the collective decision migration theory considers the relevance of social and family ties. It extends the decision making to every member of a family or a social group the individual is part of. This theory is especially pertinent to the EU labour market as according to Eurobarometer's findings (Eurobarometer, 2010), less than 37% of Europeans would move to a foreign country all alone. The rest would rather go with their partner, children, friends or relatives. As a result, for the major part of prospective migrants, the decision to move turns out to be a family (or collective) decision. Thence, gains and losses of every member of the family ought to be taken into account. If everyone is expected to benefit from the migration

then everything is fine and they move. In practice, however, this happens very rarely and family members have rather conflicting interest in moving to a foreign country.

Jacob Mincer (1978) published an article entitled Family migration decisions where he developed a model of collective decision making vis-à-vis migration. His idea is straightforward. He considers a household with two persons that would either both stay or both move to a foreign country. Mincer claims that the migration takes place if household's net gains are positive. Even if one person gains from the migration while the other loses, it is efficient to move given that the joint gains remain positive.

Network effect theory

The network effect theory is one of the latest migration theories. It was advanced by Douglas Massey (1993) who defined a migrant network as a set of interpersonal ties that connect migrants, former migrants, and nonmigrants in origin and destination areas through ties of kinship, friendship, and shared community origin.

The first movers experience a harsh time and face relatively high migration and settling costs. They do not have any knowledge of local conditions and they lack social or business ties with locals. By the time, however, they acquire useful knowledge and experience that can be advised through the network. Spreading of know-how, useful information, knowledge and social and business ties through a migrant network constitutes a valuable asset. Thanks to this, prospective migrants enjoy significantly lower migration costs and increased net expected gains which increases the labour flows.

Thus, the network effect migration, sometimes referred to as cluster or herd migration, creates large communities of migrants in foreign countries. As the network grows larger with time, it further reduces the migration costs. Every incoming worker gains new knowledge and contributes to the tank of informational asset that is shared within the community. Broader

informational asset reduces the migration costs and consequently attracts new incoming workers. Thus, the migration becomes a self-perpetuating process.

Interestingly, language or cultural resemblance between source and destination countries does not seem to play a significant role in the cluster migration. For a newcomer who is surrounded by relatives or a well known community, the language skills or knowledge of local social and cultural habits are not required. As a result, cluster migration trends emerge even between distant countries that has very little in common historically, culturally or linguistically. Cohen's (1995) extensive survey of world migration gives an example of massive inflows of Turks to Germany, Greeks to Australia or Poles to the UK.

Dual labour market theory

So far, we have discussed theories based on micro-level considerations. The dual labour market migration theory, though, focuses rather on specific features of labour markets in developed countries. It transposes findings from labour market segmentation into the migration framework. The theory was developed by Michael Piore (1979) who argued that developed economies have an intrinsic demand for immigrant labour.

The theory stresses a fragmented nature of conventional labour markets. Markets should not be considered as compact, monolithic system, but rather as composed of diverse segments that overlap only little or not at all. Although most labour markets are also segmented in terms of wages, sex, nationality, age, education, etc., market segmentation has been colloquially divided into white collar and blue collar jobs.

White collar jobs take place in the primary sector with prestigious, well-paid, stable and recognized labour and blue collar jobs in the secondary sector characterized by poor remuneration, no recognition and employment uncertainty. As labour force in developed countries is often opposed to taking jobs in the secondary sector, a permanent need for

foreign workers from developing countries emerge. Thus, according to Piore, labour flows are caused by pull factors of advanced economies.

There exist other migration theories explaining incentives and rationales of international labour flows such as institutional migration theory or world system theory, but these are of minor importance. The five theories we stated hereinbefore provides a solid theoretical background to understand what makes the labour force move from one state to another. In the following part, we are going to analyse several models dealing with international labour flows.

Models of migration flows

Models of labour migration simulate the dynamics and scopes of labour flows between countries. Some of them also assess the outcome of these flows in terms of welfare gains and losses and anticipate winners and losers of migration. In this section, we are going to examine three models that deal with labour mobility, each from a slightly different perspective.

Gravity migration model

The gravity migration model is the simplest model of labour flows. It was proposed by an American economist K. Kerry in the middle of 19th century. The model assumes that labour flows between two countries emerge in the same way as gravity between two objects. The rationale of this model stems from Isaac Newton's law of universal gravitation, hence the name. Newton's conclusion about the gravitational forces between all objects is formalized as

$$F = G \frac{m_1 m_2}{r^2}$$

where

- F is the force of gravity between two objects
- G is the gravitational constant

- m_1 is the mass of object 1
- m_2 is the mass of object 2
- r is the distance separating the objects' centres

Analogically to a gravity force between two masses, the gravity migration model assumes spatial mobility of workers as an outcome of demographic force arising between two places.

George Stuart was the first to formulate in 1941 the migration gravity model as follows

$$F = k \frac{P_1 P_2}{d^2}$$

where

- F is the demographic force between two territories
- k is a proportion coefficient
- P_1 is a population of territory 1
- P_2 is a population of territory 2
- d is the distance separating those territories

This formula implies that labour flows between territories is directly related to their populations and inversely related to the distance between them. Although very simplistic, this model is useful as it applies to labour flows within cities, regions or states and yields reliable results while being tested empirically. According to numerous statistical verification, the coefficient of determination of gravity models ranges between 0.5 and 0.7 which is surprisingly high.

The gravity model predicts an increased labour flows between nearby countries with high populations. In the EU framework, the model would suggest huge labour flows between France and Germany that are neighbouring countries and their aggregate population is nearly 147 million. Also, significant labour flows would be likely between France and Italy,

neighbouring countries with 127 million citizens in total and, though separated by the English channel, France and Great Britain that are geographically close and have over 128 million citizens altogether.

The gravity model, however, suffers from many drawbacks. Apart from huge simplification of labour migration principles, it builds upon physical forces that occur in equal and opposite pairs. In physical terms, whenever object A exerts a force on object B, object B must also exert a force on object A and the two forces are equal in magnitude and opposite in direction¹⁰. In the same way, the model assumes a reciprocal movement of workers of the same magnitude and opposite direction between two countries, a sort of intra-industry trading with human capital. Something like that is rarely observed in the real world and, moreover, it runs counter to Dual labour market theory. What we can observe in practice are rather one way flows of labour from poorer countries to more developed ones. Therefore, there needed to be a model that would better explain the incentives and outcomes of international labour mobility.

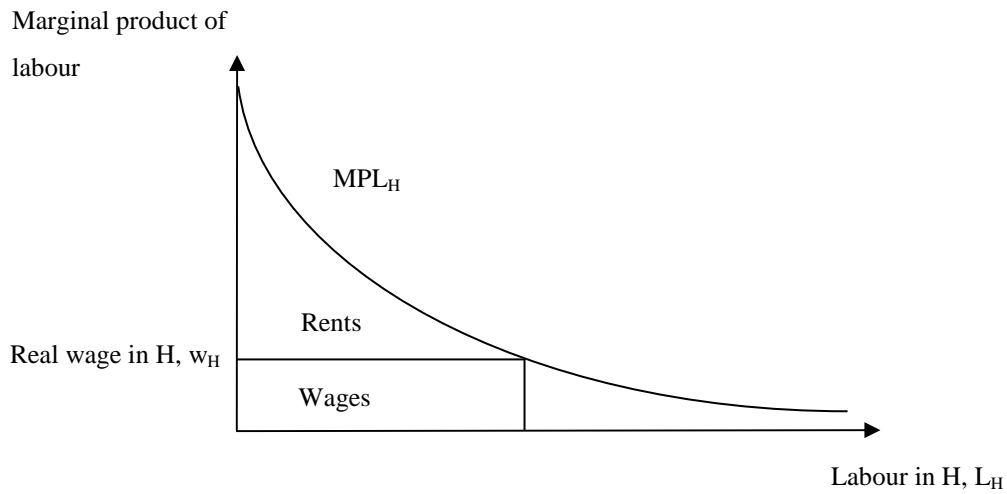
Neoclassical model

A model based on neoclassical theories of migration explains labour flows on a two-country and two factors of production model. The model shows that labour mobility between the countries generates overall welfare gains, yet there might be some groups that are worse off.

The model assumes two countries, home (H) and foreign (F), two factors of production, capital (K) and labour (L). Both countries produce only one goods using the same technology with a decreasing marginal product of labour (see Figure 1) and both enjoy competitive markets.

¹⁰ This law is known as the third of Newton's laws of motion of classical mechanics.

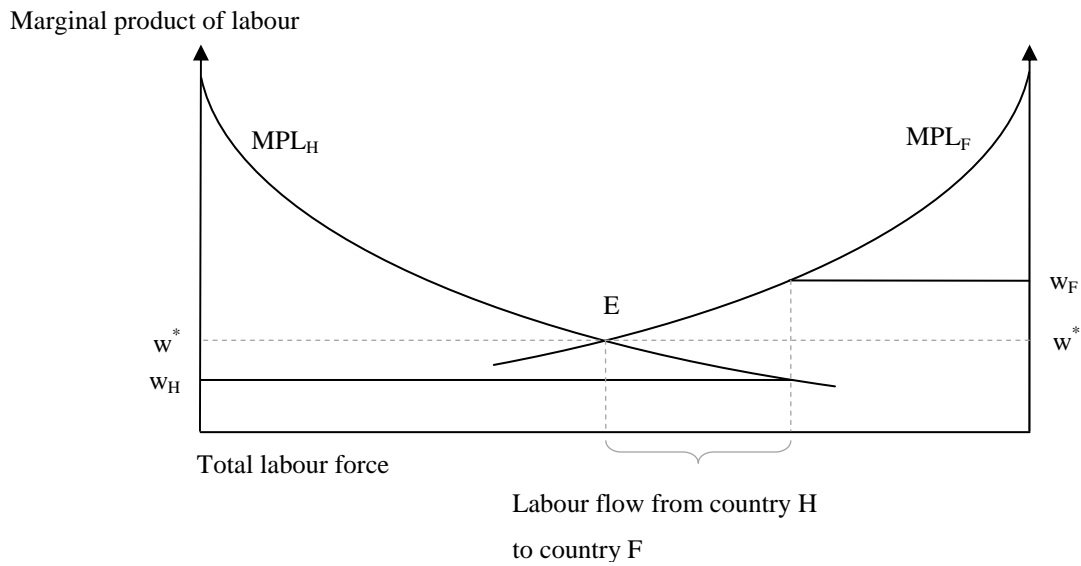
Figure 1: Marginal product of labour



The area under the MPL_H curve represents the value of output produced. Countries use different capital-labour ratios, the home country is abundant in labour, while the foreign one is abundant in capital. In the absence of labour mobility, the real wage in home country would be lower compared to the wage in the foreign country.

If the mobility of labour is enabled between these two countries, home workers would move to foreign country until the marginal product of labour equalizes in both countries. The outflow of labour force from home country will result in real wage rise, while the same inflow of workers to the foreign country will reduce the real wage there. The situation under labour mobility is depicted in Figure 2

Figure 2: Neoclassical model



The outcome of labour flow is following: Foreign country increases the output thanks to the inflow of workers, workers from home country that decide to move are better off thanks to higher wages, the overall output increases as each worker who moves becomes more productive in the foreign country. Workers in the foreign country lose as the real wage decreases and country H may lose too as its output is reduced, but this fact might be offset by the remittance sent home.

In the EU framework, neoclassical model would suggest huge labour flows from countries that are labour abundant and/or where real wages are low toward countries with higher wages. As European countries show huge diversity in workers' wages (see Graph 6), there would be supposedly significant flows of workers from Bulgaria, Romania or Lithuania to countries like Sweden, Denmark and Belgium where they would be better remunerated. The labour flows would not cease until the wage levels equalize across Europe.

The neoclassical model of labour migration explains the principles of labour mobility between two countries that differs in wage levels. It shows that when barriers to labour mobility are removed, labour flows contribute to higher productivity, increased performance of integral economy and higher wages for movers. However, there are some groups that lose

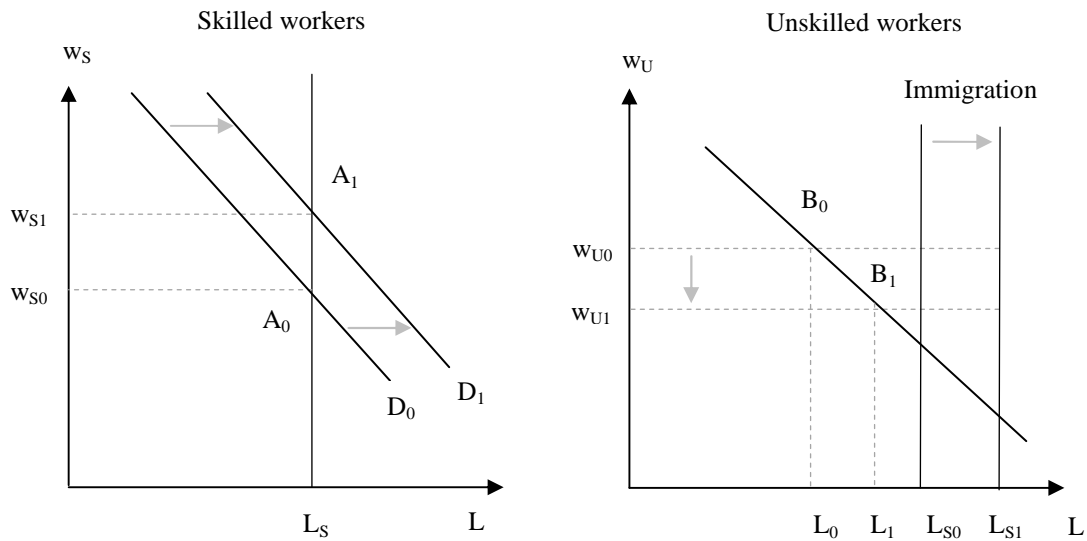
from migration. Unfortunately, the model builds upon unrealistic assumption such as perfect competition, identical technology of production, zero migration costs, flexible markets, unified and undifferentiated labour force, etc. That's why we need a more sophisticated migration models that would take these factors into account and give us a more realistic picture of labour flow and its outcome.

Model with differentiated labour and rigid wages

In this model, we are going to release the assumption of undifferentiated labour force and perfect, flexible labour markets which might in fact be useful to better approximate the conditions in EU labour markets. In fact, in most of them a minimum wage exists, labour unions prevent wages from flexible adjusting and labour force is anything but homogeneous, as pointed out by the dual labour market theory discussed in the previous section.

Model with differentiated labour and rigid wages assumes an economy in autarky producing a single output with a pre-determined price. In the production process, it uses capital and two types of complementary workers - skilled and unskilled. Native residents supply labour at fixed levels and are perfectly substitutable by immigrants. While the wage for skilled labour in a competitive market is set to w_{S0} , the wage for unskilled labour is set by national unions to w_{U0} which is well above the equilibrium wage. As a result, unemployment $L_{S0} - L_0$ exists. The result of what happens if unskilled labour is granted access to home market is depicted in Figure 3.

Figure 3: Unskilled labour migration

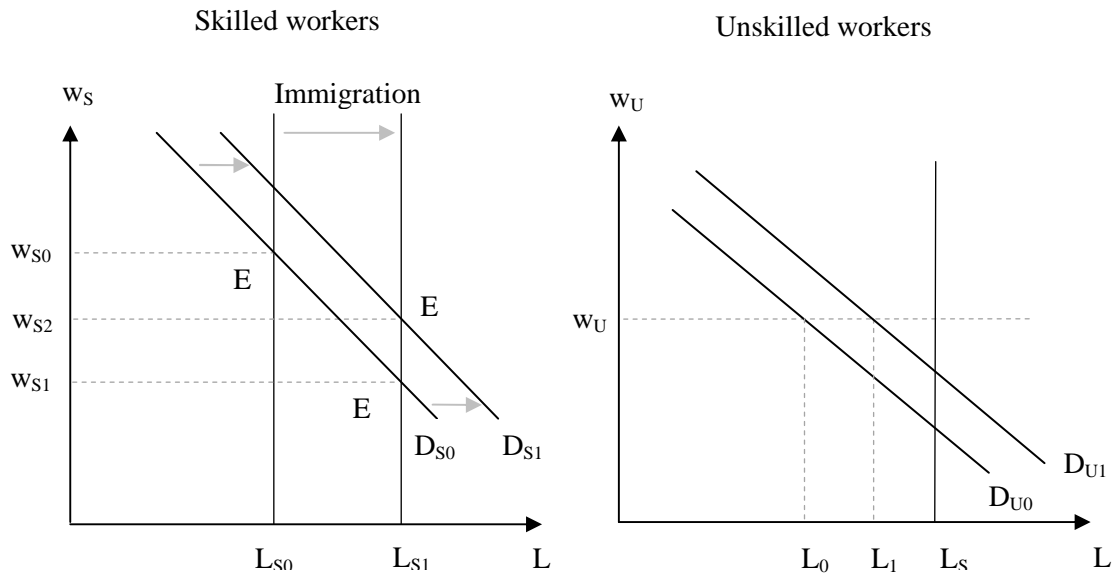


Source: Based on Bauer and Zimmermann (1999)

In this case, an inflow of unskilled workers shifts the labour supply curve to the right from L_{S0} to L_{S1} and forces the union to lower the wages to w_{U1} because otherwise, a huge unemployment of unskilled would emerge. Employment of unskilled grows from L_0 to L_1 and, as the model assumes complementarity of skilled and unskilled workers, the demand for skilled workers rises. The demand curve shifts from D_0 to D_1 and market forces make the wage increase from w_{S0} to w_{S1} . As a result, the inflow of foreign unskilled workers depresses wages of unskilled and pushes the economy toward competitive equilibrium. The overall employment effect hinges upon how powerful labour unions are. Nevertheless, it is reasonable to suppose that the employment effect for unskilled native workers would be negative, while the total employment would increase.

The outcome of skilled labour inflow is depicted in Figure 4.

Figure 4: Skilled labour migration



Source: Based on Bauer and Zimmermann (1999)

In this case, immigrants represent perfect substitutes to skilled workers and complements to unskilled ones. The inflow of skilled workers pushes the labour supply on a skilled labour market to the right from L_{S0} to L_{S1} leading to new equilibrium E_1 with higher employment and lower wages. Again, the complementarity of skilled and unskilled workers pushes the demand for unskilled workers to the right from D_{U0} to D_{U1} and employment increases from L_0 to L_1 . The increase in unskilled employment makes the demand for skilled labours shift from D_{S0} to D_{S1} to a new equilibrium E_2 . The union, again, could struggle for a wage increase, but it is not likely to completely offset the positive employment effect. So the overall employment in this case will increase.

In the EU context, both skilled and unskilled labour flows are relevant. The case of low skilled labour inflow helps to predict the outcome when less-qualified or less-educated workers come Germany, Belgium, France or Italy where, due to strong unions, the unskilled

labour wages are sticky. On the other hand, the case of skilled labour inflow simulates the situation when the brain drain makes talented and highly skilled labour force leave the home country.

The model with differentiated labour and rigid wages demonstrated that labour inflows are likely to have positive impacts on the destination country. It does not however imply, that everyone profits from the labour inflows. There might be some groups of natives that end up worse off, as they can suffer from job loss or wage reduction.

Review of labour mobility studies and methodology

Just prior the empirical part, we are going to examine two studies of labour mobility in the EU and comment on the methodology used.

The first, rather theoretical study was conducted by the Institute for the Study of Labour and lead by Holger Bonin (2008). The study analyzed statistical data of labour flows between EU-15 countries and New Member States. It focused on how many workers changed the country of residence and also on their profiles. The study concludes that in the EU-15 countries, the share of foreign born workers increased during the last decade. Surprisingly, the largest part of foreign nationals comes from outside the EU and only a minor part comes from the EU-15 states. In what concerns the profile of movers from the New Member States, they are rather younger and low-skilled. The opposite, however, holds for movers from another EU-15 country who are on average older and more educated.

In terms of mobility drivers, the study states that beside higher income, main drivers consist in personal evaluation of working conditions, housing, network related factors and local environmental conditions. However, the study emphasises a high heterogeneity of movers' profiles and a consequent high diversity in their subjective preferences and expectations.

Casting about a desired level of labour mobility, the study concedes that an optimum level is not evident. Yet, taking into account economic, demographic and social perspective, it concludes that geographic mobility in Europe is in general too low because of language and cultural barriers. The study suggests it would be reasonable to assume that increased intra-European mobility would increase the welfare of the vast majority of Europeans. Also, most of social costs associated with increased intra-EU migration are probably not too large considering the low level of geographic mobility rates in Europe.

The second, rather empirical, study by the National Institute of Economic and Social Research headed by Dawn Holland (2011) represents a different approach toward the labour mobility analysis. The study tries to assess an increase in labour mobility that resulted from EU enlargements. It analysed mobility data of EU-15 countries from 2004 to 2009 and ran a panel regression taking for variables GDP per capita, unemployment rate and index of relative restrictions on mobility.

This approach allows for more accurate analysis of labour mobility. Taking "hard data" and running a regression analysis provides reliable and clear results. The study concluded that the enlargement process is responsible for 75% of the labour shifts while the remaining 25% would have moved anyway. Although labour mobility analysis of this type does not reach for a high explanation value, it helps to determine what mobility drivers are the most significant.

Empirical analysis of the EU labour mobility

So far, we have made a thorough research background of the labour market and labour mobility in the EU. We scrutinized and commented on the data and compared it to other economies. We have discussed labour mobility from a theoretical point of view too and presented the most influential theories and models dealing with this issue. In this part, we are going to perform an empirical analysis of labour mobility that will help us to determine the factual drivers and barriers to labour mobility. Then, we will be able to conclude on the limits of labour mobility within the EU.

Regression analysis: the data and the model

Regression analysis will allow us to estimate statistical relationships between the scope of labour flows and different variables. Moreover, it will display the significance of these variables and the explanatory value of the entire model. Although some labour mobility studies fancy a sort of lay approach, such as Bonin's work (2008) presented in the previous section, in this study, we will use several regression models and build upon their results.

Data and the reference group

A very common problem with labour mobility studies, or migration studies in general, is the lack of appropriate data series. A study that encompasses a long observation period may yield reliable results, but the longer the period is, the higher risk of a missing data. By the way of contrast, with a short observation period it can work with complete data, but the results might not be relevant and determinative.

So far in this work, we have extracted data mainly from Eurostat. Unfortunately this database lacks a considerable part of the data required. Thence, we will use also data provided by

OECD database as well as by diverse national statistical offices. Together, they would provide complete and reliable data on labour flows.

For our econometric analysis of labour mobility within the EU, the original idea was to use data from 25 Member States and their mutual labour flows between 2004 and 2011. Unfortunately, after exploiting Eurostat, OECD database and numerous national statistical and immigration offices, data were still incomplete. Statistics on labour inflows to Cyprus, France, Portugal and Ireland are either completely missing or are just fractional, therefore these will not figure in our research. The 8-year period is large enough to cover all mobility drivers, such as the network migration effect that takes some time to make an impact, and all barriers, such as temporary restriction. The time period starts in 2004 which is the year of EU Eastern enlargement and stretches till 2011 when the most up-to-date data are available. Despite the fact that Romania and Bulgaria joined the EU in 2007, labour flows into and out of these countries will not be taken into account.

Model specification

Migration and mobility studies use generally two types of dependent variables: It is either mobility flows in absolute numbers, i.e. the actual number of movers, or the share of movers relative to the population. In our case, we stick to the latter one. It is mainly because EU countries show huge differences in their respective populations. The model cannot compare labour flows in absolute numbers from Poland and, let's say, Malta without taking into account the population in these countries. That's why we take for the dependent variable the share of outflow workers on the population or to be more precise on the population in active age, between 15 and 64 years old.

In the theoretical part, we discussed every all major mobility drivers. This will help us now in choosing relevant independent variables. The neoclassical theory of migration and several related theories pushes forward the wage differential as the main force that makes rational

and utility-maximizing workers move. Hence, the first independent variable in our model will be based on a wage differential. Due to different taxation in EU countries, the wage need to be expressed in net earnings, and due to different price levels across Europe, we are going to normalize it to purchasing power standard. Finally, the wage variable stands for a ratio of destination and source countries' average annual net earnings in purchasing power standard for a single person without children.

The behaviour model of neoclassical theory assumes considerable migration costs the movers are facing. The costs are proportional to a geographical distance between source and destination country, so we include the this distance into our model as another independent variable. Moreover, distance between source and destination country is a crucial parameter of the Gravity migration model too.

Determining a geographical distance between two countries is a tricky question though. When analysing flow of workers, it would be more accurate to consider a distance between some sort of demographic centrepoinets of the source and destination country. However, data on EU countries' centroids¹¹ are very scarce or do not exist at all. Therefore, we approximate the distance between two countries by the distance between their capital cities. For countries like Luxembourg or Latvia, this approximation may work well enough. It is because their capitals are well centred and gather an essential part of a national population. Unfortunately, for countries with their capital cities near national borders, like Slovakia, Estonia or Portugal, the approximation might be quite rough. For example, Spangenberg, Germany's centroid of population, is more than 300 km away from Berlin, Germany's capital. As a result, assessing a distance an average worker has to cover when moving from let's say Slovakia to Germany as a simple distance between Bratislava and Berlin may lead to a certain bias, unfortunately.

¹¹ The centroid, or mean centre, is the point on which a rigid, weightless map would balance perfectly, if the population members are represented as points of equal mass.

Workers who decide to move to a foreign country have to bear the costs related to finding a new job. The longer they are looking for a job, the higher the costs will be. In a country with a low level of unemployment, there are good chances of finding a new job relatively quickly, in a country with a high unemployment level, though, the chances are considerably lower. In consequence, costs related to finding a new job are inversely proportional to the employment level in the destination country. That's why we are going to integrate the unemployment levels of destination countries into the model.

Our model is designed to go beyond the economic and financial variables of labour mobility. It is meant to focus on non-pecuniary and personal aspects of labour mobility. Therefore, human capital theory of migration has to be taken into account by the model. This theory favours issues increasing personal costs of moving and play a major role in the decision-making process. There are many intangible factors that can influence these costs, but there are a couple of them than can be quantified and integrated into the model.

The network effect migration theory points out the importance of human networks formed by immigrants of one country. The size of a network reduces uncertainty and personal costs borne by newcomers and influences the scope of immigrants. The amount of movers depends on past flows creating a cumulative, auto-regressive process. Thence, we integrate in the model another independent variable, called lagged migration, indicating the scope of labour flows from the previous period as.

Talking about uncertainty, labour force working in a foreign country is facing an exchange rate risk in case of remittances or if planning to return to home country in some point in the future, for example for a retirement. It is therefore reasonable to presume that labour flows between countries using the same currency would be higher than between countries with different ones. That's why we include in our model a dummy variable called currency. This

variable will indicate whether the source and destination country share the same currency (i.e. Euro) or not.

Language diversity constitutes most likely the main barrier to labour mobility in Europe and it might be the main reason of poor mobility levels in Europe compared to US or Canada. Although most of the European languages belong to the same family of Indo-European languages, numerous branches, groups and language dialects make Europe a little Babel. There are, however, populations of different countries using the same official languages or using languages of the same branch that are mutually intelligible, at least to some extent. In terms of labour mobility, the language issue is of major importance, therefore we are going to approach it with major attention. For each pair of 22 different languages of our reference group, there will be a coefficient of mutual intelligibility. Coefficient 1 will indicate countries with the same language (e.g. Germany and Austria), coefficient 0.5 will indicate countries speaking languages of the same branch with high level of mutual intelligibility (e.g. Portugal and Spain), coefficient 0.1 will denote countries speaking languages of the same branch with limited mutual intelligibility (e.g. Denmark and Sweden) and finally, coefficient 0 will denote countries speaking completely different languages (e.g. Greece and Poland)¹².

There is another thing we need to take into account - the language skills of the European population. In March 2012, Eurobarometer published a report called Europeans and their languages. It showed data on European population speaking foreign languages, namely English, French, German, Spanish, Russian, Italian and Polish, well enough to be able to have a conversation. Thus, the language independent variable, we include into the model, will take into account both the lingual proximity of European countries and language skills of the European population.

¹² For further details, see Annex

Earlier, we mentioned that many EU-15 countries implemented transitional restrictions toward workers from the New Member States concerning the access to national labour markets. The immigration policies can play an important role in the decision-making process of workers willing to move. Therefore, we will integrate into the model an immigration policies' dummy variable. This variable will indicate whether or not the access to national labour market is limit by these restrictions

The scope transitional restrictions could be divided into three stages. In the first stage, from 2004 to 2007, only 3 Member States, namely Ireland, UK and Sweden, opened their labour markets for new accession countries. In the second stage showed a gradual liberalization of access to national labour markets of old Members States. In 2006 Greece, Spain, Portugal, Finland and Italy, in 2007 Netherlands, Luxembourg and in 2008 France gave a free access to their labour markets. In the very beginning of the final third phase Belgium and Denmark opened their labour markets to new member states. This meant that just two Old Member States, Germany and Austria, the truly buffer states separating New and Old Members of the EU, kept on applying substantial restrictions on labour market access until 2011.

In terms of temporal restriction to accession to national labour markets, there is a double issue as 3 of the new accession countries, namely Hungary, Poland and Slovenia used reciprocal measures in return. They restricted the access to national labour markets for workers coming from those Member States that had imposed restrictions to their national labour markets. Gradually, though, these reciprocal measures were dropped.

There are almost surely other factors that influence the scope of labour flows within the EU. It might be the quality of a health care system in destination countries, quality of education system (remember the family theory of migration), job volatility in the destination country, generosity of unemployment benefits system, cultural proximity, etc., but these variable are

either hard to quantify or of little account. In the last resort, they could cause multi-colinearity of the model and bias our findings, thence they will not be included into the model.

Finally, the model looks like this

$$\ln M_{ijt} = \beta_0 + \beta_1 \ln w_{ijt} + \beta_2 \ln d_{ij} + \beta_3 \ln m_{ijt-1} + \beta_4 \ln u_{ijt} + \beta_5 l_{ij} + \beta_6 p_{ijt} + \beta_7 c_{ijt} + \varepsilon_{ijt}$$

where

M_{ijt} stands for the share of workers to the active population that moved from country i to j in period t

w_{ijt} stands for the wage differential of countries i and j in period t

d_{ij} stands for the geographical distance between countries i and j

m_{ijt-1} stands for the mobility flows from country i to j in period $t-1$

u_{ijt} stands for the unemployment level differential between countries i and j in period t

l_{ij} stands for the language similarity and skills of population in country i toward j

p_{ijt} stands for the immigration policies of country i toward nationals from j in period t

c_{ijt} stands for the currency dummy for countries i and j in period t

β_0, \dots, β_8 stand for parameters

ε_{ijt} is a white noise

Methods and expected results

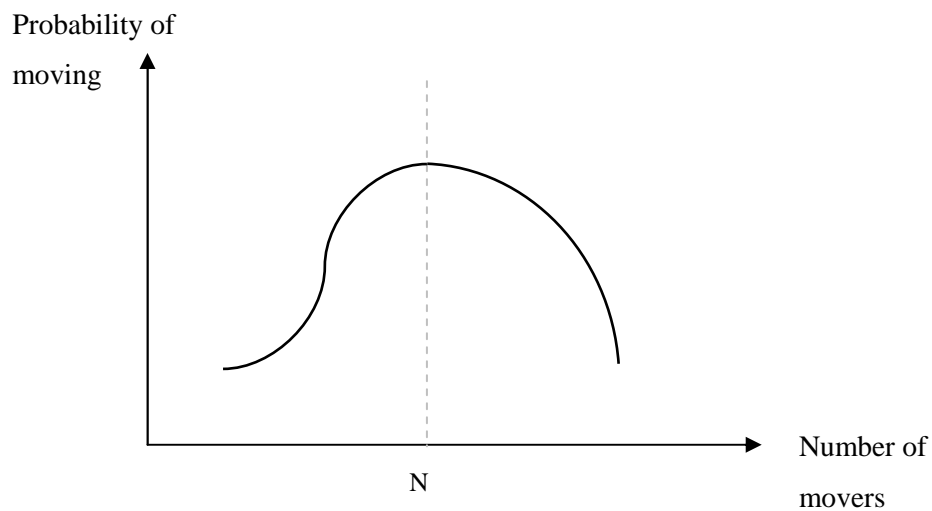
Our primary goal is to identify which variables are going to be statistically significant in determining the labour flows. Hence, we first run a regression on the whole set of data available. Yet, given the cultural, social and economic disparities of EU population, factor will presumably play different roles for different workers. Thence, we will run more regression analyses on a subset of our data: on all workers moving from the EU-15 and on all

workers moving only within EU-15 countries and then on workers moving from the EU-10¹³ and on all workers moving only within EU-10 countries. Making several models will allow us to make a clearer picture of mobility factors as well as reveal differences in mobility incentives for EU-10 and EU-15 countries.

Based on migration theories discussed earlier, we can anticipate what the results of the regression will be. First, there is the wage differential between source and destination country. Almost surely, this one will be positively correlated with the labour inflows. Since the Neoclassics, wage differential has been considered as the main incentive for workers to move abroad and the analysis is very likely to confirm that. Geographical distance will presumably be negatively correlated as it increases the costs of moving. The mobility flows in previous period is supposed to have positive effects on current flows. As pointed out for example by Gil Epstein (2002) the network migration effect spurs the future flows of workers up to a point where the number of migrants with similar characteristics can lead to tougher competition and lower wages. Epstein concludes that the probability of a worker moving abroad has an inverse U shape with regard to the number of movers already in the host country (see Figure 5).

¹³ EU-10 is a term used to denote 10 Member States that joined the EU during the 2004 enlargement

Figure 5: Network effects of migration



Source: based on Epstein (2002)

The unemployment level differential is supposed to have a negative sign. It means that whenever the unemployment level in destination country is higher than at home, fewer workers are willing to go. Language similarity and language skills should increase the flow of workers as there is a larger chance for them to find a job abroad. The sign of immigration policies' parameter is unknown, at least for now. There are a couple of studies analysing the impact of transitional measure adopted by Old Member States. Some studies affirm the efficiency of these measures (Holland et al., 2011), while others clearly state that there is no conclusive evidence of a direct link between the magnitude of migration flows and the transitional arrangements in place (Kahanec and Zimmermann, 2009). Currency dummy should have a positive parameter as the exchange rate risk can be a real threat.

Regression analysis and model testing

In the regression analysis, we will run several regressions varying in the source and destination countries. This will allow us to determine which mobility drivers are important for the EU labour in its entirety and which ones are important for the labour in EU-10 and

EU-15 countries. Estimators, standard deviations, p-values and coefficients of determination will be indicated in a table, for complete results, please see the Annex.

First, we run a regression on the entire set of data which means on mobility flows between each pair of EU-25 countries where mobility data were available. The regression yields following results:

Table 2: Determinants of labour mobility (entire set of data)

Variable	Value	Standard Error	p-value
const	-0.703 ***	0.119	<0.00001
l_w	0.193 ***	0.023	<0.00001
l_d	-0.026	0.016	0.10840
l_m_lag	0.913 ***	0.007	<0.00001
l_u	-0.017	0.021	0.41755
l	0.193 ***	0.046	0.00003
p	0.094 ***	0.032	0.00368
c	-0.020	0.024	0.39702
R-squared	0.924		
Adjusted R-squared	0.924		

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

Source: own computations

Second, we run a regression on a subset of data such that we consider labour flows coming from EU-15 countries only.

Table 3: Determinants of labour mobility (source EU-15)

Variable	Value	Standard Error	p-value
const	-0.477 ***	0.165	0.00386
l_w	0.269 ***	0.039	<0.00001
l_d	-0.068 ***	0.024	0.00526
l_m_lag	0.902 ***	0.009	<0.00001
l_u	0.029	0.027	0.28088
l	0.131 **	0.054	0.01543
p	0.151 **	0.063	0.01728
c	-0.0410	0.030	0.16916
R-squared	0.923		
Adjusted R-squared	0.923		

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

Source: own computations

Third, we consider labour flows coming from EU-10 countries only.

Table 4: Determinants of labour mobility (source EU-10)

Variable	Value	Standard Error	p-value
const	-0.962 ***	0.185	<0.00001
l_w	0.285 ***	0.052	<0.00001
l_d	-0.012	0.024	0.60127
l_m_lag	0.904 ***	0.011	<0.00001
l_u	-0.038	0.037	0.30685
l	0.285 ***	0.104	0.00633
p	0.058	0.042	0.16659
c	-0.014	0.052	0.78845
R-squared	0.923		
Adjusted R-squared	0.923		

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

Source: own computations

Fourth, we run a regression on a subset of data such that the source country and the destination country are both EU-15. Note that there is no "policy" variable. The regression analysis yields following results:

Table 5: Determinants of labour mobility (source & destination EU-15)

Variable	Value	Standard Error	p-value
const	-0,302 **	0,127	0,01753
l_w	0,064 *	0,034	0,05843
l_d	0,010	0,017	0,56079
l_m_lag	0,974 ***	0,006	<0,00001
l_u	-0,046 **	0,018	0,01051
l	0,042	0,031	0,17826
c	-0,001	0,017	0,96372
R-squared	0,963		
Adjusted R-squared	0,963		

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

Source: own computations

Finally, we run a regression on a subset of data such that the source country and the destination country are both EU-10.

Table 6: Determinants of labour mobility (source & destination EU-10)

Variable	Value	Standard Error	p-value
const	-1,003 **	0,404	0,01338
l_w	0,203	0,157	0,19822
l_d	-0,192 ***	0,059	0,00123
l_m_lag	0,803 ***	0,027	<0,00001
l_u	0,050	0,088	0,56952
l	0,609 **	0,238	0,01092
c	-0,047	0,211	0,82245
R-squared	0,787		
Adjusted R-squared	0,784		

Note: * significant at 10%; ** significant at 5%; *** significant at 1%

Source: own computations

We have run 5 regressions: one considering labour flows within the entire EU and four regressions focusing on labour flows of EU-10 and EU 15 separately. Off course, we could analyse the mobility drivers for each country individually. It would be interesting to investigate country-specific features of labour mobility and compare the results with each other. However, it would require too many models and then, country-specific features are not what we are examining in the first place.

First of all, we are interested in the coefficient of determination of our models. In accurate and technical fields, a model is acceptable when the coefficient is 0.6 or higher. For social sciences though, there is a lower threshold and even a model with a coefficient of determination around 0.4 is good enough. Examining labour mobility from a perspective of human behaviour and decision-making combine both exact/technical and social aspects for reasons we explained earlier and as such, a threshold of 0.4 would be binding. Yet, our models' coefficients of determination exceed by far this threshold as R-squared ranges from 0.78 up to 0.96.

Yet, because of a relatively high number of variables, we should be concerned whether the model is not overspecified, in other words whether we did not include an irrelevant variable. Though an excessive number of variables would not bias the estimates of parameters, it would lead to higher variance of these estimates. Luckily, in all the models adjusted R-squared coefficients do not differ from the unadjusted ones.

Interpretation of main empirical results

The regression analysis yielded interesting results. Some of them are in accordance with our prediction, while some of them not. Let's now talk through the models and their estimators one by one.

In the first model, we considered mobility flows between each pair of EU-25 countries where mobility data were available. What we supposed to be the most influential parameter of all, the wage differential, showed significant. It is no surprise, as it has been considered as an important mobility driver since Neoclassics. For labour, apparently, the pecuniary incentives to move across states remain important until today.

In terms of elasticity, the parameter 0.193 means that a 1% change in the wage differential provokes 0.19% change in the labour flows which are quite a lot. Eurobarometer's findings confirm the fact that the wage differences do matter (Eurobarometer, 2010). In this survey,

35% of EU citizens stated that the prospect of earning more money define the choice of their destination country.

The distance estimator showed insignificant in the analysis we made. It might be a bit surprising that distance between home and destination country is not quite relevant for the scope of mobility flows, but there is an explanation for that. Imagine a worker who accepts a job in a neighbour country, not quite far from his residence. The costs of moving, especially if he has a family, are likely to beat the gain from a well paid job. In this case, he would probably decide to commute on a daily or weekly basis. As a result, he would not change the place of residence and would not be included in the mobility statistics.

If a worker is offered a job in a place far enough to rule out the possibility of commuting on a daily or weekly basis, then he either turns the offer down or, in case the revenues from a new job exceed the one-shot costs of moving, he moves and settle in the workplace¹⁴. When commuting is out of line, then it does not actually matter how far the new residence would be, it can be a few hundred up to several thousand kilometres away. If the worker decides to move and settle abroad, the actual distance from old domicile is not of major importance. That is why in our analysis, the distance parameter shows not significant.

The following estimator, the lagged migration flows, turned out to be highly significant. It suggests that labour mobility between countries is an autoregressive process and that the network effect of past labour flows strongly determines the present ones. When compared to Figure 1 with an inverse U-shaped pattern of network migration, the result suggests that the current immigration is already beyond the peak. Therefore, if the Epstein's theory of network migration is correct and the inverse U-shaped pattern of network migration corresponds to real mobility flows, it would be reasonable to assume that the network migration driver will become less important in upcoming years.

¹⁴ This scheme was described in a Collective decision migration theory.

The unemployment differential parameter worked out as negative which was in sympathy with what was predicted. Nevertheless, with a p-value over 0.4 the estimator is statistically insignificant. It suggests that most workers who decide to move are already offered a particular job and are not overly concerned about the unemployment level in a destination country. Sure, there are workers, especially from Eastern Europe, that moves to Western countries aimlessly, they just take the chances. However, most workers who decide to move and settle abroad do so because they are presumably enticed by an existing proposal.

Many economists consider the language barrier to be the main culprit of modest labour mobility in the linguistically diverse EU. We can affirm that they are right, at least based on our findings. The language parameter is highly significant. Given the current state of language skills of the EU citizens, this implies two things. First, there are high bilateral labour flows between countries with the same or similar languages (e.g. Belgium and France, UK and Ireland) and second, there are considerable unilateral inflows of workers speaking destination countries' languages, most often English, German and French.

The significance of the policy estimator is high. It proves that temporary restrictions implemented by several states to prevent an invasion of cheap labour forces from new Member States were efficient.

Finally, the currency parameter is, contrarily to our predictions, insignificant. This can be interpreted in two ways. The first is that workers are not overly concerned about exchange rate risks and assume that the real value of remittances sent home and/or the real value of saving will not grow weaker over time. The second is that workers have little intention to convert their earnings into home currency.

The second and fourth models unveil several features of labour mobility specific to EU-15 countries. It is interesting to see that results obtained from these models differ in several aspects. This suggests that it makes a difference for an EU-15 worker to move within the Old

Member States and to move within the whole EU. According to our results, if he moves within EU-15, he is not overly concerned about the wage difference. Perhaps it is because the labour wages do not differ too much across EU-15 and are consistently high as it was shown in Graph 6. The language barrier is not significant either, he is impartial between moving into countries with the same and different languages.

The situation changes when a worker moves in the whole EU, i.e. when the possibility of moving to an EU-10 country is taken into account. Now, the wage difference estimator is statistically very significant. And so are the language and the distance between the country of origin and destination. What both of these models have in common is a high significance of network effects.

The third and fifth models show several specifics of labour mobility of EU-10 countries. The third model does not differ substantially from the first one with overall data. The main difference occurs in the policy parameter, where there is inconsistency with the first model. This time, the parameter turned out to be statistically insignificant. Similarly to other researchers, we also can not clearly determine the effect of transitory arrangements imposed by the Old Member States.

The fifth model that considers only labour flows of workers within EU-10 countries has the lowest coefficient of determination, therefore its results should not be taken as particularly determinative. Perhaps, there are other factors, not included in the model that shapes the patterns of labour mobility within EU-10 countries. Nevertheless, the model indicates that the wage difference is not insignificant and worker chose their destination country rather based on geographical proximity or language similarity.

The regression analysis allowed us to define the main drivers of labour mobility in the EU-25. It also pointed out some features of mobility flows specific to EU-15 and EU-10. Thanks to large database and high coefficients of determination, the results are deemed reliable.

Estimators were well chosen as all of them were significant in at least one model. In fact, 11 of them but one: the currency estimator. For mobility flows, apparently, the euro plays no role whatsoever.

To our knowledge, there are only two drawbacks related to the analysis. The first is the lack of unabridged and long-term data of labour flows in EU-25 as this would allow us to create even a clearer picture of mobility drivers. The second drawback is that the data we used in our analysis are averaged: Despite unequally distributed wage in EU Member States, in the model we included average wages. In the same way, unemployment enters the model as average level for each Member State, despite the fact that there are huge regional disparities. The distance parameter is also subjected to a certain bias for reasons explained earlier. In consequence, the results obtained in our analysis are describing average tendencies and incentives to move.

Discussion of the limits of labour mobility in the EU

This thesis is dedicated to the labour mobility in the EU and the crucial question we are trying to answer is: what are the limits of labour mobility in the EU and what can be done to spur it. The regression analysis of labour flows across EU Member States allowed us to discern significant mobility drivers from those that play a minor role or no role at all. We found out that in general there are four important factors: wages, past flows, language and policy. We are now going to discuss what is going to be their role in the future, which ones constitute a real barrier to mobility and which of these are avoidable and how.

Wage differential is one of persisting drivers of labour mobility, especially for labour in New Member States. Thanks to considerable inequalities in labour remuneration, the wage differential contributes to labour mobility to a large extend.

Yet, the labour flows spurred by wage difference are likely to decrease over time. The EU's long-term aim is a convergence. It tries to put Member States closer together, economically and politically. It pursues a regional or cohesion policy as an expression of solidarity with less developed countries and regions and intends to reduce economic disparities that persist between Europe's regions. It is important to note that EU institutions hold tight on this policy as for 2014, one third of the entire EU's budget is devoted to economic, social and territorial cohesion and more than 80% of the funding is devoted to Convergence objective¹⁵ (EC, 2014).

In the long term, disparities between EU members are likely to shrink. Together with economic performance, standard of living and price levels, labour wages will tend to converge throughout the EU, even though it may take some time. Gradually, the labour force from New Member States will have lower and lower financial incentive to move abroad. The same thing holds for condition of work. EU has adopted several regulations, binding on all Member State, to ensure high employment standards. As a consequence, every EU citizen enjoys similar working condition as in other countries and has no reason to move abroad for changing them.

What, in contrast, can be very appealing are greater career opportunities or better chances to improve one's qualifications. Based on findings of Eurobarometer (2010), 23% of European citizens would be encouraged to work in a foreign country because of better career or business opportunities.

Surprisingly, interpersonal and social ties play a huge role in the migration patterns. A Eurobarometer survey found out that if an EU citizen has a relative or friend who lives or even has lived abroad, it predisposes him to consider moving abroad. Also, 44% of

¹⁵ Convergence objective is one of three main cohesion policy's objectives aimed at reducing regional disparities in Europe by helping those regions whose per capita GDP is less than 75% of the EU to catch up with the ones which are better off.

Europeans envisaging working abroad will turn to their personal contacts (Eurobarometer, 2010). Apparently, in what concerns labour mobility, workers follow a herd behaviour. When leaders make a leap to move abroad, the rest of the crowd follow their example.

Our analysis proved that the network effect is very important driver of mobility with a high statistical significance in all models. This result together with Eurobarometer's findings suggest that moving into a foreign country is much easier when a worker knows what to expect and enjoys a presence of his peers or a familiar environment of his community. There are two reasons why: The first is that newcomers do not have to surmount any language barrier in the first moments in a new country and second, they are provided with all the necessary start-up information. Thanks to this, a settling and integrating into a new environment becomes much easier and faster. Eurobarometer (2010) found out that the choice of a country is determining particularly for EU citizens from New Member States where the presence of friends or relatives influence the choice of approximately 68% of them.

Since the network effect plays such an important role, the EU should consider a way to facilitate an integration of newcomers to a new country. In some countries, there are special centres that help immigrants to integrate quickly and smoothly into society. In Ireland, for example, a new Integration Centre was opened in July 2009 for the purpose of an integration and inclusion of people from immigrant backgrounds in Ireland. The Centre provides necessary information and services for a successful integration of an immigrant at national and regional level. The EU should follow the example of Ireland and become more active in facilitating and smoothing the integration of moving labour forces into new countries.

Our analysis showed that employment levels have no significant impact on mobility. Workers are likely to move abroad because of a particular job offer. It means that although EU employment policy can make a positive impact in terms of reducing unemployment rates in

Member States and improving quality of jobs, it is not likely to spur the mobility. What, in contrast, can help to increase the mobility levels, is the job-matching support.

At the union level, this support is held by EURES - the European employment service. So far, however, it provides a modest choice of employment opportunities and its harmonization with national employment offices is very limited. As an EEA-wide recruitment and placement service provider, it should stand for a massive information hub gathering job opportunities throughout Europe and efficiently matching employers with job seekers. It should be constantly synchronized with all European employment offices to enable an exchange of information in real time. Only through up-to-date and complete information about employment opportunities an efficient job-matching can take place.

Unfortunately, EURES is currently not able to hold a post of an efficient job-matching operator. Eurobarometer (2010) survey found out that only 12% of EU citizens who envisage working abroad have heard of EURES while no more than 2% have ever used it. Maybe this is a field that private human resource and recruitment agencies could penetrate into. Although many of these agencies operate in several EU states, so far there is no major agency providing vast international job-matching services. Given that there are currently over 26 million EU citizens seeking a job, this could be a viable business.

Language constitutes without any doubt an important barrier to labour mobility as the language estimator was statistically significant in four out of five models. It is a natural barrier that arose along with formation of Indo-European language family. Just in the EU, there are 24 official languages and over 60 indigenous regional and minority languages (Maurais and Morris, 2003). The knowledge of languages, other than a mother tongue, is an important precondition for labour mobility flows as confirmed by our analysis. Since multilingual citizens take advantage of professional and economic opportunities in an

integrated Europe, the EU implements policies promoting multilingualism of European citizens. The aim is that everyone could speak at least two foreign languages.

The tricky issue is that among foreign languages most spoken by Europeans, English dominates with 39%, followed by French with 12% and German with 11% (Eurobarometer, 2012). This situation is heading toward a one-way labour flows, mainly in an East-Western direction and most of bilingual Europeans can move only to the UK or Ireland. It is true that huge international companies operating in Central or Eastern Europe set English as the language of communication, however without at least a basic knowledge of local languages, incoming workers cannot fully integrate into the society and settle there.

Knowledge of an additional foreign language might help to widen the portfolio of destination countries. Yet, some Europeans are quite reluctant to learn foreign languages. To give an example, up to 61% of British and 60% of Irish population speak but English. In continental Europe, 65% of Hungarian, 62% Italian and 61% of Portuguese population speak but their mother tongue (Eurobarometer, 2012).

From this perspective, the idea of a trilingual European population seems to be a very bold target that might not be achieved until many decades from now, if ever. Based on Eurobarometer (2012), only 25% of Europeans can speak at least two foreign languages well enough in order to be able to have a conversation. The truth is that there is a huge potential in improving language skills of the European population. And even if the investment into language knowledge would not pay off in terms of increased labour mobility, it would be an asset for intercultural dialogue and social cohesion.

As it was said earlier, the language barrier is an important one. It is presumably the major reason why the level of labour mobility in Europe falls behind those in the US or Canada. The EU's vision of trilingual Europe is a respectable, yet a little reconsideration in favour of quality instead of quantity might be pertinent.

Transitory arrangements that some states adopted against New Members States in order to protect home labour market are simply paradoxical. On one hand, Member States adhere to the idea of a unified Europe, on the other hand they create artificial obstacles to labour mobility. National policy makers were stuck between the integration process of opening national economy and a lobby of national unions aiming to protect home labour markets against cheap labour force from abroad. Obviously, some of those policy makers succumbed to the pressure induced by national interest groups, adopted an opt-out clause and gave up the integration process.

These measures do not represent an impassable barrier and they did not prevent inflows of workers from New Member States. What they do represent, though, is a rather bipolar attitude of policy makers to the integration process. Perhaps, these restrictions were legitimate during the Eastern enlargement, when 10 New Member States joined the union. But is it really necessary to impose new restrictions on the free movement of workers from Croatia a country with a population of less than 4.5 million?

Transitory measures have a doubtful effect on labour mobility. They are rather a sign of reluctance to accept labour from New Member States which might discourage workers willing to move. The message is clear: If the EU aims to increase the labour mobility across Europe, transitory arrangements should be avoided or their validity should be shortened to a minimum.

Prospects of future labour mobility

Labour mobility in the EU is an important topic for the upcoming years and the EC is taking this issue seriously. In the Europe 2020 strategy, the Commission engages to facilitate and promote intra-EU labour mobility and better match labour supply and demand. It aims also to adopt a forward-looking and comprehensive labour migration policy which would respond in a flexible way to the priorities and needs of labour markets.

Thanks to the financial support of structural funds it intends to launch "Youth on the move" and "Youth Opportunities" initiatives that aim to promote students' and trainees' mobility. The EURES portal is supposed to take part in this initiative too and its "Your first EURES job" should help to increase job opportunities and improve the employment situation of young people.

So far, it seems that the Europe 2020 strategy might help to enhance the poor labour mobility. The above mentioned initiatives have definite purposes and aim at clearly defined target groups. The forward-looking and comprehensive labour migration policy has no clear outline, therefore it would be premature to assess its functionality and an impact on the labour mobility.

What is missing though in the strategy is an enhanced functionality of EURES that should become a real centre of employment opportunities. Also, the Europe 2020 has presented no particular policy on promotion of multilingualism, on a more intensive education of various languages.

Conclusions

The aim of this thesis was to determine relevant factors of labour mobility in the EU. The main conclusions stemming from both the literature review, the theoretical research and the empirical model testing and discussion, can be summarized in the following points:

The labour mobility in the EU is low; it is a fact we cannot deny. When compared to other countries, the difference is striking. Statistical data of labour flows remain on a considerably low levels for years and decades, so this is not a result of economic crisis we have just gone through. The EU struggles to increase the labour mobility by first adopting the right to move and work wherever in the EU and second conducting a labour policies aimed at enhancing the labour mobility.

Theories and models discussed in the second part of this thesis suggested that mobility drivers go beyond economic or pecuniary factors. Especially more recent theories stressed the influence of social ties, family ties, collective decision-making, psychological costs and similar less tangible factors

The empirical part built upon these theories and analysed labour flows within EU-25 countries taking into account both economic and personal drivers of mobility. Extensive data sample, several models and country specific variables provided for reliable results out of which following conclusion can be made:

Although the Old and the New Member States have slightly different incentives to move, there are several mobility drivers they have in common. These are (i) wage difference, (ii) past labour flows, (iii) language and (iv) transitory arrangements.

After scrutinizing the most influencing factors of labour mobility, this thesis presented several hints on how to enhance it. In a nutshell, they include: (i) improving language skills in

quantity and quality, (ii) giving suitable support and back-up to newcomers to facilitate their integration, (iii) promote the visibility and functionality of EURES as a powerful job-matching device and (iv) supporting students and trainees in gaining abroad experiences. These four recommendations, if properly implemented, would actually spur the future labour flows.

Labour mobility levels in the EU will most likely be never as high as in the US or Canada, even when all barriers to free movement would be removed. The current status of sovereign states of the EU, cultural diversity of EU citizens and their strong social and domestic ties makes it nearly impossible. However, it does not mean that the labour flows in the EU cannot increase in the future.

Although this thesis analysis the principles and outcomes of labour mobility mainly through rational reasoning, there are other reasons that cannot be omitted in this argumentation. Increased mobility within the EU promoting integration and social inclusion, it beats xenophobia and racisms and creates personal relationships that overcome national borders. And this is why the free mobility is worth preserving and developing.

Citizens of EU Member States have been granted the chance of moving and working in another EU country without any special permit relatively recently. Maybe, the phenomenon of moving abroad for a better job is something new, something that EU citizens did not get fully used to. There is a hope, though, that over the time, they will fully realize what the open European labour market can offer to them.

Annex

Language similarity and language skills of EU population

	Austria	Belgium	Cyprus	Czech republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Austria	x	1	0	0.15	0.47	0.15	0.18	0	1	0	0.18	0.17	0	0.14	0.14	1	0	0.71	0.2	0	0.22	0.42	0	0.26	0.1
Belgium	1	x	0	0.15	0.47	0.15	0.18	1	1	0	0.18	0.17	0.5	0.14	0.14	1	0.11	1	0.2	0.15	0.22	0.42	0.1	0.26	0.1
Cyprus	0	0	x	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czech republic	0	0	0	x	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	1	0	0	0	0
Denmark	0	0	0	0	x	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0
Estonia	0	0	0	0	0	x	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland	0	0	0	0	0	0.1	x	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
France	0.11	1	0	0	0	0	0	x	0.14	0	0	0	0.5	0	0	1	0.11	0.29	0	0.15	0	0	0.1	0	0.19
Germany	1	1	0	0.15	0.47	0.15	0.18	0	x	0	0.18	0.17	0	0.14	0.14	1	0	0.71	0.2	0	0.22	0.42	0	0.26	0.1
Greece	0	0	1	0	0	0	0	0	0	x	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0.1	0.1	0	0	0	x	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	0.38	0.52	0.73	0.27	0.86	0.5	0.7	0.39	0.56	0.51	0.2	x	0.34	0.46	0.38	0.56	1	0.9	0.34	0.27	0.26	0.59	0.22	0.86	1
Italy	0	0.5	0	0	0	0	0	0.5	0	0	0	0	x	0	0	0.5	0	0	0	0.1	0	0	0.5	0	0
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	x	0.1	0	0	0	0	0	0	0	0	0	0
Lithuania	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	x	0	0	0	0	0	0	0	0	0	0
Luxembourg	1	1	0	0.15	0.47	0.15	0.18	1	1	0	0.18	0.17	0.5	0.14	0.14	x	0.11	0.71	0.2	0.15	0.22	0.42	0.1	0.26	0.19
Malta	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	x	0	0	0	0	0	0	0	1
Netherlands	0.5	1	0	0	0	0	0	0	0.5	0	0	0.1	0	0	0	0.5	0	x	0	0	0	0	0	0	0.1
Poland	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	x	0	0.1	0	0	0	0
Portugal	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0.1	0	0	0	x	0	0	0.5	0	0
Slovakia	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	x	0	0	0	0
Slovenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	x	0	0	0
Spain	0	0	0	0	0	0	0	0.13	0	0	0	0	0.5	0	0	0	0	0	0	0.5	0	0	x	0	0
Sweden	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	x	0
United Kingdom	0.38	0.52	0.73	0.27	0.86	0.5	0.7	0.39	0.56	0.51	0.2	1	0.34	0.46	0.38	0.56	1	0.9	0.34	0.27	0.26	0.59	0.22	0.86	x

Regression model 1

Model 1: Pooled OLS, using 3473 observations
 Included 456 cross-sectional units
 Time-series length: minimum 4, maximum 8
 Dependent variable: I_M

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-0.703472	0.11864	-5.9295	<0.00001	***
I_w	0.192809	0.0228743	8.4291	<0.00001	***
I_d	-0.0258201	0.0160787	-1.6059	0.10840	
I_m_lag	0.913048	0.00679664	134.3381	<0.00001	***
I_u	-0.0171613	0.0211664	-0.8108	0.41755	
I	0.192842	0.0461511	4.1785	0.00003	***
p	0.093871	0.0322964	2.9065	0.00368	***
c	-0.0202528	0.0239097	-0.8471	0.39702	
Mean dependent var	-10.34572	S.D. dependent var		2.131521	
Sum squared resid	1186.755	S.E. of regression		0.585233	
R-squared	0.924768	Adjusted R-squared		0.924616	
F(7, 3465)	6084.658	P-value(F)		0.000000	
Log-likelihood	-3063.326	Akaike criterion		6142.653	
Schwarz criterion	6191.875	Hannan-Quinn		6160.226	
rho	0.017790	Durbin-Watson		1.700724	

Regression model 2

Model 2: OLS, using 2123 observations
 Missing or incomplete observations dropped: 69
 Dependent variable: I_M

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-0,476794	0,164818	-2,8928	0,00386	***
I_w	0,268973	0,0393548	6,8346	<0,00001	***
I_d	-0,0679715	0,0243335	-2,7933	0,00526	***
I_m_lag	0,902041	0,00945343	95,4194	<0,00001	***
I_u	0,0295281	0,0273758	1,0786	0,28088	
I	0,131315	0,0541732	2,4240	0,01543	**
p	0,151296	0,0634989	2,3827	0,01728	**
c	-0,0409886	0,0298014	-1,3754	0,16916	
Mean dependent var	-10,67484	S.D. dependent var		2,073411	
Sum squared resid	699,2017	S.E. of regression		0,574971	
R-squared	0,923355	Adjusted R-squared		0,923101	
F(7, 2115)	3639,941	P-value(F)		0,000000	
Log-likelihood	-1833,456	Akaike criterion		3682,911	
Schwarz criterion	3728,196	Hannan-Quinn		3699,489	

Regression model 3

Model 3: OLS, using 1350 observations
 Missing or incomplete observations dropped: 106
 Dependent variable: I_M

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-0,962133	0,185475	-5,1874	<0,00001	***
I_w	0,284961	0,0522177	5,4572	<0,00001	***
I_d	-0,0124573	0,0238329	-0,5227	0,60127	
I_m_lag	0,904046	0,011212	80,6322	<0,00001	***
I_u	-0,0380836	0,0372547	-1,0223	0,30685	
I	0,285474	0,104388	2,7347	0,00633	***
p	0,058239	0,0420802	1,3840	0,16659	
c	-0,0141648	0,0527783	-0,2684	0,78845	
Mean dependent var	-9,828136	S.D. dependent var		2,119565	
Sum squared resid	480,3707	S.E. of regression		0,598290	
R-squared	0,920737	Adjusted R-squared		0,920323	
F(7, 1342)	2226,992	P-value(F)		0,000000	
Log-likelihood	-1218,088	Akaike criterion		2452,177	
Schwarz criterion	2493,840	Hannan-Quinn		2467,780	

Regression model 4

Model 4: OLS, using 1230 observations
 Missing or incomplete observations dropped: 2
 Dependent variable: I_M

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-0,301931	0,126935	-2,3786	0,01753	**
I_w	0,0644653	0,034032	1,8943	0,05843	*
I_d	0,0100231	0,0172271	0,5818	0,56079	
I_m_lag	0,973926	0,00645975	150,7684	<0,00001	***
I_u	-0,0463901	0,0181027	-2,5626	0,01051	**
I	0,0424018	0,0314808	1,3469	0,17826	
c	-0,000781042	0,0171692	-0,0455	0,96372	
Mean dependent var	-9,445456	S.D. dependent var		1,503001	
Sum squared resid	101,6162	S.E. of regression		0,288249	
R-squared	0,963399	Adjusted R-squared		0,963219	
F(6, 1223)	5365,236	P-value(F)		0,000000	
Log-likelihood	-211,7507	Akaike criterion		437,5015	
Schwarz criterion	473,3049	Hannan-Quinn		450,9719	

Regression model 5

Model 5: OLS, using 477 observations
 Missing or incomplete observations dropped: 99
 Dependent variable: l_M

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-1,0028	0,403889	-2,4829	0,01338	**
l_w	0,202786	0,157385	1,2885	0,19822	
l_d	-0,191617	0,0589141	-3,2525	0,00123	***
l_m_lag	0,802988	0,0265825	30,2074	<0,00001	***
l_u	0,0503322	0,088432	0,5692	0,56952	
l	0,60872	0,238205	2,5554	0,01092	**
c	-0,0473008	0,21068	-0,2245	0,82245	
Mean dependent var	-11,57136	S.D. dependent var		1,767789	
Sum squared resid	316,9135	S.E. of regression		0,821148	
R-squared	0,786954	Adjusted R-squared		0,784235	
F(6, 470)	289,3498	P-value(F)		2,7e-154	
Log-likelihood	-579,3140	Akaike criterion		1172,628	
Schwarz criterion	1201,801	Hannan-Quinn		1184,098	

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www.cso.ie

Direction générale Statistique et Information économique (Belgium)

statbel.fgov.be/fr/statistiques/chiffres

Eurostat (European Union)

<http://epp.eurostat.ec.europa.eu>

OECD database (Global)

stats.oecd.org

Office for National Statistics (United Kingdom)

www.ons.gov.uk/ons

Central Statistical Bureau of Latvia

www.csb.gov.lv

Internet sources

www.europa.eu

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