The role of labour mobility in reducing unemployment in the European Union[*]

Oussama Ezzeddine[1]

LAREFI, Université Montesquieu Bordeaux IV

Abstract Labour mobility has always been encouraged within the European Union, by the European commission and by a large number of policy makers. Despite all these encouragements, labour mobility remains at a weak level in the Union. The aim of this paper is to study the relationship between labour mobility and trade liberalization, and to propose policy measures to be set up in order to stimulate labour mobility. We show that labour mobility and trade are complements, that is, trade liberalization should increase labour mobility levels. We also show that networks effects are important, and that some economic variables should not be neglected when policy makers set up economic policies in order to raise labour mobility levels.

---

[1] Laboratoire d'analyse et de recherche en économie et finance internationales (*LAREFI*), Université Montesquieu Bordeaux IV, Avenue Léon Duguit, 33608 Pessac Cedex ;
E-mails : oussama.ezzeddine@u-bordeaux4.fr, oussama.ezzeddine@gmail.com

1. Introduction

The economic crisis that began on September 2008 provoked a rise in unemployment rates in the European Union. A large number of policy makers believe that labour mobility offers a solution to reach full employment in the Union. When the European Union was created, the purpose was to create an optimum currency area (OCA), whose characteristics were: labour mobility across area's regions (Mundell, 1961), openness with capital mobility and price and wage flexibility across the region (Mc Kinnon, 1963), and production diversification (Kenen, 1969). In theory, labour mobility within the OCA should enable European workers to move from a country to another in order to reduce unemployment in countries where high unemployment rates prevail, and offer a new labour force where there is a lack of workers.

Historically, the European construction was based on a will to encourage labour mobility. Several treaties and agreements content articles on labour mobility, like the treaty of Rome (1958), the Schengen agreement (1985), the Maastricht treaty (1992) or the treaty of Amsterdam (1997).

However, it is well known that labour mobility in Europe is weak, and does not allow a balancing between European countries. So, in order to encourage European workers to move to other countries, some measures should be taken. One of them is to continue trade liberalization between the old and the new European Union's members; the latter are countries that adhered to the Union by May 2004 and January 2007. The argument is that there is a relationship between labour mobility and trade. Yet, economists are divided about this relationship. If the relationship between labour mobility and trade is positive, i.e. they are complements, trade liberalization should be maintained and reinforced in order to favour labour mobility. But if the relationship between trade and labour mobility negative, i.e. they are substitutes, European policy makers should contract trade volume to incite workers to move.

The aforementioned agreements concern all types of migrations (workers, illegal migrants…). Our study focuses on labour mobility, i.e. workers' migrations. Labour migration is made of four different flows:

- Migrants who are looking for a job;
- Foreigners that, after a status change, are looking for a job (accepted asylum seekers, foreign students…);

- People who, admitted for no economic motive but having the right to work, begin looking for a job;
- Seasonal workers.

Nowadays, increasing labour mobility levels constitutes a challenge to the European community. The aim of this paper is to determine the relationship between labour mobility and trade. The nature of the relationship will help policy makers in setting up economic policies. We run a dynamic panel data analysis and show that labour mobility and trade are complements. We will also study the determinants of labour mobility and find that wealth differences, unemployment differences and network effects are the most relevant ones. We will finally show that labour mobility and distance are positively correlated in the European Union, contrary to the acknowledged literature.

This paper is structured as follow. In the following section, we discuss the theoretical relationships between labour mobility and trade, and between labour mobility and its determinants. Section 3 presents the model adopted to run our estimation. In section 4, we will describe the data and the econometric procedure. Our main results are presented in section 5 and section 6 concludes.

2. Literature review

"There is no single, coherent theory of international migration, only a fragmented set of theories that have developed largely in isolation from one another, sometimes but not always segmented by disciplinary boundaries"[2]. The best-known theory of international migration is the neoclassic one (macro and micro), which was originally developed to explain labour migration in the process of development [Lewis (1954), Ranis & Fei (1961), Harris & Todaro (1970), Todaro (1976)].

One of the main arguments for labour migration in the economic literature is the wage difference between the sending and the host country; the probability to migrate being positively correlated to the wage difference (Heinz & Ward-Warmedinger, 2006). However, the robustness of this determiner is not undeniable. A study carried out by the United Nations concludes that migrations provoked by wage differences are low[3]. Moreover, it is not obvious which wage measure seems the most relevant to measure worker's incentive to migrate.

---

[2] Massey & al. (1993), p 432.
[3] UN (1997), World population monitoring, New York.

Generally, the relative PPP (Purchasing Power Parity) wages may be more appropriate to consider worker's migration, since this measure (PPP wages) explains price differences between the two countries. On the other side, for a commuting migrant (a person who works in a country but lives in another one), wage differences at current exchange rate are more important, since commuters spend most of their earnings in their own country. Yet, the two measures suggest a high migratory potential in the European Union, especially from the CEEC (Central and Eastern European Countries). This conclusion also prevails when the gap in per capita income is taken into consideration (ECB, 2006).

Another factor of labour mobility is the expected growth rate of real GDP per capita, since it relates the expected path of income and of the real convergence in the standards of living between the "old" and the "new" European Union's countries.

A high level of unemployment in the sending country in comparison to the host country constitutes another incentive to migrate, and this effect is stronger for the unskilled workers. Mazier & al. (2002) explain that employment prospects are fundamental to a migrant whether he wants to migrate or not.

The economic literature of migration suggests that the youngest workers are the most mobile. Brücker & al. (2003) point out that 70% of workers living in West-Europe (Native of the CEEC) are between 25 and 44 years old.

International trade will affect the extent and the speed of income and wages convergence, and therefore, the potential flow of migrants. Substantially increased international trade should accelerate the real convergence of the new EU members to the old ones, and may dampen the labour migration effect.

There are two main points of view concerning the relationship between labour mobility and trade. While some economists believe that labour mobility is a substitute to trade, as shown by Mundell (1957), others believe that trade and labour mobility are complements, as shown by Markusen (1983). In one hand, Mundell presented his model under a Heckscher-Ohlin framework and demonstrated that trade and factor mobility are substitutes. This point of view is widely acknowledged in the European Union. For instance, Straubhaar (2001) has written: *"to an important degree, trade has replaced the economic demand for migration in the EU"*. On the other hand, Markusen showed that labour mobility

and trade are complements. He exposed first the assumptions of Heckscher-Ohlin model and explained that if we consider different factor endowments, trade and labour mobility are substitutes. But if the other assumptions (countries have identical technologies, production is characterized by constant returns to scale, production is characterized by perfect competition and there are no domestic distortions in either countries) are relaxed while the countries have identical factor endowments, then labour mobility and trade are complements. This point of view seems neglected in Europe. However, Collins & al. (1997) shaded Mundell and Markusen's conclusions: by using series going back until the 1870s, these authors cannot confirm substitutability between labour mobility and trade, neither a complementarity.

The nature of the relationship between trade and labour mobility has important implications in terms of economic policy. If trade and labour mobility are substitutes, trade should be restricted in the union in order to stimulate labour mobility. If they are complements, trade levels should be raised to stimulate labour mobility.

All these explanations of labour mobility constitute what migration theories call push and pull factors. The push factors, or supply side factors, affect the incentive to migrate. The pull factors, or demand side factors, affect the demand for immigrants in the destination country. For instance, if there is a high gap between two countries unemployment rates, this gap constitutes a push factor. The case of German reunification clearly illustrates Push-motivated migration (Delisle, 2002). The economic and opportunity costs of migration were low, the opportunity costs even lower, with the massive unemployment that arose in the former Eastern Germany just after reunification. This resulted in a massive and very fast flow of migration westward, amounting up to 7% of the German population over 10 years, and 2.8% during the first 6 months.

Distance is considered as a cost by the economic theory. This cost is positively correlated with distance so that distance and labour mobility are negatively correlated [Clark (1986), Crozet (2004)]. However, we will show that they are positively correlated.

Last but not least, network effects have a strong effect on labour mobility. The number of migrants of the same nationality in a host country significantly decreases the monetary,

social and psychological costs to migration and the risk of migration for potential migrants. For instance, network effects suggest that Germany and Austria could expect to receive a large share of immigration from the CEEC due to their relatively high population of foreign nationals from these countries, and that Poland may be the key source of migrants. The networks were identified as a form of social capital [Massey & al. (1987), after Massey (2001)], referred to as "*the sum of resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network or more less institutionalized relationship of mutual acquaintance and recognition*" [Bourdieu & Wacquant (1992), after Massey (2001)]. The networks are on one hand results of migration and a propeller of migration on the others (the greater the capital, the lower the cost of migration).

Empirical evidence suggests that migrants often rely on assistance of relatives or countrymen, while establishing a new life at the destination country (Zlotnik, 1998). Mouhoud & Oudinet (2004) show that labour mobility in Europe is only due to network effects, and that the aforementioned economic variables do not explain labour mobility[4].

3. The model

In the previous section, we presented the factors that affect a worker's willingness to migrate: wages, GDP, GDP per capita, unemployment rates, trade, distance and network effects. The consideration of these factors leads us to use a gravity equation to estimate the relationship between them and labour mobility. The gravity model was first used in Physics. The economists then applied it to international trade[5]. Many recent works used the gravity models in their analysis, but differed as regards the explained variable. Portes & Rey (2000) or Portes & al. (2001) use a gravity model to explain securities exchange; Ashcroft and al. (1994) use it to explain mergers and acquisitions. Recently, gravity models have been applied to migration [Karemera & al. (2000); Mayda (2007)].

The initial model applied to international trade takes the following form:

$$F_{ij} = G \frac{M_i M_j}{D_{ij}}$$

Where F is the trade flow between countries *i* and *j*, M is the economic mass of each country, D is the distance between them and G is a constant.

---

[4] Their study concerns the whole Europe, not only the European Union.
[5] Beckerman (1956), Tinbergen (1962) or Linnemann (1966).

In our case, we will replace F by M, which designs labour migrations, and turn the equation into a logarithmic form. Our model will be estimated as follows:

$$\log(M)_t = \alpha_1 \log(T)_{t-1} + \alpha_2 \log(W_1/W_2)_{t-1} + \alpha_3 \log(GDP_1/GDP_2)_{t-1}$$

$$+ \alpha_4 \log(GDPC_1/GDPC_2)_{t-1} + \alpha_5 \log(U_1/U_2)_{t-1} + \alpha_6 \log(D) + \alpha_7 B + \alpha_8 L + \beta \log(M)_{t-1}$$

$$+ u_{it}$$

where M_t represent labour migration from country 1 to country 2 in period t, T is the exportations from country 2 to country 1, W the wage, GDP the gross domestic product, GDPC the gross domestic product per capita, U the unemployment rate, D the distance between the two countries, B a dummy which indicates of the two countries share a border, L a dummy for an eventual common language between the two countries and u_{it} is an error term. The origin country is country 1 and the destination country is country 2.

Initially, we would have wanted to express GDP differences or wages differences by the difference of two GDPs (i.e. GDP 1 – GDP 2). But the problem is if this difference is negative, it can not be converted into a logarithmic form. So we decided to use the term$\frac{GDP1}{GDP2}$. We consider that migrants need time to take the decision to migrate or not, that's why our explanatory variables are considered at time t-1. The GDPs indicates the economic mass of each country. The GDP per capita is the economic distance between two countries and D is the physical distance between them. M_{t-1} is the labour mobility at the previous period. This variable represents the network effects, as described by Mouhoud & Oudinet (2004).

In this model, the sign of α_1 will allow us to determine the nature of the relation between labour mobility and trade. If $\alpha_1 < 0$, labour mobility and trade are substitutes. If $\alpha_1 > 0$, they will be complements. Normally, labour mobility should be positively correlated with GDP differences, GDP per capita differences and wage differences, and negatively with unemployment differences and distance. Network effects do exist when there is a positive relation between labour mobility at the period t and labour mobility at the period $t-1$.

So, we expect that: $\alpha_2 > 0$, $\alpha_3 > 0$, $\alpha_4 < 0$, $\alpha_5 < 0$, $\alpha_6 < 0$, $\alpha_7 > 0$, $\alpha_8 > 0$, $\beta > 0$.

4. Data and methodology

Our study focuses on European Union countries, except Lithuania, Latvia, Malta and Cyprus. Our data come from the following databases: the data on labour mobility from a database published by the OECD, *SOPEMI* (2006, 2010); GDPs, GDPs per capita, unemployment rates come from the IMF database. The database *Laborsta*, published by the international labour organization (ILO), gives us wages data. The distances come from the *Distances* database from CEPII.

The search for economic data, such as GDPs, unemployment rates and wages was easy. However, we have found several difficulties to obtain labour mobility data. Constituting a migration database is complicated since obtaining and checking the data is difficult. It is far more difficult when we consider labour migration only. But we can rely on this data because of their reliable source (OECD database) even if the OECD mentions the difficulty to collect and constitute it. Finally, the aforementioned data covers the 1995-2008 period.

The model specified previously will be estimated for four cases: labour migration in the whole European Union, labour migration between the "old" and the "new" European countries, labour migration within the "old" European countries and labour migration within the "new" European countries.

We estimate our model using the Arellano-Bond GMM (Generalised method of moments) estimator for dynamic panel models[6]. The reason is that there are many problems to estimate our equation and we consider that this method help us do deal with them.

First, the panel dataset has a short time dimension (T = 14) and a larger country dimension (N = 23). Moreover, we are working on bilateral migration, so the number of cross sections can rise up to 115. The Arellano-Bond estimator was designed for small-T and large-N panels. Second, the presence of the lagged dependant variable M_{t-1} gives rise to autocorrelation. Third, the labour mobility variable M_t is assumed to be endogenous. Because causality may run in both directions (from labour mobility to trade and vice versa), the regressors may be correlated with the error term. Finally, Time-invariant country characteristics (fixed effects), such as geography and demographics, may be correlated with the explanatory variables. The fixed effects are contained in the error term in our equation,

---

[6] Arellano & Bond (1991).

which consists of the unobserved country-specific effects, c_i, and the observation specific errors, e_{it} : $u_{it} = c_i + e_{it}$.

In the case of the third and the last problems, estimation by OLS is likely to be biased. The Arellano-Bond difference GMM estimator, first proposed by Holtz-Eakin, Newey and Rosen (1988), makes the endogenous variables pre-determined, and therefore, not correlated with the error term u_{it}.

To cope with the second and third problem, we estimate the model by difference GMM estimator to transform the model to:

$$\log(\Delta M)_t = \alpha_1 \log(\Delta T)_{t-1} + \alpha_2 \log [\Delta (W_1/W_2)_{t-1}] + \alpha_3 \log[\Delta (GDP_1/GDP_2)_{t-1}]$$

$$+ \alpha_4 \log\Delta [(GDPC_1/GDPC_2)_{t-1}] + \alpha_5 \log\Delta [(U_1/U_2)_{t-1}] + \alpha_6 \log(D) + \alpha_7 B + \alpha_8 L$$

$$+ \beta \log(\Delta M)_{t-1} + u_t$$

By transforming the regressors by first differencing, the fixed country-specific effect is removed, because it does not vary with time:

$$\Delta u_t = \Delta ci + \Delta e_i$$

$$u_{it} - u_{it-1} = (c_i - c_i) + (e_{it} - e_{it-1}) = e_{it} - e_{it-1}$$

The first-differenced lagged dependent variable is instrumented with its past levels to cope with the second problem.

5. Econometric results

We consider four cases in our model: first, workers flows within the European Union; second, workers flows between the "old" and "new" European Union's members; third, workers flows within the "old" members; fourth, labour flows within the "new" members (for simplicity, we will refer to "old" countries as EU15 and to "new" countries as EU8).

The results obtained from our estimation are interesting. First of all, we can see that network effects constitute a main determinant of migrations. Whatever the considered area,

having people of the same nationality whom are already living in the host country is taken into consideration by migrants. However, the strength of network effects differs from an area to another.

Table 1: Estimation results

	European Union	Between EU15 and EU8	Within EU15	Within EU8
Log $(\Delta T)_{t-1}$	7,19E-08*** (2,62E-10)	3,62E-08*** (1,43E-09)	-2,02E-08 (2,04E-08)	-3,57E-08 (2,87E-07)
Log $[\Delta (W_1/W_2)_{t-1}]$	-208,71*** (0,45)	-110,16*** (0,85)	1360,91 (997,86)	-102,72* (62,53)
Log $[\Delta (GDP_1/GDP_2)_{t-1}]$	56,71*** (3,08)	292,17*** (4,83)	-18763,33* (11433,64)	3970,87 (3942,13)
Log $[\Delta (GDPC_1/GDPC_2)_{t-1}]$	-6472,95*** (15,02)	-5335,34*** (14,94)	12561,94 (8299,09)	-1953,97 (2041,96)
Log $[\Delta (U_1/U_2)_{t-1}]$	-9972,43*** (21,33)	-13437,56*** (20,59)	795,58 (809,05)	-1371,62* (774,66)
Log (D)	0,41** (0,19)	0,56*** (0,22)	-0,62* (0,36)	-0,93* (0,54)
B	- -	- -	- -	- -
L	- -	- -	- -	- -
Log $(\Delta M)_{t-1}$	0,28*** (0,0001)	0,47*** (0,0001)	0,66*** (0,13)	0,06** (0,02)
No. of observation	**566**	**256**	**227**	**81**

*Note: *, **, *** significant at 10%, 5% and 1% respectively.*
Standard errors between brackets.

Let us focus on the relationship between trade and labour mobility. Results show a positive relationship between labour mobility and trade. That means that labour mobility and trade are complements within the European Union, contrary to Straubhaar's affirmation. And if we consider that same relationship between EU15 and EU8, we obtain the same result. Markusen's analysis seems to be the most relevant in the European Union. Trade liberalization to the new members of the Union is accompanied by a raise of workers migration to west Europe. This is a major finding of our study. While all policy makers admit that labour mobility and trade are substitutes, we show that they are complements. This finding has important implications concerning economic policies. If policy makers want to

reduce unemployment by increasing labour mobility, they should continue openness towards the new European countries. The more the west and the east have trade relations, the more labour mobility will be higher. Therefore, in order to lower unemployment rates in the European Union, labour mobility should be encouraged by increasing trade liberalization between the "old" and the "new" Union's members. During the economic crisis, we know that trade volumes decreased. Since labour mobility and trade are complements, we can expect that the number of workers who will move to work in another country will be fewer. But we have no recent data[7] about labour migration to certify this hypothesis.

However, we do not obtain the same results if labour migration is considered within the EU15 and the EU8. In these two areas, the relationship between labour mobility and trade is negative, and trade and labour mobility are substitutes. Note that in these two cases, the relationship between trade and labour mobility is not significant.

The main problem of this analysis is to determine whether labour mobility causes trade or vice versa. On one hand, it is argued that if workers quit their own countries and live abroad, they are able to create some links and networks with their own countries, so that they create trade movements between the two countries. In the other hand, trade can afford to a country all the goods it does not product, so its workers don't need to migrate to get these goods. In order to determine which analysis seems most relevant, we apply a Granger Causality Test to labour mobility and trade. The latter tests the two following null hypotheses: Labour mobility does not Granger Cause Trade, and Trade does not Granger Cause Labour mobility. Applying this test to the four cases considered previously, we obtain the following results[8]: in the case of the European Union, the two null hypotheses cannot be rejected. It means that labour mobility does not cause trade and that trade does not cause labour mobility. However, our results show that trade does cause labour mobility and that the relationship between them is positive. In the case of labour migration and trade between EU15 and EU8, results show that trade does not cause labour migration but that labour migration causes trade. This result is contrary to the econometric estimation which shows that trade causes significantly labour migration. Concerning the EU15, the Granger Causality Test concludes that trade doesn't cause labour mobility and that labour mobility causes trade. Our estimation shows a non significant relationship between labour mobility and trade. Finally, in the case of

---

[7] Our data stops in 2008.
[8] Detailed results in appendix 2.

the EU8, trade doesn't cause labour mobility but labour mobility causes trade. However, the relationship between these two variables is not significant.

So we can see that is difficult to settle whether labour mobility and trade are complements or substitutes. The nature of the relationship depends on the considered zone. Trade and migration are complements in the European Union taken as whole and between the "old" and the "new" members. But if we consider each country bloc separately, labour mobility and trade within each bloc are substitutes.

Another interesting finding from this study is the relationship between labour migration and distance. Economic theory considers the distance as a cost, so distance and labour migration are negatively correlated. But if we look to our results, we do not have a negative but a positive relationship, contrarily to a classic gravity model. We expected that the more two countries are distant; the less workers are incited to migrate to the other country. This argument seems irrelevant in the case of labour mobility. If we consider the two blocs of European countries (EU15 and EU8), we can easily see that they are distinct in terms of wealth and geography. Since EU15 countries are wealthier than EU8 countries, they seem to be attractive for EU8's workers. And since these two zones are geographically distinct, it seems to be logical that distance is positively correlated to the explained variable, namely labour mobility.

As well as the previous case (the relationship between labour mobility and trade), distance is negatively correlated to labour mobility if we consider labour mobility within the EU15 and within the EU8. This can be explained by the fact that within each bloc, the countries are approximately similar. So, when migrants cannot differentiate between countries, they will choose a country which is relatively close to their own one.

We focus now on the role of economic variables on labour mobility. Theoretically, workers move to a country where salaries are higher than in their home country. That's why we expected that $\alpha_2 > 0$. But if we look to the results, α_2 is negative and the relation between labour mobility and wage gap is statistically significant, except in the case of the EU15 where the relationship is positive but not significant. The problem is that it is illogical to migrate to a

country where the wages are lower. The only explanation I can give is due to the lack of data. The available data gives us information about labour mobility in the receiving country and the origin of workers. But in the European Union, workers mainly come from outside the Union. So, we think that if we considered all the data, we would have obtained a positive relationship between wage gaps and labour mobility. But since the number of observation has been reduced to consider the European Union, the relationship may be ambiguous.

Moreover, labour mobility should be positively correlated with GDP gaps, that is, migrants choose a wealthier country to move into. This supposition seems to be true in the European Union. The relationship between labour mobility and GDP gaps is positive and significant. That means that workers move to a wealthier country. This is particularly true in case of labour mobility between EU15 and EU8. EU15 countries are wealthier than EU8 countries, so workers are likely to move from EU8 to EU15.

Similarly, we expect a positive relation between labour mobility and GDP per capita gap. However, we find a significant negative relationship between them.

Besides, a negative relationship is expected between labour mobility and unemployment rates; workers are likely to move to a country where unemployment rates are lower. Econometric estimation confirms our intuition: the relationship is significantly negative. It seems logical for a worker to migrate to a country where unemployment rate is lower, because the probability to find a job will be higher.

Finally, we did not succeed in estimating our dummy variables for a common language or border because of a non reversal matrix.

6. Conclusion

Our results depend on the available data that we have at our disposal. We have to mention that our results may have been different if more data had been available. However, this should not lessen the significance of our results. We showed that labour mobility and trade are complements within the European Union, contrary to the generally accepted idea. This finding should be taken into consideration when economic policies will be set up. If the aim of the policy makers is to reduce unemployment, openness and trade liberalization should be reinforced in order to raise workers flows between European labour markets. Thus, workers will move from a country where high unemployment rates prevail to a country where

there is a lack of workers. It was acknowledged that trade and labour mobility were substitutes within that European Union, so that trade liberalization should restrict workers flows from the East. By showing that they were complements, trade liberalization should raise workers flows. However, this did not really happen. Labour mobility has risen, but not to a level that justifies politicians' fears, or to a level that permits an adjustment within an OCA. Moreover, since it has been established that labour mobility and trade were complements, we can admit that the contraction of international trade during the economic crisis provoked a fall in migrations levels.

In this paper, we have also shown that network effects constitute a main determinant of labour mobility within the Union. Wealth differences and unemployment rates differences partly explain the worker's decision to migrate. Furthermore, contrary to traditional gravity models, we obtain a positive relationship between labour mobility and distance, which can be explained by labour mobility between eastern and western Europe (two distinct areas in terms of wealth and employment which are geographically distant).

The Monti report (2010) concludes that labour mobility within the Union should be guaranteed and encouraged. That leads us to think that European policy makers who work for an increased integration level of eastern countries will emphasize on the importance of a free labour movement in the Union, despite some declarations from both sides of the Alps.

References

Arellano M., and S. Bond (1991), "Some test specification for panel data: Monte Carlo evidence and an application to employment equations", *Review of Economic Studies*, Blackwell Publishing, vol. 58(2), 277-297, April

Ashcroft B., Coppins B., and R. Raeside (1994), "The regional dimension of take-over activity in the United Kingdom", *Scottish Journal of political Economy*, 41, 163-175

Beckerman W. (1956), "Distance and the pattern of intra European trade", *Review of Economics and statistics*, 38

Brücker B., Alvarez-Plata P. and B. Siliverstovs (2003), "Potential Migration from Central and Eastern Europe into EU-15", DIW, Berlin

Clark W.A.V. (1986), *Human Migration*, Berverly Hills (CA), SAGE Publications

Collins W.J., O'Rourke K.H. and J.G. Williamson (1997), "Were trade and factor mobility substitute in theory", *NBER Working paper*, n° 6059

Crozet M. (2004), "Do Migrants Follow Market Potentials? An Estimation of a New Economic Geography Model", *Journal of Economic Geography*, 4(4)

Delisle P. (2002), « The challenge of labour mobility in an enlarged European union », *Cahiers Européens de Sciences-Po*, n° 2

Gourévitch J.P. (2007), *Les migrations en Europe: les réalités du présent, les défis du futur,* Acropole

Harris J.R., and M.P. Todaro (1970), « Migration, unemployment, and development: A two-sectors analysis », *American Economic Review* 60: 126-142

Heinz F-F., and Ward-Warmedinger M. (2006), "Cross border labour mobility within an enlarged EU", Occasional Paper Series, n°52, BCE, October

Holtz-Eakin D., Newey W., and H.S. Rosen (1988), "Estimating vector autoregressions with panel data, *Econometrica*, 56, 1371-1395

Karemera D., Iwuagwu Ogeludo V., and B. Davis (2000), "A gravity model analysis of international migration to North America", *Applied Economics*, 32, 1745-1755

Kenen P. (1969), "The theory of optimum currency area: an eclectic view", *Monetary problems in the international economy* (Eds Mundell and Swoboda), University of Chicago Press, Chicago, 41-60

Lewis A.W. (1954), *Economic development with unlimited supplies of labour*, Manchester School of Economic and Social Studies, 22: 139-191

Linnemann H. (1966), "An econometric study of international trade flows", North Holland

Markusen J. R. (1983), "Factor Movements and Commodity Trade as Complements" *Journal of International Economics*, 14(3-4): 341-356

Massey D.S., Arango J., Hugo G, Kouaouci A., Pellegrino A, and J.E. Taylor (1993), "Theories of international migration: A review and Appraisal", *Population and Development Review*, Volume 19, Issue 3 (September), 431-466

Massey D.S. (2001), Migration, Theory of, [in:] *International Encyclopaedia of the Social and Behavioural Sciences*, Elsevier: 9828-9834

Mayda A.M. (2007), "International migration: a panel data analysis of the determinants of bilateral flows", Discussion Paper n° 6289, CEPR

Mazier J., Oudinet J. et Saglio S. (2002), « La flexibilité des prix relatifs et la mobilité du travail en Union Monétaire: une comparaison Europe – Etats-Unis », *Revue de l'OFCE*, Observatoire Français des conjonctures Economiques, Paris, Octobre

Mc Kinnon R. (1963), "Optimum currency area", *The American Economic Review*, n° 53, 717-725

Monti M. (2010), *« Une nouvelle stratégie pour le marché unique, Au service de l'économie et de la société européennes »*, Rapport au président de la commission européenne J.M. Barroso, 9 Mai

Mouhoud E.M. et Oudinet J. (2004), « Les déterminants des migrations dans l'Union Européenne : une prime aux effets de réseaux », *Revue Française des Affaires Sociales*, numéro 2, avril-juin, 58ème année, La documentation française, pp 87-108

Mundell R. (1957), "International trade and factor mobility", *American Economic Review*, n°57

Mundell R. (1961), "A theory of optimum currency areas", *American Economic Review*, Vol. 51, n° 4, 657-665

Portes R. and H. Rey (2000), "The determinants of cross border equity flows: the geography of information", *NBER Working paper*, n° 7336

Portes R., Rey H., and Y. Oh (2001), "Information and capital flows: the determinants of transaction in financial assets", *European Economic Review*, 45, 783-796

Ranis G. and J.C.H. Fei (1961), « A theory of economic development », *American Economic Review* 51: 533-565

SOPEMI (2010), Système d'observation permanent des migrations internationales, *Perspectives des migrations internationales*, OCDE

SOPEMI (2006), Système d'observation permanent des migrations internationales, *Perspectives des migrations internationales*, OCDE

Straubhaar T. (2001), *"Migrations policies and EU Enlargement, East-West migration: Will it be a problem?"*, Intereconomics, July/August

Tinbergen J. (1962), "Shaping the world economy: suggestions for an international economic policy", Twentieth Century Fund, New York, 1962

Todaro J.M. (1976), *Internal migration in developing countries*, Geneva: International Labor Office

UN (1997), World population monitoring, New York

Zlotnik H. (1998), *The theories of international migration*, Conference on international migration: Challenges for European populations, 25-27 June, Bari

Appendix 1: List of countries included in the estimation

Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italia, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom.

Appendix 2: Granger Causality Tests

Area	Null Hypothesis	F-Statistic	Prob
European Union	Labour mobility does not Granger cause Trade	0,68796	0,5029
	Trade does not Granger cause Labour mobility	0,77911	0,4592
Between EU 15 and EU 8	Labour mobility does not Granger cause Trade	5,19611	0,0060
	Trade does not Granger cause Labour mobility	1,94737	0,1443
EU 15	Labour mobility does not Granger cause Trade	10,9740	0,00002
	Trade does not Granger cause Labour mobility	1,61355	0,2007
EU 8	Labour mobility does not Granger cause Trade	3,67374	0,03
	Trade does not Granger cause Labour mobility	0,17537	0,8395