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Migration and unemployment duration in OECD countries: A dynamic panel analysis

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Abstract

This paper examines whether immigration has a positive influence on the duration of unemployment from a macroeconomic perspective. The integration of immigrants into the labor market is a recurrent topic in literature on the economic consequences of immigration, and it is a central concern to policy makers. However, to our knowledge, few researchers have studied the impact of immigration on the duration of unemployment. By using panel estimations (OLS and GMM), we show that migration seems to influence short–term unemployment positively and long-term unemployment negatively for 14 OECD destination countries.

1. Introduction

Over the last years, economists have analyzed the effects of migration, especially with regard to unemployment, on the labor market in developed countries. The results of these studies show that the impact of immigration on the labor market is limited and that the impact differs from one country to another. The economic impact of immigration will vary by time and place, and it can either be beneficial or harmful (Borjas, 1994). The effect of immigration on unemployment may depend upon on institutional frameworks (Angrist and Kugler, 2003; Jean and Jiménez, 2007). Longhi et al. (2010) show that the impact of immigration on employment is more pronounced in Europe than it is in the United States. This conclusion can be explained partly by the fact that European local labor markets are less open and flexible than those in the United States. The structural and institutional factors, including structural unemployment (Layard and Nickell, 1999), are therefore important elements to consider. For example, an increase in unemployment insurance may lengthen the duration of unemployment. Baicker, Goldin, and Katz (1998) and Juhn, Murphy, and Topel (1991) are among the first researchers to note that the duration of unemployment has increased.

However, few studies consider the importance of these factors when analyzing the relationship between immigration and the labor market (Okkerse, 2008). Nevertheless, migration can influence local labor market conditions—especially unemployment duration. The length of time in which an individual remains unemployed depends both on the rate at which he receives offers of employment and the extent to which such offers are accepted (Nickell, 1980). Local economic performance and the lack of adequate jobs in the economy may be other important factors that affect unemployment duration. The rate at which immigrant workers are integrated into the labor market can influence job search activities and the overall length of time for all workers who are seeking employment in the host country. Do migrations lead to longer unemployment spells?

The length of time that immigrants must wait to find a new job in an unknown labor market can affect the duration of unemployment in developed countries. On the other hand, immigrants may integrate quickly into the labor market by taking available jobs or by taking jobs that native workers will not accept. At the same time, migration may depend on the degree of labor market integration. As described above, labor market integration is defined in terms of employment. This paper contributes to the empirical literature by analyzing the impact of migration on unemployment duration in OECD countries.

To our knowledge, few researchers have studied the impact of immigration on unemployment duration. Zweimüller and Winter-Ebmer (1998) showed that there was a significant increase in the length of unemployment among male blue-collar workers in the Austrian manufacturing sector from 1989-92 as a result of increased immigration. Arntz and Wilke (2009) apply a semi-parametric duration model to Germany migration to show that changes in the unemployment compensation system, rather than local employment policies or administrative restructuring efforts, shorten unemployment duration. Moreover, the integration of immigrants into the labor market is a recurrent theme in literature that analyzes

the economic consequences of immigration (see for example, Gross (2002), Damette and Fromentin (2012)), and the debate about the economic effects of immigration has attracted renewed interest.

The present study aims to fill this gap in the literature by investigating the impact of migration (and structural macroeconomic variables) on unemployment duration in developed countries. Long-term unemployment is a well-known problem in European labor markets. However, in recent years, the U.S. has also faced increased long-term unemployment (Aaronson et al. (2010)). Although the current situation in the European Union has improved slightly, long-term unemployment is 41% and still substantially higher than in the U.S. Therefore, it is crucial to better understand the factors that influence the duration of unemployment. This topic is of central importance to those policy makers aiming to design policies (taking immigration into account) that will shorten the average unemployment duration. We study whether immigration has a positive influence on the duration of unemployment in a macroeconomic perspective.

With econometric models, we find evidence of an impact of migration on unemployment duration. In particular, migration seems to have influenced short-term unemployment positively and long-term unemployment negatively in 14 OECD destination countries between 1975 and 2008. We utilize two panel estimations (OLS and GMM) to test the robustness of the results.

The paper is organized as follows: Section 2 outlines the empirical model and the data. Section 3 presents and discusses the results. Section 4 provides a conclusion.

2. Empirical Model, Data and Methodology

2.1. Econometric modeling and data

The purpose of this paper is to analyze the effects of migration on unemployment duration (with the equation (1)). The dynamics of unemployment duration adjustment in the labor market, such as bargaining considerations, can be captured by introducing lagged variables in the function. Labor market adjustments are not immediate (Dustmann et al., 2008). We include lagged values of *migr, business cycle, wages* and *pty* to account for a time lag between this variable and its effect on unemployment duration. A dynamic panel data model is considered that includes unrestricted lag structures to model the slow adjustment (for more details, see Baltagi (2008) and Lachenmaier and Rottmann (2011)). The general framework used for analysis is the following models:

$$duration_{i,t,d} = \beta_1 duration_{i,t-1,d} + \beta_2 migr_{i,t} + \beta_3 migr_{i,t-1} + \beta_4 cycle_{i,t} + \beta_5 cycle_{i,t-1} + \beta_6 wages_{i,t} + \beta_7 wages_{i,t-1} + \beta_8 pty_{i,t} + \beta_9 pty_{i,t-1} + \beta_{10} repla_{i,t} + \beta_{11} notice_{i,t} + \gamma_i + \varepsilon_{i,t}$$

In the equation (1), $\varepsilon_{i,t} \sim i.i.d(0, \sigma_\varepsilon^2)$. Let i be the subscript over countries, let t be annual time and let d be process time (d represents five time intervals). γ_i is an unobserved country-specific time-invariant effect, which may be correlated with the variables but not with the $\varepsilon_{i,t}$.

The variable *duration* is interpreted as the unemployment duration (< 1 month; between 1 and 3 months; between 3 and 6 months; between 6 months and 1 year; > 1 year). This dataset contains annual labor market statistics on the share of the five durations of unemployment among total unemployment. The variable *duration* is expressed as a percentage.

The variable *migr* is represented by the net migration rate (the difference between immigrants and emigrants for a country) per 1000 inhabitants. *gdp* is represented by per capita GDP, current prices are measured in purchasing power parity (PPP) and by the business cycle (*cycle*) that is the per capita GDP (measured in Purchasing Power Parity (PPP)) de-trended by the Hodrick–Prescott (HP) filter with smoothing parameter λ=100. *wages* are expressed as the real hourly compensation in manufacturing that is deflated by the consumer price index (CPI). p*ty* is interpreted as the productivity output per employed person in manufacturing.

Additionally, we include several control variables: *repla* is represented by the replacement rate, gross replacement rate (year 1), and *notice* is expressed as the advance Notice (maximum in months). We can consider that *repla* and *notice* allow us to appreciate the flexibility of the labor market. Higher replacement rates and advance notice reflecting low flexibility in the labor market increase the level of unemployment, as in Angrist and Kugler (2003) or Weyerbrock (1995). We also hypothesize that these structural variables influence the duration of unemployment. Finally, to consider the differences among OECD countries in terms of local market conditions, we incorporated institutional or structural characteristics with selected variables, including *duration*, *business cycle*, *wages*, *pty*, *repla*, and *notice*.

Our analysis is confined from 1975 to 2008 due to annual data availability. The database consists of 14 OECD countries: Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, the Netherland, Norway, Spain, Sweden, the United Kingdom and the United States. Our empirical implementation uses a panel data set for up to 14 OECD countries from 1975 to 2008.

2.2. OLS and GMM estimations

Concerning the methodology, we begin by using linear regressions estimated via Panel Ordinary Least Squares (Panel OLS) to examine the effects of migration on unemployment duration. As discussed in Brücker and Siliverstovs (2006), differences in estimation methodologies can lead to widely divergent estimates of the migration models' parameters. Therefore, for each specification, we adopt Fixed Effects (FE) and Random Effects (RE) to treat the country-specific effects in the data. We test the validity of the FE treatment through Cross-section F. In the model with the fixed-effects panel data, the distribution of the individual effect is left unrestricted and allowed to be correlated with the explanatory variables. The conditional distribution of the individual effects does not play any role in

identifying the parameters of interest. We also test whether the random effects are uncorrelated with the explanatory variables with the Hausman Test (for discussion see, Baltagi (2005)). OLS estimation of a dynamic model, however, can lead to biased results in the presence of unobserved heterogeneity (Baltagi, 2008 for more details).

We complete the estimation of the model with the generalized method of moments (GMM) estimator because the Panel OLS estimation of this dynamic model can lead to biased coefficient estimates in the presence of unobserved heterogeneity. This simultaneity bias can be corrected by applying GMM estimation. In a dynamic specification, the correlation of the lagged dependent variable with the error term implies an endogeneity problem. The use of instruments is required to manage the possible endogeneity of the explanatory variables and the correlation between the error term and the lagged dependent variable. To address simultaneity bias in the OECD panel and the problem of correlation, we use various GMM-based techniques (Arellano and Bond, 1991; Blundell and Bond, 1998) and exploit the time dimension of the data to construct instruments. In the GMM difference estimator, the instrument matrix includes previous level values of the lagged differenced dependent variable. The GMM system estimator extends the model through the additional consideration of the original equation in levels, instrumented by their own differences. This estimator behaves better than the GMM difference estimator (especially if cross-section variability dominates time variability and if there is a strong persistence in the investigated time series). We applied the Sargan test of over-identifying restrictions, suggesting whether our instrumentation strategy is legitimate. This test checks the validity of the additional instruments. Arellano and Bond (1991) show that the instruments are only valid in GMM estimation in the case of no autocorrelation of $\varepsilon_{i,t}$.

3. Results and Discussion

3.1. Panel OLS and GMM results

First, before estimating equation (1), the order of integration of the variables must be determined by using panel unit root tests. Because we are dealing with time series variables over a relatively long period (38 years), nonstationarity of variables is a real possibility and a strict GMM approach will be inappropriate if the dependent variable is found to be nonstationary (Das and Biru Paksha, 2011). Four usual panel unit root tests are implemented: Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), Maddala and Wu (ADF Fisher) and PP-Fisher Test. Table 1 displays the results and shows that the null hypothesis of unit root for all variables was rejected.

Table 1: Panel unit root tests results

	LLC	IPS	ADF-Fisher	PP-Fisher
UD < 1 month	-2.486***	-2.551***	55.719***	39.915*
UD 1 - 3 months	-2.987***	-1.973**	40.77**	38.146*
UD 3 - 6 months	-3.741***	-3.719***	63.097***	693671***
UD 6 months - 1 year	-4.756***	-5.375***	82.06***	62.30***
UD > 1 year	-1.362*	-2.068**	45.575**	37.352***

Notes: *,** and *** : significant at the 10%, 5% and 1% level.

Second, we estimate the model with Panel OLS and GMM methodology to study the impact of migration on unemployment duration in developed countries between 1975 and 2008 with a dynamic approach. The results are presented in Table 2.

In this section, we report the estimates from the different models described in the previous section. Table 2 presents the estimates from equation (1), where the unemployment duration (< 1 month; 1-3 months; 3-6 months; 6 months-1 year; > 1 year) is the dependent variable. We retain three different methods of estimating: Panel OLS FE, Panel OLS RE, GMM difference and GMM system estimations.

The short-term unemployment (< 1 month; 1-3 months) is positively influenced by migration and business cycle. The length of time that an immigrant must wait to find a new job in an unknown labor market does not seem to have a negative affect on the labor market of the host country. On the contrary, migration seems to favor short-term unemployment. Immigrants seemingly integrate quickly into the labor market by taking available jobs or the jobs that are left unfilled by native workers. This transitory effect could partly be explained by the lack of local human capital in the developed countries. Foreign workers can fill labor and/or skill shortages (European Commission (2006)). These results are consistent with those of Chiswick (1978, 1980). Immigrants adapt quite rapidly and quite well to the labor market. In addition, the business cycle has a positive influence on short-term unemployment. This fact is consistent with the economic theory. The results also show a negative relationship between productivity and short-term unemployment. Advances in technology seem to destroy jobs and reduce short-term unemployment. The jobs cannot be replaced because productivity is already too high and too quick (see for example, Blanchard et al. (1995), Pissarides and Vallanti (2007)). Note also that higher replacement rates reduce short-term unemployment.

For the unemployment durations of 3-6 months and 6 months-1 year, migration seems to negatively influence the dependent variable. The negative relationship between migration and unemployment duration shows that immigrants do not increase the level of medium-term unemployment in their host countries. Again, the lagged variable shows significantly positive effects, and it is possible that newcomers may unexpectedly take some time to find work, reinforcing the notion of 'wait unemployment' (Burda, 1988). The relationship between business cycle and unemployment duration is negative in the two cases, and it seems consistent that the business cycle tends to reduce medium-term unemployment. The structural variables (*repla* and *notice*) also influence the duration of unemployment.

We observe a negative relationship between migration and long-term unemployment. The lag of migration only shows a slightly negative effect on unemployment duration. The results lead to the conclusion that migration takes some time to affect unemployment. The transition of immigrants into a new labor market is a gradual process. The dynamics of this process come from immigrants' occupational mobility and from adjustments by local production factors. Moreover, it is possible that employers may underestimate the skill level of immigrants because they do not accept immigrants' diplomas, language barriers that impede proper communication or a possible inability to adapt rapidly to the host country's labor market.

This result is coherent with previous findings. Immigrants integrate quickly into the labor market and reduce long-term unemployment. Migration seems to help reduce long-term unemployment. The negative effect of immigration on long-term unemployment is consistent with Simon (1989) and Altonji and Card (1991). In addition to occupying jobs, immigrants create jobs through their demand for goods and services. Additionally, the variation of the productivity has a positive impact on unemployment duration.

Diagnostic tests such as the Sargan test of overidentifying restrictions (overall validity of the GMM instruments) and the Lagrange Multiplier (LM) test support the validity of our estimations for first and second order serial correlation. The Sargan test does not reject our instruments, and the AR(2) test does not reject the null hypothesis of no second-order serial correlation (or where the significance is low).

3.2. Discussion

The OLS and GMM estimations show that a statistical connection existed between migration and unemployment duration in OECD countries from 1975 to 2008. Several factors help explain why immigration does not seem to contribute to increased long-term unemployment.

Immigrants and native workers are generally complementary inputs on the labor market (Okkerse, 2008), and it seems likely that the characteristics of immigrants are different than those of a national labor force. This result could be explained by the lack of local human capital or by the real or perceived shortage of skilled labor, particularly in European countries (European Commission (2006)). Immigrant workers tend to fill trades or occupations that are not filled by native workers especially in the catering, construction and maintenance sectors. Immigrants occupied jobs abandoned by national workers. Therefore, the complementary nature of immigrant and low-skilled native workers could be explained by the segmentation of the labor market (Piore, 1979; Gilles-Saint Paul, 2009).

Moreover, the immigrant labor force is more flexible and mobile, and it can be considered a "variable of adjustment" because immigrant workers tend to respond better than native workers to the changes that may be imposed in a particular economic climate, such as accepting contracts that do not provide much worker protection, accepting jobs that native workers will not take and maintaining the flexibility to work in new sectors or geographic areas. High-skilled immigrants may be willing to accept low-paid jobs in a labor market with a relatively high unemployment rate.

These factors also explain how the effect of immigration on unemployment duration appears to be relatively common in all countries, although migration policies and the origin of immigrants vary among countries. In fact, the Anglo-Saxon countries (Australia, Canada and the United States) aim to attract qualified people, while the European countries seek foreign labor to fill relatively low-skilled jobs. Each migration policy was implemented between 1975 and 2008 due to the economic conditions and the diversification of destination countries (OECD, 2011). Some countries adopted more restrictive attitudes towards the entry of foreigner workers; others had tightened requirements for family reunification procedures.

Table 2: Migration and unemployment duration (Dependent variable: Unemployment duration; Panel OLS with Fixed Effects (FE) and Random Effects (RE)) and GMM regressions

Dependent variable: Unemployment duration

	< 1 month				1 - 3 months				3 - 6 months				6 months - 1 year				> 1 year			
	Panel OLS		GMM		Panel OLS		GMM		Panel OLS		GMM		Panel OLS		GMM		Panel OLS		GMM	
	FE	RE	Diff.	Syst.	FE	RE	Diff.	Syst.	FE	RE	Diff.	Syst.	FE	RE	Diff.	Syst.	FE	RE	Diff.	Syst.
DURATION(-1)	0.819***	0.966***	0.67***	0.9634***	0.73***	0.95***	0.50***	0.9389***	0.58***	0.78***	0.54***	0.7947***	0.56***	0.81***	0.57***	0.8067***	0.76***	0.95***	0.63***	0.9495***
MIGR	0.193**	0.206*	0.19*	0.1450	0.043	0.017	-0.03	-0.0162	-0.072	-0.204*	-0.20	-0.2153*	-0.16*	-0.20*	-0.13	0.1877***	0.17	0.078	0.12	0.1936
MIGR(-1)	0.021	-0.12	0.027	-0.0467	0.039	0.035	0.28**	0.0655	0.16*	0.226**	0.18	0.2363**	0.17***	0.16	0.19*	0.1416	-0.54***	-0.302*	-0.59***	-0.4034*
PTY	-0.18***	-0.158**	-0.15**	-0.1640	-0.37***	-0.321***	-0.21***	0.2436***	0.004	-0.056	0.09	-0.0403	0.28***	0.11**	0.18***	0.1375***	0.49***	0.42***	0.04	0.2959**
PTY(-1)	0.18***	0.152**	0.09	0.1643	0.42***	0.349***	0.26***	0.2530***	0.026	0.088	-0.04	0.0551	-0.29***	-0.10*	-0.19***	-0.1190***	0.54***	-0.43***	-0.12	-0.3049***
CYCLE	0.0013***	0.0015***	0.0026***	0.0027***	0.0014***	0.0016***	0.001***	0.0020***	0.0014***	0.0012***	0.0014***	0.0014***	-0.0023***	0.0019***	-0.002***	0.0021***	-0.0008	-0.0003	0.0004	-0.0019***
CYCLE(-1)	-0.001***	-0.0015***	-0.0007	-0.0017**	-0.0011***	-0.0017***	0.0004	-0.0008**	0.0015***	0.0012***	0.0019***	0.0014***	0.0021***	0.0019***	-0.0017***	0.0020***	-0.0001	0.0003	-0.003***	-0.0106
WAGES	-0.044	-0.034	-0.03	-0.0539	0.12***	0.12	0.11	0.0436	0.065	0.137	0.08	0.1158	-0.072	-0.025	-0.014	-0.0356	-0.137	-0.22	-0.13	-0.0631
WAGES(-1)	0.077	0.062	0.19**	0.0881	-0.124*	-0.12	-0.11	-0.0365	-0.147**	-0.220***	-0.26***	-0.1665***	0.042	-0.004	-0.015	-0.0134	0.183*	0.19*	0.18*	0.0514
REPLA	-3.52*	-0.653	-4.30	-0.0231	-0.58	0.29	2.93	-0.2081	1.02	1.695**	-2.777	1.2956*	3.08*	1.46*	0.85	1.4938**	1.54	0.15	-3.70	-0.3866
NOTICE	0.29	-0.019	0.66	-0.0258	0.15	-0.042	1.15*	-0.0487	-0.91***	-0.052	-1.52**	-0.033	-0.257	0.039	-0.24	0.0159	0.45	0.045	-1.15	0.0678**
Constant				-2.1633				0.568				6.13***				5.129**				3.235
Adj. R²	0.96	0.94			0.96	0.91			0.78	0.75			0.89	0.73			0.97	0.95		
F-stat.	289***	416.88		8441***	325.45***	261.96***		28454***	39.52***	72.69***		624.66***	91.28***	66.99***		131.89***	386.09***	489.24***		3144.19***
Cross-section F	2.18**				3.71***				2.40***				5.03***				4.91***			
Hausman Test	22.07*				40.49***				29.25***				44.80***				60.08***			
Sargan Test			224.58***	315.24			147.30	216.43			140.65	241.62			155.16	276.13			175.21	280.16
AR(1)			-4.78***	-2.32**			-8.003***	-1.94**			-8.13***	-2.44			-6.94***	-2.71***			-6.58***	-2.72***
AR(2)			-0.84	-1.40			2.02*	1.18			1.87*	1.70*			-0.20	0.1			0.82	0.79

Notes: *, ** and *** are significant at the 10%, 5% et 1% level. The dynamic panel GMM estimations were estimated with Stata (xtabond and xtabond2). Diagnostic tests: Cross-section F for cross-section fixed effects, Hausman Test for the cross-section random effect, Sargan test of over identifying restrictions and Arellano-Bond LM test for autocorrelation of residuals AR(1) and AR(2).

4. Concluding Remarks

In this paper, we have investigated the relationship between migration and the labor market—especially the duration of unemployment—in developed countries between 1975 and 2008.

We utilize several methods of estimation to analyze the impact of migration on unemployment duration and to strengthen the conclusions of this study. Panel OLS estimator and GMM estimator show that migration does not lead to an increase in short-term unemployment and that it even reduces long-term unemployment. Other structural variables (business cycles, productivity, wages, replacement rates and notice) also influence the duration of unemployment. Finally, the study of the relationship between migration and unemployment duration (a subject that, to our knowledge, has received little consideration) shows that immigration does not have a negative impact on the labor market of OECD countries. Consequently, we believe that from an overall policy perspective, the decreased admissions rate of migrants observed in OECD countries is not beneficial, and that the desire to reduce migration flows based upon the idea of negative impact of immigration is not justified.

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Appendix: Data sources

Variables	Data sources
duration	OECD
migr	OECD International Migration Statistics
gdp	OECD
wages	US Department of Labor, Bureau of Labor Statistics
pty	US Department of Labor, Bureau of Labor Statistics
repla	IMF project and Fondazione Rodolfo DeBenedetti (fRDB) described in Aleksynska and Schindler (2011)
notice	International Monetary Fund, Labor Market Institutions in Advanced and Developing Countries: A New Panel Database, WP 11/154