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Three Million Foreigners, Three Million Unemployed? Immigration and the French Labor Market

Prepared by Dominique M. Gross[1]

Authorized for distribution by Roland Daumont

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Abstract

This paper investigates the effects of the flows of immigrant workers on the French labor market between the mid-1970s and mid-1990s. Using a system of equations for unemployment, labor-force participation, the real wage, and the immigration rate, it is shown that, in the long run, legal and amnestied immigrant workers, and their families, lower the unemployment rate permanently. In the short run, the arrival of immigrants increases unemployment slightly with an impact similar to that of an increase in domestic labor-force participation. The composition of immigration flows matters, and the proportion of skilled and less-skilled workers should remain balanced.

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Author's E-Mail Address: dgross@imf.org

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Contents Page

I. Introduction

In March 1996, an estimated 2.8 million foreigners age 15 and older were living in France. In the same year, an average of 3.15 million people were unemployed. These two separate observations have led some to conclude that immigrants are directly responsible for the high unemployment level in the country. The aim of this paper is to investigate whether such conclusion is supported in a careful analysis of the French labor market. Specifically, we are interested in investigating whether the magnitude and characteristics of immigration flows bear some responsibility in the ever-increasing rate of unemployment in France from the mid-1970s to the mid-1990s.

Recently, as the flow of immigrants grew larger to most Western countries, the interaction between newcomers and the domestic labor market became the subject of much speculation. Economic theory and empirical evidence do not provide definite answers to the impact of the arrival of migrants on local labor markets. Whether unemployment increases, depends on the flexibility of wages; on the degree of substitutability or complementarity of native-born and immigrant workers, that is whether immigrants displace existing workers or stimulate job creation; on the mobility of the domestic labor force which may decide to leave areas of dense immigration; and on the extent to which immigrants' demand for goods and services generate more jobs than they themselves occupy. Studies of the wage behavior of native-born workers such as Lalonde and Topel (1991) and Borjas (1990) find that immigrants have a small negative effect on the wage of native-born workers. Altonji and Card (1991), however, find an equally small positive effect suggesting the two types of workers are complements rather than substitutes.[2] Estimating directly elasticities of substitution in production, Greenwood et al. (1997) show there is a small substitution effect between native-born and immigrant workers, and only in the unskilled category. Recent studies on the impact of immigrants on the local labor force in major US metropolitan areas, reject the hypothesis that substitution exists between internal and international migrations (Butcher and Card, 1991, Wright et al., 1997); and between immigrants and local labor force participation (Borjas, 1990). Finally, studies of the aggregate relationship between immigration and unemployment overwhelmingly reject the hypothesis of an adverse effect. For examples, Marr and Siklos (1994) and Withers and Pope (1993) have found that immigrants to Canada and to Australia do not increase unemployment. And Gross (1998) finds a negative relationship between unemployment and immigration in the long run and a positive, but small, correlation in the short run in a regional market such as British Columbia. Overall, whether within a macroeconomic or a microeconomic framework, at the country or the regional level, there is no compelling evidence to support a significant adverse effect from the arrival of immigrants on the local labor market. All these studies, however, focus on countries with historically well-established immigration policies, such as Australia, Canada, and the United States.

The interaction between immigration and the labor market in a European country, and France in particular, is of particular interest for two reasons. First, France's immigration policy is rather distinct from that of the countries covered in the literature and from that of its

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[2] Borjas (1994) and OECD (1994) provide complete surveys of the literature.

European counterparts. In effect, the immigration policy has often been a tool for foreign policy in addition to its economic aim (Weil, 1994). Consequently, the flow of immigrants has varied widely over time and not always countercyclically as it is often the case in other countries. Second, during the past 20 years, the French labor market has been deteriorating continuously, and unemployment has shown few signs of receding, feeding speculation about the correlation between immigration and unemployment.

This paper investigates the joint behavior of immigration and labor-market indicators, such as unemployment, real wages, and local labor-force participation. Particular attention is paid to the role of the size of the flows and some of their characteristics such as immigrants' regions of origin and whether immigrants entered the country with a working permit or were legalized under an amnesty. In using the econometric methodology developed in Johansen (1995) and Johansen and Juselius (1994) we are able to estimate a system of non-stationary time-series and also to distinguish between the short- and long-run impacts of immigration on the labor market. Therefore, the methodology allows for a general equilibrium approach to immigration and the labor market and takes into account the statistical properties of the time series and their dynamics.

The results show that in a small general equilibrium framework with four equations, immigration flows and unemployment are negatively related in the long run. Hence, unemployment declines permanently with immigration, suggesting that the demand for goods and services by immigrants creates more jobs than they occupy. Moreover, the results hold whether immigrant workers enter France with a work permit or receive an amnesty and the permanent unemployment reduction is reinforced by the presence of workers' families. Still however, the total effect on unemployment remains very small. In the short run, the distribution of regions of origin of immigrant workers matters for unemployment rather than the actual size of the flow. In particular, balanced shares of regions of origin correspond to balanced shares of various skill levels which through complementarity maintain unemployment at a lower level. Thus, the overall picture that emerges from this more general equilibrium approach to immigration and the labor market is that immigration flows cannot be held responsible for the substantial increase in unemployment in France.

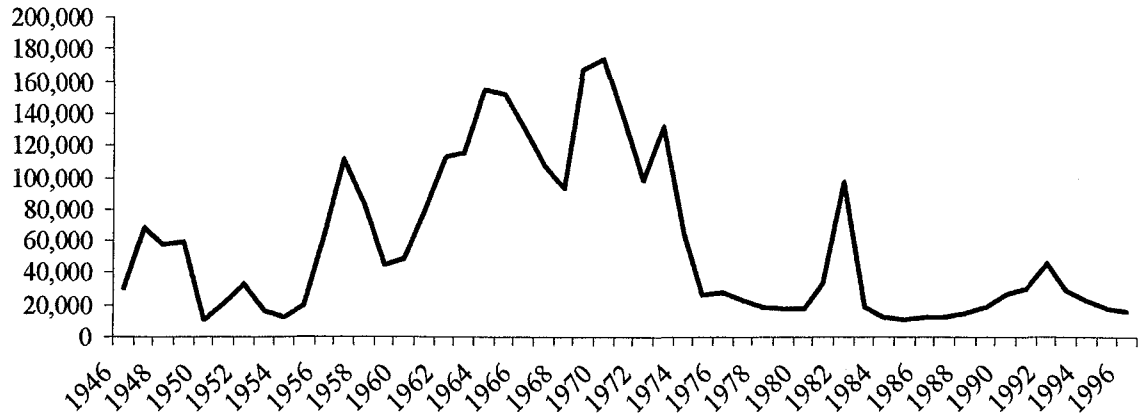
The paper is organized as follows: The next section briefly surveys immigration facts and policies in France from the mid-1970s to the mid-1990s. Section III presents the theoretical framework which supports the empirical investigation. In section IV, the long- and short-run results are discussed, and section V concludes with some policy considerations.

II. Immigration to France Since the 1970s

Informally since the 19th century and formally since 1945, when immigration rules became defined in the *code des nationalités*, France has been a country of permanent immigration for economic and demographic reasons. By accepting immigrants for demographic reasons, France is an exception among European countries and its policy is close

to those in such countries as Canada, the United States or Australia.[3] However, France also uses immigration policy as a foreign policy tool and general amnesties for illegal immigrants regularly implemented by successive French governments are an integral part of immigration policy.[4] Between 1948 and 1981, 60% of all active new immigrants received amnesty and were legalized (FMSANS, 1984, p. 559); more recent major amnesties occurred in 1968, 1974, 1981 and 1995. Usually, immigration flows fall drastically during and after amnesty periods. As a consequence, immigration flows fluctuated widely throughout the period covered in this study (see Figure 1), and these fluctuations can be mostly explained by institutional factors.

Figure 1. The Flow of Immigrant Workers to France



Since the introduction of the *code des nationalités,* the annual number of accepted immigrant workers has fluctuated between a maximum of 175,000 newcomers in 1970, and as few as 9,700 in 1985. Immediately after the government granted the amnesty of 1974, it began to enact tougher legislation to better control the flow of immigrants. Yet, by July 1981, it was apparent that the legislation had been ineffective as the government introduced another amnesty to reduce the number of illegal immigrant *workers.* Two years later, approximately

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[3] Other European countries, such as Germany and Switzerland have designed immigration rules suited strictly to their economic needs primarily by allowing the immigration of foreign workers during expansions and revoking their work permits during recessions (see, for example, Zimmermann, 1996, for details).

[4] As the French Ministry of Social Affairs and National Solidarity states: "Although described as an exceptional procedure, legalization has long been one of the three ways in which regulated foreigners can enter the French labor market, the other two being 'introduction' via the National Immigration Office (ONI) and 'admission to work' for foreigners legally resident in France." FMSANS (1984), p.559.

123,600 employed workers had obtained a legal status (Hollifield, 1986).[5] Restrictions on new immigration were in place as amnesty cases were processed and for a few years thereafter. Consequently, the average annual number of immigrant workers during the second part of the decade stood at 11,700, approximately one-third of what it was between 1980 and 1984 (see Table 1).

Table 1. Average Annual Inflow of Immigrants and Unemployment: 1975–94

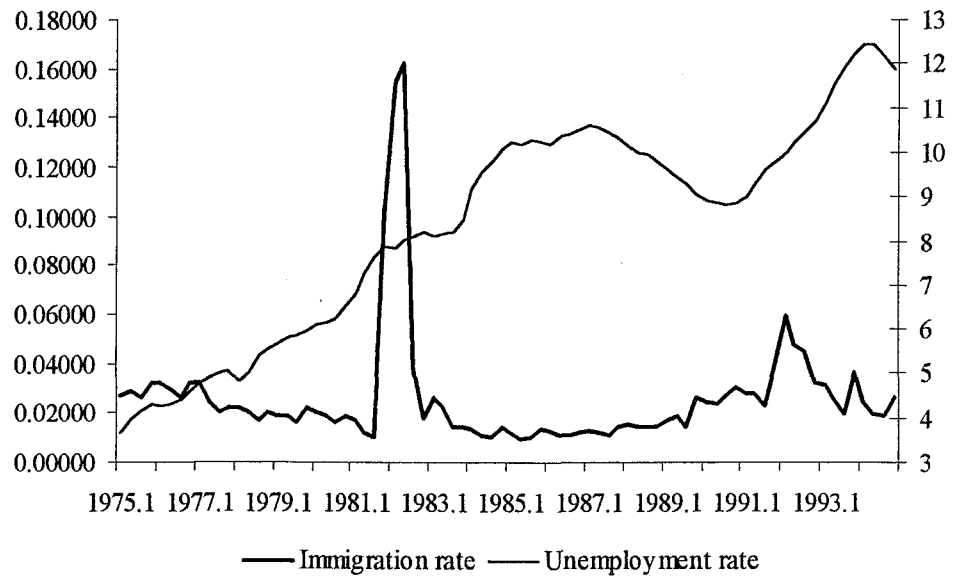
	Immigrant workers	**Immigrant families**	**Unemployment level** (millions)	**Unemployment rate** (in percent)
1975-79	22,209	48,190	1,119	4.9
1980-84	34,018	44,257	1,887	7.9
1985-89	11,718	30,079	2,466	10.1
1990-94	26,598	31,664	2,642	10.5

By the end of the 1980s, immigration policy had seemed to relax again; by the early 1990s, the flows had grown to an annual average of 26,500. One can speculate that the flow of illegal workers followed a similar pattern through time, since another amnesty program was implemented in 1995 (OECD, 1997, Part II). This general pattern of growing flows followed by sharp drops is typical of French immigration pattern as the policy is determined not only by economic considerations but also by political factors.

The conclusion that "immigrants steal jobs" is usually drawn by comparing directly the size of immigrant inflows or immigrant population and some measure of the state of the labor market. Figure 2 illustrates that comparison by presenting the French unemployment rate and immigration rate.

[5] Weil (1994) provides a detailed account of French immigration policy since the early 1970s.

Figure 2. Unemployment and Immigration Rates in France



Clearly, the state of the French labor market has deteriorated steadily since the mid-1970s. Between 1975 and 1994, the unemployment rate increased from an average of 4% to 12.2%, and periods in which immigration flows grew and unemployment increased simultaneously or shortly thereafter can be easily identified. Examples are the 1982-83 and 1989-92 periods. Such apparent correlation, however, does not imply causality, particularly because it does not account for interactions between immigrants and other labor market variables. The remaining sections of this paper provide an in-depth investigation of the joint relationship between immigration and various labor market indicators, first theoretically and then empirically, from the 1970s to the 1990s.

III. Theoretical Framework

This section broadly outlines a simple theoretical framework for analyzing the interaction between the domestic labor market and international immigration. The setup is a standard multi-equation model consisting of a labor demand, a labor supply, and a Phillips curve for wage adjustment (see, for example, Andrews, 1988). It is neoclassical in the sense that employment and labor demand coincide and prices are assumed to be determined exogenously, and thus that perfect competition prevails. Firms maximize profit under the technology constraint, and the demand for labor (n^d) is given by

$$n^d = n^d(w^p - p,\ Z^d) = n \ .$$

Lowercase letters indicate logs, $(w^p - p)$ is the real product wage, and Z^d is a vector of variables other than the real wage which influence firms' decision. Since it is assumed that firms' plans are not frustrated, the dependent variable is also actual employment (n).

The wage determination equation is a simple augmented Phillips curve so that,

$$\dot{w} = h(\dot{p}, u, Z^w) ,$$

where $\dot{p}$ is inflation, u is the unemployment rate, Z^w are other factors influencing wages, and $1>h_1>0$ and $h_2<0$.[6] Labor supply (l^s) is divided into two groups, the domestic supply (l) and new migrant workers (m),

$$l^s = l + m ,$$

and each component is endogenously determined, so that,

$$\begin{aligned} l &= l[w-p, pop, Z^l] , \\ m &= m[w-p, Z^m] . \end{aligned} \qquad \textbf{(4)}$$

Both components depend on the consumption wage ($w - p$) and other factors (Z^l, Z^m). If $l_2=1$, the participation rate given by the difference between the log of the labor force and the log of population (l-pop) becomes the dependent variable. Finally, the model is closed with the definition for the unemployment rate:

$$u = \frac{n - l^s}{l^s} \qquad \textbf{(5)}$$

For the empirical purpose the model can be summarized as follows,

$$\begin{aligned} u &= u[w-p, l, m, z^u] , \\ w-p &= w[u, l, m, z^w] , \\ l &= f[w-p, u, m, z^l] , \\ m &= m[w-p, u, l, z^m] . \end{aligned} \qquad \textbf{(6)}$$

It is a general equilibrium setup consisting of four simultaneously determined equations, and it is assumed to hold in the long term but not necessarily in the short term. In other words, unemployment, the real wage, and the two components of the labor force are endogenously determined in the long term but not necessarily in the short term. The next section defines the empirical strategy for estimating model (6) within a time-series context.

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[6] This formulation is consistent with a Phillips curve in levels whereby $(w - p^e) = k[u, Z^w]$ under the assumption that expected inflation can be proxied by lagged inflation (see, for example, Blanchard and Katz, 1999).

IV. Empirical Implementation

The sample covers the 1974-94 period at the quarterly frequency and thus includes the 1981 amnesty. Before undertaking the empirical analysis some consideration must be given to the role of this amnesty in shaping the immigration flow series.

The operation started in July 1981 and was completed by mid-1983. To be eligible for amnesty, the candidate had to have entered France before January 1981 and to have worked for at least one year. The deadline for application was January 15, 1982. By August 1, 1983, approximately 123,600 workers had obtained a legal status. As a result, and as it is clear in Figure 2, the amnesty created a large spike by recording over a two-year period immigrant workers who had likely entered the country over several previous years.

Rather than consider the amnesty period as a set of outlier observations and introduce corrective dummies in the empirical specification, we decided to exploit available information on the characteristics of the amnestied workers to reconstruct more representative immigration flows. This approach allows for a better understanding of the possibly different implications from the two types of immigrants, those who entered France with a work permit and those whose status was legalized.

Shortly after the completion of the amnesty process, the French government conducted a survey of a sample of the legalized workers (FMSANS, 1984). The results indicate that 40% of the accepted applicants arrived in France in 1980. Also, almost half of them were younger than 26 years of age in 1981 and thus could not have been in the country for very long. In fact, 90% of accepted applicants had entered France at some point after the previous amnesty was granted in 1974. This information is used to distribute the legalized workers throughout the pre-1981 amnesty period.[7] After allocating 40% of the amnestied workers to 1980, we chose two possible scenarios for the remaining 60%. In the first scenario, we distributed them proportionately to legal[8] immigration flows over the 1975-79 period. In the second scenario, we allocated them following a declining rate from 1979 back to 1977. These two series and the series that excludes legalized workers are depicted in Figure 3.

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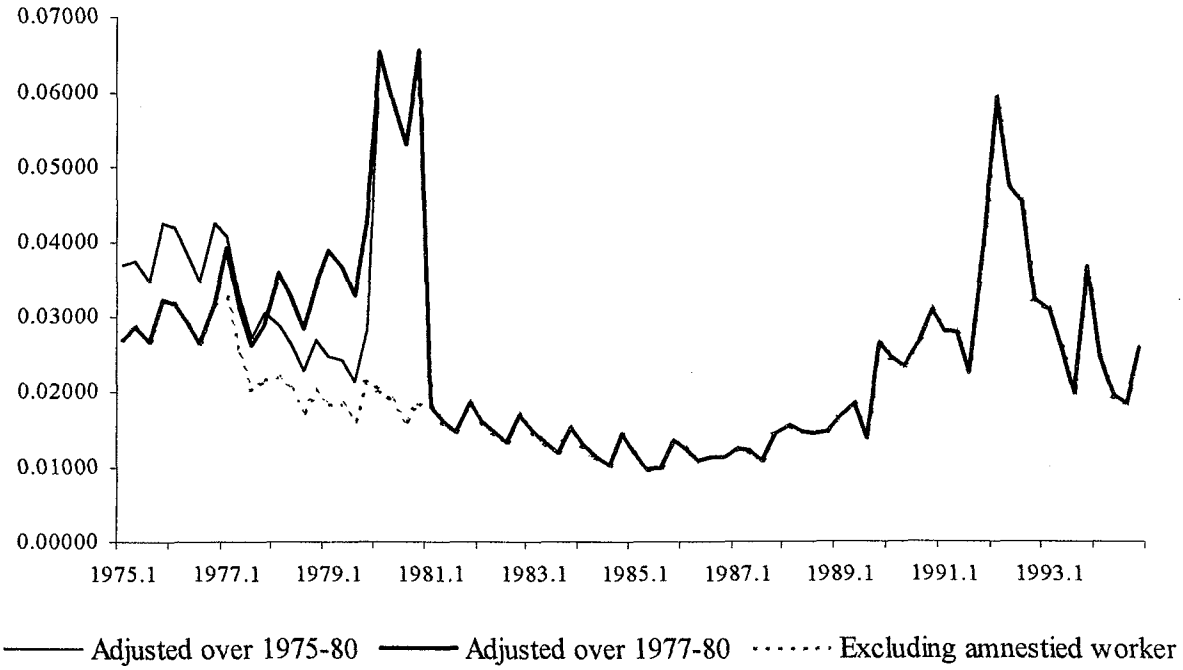
[7] All the variables are defined in detail in the Appendix.

[8] Note that amnestied workers did not necessarily enter France illegally. In fact, only approximately 5% did. Most of them entered with temporary permits such as tourist or student visa (FMSANS, 1984, Table 5).

Figure 3. Immigration Rates in France Under Different Scenarios



Note that the correction not only leads to a smaller peak but also to an earlier peak than in Figure 2, given the amnesty eligibility conditions imposed on applicants.

Since we do not have the actual date on which amnestied workers entered France, we tested the sensitivity of the results to the adjustment procedure by using three alternative immigration variables, the immigration rate for legal workers only (IRLEG) and the immigration rates including the amnestied workers based on each of the two distribution scenarios (IRA and IRB). The other endogenous variables consistent with model (6) are the unemployment rate (UR), the log of labor costs (LLABC) and women's participation rate (WPART). The latter was chosen to capture the domestic labor force because women are the most likely to be in competition for jobs with less skilled immigrants. Moreover, total participation rate has hardly changed over the period.

Before deciding on an empirical strategy, it is necessary to identify whether the endogenous variables are stationary since their degree of integration determines the specification form and the estimation procedure. Thus, Augmented Dickey-Fueller tests have been run independently on each variable and the results are shown in Table 2.

Table 2. Single-Variable Augmented Dickey-Fuller Tests

	I(1)	I(2)
	$\Delta x_t = c + \gamma x_{t-1} + \sum_{j=1}^{n} \beta_j \Delta x_{t-j} + \mu_t$	
	ADF (n = 4)	ADF (n = 4)
Unemployment rate (UR)	-1.69	-2.95**[a]
Legal immigration rate (IRLEG)	-1.83	-4.17**
Immigration rate (IRA)	-2.45	-4.95**[a]
Immigration rate (IRB)	-2.18	-4.57**[a]
Women's participation rate (WPAR)	-2.12	-4.31**
Real labor cost (LRW)	-2.16	-3.25**

H_0: $\gamma = 0$ and there is a unit-root.
** H_0 is rejected at the 5 percent level of statistical significance. The critical values are -2.86 and -1.94, respectively, for the specifications with and without constant (see Davidson and MacKinnon, 1993, Table 20.1, p. 708).
[a] without constant.

All the dependent variables are integrated of order one (i.e., I[1]) and none is I[2]. Therefore, stationarity is achieved by differencing the series once. Non stationarity in levels, however, does not preclude the existence of a long-term relationship consistent with the theoretical framework. In effect, the four endogenous variables may be cointegrated in levels. The appropriate methodology for testing for cointegration in a system is developed in Johansen (1995). To identify the long- and short-run parameters of the model we use an extension of the procedure as presented in Johansen and Juselius (1994). It is a two-step procedure whereby in the first step, cointegration is tested with a modified unconstrained VAR specification for model (6). If the series are cointegrated, one or several long-run relationships exist between the four endogenous variables. The valid relationship(s) is (are) then used as error-correction term(s) in the second step, where the model is specified as a set of simultaneous dynamic structural equations in differences. The results of the second step are thus consistent with the short-run interaction between the flows of immigrant workers and the labor market.

A. First Step: The Long-Run Relationship

The long-run strategy consists of estimating a reparameterized VAR model such that,

$$\Delta X_t = \Pi X_{t-k} + \Gamma_1 \Delta X_{t-1} + \ldots + \Gamma_{k-1} \Delta X_{t-k+1} + \mu + \epsilon_t ,$$

where μ is a vector of deterministic variables (constant and seasonal dummies) and k is the number of lags. Vector X is defined as the unemployment rate, the immigration rate under alternative definitions, the labor-force participation rate of women and the log of real labor cost. The number of lags is set to two years (k=8) to ensure that the residuals are well-

behaved. The two cointegration tests, the maximum eigenvalue and the trace tests, are based on the rank of matrix Π, which identifies the number of significant cointegrating vectors. Note that if matrix Π has full rank, the vector process X_t is stationary.

The model is estimated with three alternative immigration rates, one that excludes the amnestied workers (IRLEG) and therefore includes only workers who entered France with a valid work permit, and two which include amnestied workers according to the adjustment procedures described earlier (IRA and IRB). The results of the cointegration tests and of the cointegration analyses are given in Tables 3.

Table 3. Immigration Rate: Long-Run Model

(A) Without amnestied workers

Cointegration tests

	Maximum eigenvalue[1]		Trace[2]	
	-T.Log(1-μi)	Critical value	-T.ΣLog(1-μi)	Critical value
r≤3	1.128233	6.69	1.128233	6.69
r≤2	9.986465	12.78	10.993698	15.58
r≤1	19.693755	18.96	30.687453	28.44
r = 0	27.363271	24.92	58.050724	45.25

Critical values from Osterwald-Lenum (1992).
[1] *H_0: $r = r_0$ is tested against H_A: $r = r_0+1$.*
[2] *H_0: $r \leq r_0$ is tested against H_A: $r > r_0$.*

Standardized β' eigenvectors

	UR	IRLEG	WPART	LRW
UR	1.00000	76.60219	-.16174	-30.99985
IRLEG	-.00380	1.00000	.04540	-1.66786
WPAR T	.16659	-47.49162	1.00000	-27.15533
LRW	.00002	-3.25858	-.03003	1.00000

(B) With amnestied workers distributed over 1975-1980

Cointegration tests

	Maximum eigenvalue		Trace	
	-T.Log(1-μi)	Critical value	-T.ΣLog(1-μi)	Critical value
r≤3	3.424598	6.69	3.424598	6.69
r≤2	9.961351	12.78	13.385949	15.58
r≤1	15.336931	18.96	28.722880	28.44
r = 0	38.686667	24.92	67.409546	45.25

Standardized β' eigenvectors:

	UR	IRA	WPART	LRW
UR	1.00000	52.48221	-.54179	-11.55982
IRA	.00095	1.00000	-.02512	.64180
WPART	-.16011	9.44755	1.00000	-45.58939
LRW	.01225	-5.08038	-.03423	1.00000

(C) With amnestied workers distributed over 1977-1980

Cointegration tests

	Maximum eigenvalue		Trace	
	-T.Log(1-μi)	Critical value	-T.ΣLog(1-μi)	Critical value
r≤3	5.169242	6.69	5.169242	6.69
r≤2	8.650540	12.78	13.819782	15.58
r≤1	20.481134	18.96	34.300916	28.44
r = 0	32.206140	24.92	66.507056	45.25

Standardized β' eigenvectors

	UR	IRB	WPART	LRW
UR	1.00000	61.02617	-.79252	-4.84903
IRB	.00296	1.00000	-.02369	.58788
WPART	-.43412	11.66937	1.00000	-58.69370
LRW	.02213	-12.09491	-.03354	1.00000

Regardless of how immigration is measured, both the maximum-eigenvalue and the trace tests indicate that there are two valid cointegration vectors. The first one for each measure of the immigration rate is:

$$UR + 76.60*IRLEG - .162*WPART - 31*LLABC = 0 ,$$
$$UR + 52.48*IRA - .542*WPART - 11.56*LLABC = 0 ,$$
$$UR + 61.03*IRB - .793*WPART - 4.85*LLABC = 0 .$$

In all of these long-term relationships, the immigration rate and the unemployment rate are negatively correlated.[9] Thus, when variables are allowed to adjust that is, when wages, participation, unemployment, and immigration are endogenous, immigration flows do not have an adverse effect on the state of the labor market, as measured by the unemployment rate. Note that this result is consistent with the general equilibrium argument developed in Simon (1989) and Altonji and Card (1991), according to which immigrants create jobs in addition to occupying them. Independently of their participation to the labor market, immigrants create jobs from their demand for goods and services, and the net long-run effect is to be determined empirically. In the case of France, there is a permanent net demand effect, as unemployment falls with immigration.

To test for the validity of the demand-effect argument the impact of immigrant workers is compared with the impact of immigrant families. While immigrant workers have a direct interaction with the labor market, their impact on the unemployment rate in the long run is likely to understate the true effect of migration since most of them are later followed by family members. To obtain a more accurate picture of the total effect of immigrants the model is expanded to include the flow of immigrant families (IRFAM). Rather than consider a global immigration measure by adding all the immigrants, we decided to treat families as an additional endogenous variable in model (6). This choice is consistent with the legislation in France. To be eligible for family reunion, workers who file the request must have resided legally in France for at least one year (two years since mid-1993), and they must show proof of steady financial resources as well as adequate lodging for all family members joining them (see OMI for details). Thus, the size of the flow of immigrant *families* is endogenous to earlier flows of immigrant *workers*. Furthermore, when measured independently, the effect of immigrant families on the labor market is expected to be more strongly in favor of net demand than is the effect of workers only. This is so because the take-up job rate for families is usually less than 100% while, by definition, it is 100% for immigrant workers. Consequently, the impact of families on unemployment not only is even more likely to be negative, but it is also expected to be larger than the impact of immigrant workers alone.

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[9] Note that the negative relationship between the unemployment rate and the immigration rate also holds in all of the second valid cointegrating vectors (see Table 3, the second standardized eigenvector for each measure of immigration flow).

The results of the long-run analysis with the added equation for immigrant families are given in Table 4.[10]

Table 4. Immigration of Family Members: Long-Run Model

Cointegration tests

	Maximum eigenvalue		Trace	
	-T.Log(1-μi)	Critical value	-T.ΣLog(1-μi)	Critical value
r≤4	3.035869	6.69	3.035869	6.69
r≤3	16.212031	12.78	19.247900	15.58
r≤2	19.525259	18.96	38.773158	28.44
r≤1	31.433353	24.92	70.206511	45.25
r = 0	52.0304502	30.82	122.511013	65.96

Standardized β' eigenvectors

	UR	IRB	IRFAM	WPART	LRW
UR	1.00000	80.27117	128.09851	0.09597	-22.58077
IRB	.02239	1.00000	.93454	-.02822	.50194
IRFAM	-.00112	-.58678	1.00000	.01650	-.28811
WPART	.25748	-22.25144	12.29325	1.00000	-34.95823
LRW	-.06611	-37.39527	-12.16169	-.06678	1.00000

When immigrant families are added to the model, there are four valid cointegration vectors. For the sake of comparison with the previous results, only the first one is reproduced here:

$$UR + 80.27*IRB + 128*IRFAM + .096*WPART - 22.58*LLABC = 0 .$$

Three points emerge from this last result. First, the negative relationship between workers' immigration and unemployment is robust to the introduction of family immigration.[11] Second, the arrival of immigrant families reduces unemployment as expected and thus reinforces the initial effect of immigrant workers. And third, the effect of families is larger than that of the workers, which is consistent with the lower take-up job rate.

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[10] Since the previous results are very similar for the various definitions for the immigration rate and since normality of the residuals is better achieved with IRB as the adjusted immigration rate, only that measure is used to estimate the impact of families.

[11] Note that as in the previous cases, the second valid cointegrating vector also exhibits negative correlation between unemployment and immigration.

To summarize, the first step of the empirical investigation analyzes the simultaneous relationships between cost of labor, unemployment, labor-force participation, and immigration and is therefore consistent with the long-run adjustment in the market. The results clearly show that immigrant workers do not have an adverse impact on the labor market. In fact, they help lower unemployment permanently. Moreover, evidence from the 1981 amnesty suggests that this result holds whether workers entered France legally or are legalized under an amnesty procedure. Finally, the subsequent arrival of workers' families lowers unemployment even further, primarily because they increase the demand for goods and services. Overall, the evidence consistently suggests that, in the long run, immigrants generate more jobs than they occupy.

In the short run, however, the impact of immigrants upon arrival may be different mainly because some variables may not adjust immediately. The second step of the empirical investigation analyzes the dynamics of adjustment under constraints that are consistent with the underlying framework. In addition to the role of the size of the flow, the role of some of the immigrant workers' characteristics is investigated.

B. Second Step: The Short-Run Relationship

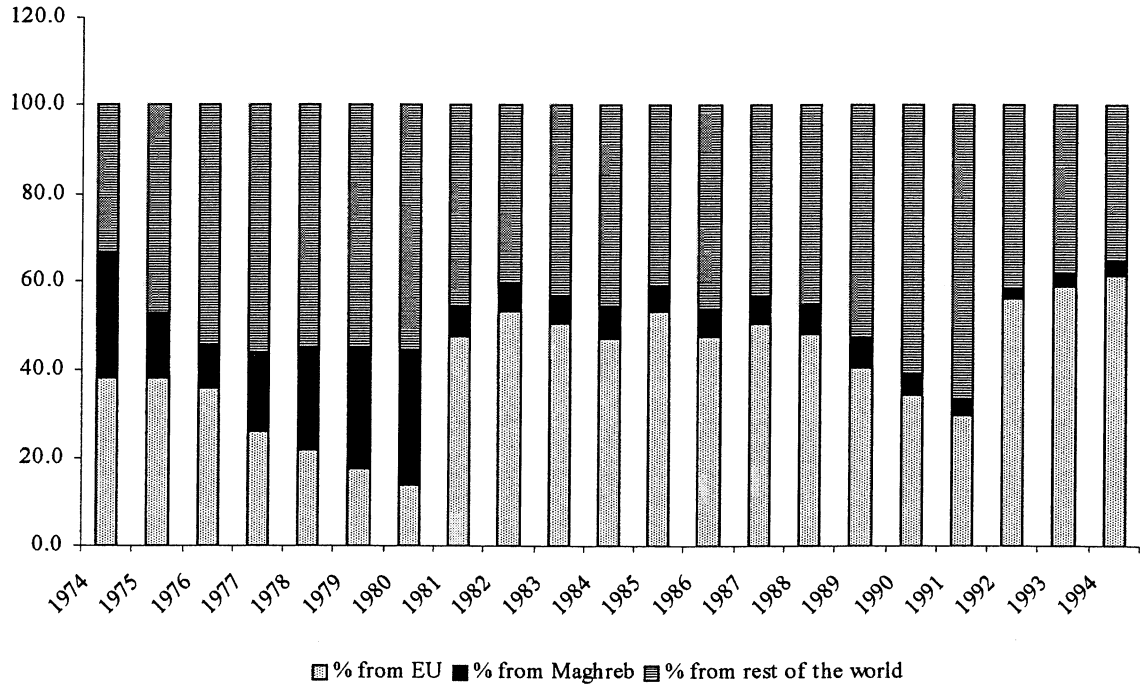
A full structural model cannot be estimated given the rapidly shrinking number of degrees of freedom. Thus, some constraints consistent with the short run must be imposed explicitly. In particular, the model is simplified to include two simultaneously determined equations:

$$\begin{aligned}
\Delta UR_t &= \alpha + \sum_{i=1}^{6} \Delta\beta_i UR_{t-i} + \sum_{i=1}^{6} \Delta\gamma_i LRW_{t-i} + \sum_{j=0}^{4} \delta_j \Delta Z_{t-j} \\
&\quad + \sum_{p=1}^{2} \lambda ecm_{p,\,t-8} + \epsilon_t \,, \\
\Delta LRW_t &= \alpha' + \sum_{i=1}^{6} \Delta\beta'_i LRW_{t-i} + \sum_{i=1}^{6} \Delta\gamma'_i UR_{t-i} + \sum_{j=0}^{4} \delta'_j \Delta Z_{t-j} \\
&\quad + \sum_{p=1}^{2} \lambda' ecm_{p,\,t-8} + \mu_t \,,
\end{aligned} \tag{7}$$

where the two endogenous variables are the unemployment rate and the log of the real labor cost. The two labor-force variables are thus considered to be exogenous in the short run. It is assumed, in particular, that the decision to migrate predates actual entry into the receiving country. Vector Z includes strictly exogenous variables that are likely to have a temporary impact on the aggregate labor market or are representative of immigrant characteristics. In addition to the immigration rate and women's labor-force participation rate, the exogenous variables are the log of energy price (LENERG) for supply shocks and a measure for

immigrant characteristics.[12] The characteristic under consideration is the region of origin, the measure of which is computed as the dispersion of immigrants' regions of origin (ORIGIN).[13] Due to data limitations, only three distinct regions are identified: the European Union (EU), Tunisia, and Morocco (hereafter also referred to as Maghreb), and the rest of the world. These groups are considered quite differently by the immigration legislation. Citizens from the EU enjoyed freer mobility during the whole sample, and citizens from Tunisia and Morocco are from countries with special ties with France.[14] On average, over the sample, 42% of the immigrant worker sare from EU countries, 9% from Tunisia and Morocco and 49% from the rest of the world. Details are given in the upper panel of Figure 4.

Figure 4. Distribution of Immigrant Workers by Region of Origin

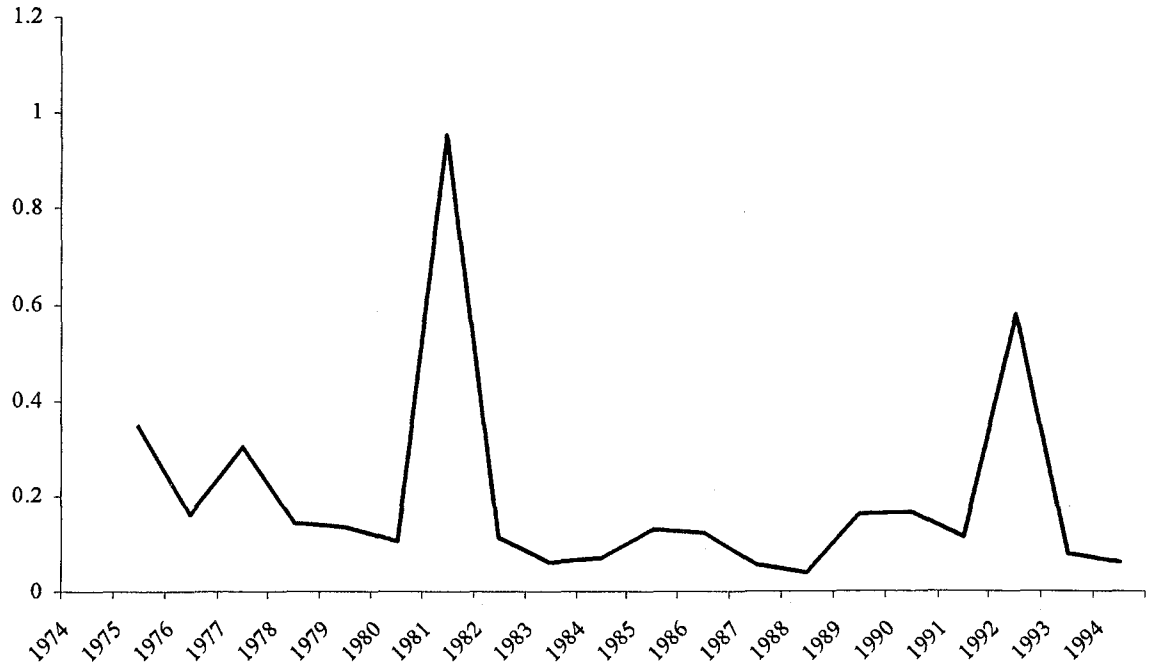


[12] Several measures for business-cycle variations were also tested but they were never significant, presumably because of multicollinearity with the unemployment rate.

[13] The Appendix provides the exact definition.

[14] For most of the sample, Algerian citizens were not submitted to immigration procedures and thus were not recorded (Miller and Martin, 1982, Chapter 4).

Figure 5. Dispersion Index for Region of Origin



More important, however, is the fact that while origin in itself may not be a determining factor, it can be easily related to the distribution of skill levels. As illustrated by Table 5, there is a correlation between the region of origin and skill distribution.

Table 5. Skill Distribution Among Immigrant Workers by Regions of Origin in 1980

	Unskilled[a] (in percent)	Skilled (in percent)
European Union	43.3	56.7
Maghreb	85.5	15.5
Rest of the World	62.4	37.6
Total	78.0	22.0

[a] Unskilled is defined as *manoeuvres* and *ouvriers spécialisés* and skilled as *ouvriers qualifiés ou professionnels* and *cadres et techniciens* (OMI, 1980).

Unskilled workers are overrepresented by workers from Maghreb, and skilled workers are overrepresented by workers from the EU. Thus, an increased dispersion by regions of origin is similar to an increased dispersion by skill representation. Note that a growing imbalance in the shares of regions is reflected by an increase in the measure. The bottom panel of Figure 4 shows the evolution of the dispersion measure. Changes in the dispersion of origins throughout the period are associated with large variations in the relative shares of EU and

Maghreb workers. Thus, variations in the index are indicative of variations in the skill distribution within immigration flows.[15]

Finally, the two *ecm* terms in each equation are the two valid cointegration vectors from the long-run analysis, and their lag is determined by the structure of the VAR model in first step.

The specifications presented in Table 6 are generated under the "general to specific" principle and the final system is estimated by three-stage least squares. Columns 1 and 1' show that the distributed lags for the immigration rates in the unemployment equation and the dispersion of regions of origin in the wage equation are not contributing significantly to the results. The Schwarz criterion declines in both equations when the variables are constrained to have zero coefficients.[16] Consequently, the size of the flow rate is not a determinant of unemployment but its composition is. In effect, the distribution by regions of origin is significant in column 2, with an effect such that a growing dispersion increases unemployment. Since the measure may reflect a change in the skill composition of immigrant workers, this result suggests that a policy of balanced shares of skilled and unskilled workers is better than a policy which tries to favor one end of the distribution over the other one. In the wage equation (column 2'), on the contrary, only the immigration rate is significant and it has a positive sign shich, production theory suggests, is consistent with complementarity between immigrant and domestic workers. By increasing the demand for other workers, the hiring of newcomers raises the overall wage rate in the short run.

Nevertheless, the role of skill/origin deserves more attention. In particular, we decomposed the immigration rate in the wage equation into the rate for EU workers and non-EU workers. Column 4' in Table 7, shows that only non-EU workers affect the cost of labor. Hence, the complementarity argument holds only for non-EU workers. This finding confirms the link between regions of origin and skill level: non-EU workers tend to be less skilled, and they are more likely to be complements with domestic workers or other immigrant workers. This result is consistent with Garson et al. (1987) who find that migrants from all countries except EEC10, Austria, and Switzerland are complements with French workers. We conclude from these results that the recent decision of French officials to facilitate market access to highly skilled foreigners, which necessarily occurs at the expense of other types of workers in the presence of overall quotas, may not have the expected effect of decreasing unemployment (see OECD, 1998, p. 55). According to our results, such a policy would increase the dispersion of skills and therefore increase unemployment without creating complementary jobs.

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[15] The sudden increase in the share of EU immigrants after 1992 is due to the expansion of membership and the implementation of the European Area Treaty. Portugal and Spain entered the EU in 1992, and Finland, Iceland, Norway, Sweden, and Austria signed the European Area Treaty in 1994.

[16] For the unemployment equation, the Schwarz criterion decreases from 0.0156 to 0.0135; for the wage equation, it declines from 0.000046 to 0.000040.

Table 6. Short-Run Dynamics in Unemployment and Real Wage

	$\Delta Y_t = \Delta UR_t$	$\Delta Y_t = \Delta UR_t$		$\Delta Y_t = \Delta LRW_t$	$\Delta Y_t = \Delta LRW_t$
	1	2		1'	2'
C	-12.05 (4.6)	-11.65 (4.6)	C	.041 (0.4)	.048 (0.5)
ΔY_{t-1}	.687 (6.7)	.707 (7.4)	ΔY_{t-3}	-.158 (1.6)	-.182 (1.9)
ΔY_{t-2}	-.168 (1.7)	-.183 (2.0)	$\Delta LENERG_t$	.026 (4.0)	.029 (4.5)
ΔY_{t-4}	-.211 (2.6)	-.186 (2.3)	$\Delta LENERG_{t-1}$	-.016 (2.2)	-.018 (2.4)
ΔLRW_{t-6}	5.95 (3.3)	6.42 (3.8)	$\Delta LENERG_{t-2}$	.023 (3.3)	.024 (3.5)
$\Delta WPART_t$	.262 (5.0)	.241 (4.9)	$\Delta LENERG_{t-3}$	-.015 (2.0)	-.015 (2.1)
$\Delta WPART_{t-1}$	-.178 (3.3)	-.176 (3.4)	$\Delta LENERG_{t-4}$	.026 (4.0)	.027 (4.0)
$\Delta WPART_{t-3}$	-.121 (2.5)	-.129 (2.9)	$\Delta WPART_{t-1}$	.005 (2.0)	.007 (2.7)
$ECM1_{t-8}$	-.102 (4.3)	-.099 (4.5)	$ECM1_{t-8}$	.001 (1.1)	.001 (0.9)
$ECM2_{t-8}$	4.57 (4.1)	4.42 (4.0)	$ECM2_{t-8}$	.017 (0.4)	.005 (0.1)
ΔIRB_t	-1.54 (1.1)	-	ΔIRB_t	.192 (2.7)	.183 (2.8)
ΔIRB_{t-1}	-.326 (0.2)	-	ΔIRB_{t-3}	.261 (3.6)	.235 (3.5)
ΔIRB_{t-2}	.063 (0.1)	-	$\Delta ORIGIN_t$	.004 (0.9)	-
ΔIRB_{t-3}	.600 (0.4)	-	$\Delta ORIGIN_{t-1}$	.005 (1.4)	-
ΔIRB_{t-4}	-.712 (0.5)	-	$\Delta ORIGIN_{t-2}$	-.002 (0.5)	-
$\Delta ORIGIN_{t-1}$	.150 (1.9)	.129 (1.8)	$\Delta ORIGIN_{t-3}$	.001 (0.4)	-
			$\Delta ORIGIN_{t-4}$	.002 (0.5)	-
Normal resid. $\chi^2(2)$[1]	1.125	1.312	Normal resid. $\chi^2(2)$	1.210	0.248
Serial correl. $\chi^2(16)$[2]	15.60	18.19	Serial correl. $\chi^2(16)$	17.60	18.73
Corr. actual and predicted	0.882	0.878	Corr. actual and predicted	0.665	0.645

[1] The critical values are 5.99 and 9.21 at the 5 percent and 10 percent levels of statistical significance respectively.
[2] The critical values are 26.30 and 31.99 at the 5 percent and 10 percent levels of statistical significance respectively.

Table 7. Short-Run Dynamics in Unemployment and Real Wage: Further Investigations

	$\Delta Y_t = \Delta UR_t$	$\Delta Y_t = \Delta UR_t$		$\Delta Y_t = \Delta LRW_t$	$\Delta Y_t = \Delta LRW_t$
	3	4		3'	4'
C	-11.67 (4.6)	-11.73 (4.6)	C	.048 (0.5)	.048 (0.5)
ΔY_{t-1}	.706 (7.3)	.708 (7.4)	ΔY_{t-3}	-.182 (1.9)	-.190 (1.9)
ΔY_{t-2}	-.181 (2.0)	-.183 (2.0)	$\Delta LENERG_t$	.029 (4.5)	.029 (4.5)
ΔY_{t-4}	-.188 (2.3)	-.193 (2.4)	$\Delta LENERG_{t-1}$	-.018 (2.4)	-.018 (2.4)
ΔLRW_{t-6}	6.40 (3.7)	6.28 (3.7)	$\Delta LENERG_{t-2}$	.024 (3.5)	.025 (3.6)
$\Delta WPART_t$	.240 (4.9)	.241 (4.9)	$\Delta LENERG_{t-3}$	-.015 (2.1)	-.016 (2.1)
$\Delta WPART_{t-1}$	-.176 (3.4)	-.176 (3.4)	$\Delta LENERG_{t-4}$	.026 (4.0)	.027 (4.0)
$\Delta WPART_{t-3}$	-.128 (2.8)	-.128 (2.8)	$\Delta WPART_{t-1}$	.007 (2.6)	.006 (2.4)
$ECM1_{t-8}$	-.099 (4.5)	-.099 (4.5)	$ECM1_{t-8}$	.001 (0.9)	.001 (0.9)
$ECM2_{t-8}$	4.42 (4.0)	4.46 (4.0)	$ECM2_{t-8}$	.004 (0.1)	.002 (0.1)
$\Delta ORIGIN_{t-1}$	.130 (1.8)	.128 (1.8)	$\Delta IRLEG_t$	.180 (1.7)	-
			$\Delta IRLEG_{t-3}$	.246 (2.3)	-
			$\Delta IRAMN_t$	.183 (2.1)	-
			$\Delta IRAMN_{t-3}$	.228 (2.6)	-
			$\Delta IREU_t$	-	.109 (0.6)
			$\Delta IREU_{t-3}$	-	.162 (0.9)
			$\Delta IRNEU_t$	-	.218 (2.7)
			$\Delta IRNEU_{t-3}$	-	.254 (3.0)
Normal resid. $\chi^2(2)$	1.313	1.279	Normal resid. $\chi^2(2)$	0.220	0.655
Serial correl. $\chi^2(16)$	18.26	18.23	Serial correl. $\chi^2(16)$	18.35	17.85
Corr. actual and predicted	0.878	0.879	Corr. actual and predicted	0.645	0.657

Before the size of the impact of immigrant workers on the unemployment rate is evaluated, one more comment can be made about the role of the composition of immigration flows. The long-run analysis showed that whether immigrants entered with a valid work permit or were granted amnesty at a later date, the qualitative impact on the labor market is identical. The results of a similar investigation for the short run are presented in Table 7, columns 3 and 3'. When the immigration rate is decomposed into legal and amnestied workers, the impact for each subgroup does not differ significantly. Thus, the long-run result that amnestied workers do not have a different impact on the labor market than the legal workers is confirmed in the short run.

Finally, since immigration is considered exogenous in the short run, it is possible to measure the magnitude of the impact of a change in the size of the flow on unemployment. Moreover, to put the result in a broader perspective, the effect of immigrants is compared to the effect of a change in women's participation rate. The experiment starts from a steady-state immigration rate equal to the average of the sample (0.025% quarterly) and is run for two cases. The first case is a permanent increase in the rate to the maximum quarterly flow rate observed over the sample (0.046%, excluding the amnesty period). The second experiment is a permanent drop to the minimum observed value (0.011%).[17] The results for the short- and the long-run impact on the unemployment rate are given in Table 8.

Table 8. The Effect of a Permanent Change in the Labor Force on the Unemployment Rate

	Unemployment Rate (in percent)			
Steady-state unemployment rate, with the immigration rate at 0.025 and women's participation rate at 51.1 percent				**4.81**
Permanent change in labor-force rates				
	Starting equilibrium rate	Short-run rate (after 8 quarters)	Max./min. rate during adjustment	Long-run equilibrium rate
Immigration rate rises to 0.046	4.81	4.85	4.60	4.68
Immigration rate falls to 0.011	4.81	4.78	4.95	4.90
Women's participation rate rises to 56.1 percent	4.81	5.03	5.05	4.30

[17] Since all the estimation results are conditional on the values taken by the variables over the sample, the results of simulations for out of sample values such as zero immigration would be misleading.

The striking feature of the dynamic adjustment is that all magnitudes are very small. In both cases the permanent effect on the unemployment rate is a less than 0.15 percentage point deviation from the steady-state value. Thus, doubling or halving the immigration rate has only a negligible effect on unemployment and an argument linking immigration to persistently high unemployment in France cannot be supported.

For the sake of comparison, the long-run impact of a 5 percentage point increase in the participation rate of women is also computed.[18] After raising unemployment in the short-run from 4.81% to 5%, their increased participation lowers it permanently to 4.3%, an effect very similar to that of immigrants. Thus, an increase in the labor force, whether from immigration or greater participation of women to labor market activities, has a very small impact in the short run and, in both cases, unemployment decreases permanently in the long-run. Clearly, reasons other than labor-force factors are responsible for the high level of unemployment in France. Our results also indirectly confirm one well-known argument: the absence of a real-wage response to unemployment. It is a common feature of European economies in general and France in particular. This is clear in Table 5, column 1', where excess supply of labor, measured by the unemployment rate does not enter the wage equation.

To summarize, the size of immigration flows does have an indirect adverse effect on unemployment in the short run by raising aggregate wages.This finding, while suggesting that less skilled immigrants are complements with higher skilled domestic workers, also leads to a temporary increase in unemployment during the dynamic adjustment. The increase is, however, short-lived as the labor market is driven to a lower unemployment rate in the long run. Hence, low-skilled workers are beneficial to the French labor market. Their positive influence is also confirmed by the direct importance of a balanced distribution of regions of origin for unemployment.

V. Conclusion

This paper investigated the long-run and short-run response of the French labor market to inflows of immigrants. Using recent time-series methodologies, it uncovered a negative relationship between unemployment and immigration in the long run, suggesting that jobs created by additional demand from immigrant workers are more numerous than those they occupy. This inference is further supported by the inclusion of families of immigrants in the analysis, which reduces unemployment even more.

In the short-run, however, there are some adverse effects from immigration to the labor market. A rising flow of immigrant workers increases the aggregate wage, which feeds into unemployment, leading to a temporary increase in unemployment. In addition, a widening of the distribution of immigrants across regions of origin, which is likely to correspond to a widening of skill composition, also increases unemployment temporarily. Further analyses indicate that only less skilled non-EU workers are likely to be complements with the local labor. Hence combining the effects indicates that to exploit the job creation arising from

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[18] Between 1975 and 1994, the women's participation rate rose from 51.1% to 59%.

complementarity, it is desirable to maintain a balanced skills-origin distribution among immigrants. The paper also identified that the short-lived adverse effect of immigrants' arrival on the French labor market is very small, and it is similar to the impact of changes in the labor-force participation of women.

Finally, there is no direct evidence that using amnesties as one channel for immigration is detrimental to the labor market. However, from a policy viewpoint, it is clear that controlling immigration flows *before* immigrants enter the country allows for easier screening of workers' characteristics. This avenue has been chosen by other countries, such as Canada, where a rigorous screening process attempts to tailor the characteristics of immigrant workers to the needs of the labor market. In France a similar approach would help stabilize the skills-origin mix.

Overall, the adverse effects of immigration on the French labor market are very small, temporary, and not specific to the foreign labor force. As such they cannot be used to support claims that immigrants are responsible for the steady rise in the country's unemployment rate in the past two decades.

Definitions of the Variables

IRA: Immigration rate computed as the quarterly adjusted immigration flow of workers over the domestic labor force (INSEE, OECD, OMI). The adjustment is such that 40 percent of the legalized workers came in 1980, and the remaining 60 percent is distributed proportionately to legal immigration over the 1975-1979 period.

IRAMN: Immigration rate computed for amnestied workers only, on the basis of the adjustment made under IRB.

IRB: Immigration rate computed as the quarterly adjusted immigration flow of workers over the domestic labor force. The adjustment is such that 40 percent of the legalized workers came in 1980 and the remaining 60 percent is allocated in the following way: 30 percent in 1979, 20 percent in 1978, and 10 percent in 1977.

IREU: Immigration rate for workers from the European Union only (OMI).

IRNEU: Immigration rate for workers from all regions of origin except the European Union (OMI).

IRFAM: Unadjusted immigration rate of family members (INSEE, OECD, OMI). Does not include families from the European Union and the European Space countries, for foreign family members of French citizens.

IRLEG: Immigration rate excluding legalized workers during the 1981 amnesty.

LENERG: Logarithm of real energy price calculated as the ratio of the price of domestically produced and consumed energy and the GDP deflator (OECD Analytical Database).

LLABC: Logarithm of the real labor cost (OECD Analytical Database).

ORIGIN: Dispersion of regions of origins computed as,

$$ORIGIN_t = [\sum_{i=1}^{3} (s_{i,t} * (\Delta \ln m_{i,t} - \Delta \ln m_t))^2]^{1/2} ,$$

where m_t is the total flow of immigrant workers during quarter t; $m_{i,t}$ is the flow of immigrant workers for i=European Union (EU), Morocco+Tunisia, and the rest of the world during the same quarter; $s_{i,t}$ is the share of category I in total flow during period t. The index is computed after the flow have been adjusted using the procedure consistent with IRB.

UR: Unemployment rate (OECD Analytical Database).

WPART: Women's labor-force participation rate force computed as the women's labor force divided by the population of women ages 15 to 64 (OECD Analytical Database).

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