Cornell University
ILR School

ILRReview

Volume 59 | Number 4 Article 6

July 2006

Mass Migration to Israel and Natives' Employment Transitions

Sarit Cohen-Goldner
Bar-Ilan University

M. Daniele Paserman
Hebrew University

Follow this and additional works at: http://digitalcommons.ilr.cornell.edu/ilrreview

Mass Migration to Israel and Natives' Employment Transitions

Abstract
This study examines how mass migration from the former Soviet Union to Israel affected natives' probability of moving from employment to non-employment and vice-versa. Using 1989–99 data from the Israeli Labor Force Survey, the authors find that the share of immigrants in labor market cells defined by occupation, industry, district of residence, schooling, and experience was generally positively associated with natives' probability of moving from employment to non-employment. However, when the analysis controls for the endogenous sorting of immigrants across cells, this effect is substantially reduced for men, and disappears or is even reversed for women. The authors conclude that immigrants tended to cluster in labor market cells with high turnover rates and that immigration did not increase natives' likelihood of exiting employment. They also find no discernible effects of immigration on natives' transitions between labor market cells or on the probability of their moving from nonemployment to employment.

Keywords
migration, Israel, employment effects of migration

This article is available in ILRReview: http://digitalcommons.ilr.cornell.edu/ilrreview/vol59/iss4/6

MASS MIGRATION TO ISRAEL AND NATIVES' EMPLOYMENT TRANSITIONS

SARIT COHEN-GOLDNER and M. DANIELE PASERMAN*

This study examines how mass migration from the former Soviet Union to Israel affected natives' probability of moving from employment to non-employment and vice-versa. Using 1989–99 data from the Israeli *Labor Force Survey,* the authors find that the share of immigrants in labor market cells defined by occupation, industry, district of residence, schooling, and experience was generally positively associated with natives' probability of moving from employment to non-employment. However, when the analysis controls for the endogenous sorting of immigrants across cells, this effect is substantially reduced for men, and disappears or is even reversed for women. The authors conclude that immigrants tended to cluster in labor market cells with high turnover rates and that immigration did not increase natives' likelihood of exiting employment. They also find no discernible effects of immigration on natives' transitions between labor market cells or on the probability of their moving from non-employment to employment.

In the years 1989–2000, more than one million Jews migrated from the former Soviet Union (FSU) to Israel, increasing Israel's population and labor force by a large magnitude. This migration wave was noteworthy not only for its size, but also for its character: in contrast with immigrants to other Western countries, FSU immigrants to Israel had on average more years of schooling than natives, and most of them had worked in white-collar occupations. In this paper we analyze the impact of the FSU immigrants on the employment outcomes of Israeli natives. In some regards, this episode of mass migration is an ideal case for examining the effect of immigration on the labor market outcomes of the native-born. We have here a large and unexpected migration wave of mostly highly educated immigrants, whom local employers may view as an attractive alternative to native workers. These conditions may provide an upper bound on the potential effect of immigrants on the labor market outcomes of the native-born.

*Sarit Cohen-Goldner is Lecturer at Bar-Ilan University and M. Daniele Paserman is Lecturer at Hebrew University, Research Affiliate at CEPR, and Research Fellow at IZA. The authors thank seminar participants at the 2002 SOLE meetings in Baltimore, at Tel Aviv University, and at Hebrew University for helpful comments. They acknowledge generous financial support from the Maurice Falk Institute for Economic Research in Israel. Stas Krasinski and Royi Ben-Ivry provided excellent research assistance.

A data appendix with additional results, and copies of the computer programs used to generate the results presented in the paper, are available from the second author at Hebrew University, Department of Economics, Jerusalem 91905, ISRAEL; e-mail dpaserma@shum.huji.ac.il

Industrial and Labor Relations Review, Vol. 59, No. 4 (July 2006). © by Cornell University.
0019-7939/00/5904 $01.00

While previous studies have primarily focused on how migration affects natives' wages and employment, we prefer to concentrate our attention in particular on the transition probabilities of natives between employment and non-employment. There are several reasons for this shift in focus. First, employment outcomes of natives are usually at the center of the public discourse in immigrant-receiving countries, possibly because the short-term pains of unemployment and job loss are felt more acutely than wage effects and have a larger echo in the media, creating negative attitudes toward immigrants among natives and policy-makers. Second, much of the existing literature has found little or no effect of immigration on natives' outcomes, suggesting that increases in labor supply due to immigration may be counterbalanced by offsetting flows of native capital and labor. Hence, we can shed some light on the importance of offsetting native flows by focusing on transitions between different labor market states, on the reasons for these transitions, and on whether different personal characteristics may affect transition probabilities differently. Finally, focusing on transition probabilities allows us to discriminate between adverse employment effects due to job loss and those due to difficulties in finding employment among the already unemployed. This distinction is important if we are to fully understand the dynamic impact of migration on natives' labor market outcomes, yet it has received little attention in the migration literature, either in Israel or elsewhere.

An analysis of the kind we undertake here would be impractical or impossible in most settings. The two conditions that make it feasible in the case we examine are the sheer magnitude of the mass migration wave and the rotating panel nature of the Israeli Labor Force Survey (LFS), in which each household is interviewed for two consecutive quarters, followed by a break of two quarters, followed by interviews in another two consecutive quarters.

An additional novel feature of our work is that we take a longer-run perspective on immigration. We investigate whether immigrants with different levels of experience in the new country, different levels of human capital, and differing information about the Israeli labor market affected the labor market differently. Since the transition of immigrants into a new labor market is a gradual process, and immigrants' occupational mobility is the main dynamic in this process, we believe that natives may face changing labor market conditions even years after the immigrants' arrival.

Literature Review

It is natural to expect that a large migration wave will have an adverse effect on employment rates and wages of native workers in the short run. However, various studies of the impact of the FSU immigrant wave on labor market outcomes of Israeli natives suggest that there is no conclusive evidence for such an effect. Friedberg (2001) studied the impact of immigrants on wages of natives. Using an instrumental variable approach to control for the occupational selectivity of the immigrants, she showed that the mass migration had no effect on wages of natives. Our study differs from Friedberg's in taking a longer-run perspective on immigration and analyzing specifically the mobility of natives, with our identification coming from the variation in the immigrant share across labor market segments *and* over time. Cohen and Tai-Hsieh (2001) studied the effect of this migration wave on macroeconomic variables such as average wages, the current account deficit, and investment. Calibrating a neoclassical growth model, they showed that wages per unit of effective labor of native Israelis decreased and the return to capital increased during the height of the immigration influx in 1990 and 1991. By 1997, however, both average wages and the return to capital returned to pre-immigration levels, due to an investment boom induced by the initial increase in the return to capital. Eckstein and Weiss (2004) analyzed the degree to which the wages of FSU immigrants converged to those of native Israeli workers by using cross-sectional data from 1990 to 2000 that included a large

sample of immigrants. The main finding was that while immigrants' and natives' occupational distributions converged, their wages did not. Correcting for differences in productivity between immigrants and natives, Eckstein and Weiss showed that the adjusted capital-labor ratio did not change much due to the arrival of the immigrants, and that immigration therefore had practically no effect on natives' real wages.

Altogether, the results in the aforementioned studies are consistent with much of the international evidence accumulated on the impact of immigration on host country wages and employment. A number of studies have exploited variation in immigrant rates across U.S. cities and over time to measure the impact of immigration on local labor market outcomes (Altonji and Card 1991; LaLonde and Topel 1991; Goldin 1994). These studies have typically concluded that immigration had little or no adverse impact on natives' wages and employment. Pischke and Velling (1997) obtained similar results when looking at variation in immigrant rates across German counties. Other studies, focusing on natural experiments generated by political factors in the sending country (Card 1990; Hunt 1992; Carrington and de Lima 1996), also have found surprisingly little effect of migration. Venturini and Villosio (2002), in a closely related work, investigated the effect of immigration on employment transitions in Italy and also found no evidence of displacement effects.

One of the conceptual problems of the cross-market approach, raised by Borjas, Freeman, and Katz (1996), is that an increase in the labor supply in a certain city (due to immigration) can be diffused across the economy by intercity trade, movements of capital, or outflows of natives. Acknowledging this problem, Card (2001) assumed that immigrants and natives are perfect substitutes within occupations and cities. Under this assumption, Card did find that occupation-specific wages and employment rates were systematically lower in cities with higher relative supplies of workers in a given occupation. Similarly, Borjas (2003) claimed that any approach that attempts to exploit geographic variation in immigrant rates is of questionable validity because of the strong currents that tend to equalize economic conditions across cities and regions. He therefore used only variation in the human capital mix of immigrants (that is, the combination of schooling and experience) to study the effect of immigration on different groups of natives. He found that, within groups, immigrants did have an adverse effect on natives' wages and employment opportunities.

In this paper we study the effect of immigrants on the probability of natives entering or exiting employment in a well-defined labor market segment (LMS). The empirical analysis is based on micro data from the Israeli Labor Force Survey (LFS) from 1989 to 1999. The LFS provides detailed information on demographic characteristics of natives and immigrants, such as education, marital status, occupation, industry, location of residence and workplace, and date of immigration. We take advantage of the special rotating panel nature of the data to study the impact of immigration on natives' transitions between employment and non-employment, and between employment in different segments of the labor market. Our identification strategy exploits variation in the distribution of immigrants across occupations, industries, geographic districts, and skill levels, as well as over time.

Background

We begin by providing some brief background information on the mass migration wave from the Former Soviet Union (FSU) to Israel in the 1990s, and describing how the occupational and residential distribution of natives evolved over those years. This overview will give us a first-pass impression of whether the mass migration wave affected native choices.

The million-plus immigrants from the FSU who arrived in Israel from late 1989 through 2000 expanded the country's population and labor force by extraordinary rates. In just two years at the peak of this wave, in 1990–91, over 330,000 FSU Jews

Table 1. Educational Distribution of Immigrants and Natives in Israel, 1989–1999.

Education	*All Immigrants, 1989–99*	*Immigrated in 1989–93*	*Immigrated in 1994–99*	*Natives*
		A. Men		
Less Than High School	9.54	8.33	11.18	32.40
High School or Equivalent	20.93	18.57	24.89	28.87
Some College	25.15	24.26	26.37	15.72
College Graduates	44.39	48.84	37.55	23.00
		B. Women		
Less Than High School	8.43	7.77	8.81	29.26
High School or Equivalent	18.13	16.21	21.31	29.95
Some College	29.66	27.58	32.73	18.95
College Graduates	43.78	48.44	37.14	21.84

Source: Authors' calculations from the Israeli Labor Force Survey, 1997–99.

immigrated to Israel, increasing Israel's potential labor force by 8% and its population by 15%. Figures (1a) and (1b) present the flow and the stock of immigrants aged 25–64 as a percentage of the total population in this age group (Jews and non-Jews).

The most notable characteristic of these immigrants is their high level of education. Table 1 presents the educational distribution of male and female natives and immigrants by year of arrival. Over 69% of all FSU male and female immigrants had at least some college education, and over 40% were college graduates. The share of college-educated natives, in contrast, was only about 35%, and only 22% of natives were college graduates. Table 1 also reveals that immigrants who arrived in the early wave (1989–93) were, on average, more educated than those who arrived in the later wave.

It is useful to distinguish between the stock of all post-1989 immigrants who are present in an LMS and the stock of only recent immigrants: for any given year *t*, we define the stock of *recent* immigrants as the number of immigrants who arrived in Israel during the three years prior to year *t*. In Table 2 we present the one-digit occupational distribution of natives and immigrants, both recent and overall. Independently of the definition of immigrants, Table 2 shows that immigrants were more concentrated than natives in skilled industrial occupations, in services (women in particular), and in unskilled occupations in both sub-periods and that the distribution of natives was almost unchanged between the two periods. At first glance, there is no evidence that immigrants adversely affected the occupational distribution of natives.

As for the distribution of immigrants, it is worthwhile to note that early immigrants (1989–93) were more likely than later immigrants (1994–99) to be absorbed into academic and professional occupations (probably reflecting their higher measured human capital), but were also more likely to be absorbed into unskilled occupations (probably reflecting the fact that the size of the initial wave was so large that for many immigrants it was difficult to find a job suited to their skills).

In addition, we see that in the later period the occupational distributions of recent and all immigrants differed substantially. In particular, recent immigrants were more concentrated at the low end of the occupational spectrum. This finding is unsurprising for two reasons: first, later immigrants tended to be less educated than early immigrants; and second, the labor market's absorption of immigrants is a gradual process that involves occupational upgrading as immigrants study the new language and the conditions and technology of the new labor market.

In contrast to earlier waves of immigrants

Figure 1a. Immigrant Flow in Israel, 1989-1999.

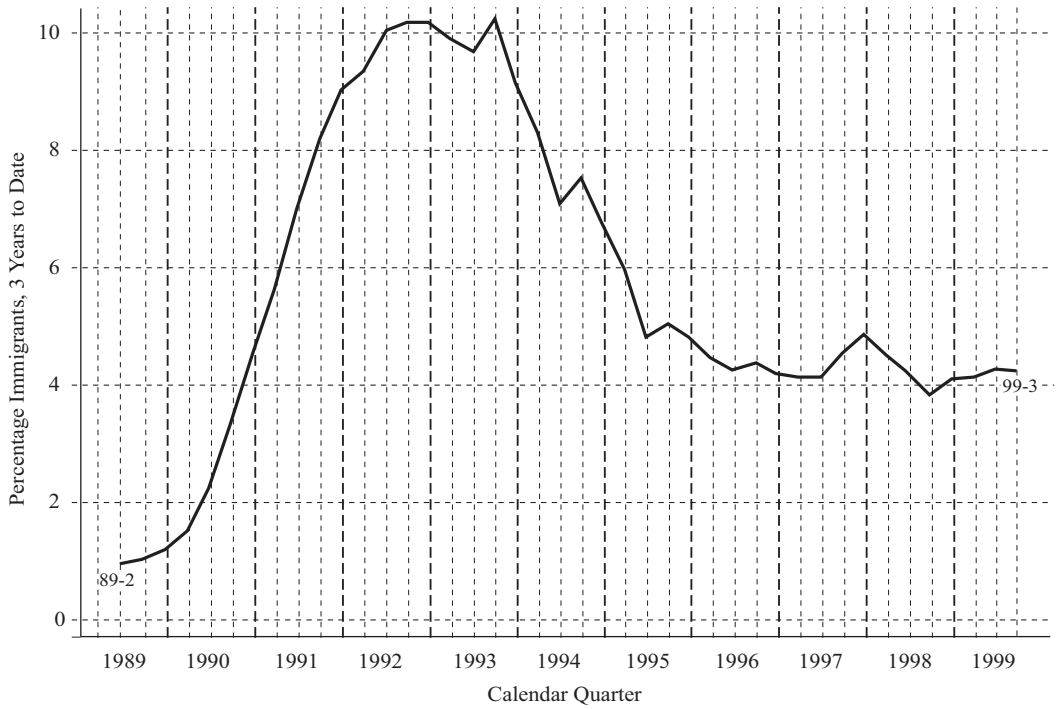

Figure 1b. Immigrant Stock in Israel, 1989-1999.

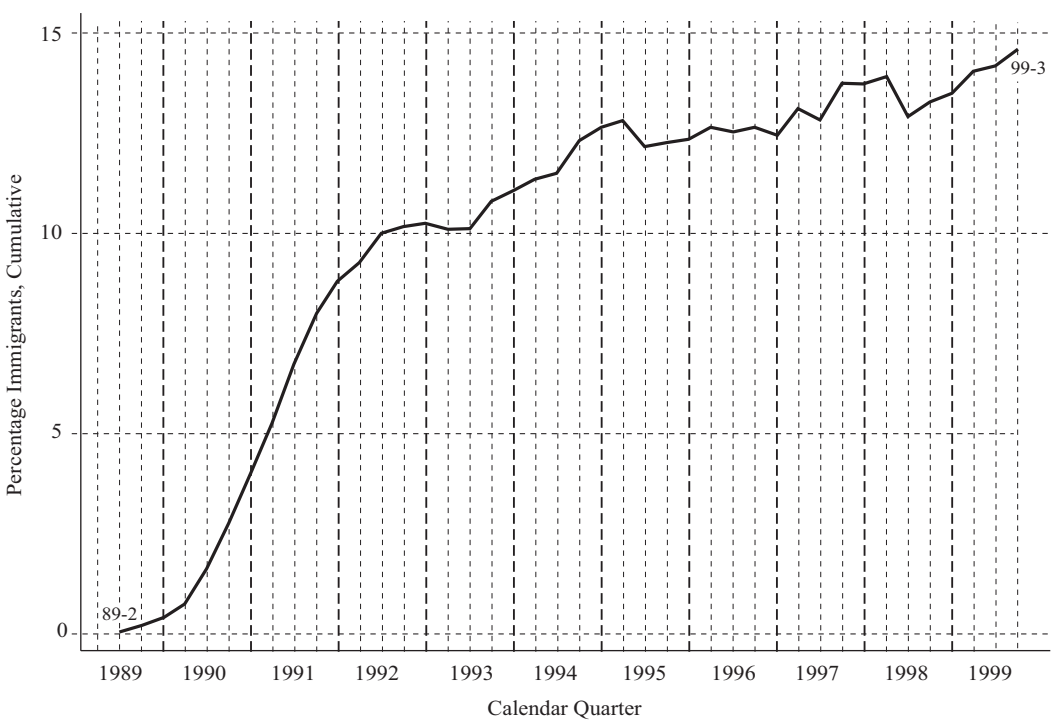

Table 2. Occupational Distribution of Immigrants and Natives.

	1989–1993		*1994–1999*		
Occupation	*All Immigrants*	*Natives*	*All Immigrants*	*Recent Immigrants*	*Natives*
A. Men					
Academic and Scientific Professionals	12.02	9.41	12.94	6.91	10.16
Other Professionals and Technicians	8.26	10.92	10.02	7.59	11.87
Managers	0.40	8.61	1.74	1.47	9.60
Clerical Workers	1.56	9.14	3.34	2.34	9.19
Sales Workers	2.34	9.75	3.45	3.26	9.68
Service Workers	14.17	8.16	13.52	17.27	9.48
Skilled Agricultural Workers	3.47	4.60	5.03	6.51	4.20
Skilled Industry Workers	44.12	36.03	41.88	44.15	33.46
Unskilled Workers	13.66	3.39	8.09	10.51	2.34
B. Women					
Academic and Scientific Professionals	9.03	9.49	10.39	6.73	10.04
Other Professionals and Technicians	14.40	26.51	13.79	9.07	25.68
Managers	0.42	2.49	0.70	0.29	3.59
Clerical Workers	7.82	27.62	9.90	6.01	30.09
Sales Workers	4.99	7.71	6.37	5.64	7.47
Service Workers	36.75	18.17	36.30	49.96	17.48
Skilled Agricultural Workers	2.24	1.27	3.79	4.11	1.21
Skilled Industry Workers	15.37	5.42	13.83	12.72	3.74
Unskilled Workers	8.97	1.32	4.94	5.48	0.70

Source: Authors' calculations from the Israeli Labor Force Survey, 1989–99. Recent immigrants are immigrants who arrived in Israel no more than three years prior to the date of the LFS interview.

to Israel during the 1950s and the 1960s, FSU immigrants who arrived in the 1990s could choose where to live right after arrival.[1] Table 3 presents the residential distribution of immigrants and natives. The majority of natives lived in cities and metropolitan areas. The residential distribution of immigrants was quite similar to that of natives except that they seem to have been more likely to be located in the south than in the north. Moreover, recent immigrants in the second sub-period (1994–99) were substantially more concentrated in the south than immigrants who arrived at the beginning of the 1990s.[2]

Overall, the data suggest that the occupational and residential distribution of natives remained relatively stable throughout the 1990s. This can be interpreted as evidence that the mass migration wave had little effect on natives' choices. However, the finding that the stock of natives in a particular occupation or residential area was unaffected by the migration wave does not necessarily imply that the *flows* between employment and non-employment, between occupations, or between localities were also unchanged. In the following sections, we examine whether natives' employment transitions in a given labor mar-

[1]Ethiopian immigrants who arrived in May 1991 in the context of Operation Solomon represent an exception, as they were scattered essentially randomly across the country. Gould, Lavy, and Paserman (2004) used this natural experiment to study the effects of school quality on the educational achievements of the immigrants.

[2]This is likely to be related to the affordability of housing as a result of sizeable government-initiated construction in the south.

Table 3. Residential Distribution of Immigrants and Natives.

	1989–1993		*1994–1999*		
Area	*All Immigrants*	*Natives*	*All Immigrants*	*Recent Immigrants*	*Natives*
	A. Men				
Jerusalem	7.08	10.44	5.17	4.43	10.11
North	13.33	16.68	13.29	11.66	17.56
Haifa	17.98	13.86	16.03	16.51	13.32
Tel Aviv (outer circle)	23.58	22.55	21.90	22.06	23.77
Tel Aviv (inner circle)	20.61	23.68	17.96	21.60	21.52
South	16.20	10.88	23.09	21.95	11.58
West Bank	1.23	1.92	2.56	1.79	2.13
	B. Women				
Jerusalem	8.23	11.49	5.78	5.34	11.32
North	13.26	15.98	13.07	11.68	16.93
Haifa	18.33	13.44	16.45	17.00	13.13
Tel Aviv (outer circle)	23.47	22.08	20.78	20.16	23.43
Tel Aviv (inner circle)	19.21	24.60	18.10	21.49	21.98
South	16.20	10.46	23.31	22.76	11.03
West Bank	1.30	1.95	2.50	1.57	2.18

Source: Authors' calculations from the Israeli Labor Force Survey, 1989–99. Recent immigrants are immigrants who arrived in Israel no more than three years prior to the date of the LFS interview.

ket segment were affected by immigrants' share in the same segment.

Data

We use micro data from the Israeli *Labor Force Survey* (LFS) of 1989–99. Each household in the LFS was interviewed for two consecutive quarters, left alone for two quarters, then interviewed for two more consecutive quarters. To study the impact of immigration on natives' transitions between employment and non-employment, we focus on natives and pre-1989 immigrants in their first two LFS interviews. To limit potential problems associated with non-random attrition, we do not make use of individuals' third and fourth interviews.[3] The male sample includes men between 25 and 65, and the female sample includes women between 25 and 60.[4] We do include non-Jews in our sample, but we exclude ultra-orthodox Jews,[5] immigrants whose age at arrival was less than 25, and people who reported more than 30 years of schooling. Overall, the sample includes 99,430 individual natives (men and women), whom we observe in both their first and second LFS

[3]The attrition rate of households between the first and second interview of the LFS is about 20%. The attrition rate of households between the second and the third interview is much higher.

We should note that in the LFS it is possible to link households across two consecutive interviews for almost the entirety of the period under investigation. The only exceptions are the first quarter of 1995 and the first quarter of 1997, when minor changes were introduced in the sampling frame.

[4]The upper age cutoffs were chosen because they represent the retirement ages during the sample period (65 for men and 60 for women). For reasons of confidentiality, the LFS does not report the exact age of individuals aged 18–24. Since most of the individuals in this age group serve in the military for a compulsory period of between 20 months (women) and 36 months (men), we omit all individuals aged less than 25.

[5]Berman (2000) documented that during this period ultra-orthodox Jewish men had very low attachment to the labor force, despite very high rates of poverty in their families. He argued that much of the behavior of ultra-orthodox Jews is at odds with standard price theory. For this reason, we choose to omit this group from our investigation.

Table 4. Summary Statistics.

Statistic	*Men*	*Women*
Percentage of Recent Immigrants	4.63	5.18
Percentage of All Immigrants	8.87	9.69
Percentage Natives Not Employed	18.75	41.71
Quarterly Transition Rate from Employment to Non-Employment (Natives + Non-Recent Immigrants)	4.52	7.27
Quarterly Transition Rate from Non-Employment to Employment (Natives + Non-Recent Immigrants)	17.54	9.06
Total Number of Natives in Sample	48,908	50,522

Source: Authors' calculations from the Israeli Labor Force Survey, 1989–99.

interviews, and for whom therefore we can measure employment transitions (Table 4).

In our analysis we examine two partially overlapping groups of immigrants: (1) those who arrived in Israel during the three years prior to the interview (referred to as recent immigrants), and (2) all immigrants who arrived after 1989 (referred to as total immigrants). Looking at the first group enables us to focus specifically on the effect of recently arrived immigrants, who tended to move more frequently across different labor market segments, while looking at the second group enables us to capture immigrants' cumulative effect on natives' transitions. We calculate the share of recent and total immigrants in a given LMS in each calendar quarter, from the third quarter of 1989 to the fourth quarter of 1999.

Table 4 presents summary statistics of our data by gender. As can be seen, the average share of recent immigrants (men and women), across all years, was about 5%, while the average share of the immigrant stock was 9% for men and 10% for women. The average quarterly rate of transition from employment to non-employment among natives in 1989–99 was 4.52% for men and 7.27% for women. The average quarterly rate of transition from non-employment to employment was 17.54% for men and 9.06% for women.

Transitions from Employment to Non-Employment

One of the main objectives of this paper is to study the dynamic implications of the immigration wave for natives' outcomes. This task is feasible in the setting we are examining both because of the large size of the FSU immigration wave and because of the structure of our data, which allows us to observe workers' employment status at three-month intervals. The three-month interval is long enough to allow both non-negligible changes in the percentage of immigrants in a cell and adjustments by employers to the size of their work force. At the same time, it is probably not sufficiently long to allow longer-term adjustments in the behavior of workers and firms (such as investments in physical and human capital).

We first analyze the effect of the immigrant flow (that is, recent immigrants) on the transition probability from employment to non-employment. The model is a linear probability model of the form

$$(1)\quad E(\text{NotEmployed}_{ijt} \mid \text{Employed}_{ijt-1} = 1, \text{ImgrntShare}_{jt}, X_{ijt}) = \beta\text{ImgrntShare}_{jt} + \gamma' X_{ijt} + \delta_t + \eta_j,$$

where NotEmployed_{ijt} (Employed_{ijt-1}) is a dummy variable equal to 1 if worker i in labor market segment j at time t (t–1) is non-employed (employed),[6] and zero oth-

[6]We choose not to make a distinction between unemployment and out-of-the-labor-force status. This choice is motivated in part by the fact that there are

erwise; IMGRNTSHARE_{jt} is the share of recent immigrants (both men and women) in labor market segment (LMS) j at time t; X_{ijt} is a vector of individual characteristics; and δ_t and η_j are time effects and LMS fixed effects, respectively. The vector of individual characteristics in this and the following models includes years of schooling, years of potential experience, experience squared, a marital status dummy, dummies for the presence of children aged 0–4, 5–14, and 15–17, three ethnic origin dummies (non-Jews, Asia-Africa, and Europe-America-Oceania, with Israeli Jews whose ethnic origin is undetermined the omitted category), a dummy for foreign-born status, and years since immigration (which takes the value of zero for natives). All models include a full set of calendar quarter dummies. The sample includes natives and foreign-born individuals who had been living in Israel for more than three years, and who were employed on their first LFS interview, between 1989 and 1999. We estimate equation (1) by least squares, with standard errors adjusted for clustering at the LMS–calendar quarter level (that is, the same level of variation as the main variable of interest).[7]

Heeding the recent criticisms of the local labor market approach, we take particular care to define the labor market segments in such a way that they can be viewed as isolated markets with limited possibilities for native workers to move between them. We consider five definitions of LMSs within which immigrants and natives may compete: (a) 2-digit occupation cells, (b) residential district interacted with 1-digit occupation, (c) schooling interacted with 1-digit occupation (where schooling is based on four categories: less than high school, high school, some college, college degree or more), (d) 1-digit industry interacted with 1-digit occupation, and (e) schooling interacted with potential experience (where schooling is divided into the four categories defined above, and experience is grouped into ten categories, each one containing a five year interval: 0–4 years of experience, 5–9, 10–14, and so on).[8] While none of these LMS definitions is ideal, each has some advantages and disadvantages. Two-digit occupational cells (used also by Friedberg 2001) probably come closest to identifying workers who perform similar tasks and hence are in competition with one another, yet it may miss some aspects of the immigrants' geographic or industrial distribution. On the other hand, one should keep in mind that the first four definitions are based on the occupational choices of immigrants, and may therefore be subject to self-selection (we address this concern later by instrumenting immigrant share at time t with its lag). The fifth definition is based exclusively on measures of human capital that presumably were already determined at the time of immigration, even though one can argue that the imported experience and schooling of immigrants is not equivalent to locally acquired experience and schooling.

Model (1) is estimated both with and without LMS fixed effects. The former should be viewed primarily as a descriptive exercise, while in the latter the parameter β can be interpreted as a causal effect under the assumption that there are no time-varying unobservables that are correlated with the immigrant share. In addition, to ad-

numerous direct transitions, in both directions, between employment and out-of-the-labor-force. See also Beenstock and Klinov (1996).

[7]We estimate equation (1) using a linear probability model mainly to facilitate comparison between the OLS estimates and the instrumental variable estimates described below. Since our main focus of interest is the marginal effect of immigration on transition probabilities (rather than the coefficient of the index function itself), the linear probability model can probably provide a fairly reasonable approximation of the true effect (Moffitt 1999). Probit estimates of equation (1) are available from the authors upon request.

[8]Potential experience is defined as age – years of schooling – 6. We assume here that experience acquired abroad is equivalent to experience acquired in Israel.

The numbers of cells based on the five definitions are, respectively, 86, 63, 36, 81, and 39. The average cell sizes are, respectively, 112, 150, 259, 121, and 329.

dress potential concerns regarding the endogeneity of the contemporaneous immigrant share, we instrument this variable with its lagged value. The rationale for this instrument is that immigrants can find jobs more easily in occupations where earlier immigrants are employed and lagged immigrant employment is uncorrelated with the transitory fluctuations in LMS–specific turnover.[9]

Our sample is restricted to those who were employed at the time of the first LFS interview, and the dependent variable is a dummy for non-employment at the time of the second LFS interview. The results of this estimation are presented in Table 5. When we exploit both time series and cross-sectional variation in immigration rates (the no-fixed-effects model), we find that natives in LMSs with a higher share of immigrants were facing a higher probability of job loss, and that this association was considerably larger for women than for men. When we adopt the first four definitions of LMSs, a ten percentage point increase in the proportion of immigrants in a cell is associated with an increase in the job loss probability by between 0.9 and 1.4 percentage points for men and between 3.0 and 6.1 percentage points for women. These estimates correspond to an elasticity of job loss probability with respect to the immigration rate of about 0.09–0.15 for men and about 0.16–0.33 for women.

However, when we include cell fixed effects, the effect becomes negative for women (though it is not always statistically significant) and very small for men. This evidence suggests that immigrants tend to cluster in LMSs with high turnover rates.[10] The fifth definition we use (schooling interacted with experience) yields slightly different results. For men we find a small and statistically insignificant positive effect on job loss in both specifications with and without fixed effects. For women, immigrants' presence in a cell leads to a lower transition rate from employment to non-employment. However, inclusion of cell fixed effects washes away this result completely.

The results obtained from the instrumental variable (IV) regressions are quite similar, both in the no-fixed-effects specification (columns 3 and 7) and in the fixed-effects estimation (columns 4 and 8).[11] In the no-fixed-effects estimation, the point estimates and standard errors are quite similar to the OLS ones. In the model with fixed effects, the IV point estimates are slightly larger than the OLS estimates for men, though the effect is still statistically insignificant. For women, the fixed-effects point estimates in the IV and OLS models are nearly identical, with the exception of the estimation that employs a schooling-experience LMS definition, for which the IV estimate is larger, although insignificant.[12]

It may be argued that looking at the immediate impact of the flow of immigrants

[9]Altonji and Card (1991) were among the first to use historical immigration patterns as instruments for current inflows.

[10]An alternative interpretation is that immigrants are drawn to LMSs of the labor market with high turnover, since turnover creates job openings.

[11]The first stage regression results are available from the authors upon request. In all specifications, the first stage F-statistic is extremely high, well beyond conventional significance levels.

[12]We have also examined the robustness of our results with respect to the age span used and with respect to inclusion of public sector workers. The overall picture remains largely unchanged, although some of the coefficients do vary. The most notable difference is in the fixed-effects coefficient for men in the estimation based on the two-digit occupation LMS definition, which goes from 0.0237 to 0.0531 (s.e. 0.0491) when we limit the sample to workers below the age of 55, and to 0.0580 (s.e. 0.0541) when we exclude public sector workers. Despite the marked increase in the coefficient, it remains well below conventional significance levels. Nearly all the other coefficients change little, either in magnitude or in statistical significance. Finally, we also estimated the model using a simple Heckman selection correction model to correct for potential attrition bias. In the absence of any credible exclusion restrictions, the model is identified solely by functional form. In any case, the results were very similar to those of Table 5. All these results are available from the authors upon request.

Table 5. Immigrant Flow and the Transition from Employment to Non-Employment.

	Men				*Women*			
Labor Market Cells Defined by:	*OLS No Cell Fixed Effects*	*OLS Cell Fixed Effects*	*IV No Cell Fixed Effects*	*IV Cell Fixed Effects*	*OLS No Cell Fixed Effects*	*OLS Cell Fixed Effects*	*IV No Cell Fixed Effects*	*IV Cell Fixed Effects*
Two Digit Occupation	0.0910	0.0272	0.105	0.0689	0.4025	–0.1924	0.3991	–0.2388
	(.0255)	(.0460)	(.0270)	(.0531)	(.0438)	(.0862)	(.0449)	(.0985)
District of Residence × Occupation	0.1344	0.0120	0.1477	0.0537	0.4959	–0.1447	0.5029	–0.1309
	(.0271)	(.0491)	(.0279)	(.0577)	(.0466)	(.0967)	(0.0476)	(.1072)
Schooling × Occupation	0.0995	0.0520	0.0969	0.0447	0.3022	–0.0306	0.2999	–0.0309
	(.0197)	(.0340)	(.0199)	(.0370)	(.0350)	(.0718)	(0.0346)	(.0733)
Industry × Occupation	0.1381	0.0164	0.1501	0.0361	0.6013	–0.3725	0.6189	–0.3537
	(.0253)	(.0482)	(.0260)	(.0540)	(.0605)	(.0963)	(0.0603)	(.1070)
Schooling × Experience	0.0296	0.0462	0.0276	0.0435	–0.1348	0.0522	–0.1310	0.1210
	(.0295)	(.0347)	(0.0342)	(.0485)	(.0431)	(.0529)	(0.0512)	(.0741)

Number of observations is 35,696 in the regressions for men and 26,874 in the regressions for women.

Entries in the table represent the estimated effect of the share of immigrants in one's cell on the probability of moving from employment to non-employment, as estimated by *separate* linear probability models. Immigrants are defined as those who have been in Israel less than three years. Standard errors are robust with respect to clustering at the LMS–calendar quarter level, and are presented in parentheses.

The sample includes natives and foreign-born individuals who had been living in Israel for more than three years, and who were employed at the time of their first LFS interview, between 1989 and 1999. The male sample includes men between 25 and 65, and the female sample includes women between 25 and 60. All regressions include the following variables: education, experience, experience squared; a dummy for married; dummies for the presence of children in the age groups 0–4, 5–14, and 15–17; a dummy for non-Jews; dummies for ethnic origin Asia-Africa and ethnic origin Europe-America-Oceania (Israeli Jews of undetermined ethnic origin are the omitted category); a dummy for foreign-born status and years since immigration (zero for natives); and a full set of calendar quarter dummies. Observations with missing data were deleted.

is not the appropriate way to measure the extent of the migration wave's effect on the local labor market. The immigrant absorption process is a long and gradual one: as immigrants learn new skills, they move up the occupational ladder, so that the inflow of immigrants in a given LMS in the first few years since immigration does not fully capture the long-term effects of immigration. Therefore, we also estimate a model in which we use the stock of all post-1989 immigrants in a labor market cell as our basis for measuring the immigration rate. The results are presented in Table 6.

The pattern here is similar to that of Table 5: for men there appears to have been a small but statistically significant positive effect of immigrants on natives' job loss probability in the cross-section (column 1), but this was due almost exclusively to the clustering of immigrants in high-turnover segments of the labor market, since the effect completely disappears when cell fixed effects are included (column 2). The IV estimates also suggest that the immigrant share had no statistically significant effect on native men's probability of job loss.[13] For women, however, when the first four LMS definitions are used, the within-LMS analysis (column 5) suggests that a higher share of immigrants in an LMS actually lowered the probability of transition from employment to non-employment. The estimate using the fifth LMS definition (experience interacted with schooling) indicates that female natives faced a significantly higher probability of job loss in cells with a greater presence of immigrants. The IV estimates for women (column 6) are almost identical to the cell fixed-effects estimates and are always statistically significant. Altogether, using the immigrant stock as our measure does not fundamentally alter the conclusions obtained in Table 5. Immigration had a small and statistically insignificant effect on the job loss probabilities of natives, while it appears that the long-term process of immigrants' occupational upgrading significantly affected female natives, but in a direction that was mostly opposite that predicted by economic theory.

There are several possible explanations for the difference in results between male and female workers. First, there was a sharp increase in the labor force attachment of Israeli women over the period of investigation, with the labor force participation rate increasing from 59% to 67% and the quarterly transition rate from employment to non-employment dropping from 8.9% to 6.7%. While calendar time dummies in our regressions capture the overall secular trend in women's labor force attachment, differences in this trend between different LMSs may bias the estimates of the effect of immigration on transition probabilities. We suspect that the distribution of female employment across the public and private sectors, and the change in this distribution over time, may indeed induce such a bias.

A large proportion (around 45%) of native women held jobs in the public sector (teaching, nursing, and so on). Workers in the public sector have stronger attachment to the labor force through several channels. First, employment in the public sector is more stable than that in the private sector, as most of the workers have tenure; second, unionization is more common in the public sector, and hence there are fewer fluctuations in employment; and finally, the demand for non-traded goods and services (education, health services, and so on) increased dramatically with the arrival of immigrants.

A downward bias in our estimates reported in Tables 5 and 6 would result if immigrants were more concentrated in those LMSs that experienced a faster than average downward trend in job turnover.[14]

[13]The first stage results for the IV regressions in Table 6 are available from the authors upon request.

[14]Formally, the omitted variable formula in the regression with LMS fixed effects shows that the sign of the bias depends on the covariance between $(\text{Imm}_{jt} - \overline{\text{Imm}}_j)$ and $(u_{jt} - \bar{u}_j)$, where u_{jt} is unobserved labor force attachment in LMS j at time t.

Table 6. Immigrant Stock and the Transition from Employment to Non-Employment.

	Men				*Women*			
Labor Market Cells Defined by:	*OLS No Cell Fixed Effects*	*OLS Cell Fixed Effects*	*IV No Cell Fixed Effects*	*IV Cell Fixed Effects*	*OLS No Cell Fixed Effects*	*OLS Cell Fixed Effects*	*IV No Cell Fixed Effects*	*IV Cell Fixed Effects*
Two Digit Occupation	0.0314	0.0079	0.0391	0.0367	0.2078	–0.3304	0.1992	–0.3678
	(.0142)	(.0286)	(.0148)	(.0314)	(.0252)	(.0637)	(.0251)	(.0659)
District of Residence × Occupation	0.0751	0.0170	0.0782	0.0300	0.2609	–0.2184	0.2600	–0.2144
	(.0164)	(.0311)	(.0169)	(.0333)	(.0284)	(.0629)	(.0289)	(.0674)
Schooling × Occupation	0.0523	–0.0195	0.0513	–0.0218	0.2032	–0.1347	0.1983	–0.1378
	(.0131)	(.0289)	(.0132)	(.0308)	(.0243)	(.0616)	(.0242)	(.0632)
Industry × Occupation	0.0552	–0.0151	0.0620	0.0067	0.3496	–0.2781	0.3502	–0.2746
	(.0149)	(.0300)	(0.0156)	(.0339)	(.0374)	(.0651)	(.0376)	(.0685)
Schooling × Experience	0.0178	–0.0158	0.0256	–0.0064	–0.0003	0.1185	0.0105	0.1675
	(.0196)	(.0286)	(.0216)	(.0362)	(.0298)	(.0505)	(.0338)	(.0648)

Number of observations is 33,925 in the regressions for men and 25,181 in the regressions for women.

Entries in the table represent the estimated effect of the share of immigrants in one's cell on the probability of moving from employment to non-employment, as estimated by *separate* linear probability models. Immigrants are defined as those who arrived in Israel after 1989. Standard errors are robust with respect to clustering at the LMS–calendar quarter level, and are presented in parentheses.

The sample includes natives and foreign-born individuals who had been living in Israel prior to 1989, and who were employed at the time of their first LFS interview, between 1989 and 1999. The male sample includes men between 25 and 65, and the female sample includes women between 25 and 60. All regressions include the following variables: education, experience, experience squared; a dummy for married; dummies for the presence of children in the age groups 0–4, 5–14, and 15–17; a dummy for non-Jews; dummies for ethnic origin Asia-Africa and ethnic origin Europe-America-Oceania (Israeli Jews of undetermined ethnic origin are the omitted category); a dummy for foreign-born status and years since immigration (zero for natives); and a full set of calendar quarter dummies. Observations with missing data were deleted.

Table 7. Transitions from Employment to Non-Employment in Selected Occupations.

	Men		*Women*	
Definition of a Labor Market Cell:	*All Blue-Collar Workers*	*Services, Skilled Industry, and Unskilled Occupations*	*All Blue-Collar Workers*	*Services, Skilled Industry, and Unskilled Occupations*
Two-Digit Occupation	0.0314	0.0485	–0.1786	–0.1918
	(.0580)	(.0713)	(.0940)	(.1307)
District of Residence × Occupation	–0.0106	–0.0186	–0.0693	0.1971
	(.0612)	(.0927)	(.1114)	(0.1950)
Schooling × Occupation	0.0511	0.0507	–0.0116	–0.0085
	(.0364)	(.0394)	(.0772)	(.0852)
Industry × Occupation	–0.0145	–0.0152	–0.3101	–0.3912
	(.0613)	(.0809)	(.1062)	(.1781)
Schooling × Experience	0.0651	0.1805	0.0292	0.1541
	(.0654)	(.1025)	(.0941)	(.2185)
Cell Fixed Effects	Yes	Yes	Yes	Yes
Number of Observations	24,102	16,083	16,002	6,108

Entries in the table represent the estimated effect of the share of immigrants in one's cell on the probability of moving from employment to non-employment, as estimated by *separate* linear probability models. Immigrants are defined as those who have been in Israel less than three years. All models include the full set of control variables (see Table 5). Standard errors are robust with respect to clustering at the LMS–calendar quarter level, and are presented in parentheses.

Blue-collar occupations: clerical, sales, services, skilled agricultural workers, skilled industry workers, and unskilled workers.

Our data show that the share of immigrants in the public sector was relatively low, while labor force attachment of native women was stable throughout the period in the public sector and dropped sharply in the private sector.[15] This suggests that the increase in labor force attachment came primarily from women who were employed in the private sector, in jobs that traditionally have been predominantly male. In the next section we directly explore whether there were any private/public sector differences in the effects of immigrants on job loss.

[15]The quarterly transition rate of native women fluctuated around 4.0% in the public sector, while it dropped sharply in the private sector, from 13.2% in 1989 to 8.0% in 1999.

Is the Effect of Immigrants Homogeneous?

Restricting the Sample to Selected Occupations

One possible way to obtain a clearer picture about the impact of immigration is to focus on low-skill occupations, where most of the immigrants were concentrated (see Table 2), and also where job loss was more frequent. For example, for men the probability of moving from employment to non-employment was 7.5% for service workers, 5.5% for skilled industry workers, and 8.9% for unskilled workers, as compared to 2.4% for academic professionals and 1.8% for managers. For women, the gap in job loss probabilities between skilled and unskilled workers was even larger: 15.0% for service workers, 12.7% for skilled industry workers, and 9.1% for unskilled workers, as compared to 3.1% for academic profes-

sionals and 2.3% for managers. Therefore, in Table 7 we re-estimate the model of Table 5, but restrict the sample to either all blue-collar workers (columns 1 and 3) or just service workers, skilled industry workers, and unskilled workers (columns 2 and 4). All models include cell fixed effects. For men, under some LMS definitions (two-digit occupation, schooling-experience) the point estimate increases somewhat relative to the results shown in Table 5, while it stays unchanged or becomes negative under others; in any case, the effect is never statistically significant. For women, the majority of the point estimates are negative and insignificant. Altogether, there is no evidence that restricting the sample to low-skill occupations yields a larger adverse effect of immigration on transition probabilities.

Differential Effects by Schooling, Experience, and Economic Sector

Up to now our analysis has assumed that the immigrant wave had separate effects on male and women workers, but that these effects did not differ along other dimensions. However, it is possible that different categories of native workers were affected differentially by the immigration wave. For example, since these immigrants were highly educated and had no experience in the Israeli labor market, they increased the relative supply of this particular type of worker, hence affecting young and educated natives more than others. It is also possible that the presence of immigrants affected natives in the public sector differently from natives in the private sector, if the terms of employment and the degree of competitiveness differed between these sectors. The results of specifications examining these possibilities are presented in Table 8 using two-digit occupations to define LMSs (the results in the other specifications were similar). All models include cell fixed effects.

For men, we find that within occupations (column 1), there was some effect of immigration on natives with zero years of experience (p-value of 0.066). The interaction term between immigrants' share and natives' experience is negative and statistically significant, indicating that the magnitude of the effect declined with native workers' experience. The parameter estimates and standard errors indicate that the effect is statistically different from zero (at the 10% level) for all natives with less than 7 years of experience, and is positive for all natives with less than 29 years of experience. There is weak evidence that the effect of immigration was larger for educated workers (column 2) and for workers in the private sector (column 3), although these effects are not statistically significant. The fact that young (and thus less experienced) natives were more likely to be affected may indicate that the large influx of immigrants caused more mobile workers (including highly educated workers) to seek alternative career paths.[16] As expected, public sector workers were essentially shielded from any negative effects of immigration, whereas the effects for private sector workers were similar in magnitude to those found for the overall population.

For women, we find that immigration had no statistically significant effect on inexperienced natives, whereas it lowered the job loss probability of older natives (column 1). Within occupations, all female natives faced a lower probability of moving to unemployment in cells with a greater presence of immigrants, regardless of their level of education (column 2). The interesting finding is that female natives in the public sector were facing substantially *lower* probabilities of moving from employment to non-employment due to the presence of immigrants in their occupation, whereas female natives in the private sector were not affected by immigrants in their labor market cell (column 3). Coupled with the

[16]In a previous version of this study (Cohen-Goldner and Paserman 2004), we analyzed the effect of immigration on young natives' occupational choice using a conditional logit model. There was no evidence that differences between occupations in the percentage of immigrants affected young workers' career choices.

Table 8. Differential Effects by Experience, Education, and Economic Sector.

	Labor Market Cells Defined by Two-Digit Occupation		
Description	*(1)*	*(2)*	*(3)*
A. Men			
Share of Immigrants	0.1306	0.0315	–0.0375
	(.0711)	(.0462)	(.0576)
Share of Immigrants × Experience	–0.0044	—	—
	(.0021)		
Share of Immigrants × (Years of Schooling – 12)	—	0.0085	—
		(.0059)	
Share of Immigrants × Private Sector	—	—	0.0739
			(0.0538)
Private Sector			0.0131
			(.0043)
Cell Fixed Effects	Yes	Yes	Yes
Number of Observations	35,707	35,707	35,707
B. Women			
Share of Immigrants	–0.0204	–0.2135	–0.5088
	(.1321)	(.0906)	(.0994)
Share of Immigrants × Experience	–0.0072	—	—
	(.0037)		
Share of Immigrants × (Years of Schooling – 12)	—	–0.0031	—
		(.0104)	
Share of Immigrants × Private Sector	—	—	0.4830
			(0.0904)
Private Sector			0.0371
			(0.0058)
Cell Fixed Effects	Yes	Yes	Yes
Number of Observations	26,879	26,879	26,879

Entries in the table represent the coefficient on the relevant variable in a linear probability model for the probability of moving from non-employment to employment, with cell fixed effects. Immigrants are defined as those who have been in Israel less than three years. Labor market cells are defined by two-digit occupation. For a full list of control variables, see Table 5. Standard errors are robust with respect to clustering at the LMS–calendar quarter level, and are presented in parentheses.

results on experienced workers, this suggests that the pervasiveness of tenure in the public sector played a major role in protecting female natives from competition with immigrants. Supporting this conjecture is the evidence that Russian immigrants may actually have been complements to native workers, especially in the public sector. Sussman and Zakai (1998) found that Russian physicians were confined to low-paying jobs in Israeli hospitals, enabling their native counterparts to be promoted to higher-rank positions in an expanding health care system.[17]

Immigrants' Tenure in Israel

To further explore how the gradualism of the absorption process affected natives'

[17]We attempted to find evidence for such occupational upgrading among natives using the LFS data, but were unable to identify a sufficient number of vertically related pairs of occupations.

labor market outcomes, we now study whether immigrants with different lengths of tenure in Israel affected natives differentially. We consider the following econometric specification: let ImgrntShare_{jts} be the share of immigrants with s years of tenure in Israel out of total employment in cell j at time t. A fully flexible specification of the relationship between transition probabilities and immigrants would then be

$$(2)\quad E(\text{NotEmployed}_{ijt} \mid \text{Employed}_{ijt-1} = 1, \{\text{ImgrntShare}_{jst}\}_{s=0}^{10}, X_{ijt}) = \beta_0 \text{ImgrntShare}_{j0t} + \beta_1 \text{ImgrntShare}_{j1t} + \ldots + \beta_{10} \text{ImgrntShare}_{j,10,t} + \gamma' X_{ijt} + \delta_t + \eta_j.$$

There might be insufficient degrees of freedom to separately estimate precisely each one of the β parameters, so we choose a more parsimonious specification:

$$(3)\quad \beta_s = \gamma_0 + \gamma_1 s.$$

Assumption (3) states that the effect of immigrants changes linearly with their tenure: in this case, equation (2) reduces to a linear probability model of the transition to unemployment on the simple immigrant share (the total number of immigrants divided by total employment in the cell: this is the same measure used in Table 6) and on the tenure-weighted immigrant share in a cell, and can be written as

$$(4)\quad E(\text{NotEmployed}_{ijt} \mid \text{Employed}_{ijt-1} = 1, \{\text{Imgrnt}X_{jst}\}_{s=0}^{10}, X_{ijt}) = \lambda_0 \sum_s \text{ImgrntShare}_{jst} + \lambda_1 \sum_s s \times \text{ImgrntShare}_{jst} + \gamma' X_{ijt} + \delta_t + \eta_j.$$

The signs of λ_0 and λ_1 are *a priori* ambiguous: on one hand, if immigrants are poor substitutes for natives when they arrive, but then natives become easily substitutable for immigrants as the latter acquire local skills, we would expect λ_0 to be approximately zero, and λ_1 to be positive; on the other hand, immigration might have a short-run displacement effect, but as time since immigration increases it is more likely that the local factors of production (native workers and capital) adjust so as to diffuse the effects of immigration: in this case, λ_0 would be positive and λ_1 would be negative. Note that a value of λ_1 equal to zero implies that the effect of immigrants is the same regardless of their length of tenure in Israel; in this case, equation (2) reduces to a regression of the transition dummy on the simple share of immigrants in a labor market cell, as in Table 6.[18]

In addition to (4), we estimate a more flexible specification of the dynamic impact, by no longer constraining the effect of immigration to vary linearly with immigrants' tenure. We use a piecewise-constant function for the βs in equation (2):

$$(5)\quad E(\text{NotEmployed}_{ijt} \mid \text{Employed}_{ijt-1} = 1, \{\text{ImgrntShare}_{jst}\}_{s=0}^{10}, X_{ijt}) = \tilde{\beta}_0 \text{ImgrntShare}_{j0t} + \tilde{\beta}_1 \sum_{s=1}^{3} \text{ImgrntShare}_{jst} + \tilde{\beta}_2 \sum_{s=4}^{6} \text{ImgrntShare}_{jst} + \tilde{\beta}_3 \sum_{s=7}^{10} \text{ImgrntShare}_{jst} + \gamma' X_{ijt} + \delta_t + \eta_j.$$

The results are presented in Table 9 using the two-digit occupational labor market segmentation, with fixed effects. In column (1) we estimate equation (4) assuming that λ_1 is equal to zero. This column essentially reproduces the fixed-effects estimates from the first row in Table 6.[19] For men, the total effect of immigration is very small and statistically insignificant, while for women immigration appears to have a negative effect on transition probabilities. In column (2) we estimate equation (4) with no restrictions. For men, both coefficients are estimated imprecisely; however, the coefficient on the simple immigrant share (λ_0) becomes substantially larger than in the constrained version, while the coefficient on the tenure-weighted im-

[18]Note that in this specification, we calculate the immigrant share based on the stock of all immigrants who arrived since 1989, as in Table 6.

[19]The small difference between the estimated coefficients is attributable both to a small difference between the samples used and to rounding error.

Table 9. The Effect of Immigrant Share by Tenure in Israel on the Transition from Employment to Non-Employment.

	Labor Market Cells Defined by Two-Digit Occupation		
Description	*(1)*	*(2)*	*(3)*
A. Men			
Simple Immigrant Share	0.0089 (0.0286)	0.0561 (0.0585)	—
Tenure-Weighted Immigrant Share	—	–0.0100 (0.0098)	—
Immigrants Who Have Been in Israel Less Than a Year as a Share of All Employed Persons	—	—	–0.2521 (0.2637)
Immigrants Who Have Been in Israel for 1–3 Years as a Share of All Employed Persons	—	—	0.0402 (0.0493)
Immigrants Who Have Been in Israel for 4–6 Years as a Share of All Employed Persons	—	—	0.0189 (0.0400)
Immigrants Who Have Been in Israel for 7–10 Years as a Share of All Employed Persons	—	—	–0.0402 (0.0490)
Cell Fixed Effects	Yes	Yes	Yes
B. Women			
Simple Immigrant Share	–0.3299 (0.0636)	–0.2781 (0.1124)	—
Tenure-Weighted Immigrant Share	—	–0.0113 (0.0167)	—
Immigrants Who Have Been in Israel Less Than a Year as a Share of All Employed Persons	—	—	–0.3433 (0.5875)
Immigrants Who Have Been in Israel for 1–3 Years as a Share of All Employed Persons	—	—	–0.2851 (0.0906)
Immigrants Who Have Been in Israel for 4–6 Years as a Share of All Employed Persons	—	—	–0.3846 (0.0817)
Immigrants Who Have Been in Israel for 7–10 Years as a Share of All Employed Persons	—	—	–0.3099 (0.0916)
Cell Fixed Effects	Yes	Yes	Yes

Number of observations is 33,916 in the regressions for men and 25,177 in the regressions for women.

Entries in the table represent the estimated effect of the relevant variable on the probability of moving from employment to non-employment, as estimated by a linear probability model with cell fixed effects. Immigrants are all those who immigrated after 1989. For the full list of control variables, see Table 5. Standard errors are robust with respect to clustering at the LMS–calendar quarter level in parentheses, and are presented in parentheses.

migrant share (λ_1) is negative. For women, the magnitude of λ_0 is about the same as that in the constrained version, while λ_1 is also negative and statistically insignificant.

According to the more flexible piecewise specification (column 3), there is no monotonic trend in the dynamic effect of immigration on native men's probability of moving to non-employment. Men were adversely affected by the presence of immigrants who had arrived 1–6 years earlier, while they were positively affected by immigrants who had just arrived or had arrived more than 7 years earlier. On the other hand, the effect of immigration on women's transition probabilities stayed roughly constant at around –0.3, with the effects of less recent immigrants estimated more precisely.

It is difficult to draw strong conclusions from these coefficients, since they are estimated imprecisely and, for men, are statistically indistinguishable from zero. There is some suggestive evidence that native men may have been adversely affected in the short run (1–3 years), while the negative association between female transition probabilities and immigration was independent of immigrant time spent in Israel.

Transitions between Labor Market Segments

Our analysis up to now has ignored job-to-job transitions, which can play an important role for job losers, and may be affected strongly by immigration. Unfortunately, our data do not allow us to identify exactly which workers moved between jobs between two consecutive LFS interviews. We can, however, look at transitions between different LMSs. That is, we can look at changes in either one's two-digit occupation or one's industry-occupation cell.[20] Workers who were employed during the first LFS interview could therefore have experienced one of three possible outcomes at the time of the second interview: they could have been employed in the same labor market cell (outcome 1), they could have moved to employment in a different labor market cell (outcome 2), or they could have moved out of employment altogether (outcome 3).[21] We therefore estimate the effect of the immigrant share on one's status in the second interview using a multinomial logit model. Namely,

$$(6)\qquad P(\text{EmploymentStatus}_{ijt} = l \mid \text{EmploymentStatus}_{ijt-1} = 1, \text{ImgrntShare}_{jt}, X_{ijt}) = \frac{\exp(\beta_l \text{ImgrntShare}_{jt} + \gamma_l' X_{ijt} + \delta_{lt} + \eta_{lj})}{1 + \sum_{l=2}^{3} \exp(\beta_l \text{ImgrntShare}_{jt} + \gamma_l' X_{ijt} + \delta_{lt} + \eta_{lj})}, \quad l = 2, 3.$$

The omitted category is staying employed in the same LMS. Here, the coefficient β_l denotes the effect of the immigrant share on the log odds of outcome l relative to the base outcome. The results are presented in Table 10. For each specification, we report the multinomial logit coefficients on the immigrant share. Note that if one collapses the two "staying employed" outcomes, we are back to simple transitions from employment to non-employment, as in Table 5. Therefore, we also report the logit coefficients for the effect of immigrant share on employment to non-employment transitions, to give a better sense of the magnitude of the coefficients.

The results in the specifications without fixed effects are mixed: the effect of immigration on between-LMS transitions ranges from large and positive (under the two-digit occupation LMS definition for men and the industry-occupation definition for women) to large and negative (the two-digit occupation LMS definition for women). However, none of the effects are statistically significant when we include cell fixed effects. Finally, the multinomial logit coefficient for the transition to non-employment is quite similar to the simple logit coefficient in all specifications, meaning that our previous results were not sensitive to the inclusion of transitions between LMSs as a third possible outcome.

Transitions from Non-Employment to Employment

Up to now we have focused on labor market transitions in one direction, from employment to non-employment. In this section we investigate whether the mass

[20]This measure may pick up some true job-to-job transitions, but may also reflect noise in workers' industrial and occupational classification. Moreover, the measure fails to pick up true job changes that occur within the same LMS.

[21]The average probability of moving between employment in different two-digit occupations is 31.3% for men and 24.1% for women. The average probability of moving between different industry-occupation cells is 28.9% for men and 18.2% for women.

Table 10. Transitions between Labor Market Segments.

	Labor Market Cells Defined by:			
	Two-Digit Occupation		*Industry × Occupation*	
Change in Employment Status	*No Cell Fixed Effects*	*Cell Fixed Effects*	*No Cell Fixed Effects*	*Cell Fixed Effects*
	A. Men			
Multinomial Logit				
Moved to Employment in a Different LMS	0.8473	–0.1506	–0.0956	–0.0140
	(.3815)	(.4394)	(.4329)	(.4890)
Moved to Non-Employment	1.9899	0.6118	2.6450	0.3527
	(.4844)	(.8730)	(.4643)	(.9314)
Logit				
Moved to Non-Employment	1.7071	0.6856	2.6708	0.3637
	(.4739)	(.8430)	(.4538)	(.9166)
N	36,812		36,850	
	B. Women			
Multinomial Logit				
Moved to Employment in a Different LMS	–2.5810	0.1236	3.0512	0.0682
	(.5952)	(.6786)	(.5616)	(.7212)
Moved to Non-Employment	3.9829	–1.2405	7.4805	–1.9531
	(.4974)	(.7929)	(.5990)	(.8949)
Logit				
Moved to Non-Employment	4.5994	–1.2947	6.8000	–2.0029
	(.4873)	(.7478)	(.6155)	(.8883)
N	27,824		27,780	

Entries in the table represent the coefficients on the share of immigrants in a cell in a multinomial logit model with three possible choices: staying employed in the same LMS (the omitted category), moving to employment in a different LMS, and moving to non-employment. Specifically, the coefficients represent the effect of the share of immigrants on the log odds of moving to employment in a different LMS (moving to non-employment) relative to staying employed in the same LMS. For the full list of control variables, see Table 5. Standard errors are robust with respect to clustering at the LMS–calendar quarter level, and are presented in parentheses.

migration affected the dynamics of the labor market in the other direction, from non-employment to employment. We estimate a linear probability model of transitions from non-employment to employment, along the lines of that estimated in Table 5, and present the results in Table 11. The analysis is based on the two-digit occupation LMS definition and on the schooling-experience definition.

In the model based on LMSs as defined by two-digit occupation, the sample is limited to individuals (either currently unemployed or out of the labor force) who worked in Israel in the 12 months prior to the first LFS interview, since no data on occupation are available for the longer-term unemployed. For the estimation using the schooling-experience LMS definition, we report two sets of results: one based on the same sample as in the estimation using the two-digit occupation LMS definition, for purposes of comparability, and the other based on all non-employed individuals in the first interview.

In the model using the two-digit occupation LMS definition, with no fixed effects, there is a weak negative association between immigrants' concentration and native men's probability of finding a job.

Table 11. Transitions from Non-Employment to Employment.

	Labor Market Cells Defined by:			
	Two-Digit Occupation		*Schooling/Experience*	
Change in Employment Status	*No Cell Fixed Effects*	*Cell Fixed Effects*	*No Cell Fixed Effects*	*Cell Fixed Effects*
A. Men				
1) Sample includes only individuals who did not work in the last 12 months prior to the first interview				
Share of Immigrants	–0.2807	–0.1010	0.2602	0.2701
	(.1660)	(.2710)	(.2593)	(.3563)
Number of Observations	2,398			
2) Sample includes all individuals who did not work in the first interview				
Share of Immigrants	—	—	–0.0166	0.0583
			(.1078)	(.1462)
Number of Observations	9,006			
B. Women				
1) Sample includes only individuals who did not work in the last 12 months prior to the first interview				
Share of Immigrants	0.0023	0.0387	0.1245	0.0157
	(.1579)	(.2788)	(.2641)	(.3361)
Number of Observations	2,643			
2) Sample includes all individuals who did not work in the first interview				
Share of Immigrants	—	—	0.2440	0.0775
			(.0697)	(.1005)
Number of Observations	20,739			

Entries in the table represent the estimated effect of immigrant share on the probability of moving from non-employment to employment, as estimated by a linear probability model. Immigrants are those who have been in Israel less than three years. All specifications include the same set of control variables as in Table 5. In addition, we include dummies for out of the labor force and for unemployed more than 12 months (full sample). The omitted category is unemployed less than 12 months. Standard errors are robust with respect to clustering at the LMS–calendar quarter level, and are presented in parentheses.

However, inclusion of cell fixed effects wipes away this impact. For women and in all the models that use the schooling-experience LMS definition, the coefficients are small and statistically insignificant. Overall, we do not find any consistent evidence that a higher immigrant share leads to a higher probability of natives finding a job.

Conclusion

In this paper we have studied the mass migration wave from the former Soviet Union to Israel in the 1990s and its effect on native transitions from employment to non-employment and vice-versa. We find that within a given labor market segment (LMS), there was a positive correlation between the share of immigrants and the probability of natives moving from employment to non-employment. Controlling for LMS fixed effects, however, substantially reduces the measured effects for men, and results in either zero or negative measured effects for women. The results obtained by instrumenting the share of immigrants with its lag are almost identical to the fixed-effect estimates. These results suggest that immigrants selectively cluster in high-turnover LMSs. In any case, the effect is not large: in our preferred specification, a 10 percentage point increase in the immigrant

share raises employment-to-non-employment transition probabilities by at most 0.49%. We also find no statistically significant effect of immigration on between-LMS transitions or on natives' job-finding probabilities.

All told, the results in this paper are in line with much of the previous research on the impact (or lack thereof) of immigration on native labor market outcomes, both in Israel and in other countries. Given the extraordinary size of the migration wave to Israel, especially in the first two years after the fall of the Soviet Union, our results can be viewed as especially surprising. However, a number of factors may explain why employment transitions were relatively insensitive to the large shock in labor supply generated by the migration wave. For example, layoffs and firings are likely to be induced by slack business conditions, by bankruptcy, or by dissatisfaction with the quality of a worker-firm match, none of which is necessarily responsive to excess labor supply. Similarly, voluntary quit rates are affected by workers' perceived re-employment probabilities, which are likely to fall when the pool of available workers widens. On the other hand, the availability of low-cost workers may induce higher turnover, with employers laying off older or less productive workers. This issue has been studied in the context of the effects of fixed term contracts on labor flexibility and turnover in a number of European countries, with mixed results.[22]

Therefore, it remains to be explained why the large migration episode did not substantially affect flows of native workers. One appealing explanation is that the capital stock adjusted relatively quickly, as documented in Cohen and Tai-Hsieh (2001). However, these capital inflows can be attributed not only to the mass migration wave, but also to other significant events that took place in Israel around the same time, such as the Oslo Accords or the Israeli high tech boom in the mid-1990s. The causality and complex ties between these factors remain to be investigated.

[22]See Contini and Rapiti (1999); Hunt (2000); García Serrano (1998).

REFERENCES

Altonji, Joseph G., and David Card. 1991. "The Effects of Immigration on the Labor Market Outcomes of Less-Skilled Natives." In John M. Abowd and Richard B. Freeman, eds., *Immigration, Trade, and the Labor Market.* Chicago: University of Chicago Press.

Beenstock, Michael, and Ruth Klinov. 1996. "Why Did the Probability of Exiting Unemployment Decline? Israel, 1969–1992." Maurice Falk Institute for Economic Research in Israel, Discussion Paper 96.12.

Berman, Eli. 2000. "Sect, Subsidy, and Sacrifice: An Economist's View of Ultra-Orthodox Jews." *Quarterly Journal of Economics,* Vol. 115, No. 3 (August), pp. 905–53.

Borjas, George J. 2003. "The Labor Demand Curve *Is* Downward Sloping: Reexamining the Impact of Immigration on the Labor Market." *Quarterly Journal of Economics*, Vol. 118, No. 4 (November), pp. 1335–74.

Borjas, George J., Richard B. Freeman, and Lawrence F. Katz. 1996. "Searching for the Effect of Immigration on the Labor Market." *American Economic Review,* Vol. 86, No. 2 (May), pp. 246–51.

Card, David. 1990. "The Impact of the Mariel Boatlift on the Miami Labor Market." *Industrial and Labor Relations Review,* Vol. 43, No. 1 (January), pp. 245–57.

____. 2001. "Immigrant Inflows, Native Outflows, and the Local Labor Market Effects of Higher Immigration." *Journal of Labor Economics,* Vol. 19, No. 1 (January), pp. 22–64.

Carrington, William J., and Pedro J.F. de Lima. 1996. "The Impact of 1970s Repatriates from Africa on the Portuguese Labor Market." *Industrial and Labor Relations Review,* Vol. 49, No. 2 (January), pp. 330–47.

Cohen, Sarit, and Chang Tai-Hsieh. 2001. "Macroeconomic and Labor Market Impact of Russian Immigration in Israel." Bar Ilan University Working Paper No. 11–01.

Cohen-Goldner, Sarit, and M. Daniele Paserman. 2004. "Mass Migration to Israel and Natives' Transitions from Employment." IZA Discussion Paper No. 1319, Bonn.

Contini, Bruno, and Fabio M. Rapiti. 1999. "'Young In, Old Out' Revisited: New Patterns of Employment Replacement in the Italian Economy." *Inter-*

national Review of Applied Economics, Vol. 13, No. 3 (September), pp. 395–415.

Eckstein, Zvi, and Yoram Weiss. 2004. "On the Wage Growth of Immigrants: Israel 1990–2000." *Journal of the European Economic Association,* Vol. 2, No. 4 (June), pp. 665–95.

Friedberg, Rachel M. 2001. "The Impact of Mass Migration on the Israeli Labor Market." *Quarterly Journal of Economics,* Vol. 116, No. 4 (November), pp. 1373–1408.

García Serrano, Carlos. 1998. "Worker Turnover and Job Reallocation: The Role of Fixed-Term Contracts." *Oxford Economic Papers,* Vol. 50, No. 4 (October), pp. 709–25.

Goldin, Claudia. 1994. "The Political Economy of Immigration Restriction in the United States, 1890–1921." In Claudia Goldin and G. Libecap, eds., *The Regulated Economy: A Historical Approach to Political Economy.* Chicago: University of Chicago Press.

Gould, Eric D., Victor Lavy, and M. Daniele Paserman. 2004. "Immigrating to Opportunity: Estimating the Effects of School Quality Using a Natural Experiment on Ethiopians in Israel." *Quarterly Journal of Economics,* Vol. 119, No. 2 (May), pp. 489–526.

Hunt, Jennifer. 1992. "The Impact of the 1962 Repatriates from Algeria on the French Labor Market." *Industrial and Labor Relations Review,* Vol. 45, No. 2 (April), pp. 556–72.

____. 2000. "Firing Costs, Employment Fluctuations, and Average Employment: An Examination of Germany." *Economica,* Vol. 67, No. 266 (May), pp. 177–202.

LaLonde, Robert, and Robert Topel. 1991. "Labor Market Adjustments to Increased Immigration." In John M. Abowd and Richard B. Freeman, eds., *Immigration, Trade, and the Labor Market.* Chicago: University of Chicago Press.

Moffitt, Robert A. 1994. "New Developments in Econometric Methods for Labor Market Analysis." In Orley C. Ashenfelter and David Card, eds., *Handbook of Labor Economics, Volume 3A.* Amsterdam: North Holland, pp. 1367–97.

Pischke, Jorn-Steffen, and Johannes Velling. 1997. "Employment Effects of Immigration to Germany: An Analysis Based on Local Labor Markets." *Review of Economics and Statistics,* Vol. 79, No. 4 (November), pp. 594–604.

Sussman, Zvi, and Dan Zakai. 1998. "The Mass Immigration of Physicians and the Steep Rise in Wages of Veterans in Israel: A Paradox?" (in Hebrew). *Economic Quarterly,* Vol. 45, No. 1 (May), pp. 28–63.

Venturini, Alessandra, and Claudia Villosio. 2002. "Are Immigrants Competing with Natives in the Italian Labour Market? The Employment Effect." IZA Discussion Paper No. 467, Bonn.