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Do Foreign Workers affect Local Wages? Evidence from Israeli Agriculture

By

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Abstract

This paper examines the changes in the wages of different types of workers in different industries during a period in which the number of foreign workers in Israel increased considerably, especially in agriculture. We focus on unskilled workers, presumed to be substitutes to foreign workers, and skilled workers, who are presumed to be complements. We estimate a difference-in-difference log-wage regression in order to identify the relative wage changes in agriculture, construction and manufacturing, compared to all other industries. We find that the wages of unskilled workers in agriculture decreased compared to the other industries, while the wages of skilled workers and other occupations increased. This is consistent with the view that foreign workers have an important role in affecting the agricultural demand for local workers. Similar results were not found for the other industries, perhaps because their dependence on foreign workers is not as large as in agriculture. In the policy debate over the number of foreign workers in agriculture and their cost, the negative impact on the wages of unskilled workers has to be weighed against the positive impact on the wages of all other workers.

Introduction

Rural sectors in developed countries have been undergoing substantial structural changes in recent decades. One of the manifestations of these changes is the decline of agriculture as an important source of income. In Israel, this decline has been extremely fast due to the 1985 financial crisis and the dismantling of the cooperative system (see Kislev, Lerman and Zusman 1991, Kimhi 2008, and Kislev 2015). In the past, the rural sector and the agricultural sector have been close to synonyms. These days they are much less so. For example, in 1960, 84% of workers in small villages reported agriculture as their major sector of employment. By 2017, this fraction has plummeted to 6%. The number of self-employed in agriculture (including forestry and gardening) declined from 75 thousand in 1960 to about 16 thousand in 2011 (figure 1), and continues to decline since then. The number of salaried workers in agriculture, on the other hand, declined in a similar pace until the early 1990s, but has been on the rise since then. The fraction of salaried employees out of all agricultural employees was stable during the 60's, 70's and 80's at about 40%. Since then, it has more than doubled (figure 2). This reflects a major structural change in the farm sector, including the transition from small and diversified family farms using predominantly family labor to much larger and more specialized commercial farms employing many hired workers.

In addition to the 1985 financial crisis, the structural change in agriculture was also facilitated by the arrival of foreign workers since the mid-1990s. To be precise, foreign workers used to work in Israel way before the 1990s. In particular, Palestinians used to work as daily laborers in agriculture, construction and services

since the late 1960s (Bartram 1998), but the worsening security situation during the Palestinian uprising of the late 1980s did not allow them to arrive regularly at work (Angrist, 1996), and as a result, the government allowed employers to replace them with foreign workers that came for a five-year period each. The employment of Thai workers in agriculture, Romanian workers in construction, and Philippine workers in domestic services started in 1993 in small numbers, but as can be seen in table 1, those numbers increased considerably in subsequent years (Miaari and Sauer, 2011).

Subsequent government efforts to reduce the number of foreign workers were motivated by the presumption that foreign workers take the jobs of local low-skill workers. These efforts were quite successful in the construction sector. The number of foreign workers in construction dropped from 40 thousand to 10 thousand between 2002 and 2005 (table 1). A similar effort to reduce the number of foreign workers in agriculture did not succeed. Kimhi (2014) claimed that Thai workers in agriculture turned out to be much more than a source of cheap labor that competes with local low-skilled workers. Compared to the daily Palestinians laborers who commuted long distances and often could not arrive to work due to military closures, Thai workers lived on farm and were available 24/7, and perhaps more importantly, were not allowed to switch employers easily. This enabled farmers to commit to quantity, quality and timing standards required by international wholesalers and therefore to expand exports. They also allowed farms to increase within-farm labor specialization, with farm operators and hired Israelis doing mostly managerial tasks and supervision, and Thai workers doing the manual tasks. As a result, Kimhi (2014) concluded that the positive effects of farm growth on employment and income outweigh the negative effect on the employment of low-

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skilled workers, so that the net contribution of foreign workers in agriculture is positive.

This conclusion is supported by the theoretical model of Razin and Sadka (2000), who showed that in open economies, an inflow of low-skilled immigrants benefits the local workers. Shimada (2005) also reached a similar conclusion. Considering the fact that foreign workers in Israel arrive for a limited period and then return to their country of origin and do not share the benefits of the welfare state, this conclusion makes even more sense in their case.

These theoretical arguments receive further support in the literature. Constant (2014) reviewed empirical studies of the effects of low-skilled immigration on local workers and concluded that the negative effect on local low-skilled workers is limited, and in any case is outweighed by the overall positive effect of immigration on the local economy. Kerr and Kerr (2001) also surveyed the empirical literature and concluded that even large-scale immigration does not have considerable effects on the local labor market. Dadush (2014) focused on low-skill immigrants and reached a similar conclusion. Cattaneo et al. (2015) examined data from 11 European countries and found that local workers benefit from immigration.

The purpose of this paper is to examine the changes in wages of hired workers in agriculture between 1995 and 2008, a period during which the number of foreign workers in agriculture almost doubled. The years 1995 and 2008 were chosen because of the existence of data from population censuses for those years. Alternative data sources such as labor force surveys or social surveys are too small for this purpose, given the small and declining fraction of agriculture in the labor

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force. We will differentiate between skilled and unskilled workers, and compare the wage trends in agriculture to those in other sectors.

Theoretical arguments and hypotheses

Kislev (2003) suggested a theoretical model to assess the impacts of an inflow of cheap foreign workers on the agricultural sector of the host country. He assumed that the inflow of cheap foreign workers drives down the wages of local workers, and predicted that this will crowd out both local hired labor and farm operators, as farms become fewer and larger. However, he did not differentiate between skilled and unskilled hired workers. Kimhi (2014) extended the model such that skilled and unskilled workers are different inputs in agricultural production, and assumed that they are complements. He examined two alternative scenarios, depending on whether the supply of local unskilled workers is infinitely elastic or not. We can plausibly focus on the second scenario, given the vast anecdotal evidence that all the attempts by the Ministry of Agriculture to encourage Israeli workers to replace the foreign workers have failed completely for years, despite generous incentives to both workers and employers. In this case, the inflow of cheap unskilled workers is expected to drive down the wage of local unskilled workers. However, the total (local and foreign) number of unskilled workers increases, and this in turn induces an increase in the demand for skilled workers and an increase in their wages, unless their labor supply is perfectly elastic.

Hence, under plausible assumptions, our working hypothesis is that an increase in the inflow of foreign workers will drive down the wage of unskilled local workers in agriculture and drive up the wage of skilled workers.

Data and descriptive statistics

Labor data is usually collected in Israel through the quarterly Labor Force Survey. However, the size of the samples does not enable focusing on small industries such as agriculture. We therefore rely in this research on the two latest population censuses, those conducted in 1995 and 2008, that provide detailed labor data for roughly a fifth of Israeli households.

Our sample is limited to wage workers who worked in each of the 12 months preceding the survey and did not report self-employment income.[1] We excluded employees whose hourly wages were outside the range of 15-400 NIS (roughly $4-105) in 2008 prices. Altogether, we ended up with 236,551 workers in 1995 and 293,663 workers in 2008.

We divided the samples into 12 broad industries.[2] An occupation is also reported for each worker. We focus here on two types of occupations, skilled workers and unskilled workers, for two reasons. First, they account for the vast majority of wage workers in agriculture (table 2). Second, average wages in those

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[1] The hourly wages of those who have not worked in each of the 12 months preceding the census were significantly lower than the hourly wages of those who did.
[2] The complete list of industries can be seen in Appendix 1.

occupations are lower than the average wages in most other occupations (table 3), and hence they are most likely to be affected by the inflow of foreign workers.[3]

Table 2 shows that three industries stand out as employing predominantly skilled and unskilled workers: agriculture, manufacturing and construction. In 1995, 65%, 50% and 60% of the wage workers were defined as skilled workers in the three industries, respectively. In 2008, these fractions declined to 61% and 44% in agriculture and manufacturing, respectively, and increased to 71% in construction. Unskilled workers comprised 17% of wage workers in agriculture in both 1995 and 2008. In manufacturing, they comprised 4% of wage workers in 1995 and 7% in 2008. Unskilled workers comprised 16% of wage workers in construction in 1995, and this fraction dropped to 6% in 2008.

The three sectors are not similarly exposed to the inflow of foreign workers. IN agriculture, foreign workers (including Palestinians) comprise more than 50% of hired labor (figure 3). In construction, foreign workers comprised up to 35% of hired labor, but this fraction dropped to around 20%. While we do not have data on the number of foreign workers in manufacturing, the fraction of foreign workers in all sectors besides agriculture and construction is not higher than 2%. Even if all those foreign workers worked in manufacturing, their fraction would not have been more than 10%.

Our main variable of interest is hourly wage, which is the monthly wage divided by monthly hours of work.[4] The average wages of skilled and unskilled

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[3] It should be emphasized that foreign workers are not included in the population censuses.
[4] Employees reported their weekly hours of work, and we multiplied them by 4.3.

workers in all industries are presented in table 3. Wages of unskilled workers are the lowest, while the wages of skilled workers are somewhat higher but still lower than those of workers in other occupations. Skilled wages in agriculture are somewhat lower than in manufacturing, and both have increased from 1995 to 2008. Skilled wages in construction were somewhat higher than in manufacturing in 1995, but were lower in 2008. Unskilled wages increased from 1995 to 2008 in agriculture and manufacturing, but decreased in construction.

The explanatory variables of the wage equations and their sample means are presented in tables 4 and 5, for skilled and unskilled workers, respectively. The conventional human capital variables of gender, age and years of schooling are naturally included. For Israel, an immigration country, it is also important to include ethnic origin and immigration status. First, we include a dummy variable for those who immigrated to Israel in the most recent wave starting in 1989, mostly coming from the Former Soviet Union, but also from Ethiopia. Second, we include a set of dummies for country of origin. Born/East and Born/West are those who were born outside of Israel, in an Eastern or A western country, respectively. Similarly, Origin/East and Origin/West are those who were born in Israel but their parents were born in a foreign country. Origin/mixed include those with one parent coming from an Eastern country and another from a Western country, or one parent born outside of Israel and the other born in Israel. Arabs include the ethnic minorities of Arabs, Druze and Circassians. The excluded category, Natives, include Jews and others whose parents were born in Israel. Two additional sets of dummy variables, representing local labor market conditions, are included: a set of regional dummies and asset of municipality size dummies.

Table 4 shows that the fraction of females among skilled workers in agriculture, construction and manufacturing is much higher than in other sectors. This fraction has increased between 1995 and 2008, more in agriculture than in any other sector. As shown in table 5, the fraction of females among unskilled workers in the three industries is lower than in other sectors, and has decreased from 1995 to 2008 in all sectors except for manufacturing. Both skilled and unskilled workers in manufacturing have more years of schooling on average than in the other sectors, with the exception of unskilled workers in agriculture in 2008. Average years of schooling of skilled workers is higher than that of unskilled workers in all industries, and average years of schooling has increased for both skilled and unskilled workers in all industries. The fraction of immigrants among both skilled and unskilled workers is higher in manufacturing than in any other sector. The fraction of immigrants among skilled workers is lowest in agriculture, while among unskilled workers it is lowest in construction. The fraction of new immigrants among both skilled and unskilled workers in agriculture declined between 1995 and 2008, while in increased in manufacturing and in the other sectors. The fraction of immigrants in construction increased among skilled workers and decreased among unskilled workers. The fraction of Arab workers is highest in construction than in any other sector, by far, and this is true for both skilled and unskilled workers. The fraction of Arab workers in agriculture decreased from 1995 to 2008, while it increased in all other sectors.

Empirical methodology and results

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Our empirical methodology is based on a difference-in-difference estimation of the log-wage equation (1) over time and across industries.

$$(1) \quad w_i = X_i\beta_X + M_i\beta_M + \alpha T + M_i T\beta_{MT} + \varepsilon_i$$

In (1), w is log hourly wage, X is a matrix of explanatory variables, M is a matrix of industry dummies, T=1 for 2008 and 0 for 1995, and ε is an idiosyncratic error term. In our main specification, the matrix M includes dummies for agriculture, manufacturing and construction, while all other industries as grouped together as the excluded category. Hence, the coefficients β_M measure the wage gaps between industries in 1995, while ($\beta_M + \beta_{MT}$) measure the wage gaps in 2008. Therefore, β_{MT} measure the inter-industry gaps in wage increases from 1995 to 2008. In one specification, we include all industry dummies in M (the excluded category is unknown industry). In a second specification, we group all industries other than agriculture, industry and construction as the excluded category. from the sample and use construction as the excluded industry. Equation (1) is estimated separately for skilled and unskilled workers.

The regression results are in table 6. The traditional human capital variables have the expected effects on wages. Wage increases with age at early ages and decreases at later ages. Schooling has a positive effect on wage, and this effect is less than 1% for unskilled workers, close to 3% for skilled workers, and more than 5% for all other workers. Females, Arabs and new immigrants have lower wages in all occupations. Those wage penalties are lowest among unskilled workers, probably because that the wages of unskilled workers are the lowest overall.

The coefficients of the industry dummies indicate that wages of skilled in all three industries, and especially in agriculture, were lower in 1995 than in the other industries. For unskilled workers the picture is different: wages are higher in construction than in other industries, but not different in agriculture and manufacturing. In all other occupations, wages are lower in agriculture, higher in construction, and not different in manufacturing than in all other sectors.

The coefficients of the 2008 dummies are positive in all occupations, indicating an increase in wages in all other industries. The wage increase is most remarkable for unskilled workers, who tend to be near the bottom of the wage distribution. This is consistent with the findings of Kimhi and Shraberman (2014), who showed that the lowest-paid workers gained the most in terms of wages between 1997 and 2007. The interaction of the industry dummies and the 2008 dummies indicate the wage change in each industry compared to all other industries. In agriculture, we find a relative decrease in wage for unskilled workers and a relative increase in wage for skilled workers and especially for all other workers. In construction, we find a relative wage decrease for skilled and unskilled workers and no difference for all other workers. In manufacturing we find a relative wage increase for all types of occupations.

The results for agriculture are consistent with the hypothesis that the inflow of unskilled foreign workers during the second half of the 1990s reduced the demand for local unskilled workers and increased the demand for local skilled workers and other types of occupations.

Summary and discussion

This paper contributes to the literature on the impact of immigration on local labor markets, by examining the changes in wages in Israel during 1995-2008, a period in which the number of foreign workers in agriculture increased considerably. We focus on unskilled workers, presumed to be substitutes to foreign workers, and skilled workers, who are presumed to be complements. Using data from the 1995 and 2008 population censuses, we estimate a difference-in-difference log-wage regression in order to identify the relative wage changes in specific industries, namely agriculture, construction and manufacturing, compared to all other industries.

We find that the wages of unskilled workers in agriculture decreased almost 6% compared to the other industries, while the wages of skilled workers increased by 6.5%, and the wages of workers in other occupations increased by close to 11%. This is consistent with the research hypothesis, but could also be driven by other sector-specific changes. In construction, for example, wages of both skilled and unskilled workers decreased relative to the other industries despite the considerable drop in the number of foreign workers employed in the sector during the period. This wage drop cannot be related to the change in the number of foreign workers alone. In the case of manufacturing, we do not have statistics on the number of foreign workers, but in any case, the wages of workers in all occupations have increased between 1995 and 2008, again ruling out the fact that the main driver of the wage changes is the inflow of foreign workers.

Still, the results for agriculture support the view that foreign workers have an important role in affecting the demand for local workers. Perhaps we obtain this

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conclusion for agriculture and not for construction and manufacturing because agriculture has the largest fraction of foreign workers among all industries (figure 3). In any case, further research is needed in order to substantiate our conclusion. One possible avenue is to examine the effects of exogenous changes in the cost of foreign workers on the wages of local employees. This is left for future research.

There is a vivid public debate in Israel about the need to reduce the number of foreign workers in agriculture and/or increase their cost. Our results indicate that there is no clear solution to this debate. Unskilled workers seem to be the losers as a result of the inflow of foreign workers, but all other workers seem to benefit. Overall, employment of hired workers in agriculture has increased since the arrival of foreign workers (figure 2). Cheap labor also helps maintaining and even boosting the supply of fresh agricultural products, and assists in the fight against the cost of living. Hence, the policy decisions regarding the number of foreign workers in agriculture and their cost have to take all these aspects into consideration.

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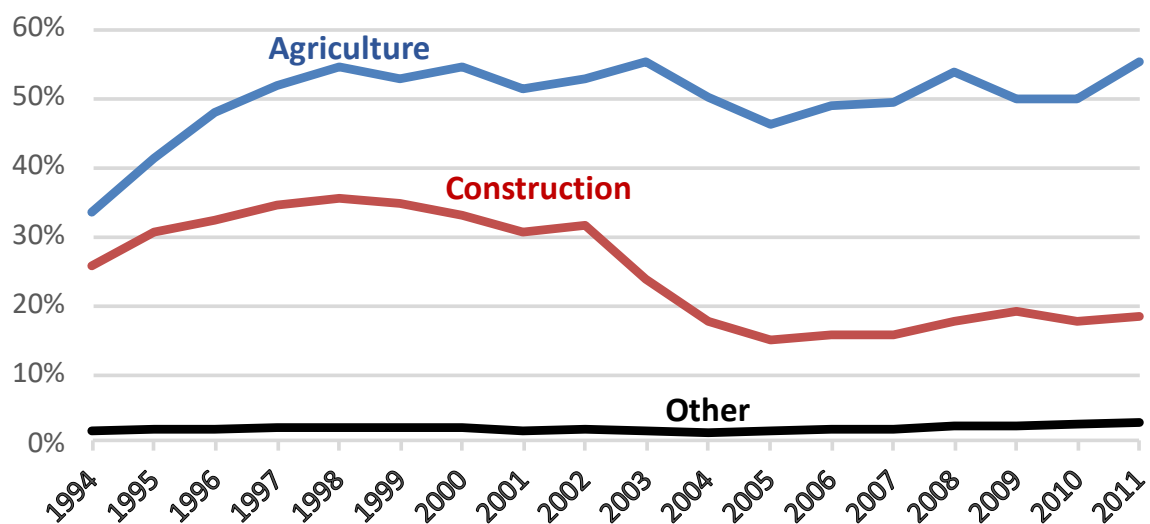Figure 1. Number of employed in agriculture, forestry and gardening
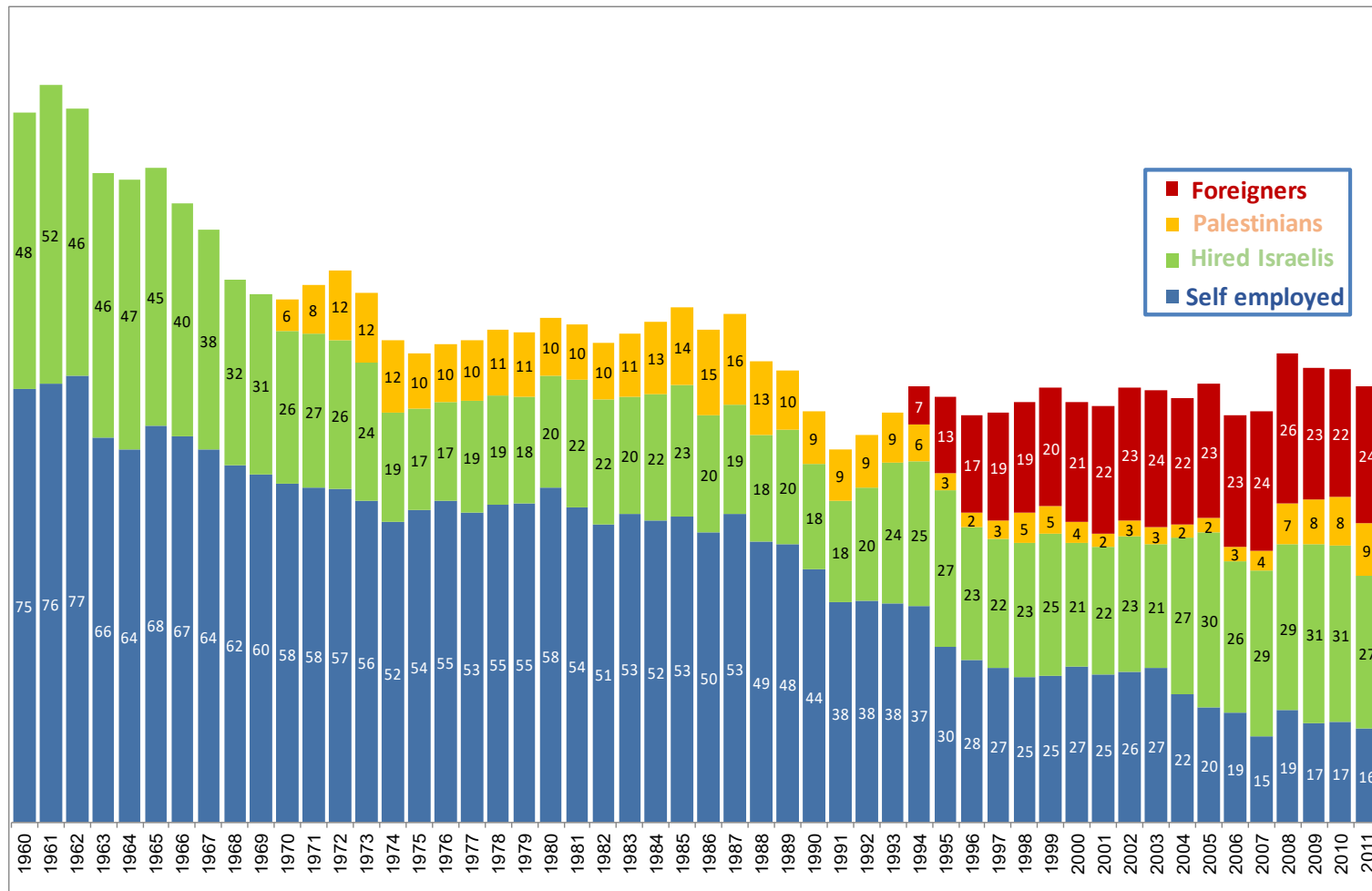
Source: Israeli Central Bureau of Statistics

Figure 2. Number of self-employed and wage workers in agriculture, forestry and gardening, and the fraction of wage workers
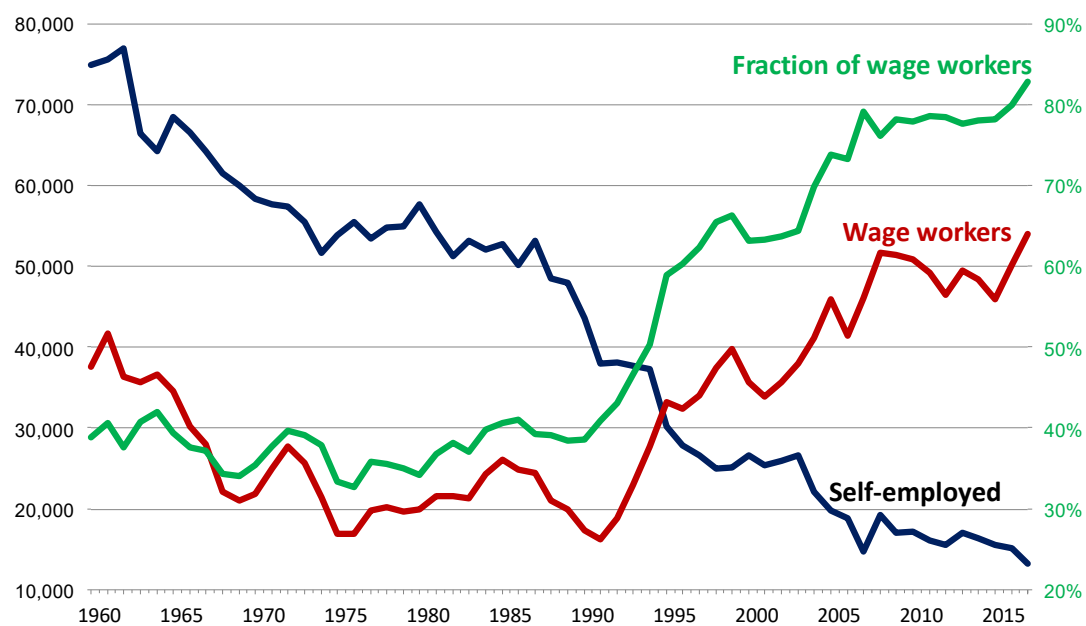
Source: Israeli Central Bureau of Statistics

Figure 3. Fraction of foreign workers by sector

Source: Israeli Central Bureau of Statistics

Table 1. Number of foreign workers in Israel by industry

year	All industries			Agriculture			Construction			Other industries		
	Total	Palest-inians	other	Total	Palest-inians	other	Total	Palest-inians	other	Total	Palest-inians	other
1994	68.8	38.3	30.5	14.6	8.1	6.5	33.5	19.6	13.9	20.7	10.6	10.1
1995	92.9	33.0	59.9	18.8	5.7	13.1	49.4	18.3	31.1	24.7	9.0	15.7
1996	106.4	26.6	79.8	21.1	4.1	17.0	57.3	14.7	42.6	28.0	7.8	20.2
1997	116.1	33.1	83.0	23.8	5.3	18.5	60.9	18.4	42.5	31.4	9.4	22.0
1998	116.2	36.9	79.3	26.5	6.4	20.1	57.5	19.9	37.6	32.2	10.6	21.6
1999	111.5	35.0	76.5	26.9	6.5	20.4	50.4	17.9	32.5	34.2	10.6	23.6
2000	105.7	27.7	78.0	25.5	4.9	20.6	46.0	13.8	32.2	34.2	9.0	25.2
2001	93.0	3.8	89.2	23.0	1.0	22.0	40.9	1.4	39.5	29.1	1.4	27.7
2002	99.4	6.4	93.0	25.7	2.9	22.8	43.2	2.6	40.6	30.5	0.9	29.6
2003	84.9	12.6	72.3	26.6	2.9	23.7	32.2	7.9	24.3	26.0	1.7	24.3
2004	72.5	8.5	64.0	26.8	2.3	24.5	21.9	4.8	17.1	23.8	1.5	22.4
2005	74.5	8.5	63.1	25.7	2.3	23.3	17.5	4.8	10.8	31.2	1.5	29.0
2006	78.9	11.4	65.9	25.1	2.4	22.6	19.5	6.7	11.7	34.3	2.2	31.6
2007	88.8	13.0	69.9	27.5	2.5	23.9	22.2	7.8	10.1	39.1	2.7	35.9
2008	108.4	18.9	79.9	33.0	3.6	25.9	25.1	12.1	11.0	50.3	3.2	43.0
2009	110.8	28.5	79.3	30.5	7.1	22.8	25.7	14.1	10.2	54.6	7.3	46.3
2010	117.1	31.5	82.8	30.3	7.7	22.0	26.0	15.5	9.7	60.8	8.3	51.1
2011	128.6	34.3	90.5	32.7	8.3	23.7	28.5	16.3	10.3	67.4	9.7	56.5
2012	140.8	43.4	97.4	33.3	10.3	23.0	31.5	21.3	10.2	76.0	11.8	64.2
2013	156.6	51.0	105.6	33.4	11.4	22.0	38.1	26.9	11.2	85.1	12.7	72.4
2014	168.0	60.5	107.5	34.9	12.5	22.4	44.7	34.2	10.5	88.4	13.8	74.6
2015	177.7	67.6	110.1	33.8	13.2	20.6	51.4	39.8	11.6	92.5	14.6	77.9
2016	194.0	79.2	114.8	37.4	14.7	22.7	61.5	48.5	13.0	95.1	16.0	79.1
2017	216.1	89.8	126.3	38.9	14.8	24.1	72.5	57.3	15.2	104.7	17.7	87.0

Source: Israeli Central Bureau of Statistics

Table 2. Skilled and unskilled workers by industry

	1995				2008		
	Skilled	Unskilled	Other		Skilled	Unskilled	Other
Total	22%	7%	71%		16%	7%	76%
Agriculture	65%	17%	18%		61%	17%	22%
Manufacturing	50%	4%	46%		44%	7%	49%
Construction	60%	16%	24%		71%	6%	22%
Trade	18%	4%	78%		15%	6%	79%
Accommodation	5%	19%	76%		4%	17%	79%
Transportation	36%	5%	59%		31%	5%	65%
Banking	3%	6%	92%		3%	9%	88%
Public	6%	4%	90%		5%	5%	91%
Education	1%	4%	95%		1%	4%	96%
Health	2%	7%	91%		2%	6%	93%
Services	6%	24%	71%		5%	18%	77%
Unknown	18%	6%	77%		11%	6%	83%

Table 3. Average hourly wage by industry and occupation

	1995					2008			
	Skilled	Unskilled	Other	Total		Skilled	Unskilled	Other	Total
Total	39	33	52	47		40	34	55	51
Agriculture	35	35	44	36		39	34	51	41
Manufacturing	37	32	56	45		41	37	67	54
Construction	39	38	51	42		34	33	54	38
Trade	38	31	43	42		38	30	43	41
Accommodation	34	31	37	36		35	31	35	34
Transportation	48	39	52	50		42	39	49	47
Banking	42	31	55	53		45	31	62	59
Public	47	31	52	51		50	41	57	56
Education	43	30	56	55		47	36	58	57
Health	40	31	50	48		40	35	49	48
Services	42	34	46	43		42	34	45	43
Unknown	36	30	49	46		36	30	58	54

Table 4. Descriptive statistics – skilled workers

Variable	1995					2008			
	Agriculture	Construction	Manufacturing	All other		Agriculture	Construction	Manufacturing	All other
Female	28.98	35.43	29.28	5.88		37.48	39.19	31.15	7.73
Age	36.16	34.70	38.77	37.72		38.96	37.13	41.86	40.31
Years of schooling	10.46	10.55	11.32	11.11		11.90	11.20	12.22	11.99
Born/East	15.48	12.27	21.74	17.66		6.92	5.72	12.24	9.23
Born/West	14.01	15.27	32.21	18.13		11.79	14.74	38.47	19.66
Origin/East	17.14	17.81	19.19	25.85		15.34	12.26	15.49	20.83
Origin/West	8.62	4.06	5.42	7.28		10.77	2.00	4.37	5.31
Origin/mixed	10.33	5.17	5.29	9.17		14.97	5.16	6.93	11.24
Native	9.60	2.92	2.99	4.83		17.31	4.73	5.50	8.88
Arab	24.83	42.50	13.17	17.09		22.9	55.38	16.98	24.84
Region-Jerusalem	5.44	7.59	4.72	8.98		5.1	10.72	5.11	11.34
Region-North	32.03	30.58	20.68	15.15		35.53	34.66	28.73	18.83
Region-Haifa	11.95	14.82	14.02	14.31		9.26	14.96	13.17	11.86
Region-Center	20.57	19.00	23.97	23.92		16.48	15.37	20.35	23.81
Region-Tel Aviv	6.51	13.24	18.48	21.26		2.61	8.98	10.22	14.30
Region-South	21.94	13.75	16.61	14.51		26.34	13.46	20.09	16.69
Region-Judea & Samaria	1.57	1.03	1.51	1.86		4.69	1.84	2.32	3.16
Municipality-200K+	6.71	12.76	11.96	18.81		6.5	19.41	18.96	26.42
Municipality-100K-200K	7.44	19.19	28.79	26.41		4.27	11.97	16.75	16.22
Municipality-50K-100K	8.08	12.57	12.60	12.36		3.7	9.03	10.84	10.47
Municipality-20K-50K	16.06	17.21	23.79	18.85		14.13	23.69	29.03	21.34
Municipality-10K-20K	12.1	17.27	10.17	8.77		6.2	16.82	8.07	7.32
Municipality-2K-10K	12.54	15.83	8.17	8.95		7.18	10.91	6.38	6.14
Municipality-Under 2K	37.07	5.16	4.52	5.85		58.01	8.18	9.97	12.09
New immigrant	11.8	13.29	25.07	10.94		9.07	14.19	35.76	15.56
Number of observations	2,042	8,621	26,537	14,649		2,646	8,140	20,802	16,354

Table 5. Descriptive statistics – unskilled workers

Variable	1995					2008			
	Agriculture	Construction	Manufacturing	All other		Agriculture	Construction	Manufacturing	All other
Female	36.60	38.12	27.89	47.46		28.38	32.44	29.10	45.87
Age	35.66	33.43	38.97	40.77		39.10	37.13	41.23	42.73
Years of schooling	9.577	9.772	10.38	10.03		11.66	10.71	11.54	11.27
Born/East	17.82	12.27	25.83	29.69		9.47	8.77	16.39	18.10
Born/West	14.75	15.27	30.39	25.21		17.41	10.39	36.90	29.23
Origin/East	12.64	17.81	15.86	18.49		14.48	9.58	15.43	17.26
Origin/West	5.36	4.06	4.32	3.27		7.8	2.43	4.15	3.13
Origin/mixed	6.51	5.17	6.27	5.91		10.03	4.59	7.50	6.75
Native	6.70	2.92	3.80	3.89		16.99	4.59	5.94	6.30
Arab	36.21	42.50	13.53	13.54		23.82	59.65	13.69	19.23
Region-Jerusalem	3.64	7.59	6.27	10.84		3.48	14.57	6.05	13.58
Region-North	34.87	30.58	18.85	13.19		36.07	31.85	26.45	15.53
Region-Haifa	16.09	14.82	15.91	14.55		7.80	14.71	12.24	11.85
Region-Center	22.61	19.00	24.12	23.15		13.09	14.44	20.40	23.09
Region-Tel Aviv	2.49	13.24	16.81	24.55		1.39	7.83	9.35	16.05
Region-South	19.92	13.75	17.24	12.46		33.98	14.57	23.86	16.72
Region-Judea & Samaria	0.38	1.03	0.81	1.26		4.18	2.02	1.65	3.19
Municipality-200K+	7.28	12.76	15.57	24.90		5.29	20.92	18.44	29.89
Municipality-100K-200K	9.00	19.19	25.26	23.29		6.13	10.39	17.30	17.79
Municipality-50K-100K	9.58	12.57	13.39	12.49		3.48	7.02	10.80	10.71
Municipality-20K-50K	15.71	17.21	23.84	18.93		19.78	24.97	30.06	21.32
Municipality-10K-20K	19.16	17.27	9.69	7.37		6.96	15.65	7.16	5.92
Municipality-2K-10K	17.43	15.83	7.55	7.95		7.10	10.80	5.74	5.01
Municipality-Under 2K	21.84	5.16	4.70	5.07		51.25	10.26	10.51	9.35
New immigrant	16.28	13.29	28.02	21.84		14.21	9.85	36.96	31.52
Number of observations	522	2,310	2,106	11,385		718	741	3,520	16,971

Table 6. Log-wage regression results

Variable	Skilled workers	Unskilled workers	All other workers
Female	-0.2100***	-0.0903***	-0.1743***
	(0.0051)	(0.0054)	(0.0018)
Age	0.0293***	0.0088***	0.0534***
	(0.0008)	(0.0011)	(0.0004)
Age squared	-0.0003***	-0.0001***	-0.0004***
	(0.0000)	(0.0000)	(0.0000)
Schooling	0.0232***	0.0090***	0.0545***
	(0.0006)	(0.0008)	(0.0003)
Arab	-0.1390***	-0.0977***	-0.1023***
	(0.0081)	(0.0130)	(0.0044)
New immigrant	-0.3070***	-0.1811***	-0.3036***
	(0.0058)	(0.0085)	(0.0034)
Agriculture	-0.119***	0.0110	-0.1369***
	(0.0118)	(0.0217)	(0.0226)
Manufacturing	-0.0184**	-0.0137	-0.0019
	(0.0068)	(0.0114)	(0.0091)
Construction	-0.0601***	0.0996***	0.0376***
	(0.0051)	(0.0116)	(0.0038)
2008	0.0452***	0.1316***	0.0278***
	(0.0057)	(0.0061)	(0.0020)
Agriculture 2008	0.0654***	-0.0598*	0.1087***
	(0.0155)	(0.0283)	(0.0284)
Construction 2008	-0.0820***	-0.1329***	0.0069
	(0.0094)	(0.0211)	(0.0140)
Manufacturing 2008	0.1240***	0.0776***	0.1284***
	(0.0072)	(0.0144)	(0.0052)
Intercept	2.661***	3.0466***	1.8843***
	(0.0182)	(0.0253)	(0.0094)
Country of origin[1]	yes	yes	yes
Region[1]	yes	yes	yes
Municipality size[1]	yes	yes	yes
R^2	0.1535	0.0774	0.2520
Observations	99,791	38,273	392,150

[1] The coefficients of these variables are in Appendix 2.
Note: standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix 1: Full names of industries

Industry	Full name
Agriculture	Agriculture, forestry and fishing
Manufacturing	Manufacturing, mining and quarrying, electricity and water supply, and waste management
Construction	Construction
Trade	Wholesale and retail trade and repair of motor vehicles
Accommodation	Accommodation and food services
Transportation	Transportation, storage, information and communication
Banking	Banking, insurance, and real estate
Public	Public and extra-territorial organizations
Education	Education
Health	Health, welfare and social work
Services	Community services and Private household services
Unknown	unknown

Appendix 2: Regression coefficients of country of origin, region and municipality

Variable	Skilled workers	Unskilled workers	All other workers
Jerusalem	-0.0650***	-0.0247*	-0.0853***
	(0.0076)	(0.0106)	(0.0035)
North	-0.0648***	-0.0400***	-0.1137***
	(0.0054)	(0.0090)	(0.0033)
Haifa	-0.0026	-0.0223*	-0.0715***
	(0.0057)	(0.0090)	(0.0031)
Tel Aviv	-0.0345***	-0.0066	-0.0036
	(0.0055)	(0.0083)	(0.0026)
South	-0.0343***	-0.0594***	-0.0867***
	(0.0052)	(0.0084)	(0.0030)
Judea & Samaria	-0.0301*	-0.0165	-0.1078***
	(0.0118)	(0.0183)	(0.0050)
100K~200K	-0.0191**	-0.0076	-0.0410***
	(0.0058)	(0.0086)	(0.0028)
50K-100K	0.0073	0.0084	0.0198***
	(0.0065)	(0.0097)	(0.0032)
20K-50K	-0.0177**	-0.0026	-0.0031
	(0.0058)	(0.0086)	(0.0029)
10K-20K	-0.0284***	-0.0109	0.0387***
	(0.0072)	(0.0116)	(0.0043)
2K-10K	0.0328***	0.0557***	0.0817***
	(0.0077)	(0.0121)	(0.0043)
Under 2K	-0.0361***	0.0291**	0.0020
	(0.0073)	(0.0113)	(0.0035)
Born/East	-0.0101	-0.0015	-0.0595***
	(0.0087)	(0.0135)	(0.0040)
Born/West	0.0051	-0.0275	-0.0068
	(0.0089)	(0.0143)	(0.0036)
Origin/East	-0.0003	0.0396**	-0.0339***
	(0.0078)	(0.0128)	(0.0032)
Origin/West	0.1040***	0.0682***	0.0438***
	(0.0098)	(0.0175)	(0.0036)
Origin/mixed	0.0252**	0.0347*	0.0061
	(0.0088)	(0.0144)	(0.0032)