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Competition, substitution, or discretion: an analysis of Palestinian and foreign guest workers in the Israeli labor market

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Abstract This paper investigates the effects of foreign workers on labor market outcomes for Palestinian workers in the Israeli labor market. The paper utilizes a micro-dataset on the Palestinian labor force combined with time-series data on foreign workers in Israel. The data covers the period 1999–2003, a period in which Israel enforced a strict closure on labor (and goods) movement, particularly in 2001 and 2002. The evidence suggests that foreign workers in Israel do not affect Palestinian employment; however, an increase in the number of foreign workers in Israel tends to reduce Israeli wages paid to Palestinian workers from the Gaza Strip. The Israeli closure policy appears to be the main cause for the substantial reduction in long-run Palestinian employment levels in Israel, not the presence of foreign workers.

Keywords Labor market outcomes · Palestinian labor force · Foreign guest workers

JEL Classification J21 · J31 · J61

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1 Introduction

The Israeli labor market has become an attractive market for Palestinian workers from the West Bank and Gaza Strip since the early 1970s. Most workers from the Palestinian territories who are employed in Israel are daily workers in semiskilled and unskilled jobs in the construction and agriculture sector (see Kleiman 1992; Angrist 1995). However, substantial changes have taken place in the Israeli market for unskilled labor. One of the most important changes over the past decade has been the change in Israeli policy to reduce reliance on Palestinian workers in favor of foreign guest workers from outside the region. As an end result, the number of foreign workers employed in Israel has increased over time, and the proportion of Palestinians working in Israel has fallen drastically.

The purpose of this paper is to analyze the effects of the presence of foreign workers in Israel on the labor market outcome for Palestinian workers from the West Bank and Gaza Strip. Angrist (1998) reports that Israeli employers have substituted Palestinians with guest workers, either due to structural changes in the Israeli economy or as a consequence of the first Intifada (1987–1993). His analysis of the likely effect of foreign workers was based on the Territories Labor Force Surveys (TLFS) conducted by the Israeli Central Bureau of Statistics (CBS) for the period 1992–1995 for men between 18 and 65 years old. The conclusions he draws relate the volatility of wages and days work, in principle, to check the effect of reducing the reliance on Palestinian workers on their earnings. In contrast, this paper utilizes a set of labor force surveys conducted by the Palestinian Central Bureau of Statistics (PCBS) from 1999 to 2003. This period can address the effect of foreign workers more accurately simply due to the fact that changes in Palestinian earnings during 1992–1995 were more likely to be due to growth in the Israeli economy rather than guest workers as Angrist points out.

Makhool et al. (2004) suggests that the supply of Palestinian labor to the Israeli market is not as much driven by the higher wages in Israel as it is by unemployment at home. Since as much as 20% of the Palestinian labor force was employed in Israel (in 1999), the substitution of foreign workers have serious implications on the Palestinian economy in general. The export of Palestinian employment to Israel has become one of the most substantial sources of income for Palestinians from the West Bank and Gaza Strip. In turn, because of the relatively higher Israeli wages, Palestinian reliance on Israeli jobs produces important income and welfare effects.

The effects of immigration on labor market outcomes for native populations have been researched by many (for an example, see Friedberg 2001). However, since the Palestinian and Israeli labor markets display a high degree of segmentation, the question of how the presence of foreign guest workers in Israel affects the labor market outcomes of the Palestinian labor force is raised. The purpose of this paper is to analyze the consequences the presence of foreign workers in Israel has on the labor market outcome for Palestinian workers from the West Bank and Gaza Strip. In particular, the paper evaluates

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the effect foreign workers in Israel presents in terms of average daily wages and employment. The evidence presented in this study suggests that foreign workers in Israel do not affect Palestinian employment. However, an increase in the number of foreign workers in Israel tends to reduce Israeli wages paid to Palestinian workers from the Gaza Strip.

Friedberg and Sauer (2003) have also addressed this question by utilizing a different dataset (the TLFS of the Israel CBS) for a different time period (1991–1995). On the other hand, Miaari and Sauer (2006) use the PCBS data for almost the same time period investigated in this paper (1999–2004). These papers have come to different conclusions compared to those of this paper. Both Friedberg and Sauer (2003) and Miaari and Sauer (2006) found that the presence of foreign workers in Israel has large and statistically significant negative effects on Palestinian employment in Israel and earnings.[1] In contrast to those papers, in this study, we utilize the two-step approach discussed by Donald and Lang (2007), particularly for testing hypothesis about the aggregate explanatory variable on the individual specific response variable. Failing to account for common group errors, in models with mixtures of individual and grouped data, can generate estimated standard errors that are dramatically biased downwards, especially when the number of groups is small. That is, the results can get significant when there is really not any significance. This is probably the main cause for the different results in this study compared to Friedberg and Sauer (2003) and Miaari and Sauer (2006).

Using micro-level data from the PLFS for the West Bank and Gaza Strip, combined with data on the number of foreign guest workers in Israel provided by the Israeli CBS, makes this research possible. The data used in this study covers the time period from 1999 to 2003 on a quarterly basis.

The rest of this paper is organized as follows: In the next section, a background description of the Palestinian labor market is provided. In Section 3, data and a descriptive analysis are reported. Section 4 outlines the theoretical motivation, followed by the empirical methodology in Section 5 and the estimation results located in Section 6. The last section closes out the finding in the conclusion.

2 Background

After its occupation of the West Bank and Gaza Strip in 1967, Israel has pursued a policy designed to create a Palestinian economy more dependent on that of Israel's. Palestinian trade with the rest of the world was discouraged by red tape and security barriers; domestic infrastructure was not improved, and in particular, the Palestinian agricultural sector suffered on several different

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[1]Friedberg and Sauer (2003) found a significant reduction in earnings only among Palestinians from the Gaza Strip; meanwhile, Miaari and Sauer (2006) found negative effects on earnings regardless of workplace location.

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levels. The transformation to a "cash society" has led many to abandon agriculture (and schooling) in favor of employment in Israel. The confiscation of land for settlements and the takeover of the underground water supply coupled with the pollution resulting from settlement sewerage have dealt a severe blow to agriculture. Palestinian industries that were smaller and not as technically advanced as their Israeli counterparts did not grow at a pace compatible with population growth. As a result, unemployment in the West Bank and Gaza Strip was high, and in turn, Israel used the Palestinian market as a reserve of unskilled laborers. The Israeli CBS shows unemployment in the Palestinian territories for most of the period of 1972–1993 to be around 4% (Daoud et al. 2005). This figure is derived, however, from only those who reported to Israeli employment offices as unemployed.

Following the occupation, the Israeli government began issuing general permits, allowing relatively free movement. These permits granted residents in the Palestinian territories unlimited access to Israel and East Jerusalem, as well as unrestrictive passage between the West Bank and the Gaza Strip. Prior to the outbreak of the Gulf War in 1991, Palestinian labor flows from the West Bank and Gaza Strip to Israel grew steadily (see Fig. 1). However, following the total curfew placed by Israel on the Palestinian territories during the Gulf War, Israel erected checkpoints along its borders. By the year 1993, the general permit system was replaced with an individual permit system, which made it more difficult for Palestinians to reach work in Israel. The resulting temporary shortage of mainly low-skilled labor in Israel led the Israeli government to allow work permits to foreign guest workers from outside the region. Still, relatively few permits were issued (to "low-skilled" foreign guest workers), as the Israeli government expected that the dramatic influx of immigrants to Israel, during the 1990s, would replace the former Palestinian workers in Israel (see Locher 2004). However, as a large number of the new immigrants were high skilled, and thus not attracted to the jobs that Palestinians traditionally held, the Israeli government substantially increased the number of permits issued to foreign guest workers (see Weiss et al. 2003).

Fig. 1 Share of labor force employed in Israel from the West Bank and Gaza Strip. Figures for the West Bank exclude East Jerusalem for the period 1969–1993 and include it afterwards; 1994 figures are not available. The 1969–1993 statistics are calculated from the Israeli CBS and the Statistical Abstract of Israel; the data for 1995–2003 are collected from PCBS

The decreased Israeli reliance on Palestinian labor became even more obvious following the signing of the Oslo accords in 1993 and the establishment of the Palestinian Authority. For example, the Gaza Strip could no longer rely on the Israeli labor market to absorb its labor force, as it did before 1993. The Israeli labor market absorbed less than 13% of the total Gaza Strip active labor force in mid-2000, compared to 35–45% before 1993 (see Fig. 1). The West Bank, by contrast, still exported 18–25% of its labor force to Israel during 1995–1999 (compared with 25–30% in the pre-Oslo period).

With the beginning of the second Intifada in late September 2000, the permit system for Palestinians from the West Bank and Gaza Strip was dramatically tightened. Travel permits where frequently cancelled, and crossings were sporadically sealed off completely, greatly reducing Palestinian employment in Israel as well as commercial transactions with or through Israel. As shown in Fig. 1, there was a huge decline in the share of workers from the Palestinian territories employed in Israel after the outbreak of the second Intifada. This was especially true for Gazans. Less than 3% of the Gaza Strip labor force was employed in Israel compared to 12–17% from the West Bank.

Foreign workers in Israel from outside of the region are generally cheaper to employ than Palestinians from the West Bank and Gaza Strip.[2] However, the situation of a permanent guest worker population in Israel has become a major concern for Israeli policy makers. Work permits issued to foreign workers have a fixed duration (typically 1 year). Yet, most foreign workers remain longer, either through permit renewal or in informal jobs, in Israel. This is evidenced by the fact that the number of illegal foreign workers in Israel are at least equal to those legal, or even outnumber them three-to-one (Ruppert Bulmer 2003). On the other hand, Palestinian workers do not aspire for Israeli citizenship and, for the most part, return to their homes in the West Bank and Gaza Strip every evening. This is a remarkable feature of Palestinian labor migration.[3]

3 Data and descriptive analysis

This study is based on the PLFS in the West Bank and Gaza Strip. The micro-level dataset used is obtained from pooling 20 consecutive quarterly PLFS cross-sections from the first quarter 1999 to the fourth quarter 2003. The studied time period covers an important and highly volatile time in the Palestinian economy, especially for the Palestinian labor force, as the period before and through the second Intifada is investigated. The PLFS have a rotating sample design as individuals are replaced. A selected household remains in the sample for two consecutive rounds, is then suspended from the next two rounds, and is

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[2]Foreign workers in Israel are mainly from the Far East (particularly Thailand), Latin America, and Eastern Europe.

[3]Similar experiences could be found in the case of French workers commuting to Germany and Switzerland.

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again represented in the sample for two additional consecutive rounds before it is dropped. Each survey round consists of approximately 7,600 households, which amounts to a sample of around 22,000 individuals aged 15 years and above living in the Palestinian territories. The usual types of sampling and non-sampling errors in labor force surveys are also present in the PLFS.[4] In addition, data collection after the outbreak of the second Intifada in late September 2000 became more difficult.

3.1 Labor force characteristics

The sample contains observations on men between the ages of 15 and 64 years interviewed in the years 1999–2003.[5] Basic descriptive statistics and sample sizes for the extract used in this paper are reported in Table 1. About two thirds of the sample resides in the West Bank, with the remaining from the Gaza Strip. Labor force participation rates are generally higher in the West Bank than in the Gaza Strip, with participation rates ranging between 69–75% and 60–69%, respectively. The proportion of wageworkers in the West Bank fluctuates from a high of 55% to a low of 29%, with the remainder being mostly self-employed (including work on a family farm or business), unemployed or in school. In the Gaza Strip, the share of wageworkers varies from a high of 48% to a low of 25%. Wage laborers amounted to over two thirds of the labor force in the years 1999–2000, in both the West Bank and Gaza Strip. However, between year 2000 and 2002 the share of wageworkers in the labor force declined by 25 percentage points in the West Bank and by 23 percentage points in the Gaza Strip. This decline is probably explained by the outbreak of the second Intifada. Additionally, the table shows that the average days worked per month are generally higher for residents in the Gaza Strip than in the West Bank.

   The last column of Table 1 shows that there was a large decline in the share of workers from the Palestinian territories employed in Israel.[6] The proportion of wage-earning West Bankers and Gazans working in Israel was stable until the third quarter of year 2000. Between the third and the fourth quarter 2000, this proportion declined from 42 to 25% for West Bankers compared to a fall from 23 to 4% for Gazans.[7] Again, this is most likely to be a consequence of the Palestinian uprising. An important component of this change comes from difficulties in getting to work due to border controls, closures, and curfews. Table 2 shows that workers from the Palestinian territories who were

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[4]The overall non-response rate amounted to almost 10.4 percent, which is relatively low; a higher rate is rather common in an international perspective.

[5]Men constitute the bulk of the Palestinian labor force, as labor force participation of women is low, 8% in the Gaza Strip and 10–12% in the West Bank.

[6]The referred variable capturing if the individual is working in Israel also includes if the wage earner was working in Israeli settlements in the Palestinian territories.

[7]The Gaza Strip experienced a more severe border closure policy, compared to the West Bank, where Palestinian workers were cutoff from their work in Israel during long periods.

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employed in Israel are concentrated in semiskilled and unskilled jobs, as trade workers and in elementary occupations.

Table 1 Descriptive statistics

	Sample size	Labor-force participation	Wage worker	Days worked per month	Share of employment in Israel to total empl.
Residents in the West Bank					
1999	28,926	0.75	0.55	21.5	0.41
2000	28,917	0.76	0.54	21.4	0.39
2001	26,708	0.73	0.41	21.5	0.29
2002	21,789	0.69	0.29	21.4	0.23
2003	26,982	0.70	0.35	22.4	0.20
Residents in the Gaza Strip					
1999	15,261	0.69	0.46	22.8	0.25
2000	15,456	0.65	0.48	23.1	0.21
2001	15,387	0.60	0.35	24.3	0.02
2002	14,352	0.62	0.25	23.7	0.04
2003	15,210	0.65	0.34	21.9	0.05

Table 2 Palestinian employment in Israel by PCBS occupation code

	Employed in Israel						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1999	0.03	1.48	2.99	2.44	33.14	4.83	55.10
2000	0.02	1.66	4.49	3.90	36.77	5.20	47.96
2001	0.08	2.01	5.70	1.05	31.46	5.91	53.79
2002	0.14	2.79	6.70	0.49	36.10	7.40	46.37
2003	0.20	1.96	6.70	0.27	41.91	8.67	40.28

Statistics are from micro-level data from PCBS labor force surveys, round 12–31. Table 2 reports the percentage distribution of Palestinians employed as wage earners in Israel by PCBS occupation codes. The PCBS occupation codes are: (1) legislators, senior officials and managers; (2) professionals, technical, associate and clerks; (3) service, shop and market workers; (4) skilled agricultural and fishery workers; (5) craft and related trade workers; (6) plant and machine operators and assemblers; (7) elementary occupations

Roughly 50% of the Palestinians who were employed in their own region of residence worked in the service sector. Service workers are mainly national government employees in the Palestinian territories. As can be seen in Fig. 2, the structure of wage working Palestinians employed in the local market has been basically constant. After the year 2000, there was a minor decline in the construction sector, and the proportion employed in the service sector slightly increased. However, by year 2003, these shares seem to have returned to the same proportions prevalent before the outbreak of the second Intifada. Workers employed in manufacturing, construction, and commerce account for a larger share of local employment in the West Bank compared to the Gaza Strip where the importance of employment in the service sector is huge. The Palestinian national government has become the most important employment sector in the Gaza Strip. This is especially true following the second Intifada, where roughly 70% of Gazan wageworkers in the local market were employed

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in the public sector. In the West Bank, the corresponding share amounted to nearly 50%.
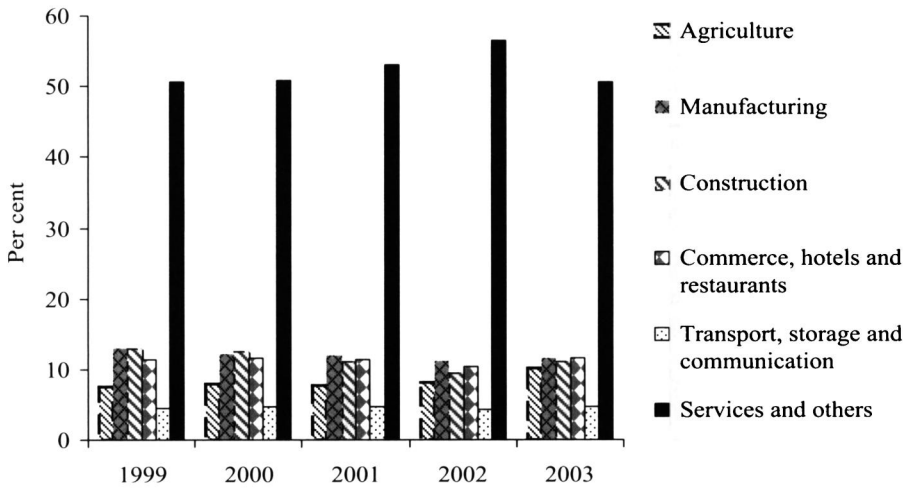
Fig. 2 The distribution of domestic wage employment shares by industry of employment

Palestinian workers employed in Israel have generally been concentrated in a number of industries. In 1981, half of the Palestinians employed in Israel worked in construction; by 1991, this proportion rose to 70% (Angrist 1996). Figure 3 shows that there was a decrease in the share of wage-working Palestinians employed in the construction industry in Israel during 1999–2003. Beginning in 2001, there was a structural change of Palestinian employment in Israel. The share of construction workers declined, as the proportion employed in manufacturing rose.
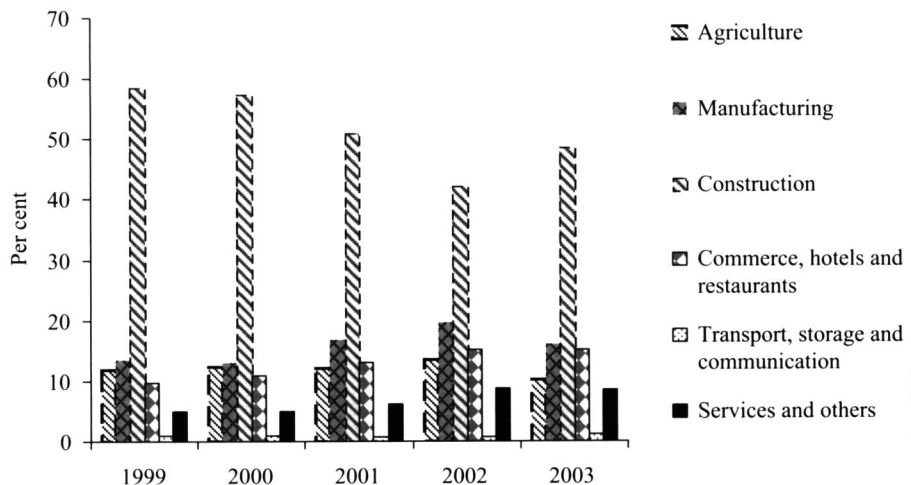
Fig. 3 The distribution of wage employment shares in Israel by industry of employment

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Figure 4 plots survey data on the mean real daily wage by workplace location.[8] The wages that are published in the PLFS reflect the nominal daily wages. The real daily wages were computed by deflating the nominal daily wage for each quarter by its consumer price index, with base year 1996. The figure shows that the real daily wages for Palestinian employees basically remained constant; only those employed in Israel experienced a minor decrease.[9] Israeli jobs pay considerably higher wages than jobs in the local Palestinian market; Daoud (2005) estimates the work in Israel premium to be in the range of 45–50% higher than domestic wages. The higher wages in Israel reflect Israel's large and well-developed economy. Additional factors that might contribute to this wage gap are higher average productivity in Israel, minimum wages, a unionized labor force, and a relatively high demand for unskilled labor in Israel.[10] As is also shown in Fig. 4, jobs in the West Bank pay better than those in the Gaza Strip. However, this wage gap converged following the second Intifada.
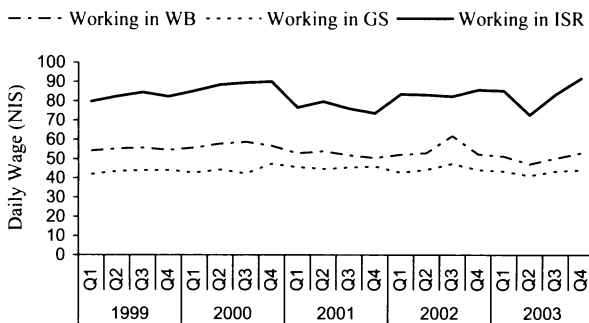
Fig. 4 Real daily wage (mean) by place of work

Before the signing of the Oslo accords, the number of Palestinian workers in Israel exceeded that of foreign workers. Following the establishment of the Palestinian Authority, Israel reduced the number of permits given to Palestinians. In addition, there was a rapid increase in the number of foreign worker permits issued over the period.[11] In 1994, the presence of foreign

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[8] Daily wages are expressed in New Israeli Shekels (NIS). During 1999–2003 the New Israeli Shekel was worth approximately 0.22–0.25 USD.

[9] The plot does not consider the structural change in the Palestinian labor force during the period 1999–2003.

[10] As seen in Table 2, over 80% of Palestinians employed in Israel during 1999–2003 worked in elementary occupations or as craft and related trade workers.

[11] Following an Israeli policy decision after the signing of the Oslo accords in 1993, the Israeli government dramatically increased the number of permits to foreign workers from outside of the region. The aim of this policy was to decrease the former Israeli reliance on Palestinian workers, as those now became the responsibility of the newly established Palestinian Authority.

workers in Israel outnumbered the Palestinians (Friedberg and Sauer 2003).
Figure 5 shows that there was a massive inflow of foreign guest workers to
Israel after 1998. Following the outbreak of the second Intifada, Palestinian
employment in Israel dipped while the number of foreign workers continued
to grow steadily. However, by 2003, the number of foreign workers in Israel
decreased.
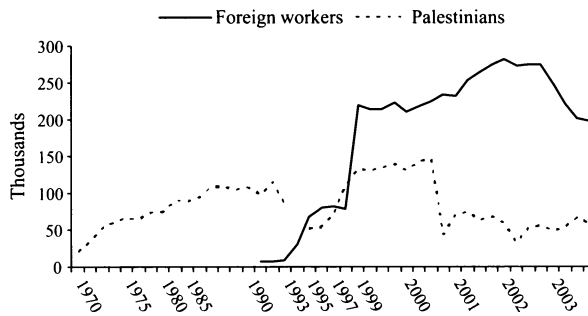
Fig. 5 Palestinian and foreign workers employed in Israel

The Israeli policy of replacing Palestinian workers with foreigners is directly
linked to a lack of progress in the peace process. Consequently, foreign
workers in Israel have been used as substitutes for low-skilled Palestinian
workers. It is therefore a relevant policy concern for Palestinians to analyze
the impact of foreign workers on Palestinian wages and employment in both
the Israeli and local domestic markets.

4 Theoretical motivation

This section outlines the theoretical motivation to estimate the effect of foreign
workers in Israel on Palestinian wages and employment. As Palestinian and
Israeli labor markets display a high degree of segmentation, foreign workers
in Israel will certainly affect the labor market outcomes of the Palestinian labor
force. Foreign workers in Israel are likely to affect groups of Palestinian wage
earners differently. For example, Israel's policy of increasing the demand for
foreign workers might decrease the employment of Palestinians in Israel. This
would increase the labor supply in the Palestinian territory, as former Israeli
migrant workers would compete for employment in the local domestic market.
This paper will control for the differences between those wage earners who are
employed in Israel and those employed locally.

As presented in Pischke and Velling (1997), an increase in the supply of
foreign labor can be expected to reduce the wages and the employment of

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natives, and raise total employment, in a standard competitive model. This can be written as:

$$\Delta \log w_{it} = \frac{A \Delta F_{it}}{P_{it-1}} \tag{1}$$

where F_{it} is the number of foreigners in the labor market; P_{it} is the entire active population; w_{it} is the domestic wage; and A is a function of the supply and demand elasticities (see, e.g., Altonji and Card 1991). An analogous result for employment is obtained by substituting the result in Eq. 1 into a labor–supply curve. Equation 1 postulates that A is negative showing the negative impact of an increase in foreign workers on wages. In the Palestinian workers context, it depends on the substitutability between Palestinian and foreign workers. The magnitude of A depends positively on the share of output exported because that raises the demand for labor, but negatively on the difference between elasticity of labor supply and labor demand. A can also be used in the labor supply function relating per capita labor supply to elasticity of labor supply times proportional change in wages. Therefore, an increase in foreign workers decreases labor supply because it depresses wages.

Extensive empirical literature exists on the impact of immigrants on the labor markets of host countries (see Borjas 1994, 1999, or Friedberg and Hunt 1995 for an overview). The majority of those studies conclude that the impact of immigrants on wages and employment in local labor markets is, if anything, modest.[12] The direct effect of foreign workers on the labor market outcomes of natives is actually theoretically undetermined. Depending, among other things, upon the substitutability or complementarity between foreigners and natives, wages and employment may fall or even rise.[13] For example, the large influx of foreign guest workers in Israel may be the main cause of the decreasing Palestinian employment levels in Israel. On the other hand, as discussed in Friedberg and Sauer (2003), it is not always the case that an increase of foreign labor leads to a decrease in demand for competing types of labor. For example, an increase in output, due to the employment of cheaper foreign labor, could lead to an increase in demand for Palestinians. Additionally, the inflow of foreign workers to Israel could lead the Palestinians to move up in

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[12]These findings are probably due to the problems associated with defining competing groups of immigrants and natives. In this paper, these problems can be overcome, as foreign guest workers and Palestinian workers from the West Bank and Gaza Strip actually compete in the Israeli labor market.

[13]The experience of countries that have employed migrant workers at one time or another has been mixed. Recent examples of non-citizen labor include US employment of Mexicans, German employment of Turks, Western European employment of citizens of Southern and Eastern European nations, and Malaysians employed in Singapore.

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the job hierarchy. This type of employment promotion actually took place among Israelis who were employed in the construction and agriculture sector before the huge influx of Palestinians to the Israeli labor market in the early 1970s (Semyonov and Lewin-Epstein 1987). This type of complementarity was also found in Card (1990), who showed that the Mariel influx had no effect on wages and unemployment among Cubans who had immigrated to Miami earlier. West Bankers and Gazans employed in Israel can be considered native workers, in relation to the foreigners from outside the region, thus the empirical model in this paper is based on the theoretical framework presented in the literature on how immigration affects the labor market outcomes of natives.[14]

The estimation of Eq. 1 may be affected by an important endogeneity problem if foreigners choose to locate in areas that are enjoying current economic success (see Chiswick (1999) for more on this issue). In this case, it is not only that immigrant inflow is driven by labor market changes but also that labor market changes are driven by inflows. This would lead to an upward bias in estimating the effect of immigrants on the labor market outcomes of natives. The simultaneity issue due to the self-selection of foreigners is addressed more directly in studies that analyze the effects of isolated, exogenous inflows of migrants, such as Card's (1990) analysis of the effect of the Mariel boatlift on the Miami labor market.

5 Empirical methodology

The approach used to estimate the impact of foreign workers from outside of the region on the Palestinian labor market outcomes is based on the theoretical framework presented above. Transforming Eq. 1 into a regression equation that describes the level of wages or employment, dependence on foreign workers, other observable characteristics, and possibly an unobserved fixed effect results in:

$$y_{ilt} = \alpha_l f_t + \gamma_l x'_{ilt} + \varepsilon_{ilt} \tag{2}$$

where y_{ilt} is a measure of the Palestinian labor market performance, such as employment and wages (in log); f_t is the logarithm of the number of foreign workers in Israel. x'_{ilt} is a vector of other variables that influence the level of the labor market outcomes of Palestinians. Subscript i = individual; l = region of residence West Bank, Gaza Strip; and t = time.[15] The coefficient of interest

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[14]For formal models, see among others, Borjas (1999), Greenwood and Hunt (1995), and Johnson (1998).

[15]A variable description is given in Appendix A.

α will capture the effect of foreign workers from outside the region on the Palestinian labor market. In order to deal with the endogeneity problem, the level of foreign workers will be instrumented with its own lag and the lagged Israeli unemployment rate. Friedberg and Sauer (2003) and Miaari and Sauer (2006) used data on foreign worker permits issued by the Israeli government as an instrument for the number of foreign workers in the Israeli labor market.[16] We have made some tests for the relevance of the instrument used in those papers. The tests suggest that government-issued foreign worker permits is a weak instrument (i.e., issued foreign worker permits explain very little of the variation in the number of foreign workers, partial $R^2 = 0.0047$). Therefore, we will use the lag of foreign workers and the lagged Israeli unemployment rate to correct for biases that arise due to non-random immigration.[17] It is reasonable to assume that the supply of foreign labor is itself driven by labor market conditions like the unemployment rate in the area. In addition, the number of foreign workers in the past is likely to affect the influx of foreign workers to that area, as argued by Altonji and Card (1991).

It is reasonable to assume that the supply of foreign labor to Israel is tied with the imposed closures on the West Bank and Gaza Strip.[18] Nevertheless, given that the Israeli government decided to replace Palestinian workers after the signing of the Oslo accords, due to both political and economic reasons, it is here assumed that this policy (of permits issued to foreign workers) is an exogenous policy aimed to replace the former Israeli reliance on Palestinian workers. It is arguable whether this policy would have occurred had there been no escalation in the intensity in the Israeli–Palestinian conflict. Although the estimated correlation coefficient between the number of foreign workers in Israel and closure days in the West Bank and Gaza Strip is low, it is documented in the literature that closure days significantly reduce Palestinian employment in Israel (see, e.g., Aranki 2006). However, to separate short-run lack of access to the Israeli labor market and long-term replacement by foreign workers, we will control for the general turmoil during the second Intifada in the regression models.

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[16]They argue that the number of foreign work permits issued is a potential source of exogenous variation in the number of foreign workers actually employed in Israel. This is because there is a virtually infinite supply of unskilled workers from other countries that are willing to work in Israel, and there are lags and inefficiencies in the regulatory process that govern the issuance of permits, which creates a situation whereby the influx of foreign workers is not directly dependent of the Israeli labor market conditions.

[17]An F test for joint significance of the identifying instruments suggests that these instruments have good explanatory power.

[18]Although the Israeli policy of closure is applied to restrict all individuals who need to cross the borders, the border with Israel is not completely hermetically sealed. The random selection at the border crossing has created a situation of long border lines during time of closure. This is so especially in the Gaza Strip where the Israeli policy of closure is much closer to hermetic compared to in the West Bank.

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The closure policy variable can be seen both as a labor supply shock and as a labor demand shifter. For example, closure may lead workers to substitute to local employment rather than Israeli employment (supply effect), and it may lead Israeli employers to substitute to other workers (demand effect). In the short run, we would expect a supply effect of closure, as closure consequently restrain workers who need to cross the borders to their place of work. This would lead to a labor supply increase in the Palestinian territories, where former Israeli migrant workers would compete for employment in the local market. If wages are sticky, this supply increase may result in unemployment rather than an increase in local employment.[19]

The Israeli policy of closure may have a different impact on residents from the West Bank and the Gaza Strip. For example, the imposed internal closure has also had a significant impact on the Palestinian territories and especially in the West Bank where it got most severe. Additionally, a significant difference between the West Bank and Gaza Strip is that external closures of the Gaza Strip have always been more strictly enforced than those of the West Bank. This structural difference between the two entities implies that closure may have a greater impact on the local market in the West Bank compared to the Gaza Strip. On the other hand, the effect of closure is probably larger for Gazans who need to cross the borders in order to reach their work. To capture some of these differences between the West Bank and Gaza Strip, separate estimations are made for the two regions.[20] Furthermore, we will control if the effect of closure differs between those wage earners who are employed in Israel and those employed locally.

5.1 Econometric consideration

In the analysis, the dependent variables (employment and wages) differ across individuals; however, the main explanatory variables (foreign work and closure) are constant among all members of a group, as these variables only vary by time. Moulton (1990) shows that in regression models with mixtures of individual and grouped data (e.g., regressing outcomes at the individual level on a policy that applies to all individuals in the group), failing to account

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[19]Closure might also affect labor demand negatively, since closure may increase the uncertainty on behalf of the Israeli employers regarding Palestinian workers showing up at work or not. If employers are risk-averse, closure might in effect induce employers to change their hiring practices. However, since the Israeli policy of closure is instituted as a security instrument during political instability, which most likely has a negative impact on the Israeli economy, labor demand in Israel, may also exhibit a negative correlation with closure. In fact, the Israeli economy experienced a deep recession in 2001, a year in which days of closure peaked.

[20]Since the correlation between the external and internal closure in the West Bank and Gaza Strip is very high, the effect of internal closure will be captured by our measure of closure in the estimations.

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for common group errors can generate estimated standard errors that are dramatically biased downwards. Additionally, Donald and Lang (2007) show that when the number of groups is small, inference is further complicated. Asymptotic results based on the assumption of an infinite number of groups are inappropriate.

Donald and Lang (2007) have illustrated an alternative two-step approach to inference, particularly for testing hypothesis about the aggregate explanatory variable on the individual specific response variable. We will use this two-step approach discussed by Donald and Lang (2007), which provides a good remedy for the problem of correlated errors within groups. The two-step procedure is a compromise between grouped and individual analyses in that it uses micro-data to reduce the dispersion in group means. Donald and Lang (2007) shows that the two-step estimator has good finite sample properties and always improves the precision on cluster adjustments.

In the case presented in this paper, this amounts to first adjusting the group means for effects of micro-covariates by estimating quarterly fixed effects and then regressing the estimated fixed effects on the group variables. In the first-step, the following equation is estimated:

$$y_{ilt} = \mu_{lt} + \gamma_l x'_{ilt} + \varepsilon_{ilt} \tag{3}$$

and in the second-step, we regress $\hat{\mu}_{lt}$, the estimated μ_{lt}, on the group variables. Thus, the second step is:

$$\hat{\mu}_{lt} = \rho_l + \alpha_l f_t + \omega_{lt} \tag{4}$$

where f_t is a $1*K$ vector including the group variables, "foreign workers" and percentage "closure" days imposed on the West Bank and Gaza Strip. Subscript $t = 1, \ldots, 20$ quarters; l = West Bank and Gaza Strip. Inference is used based on the t_{G-K-1} distribution to test hypotheses about α, provided $G > K + 1$, where G is the number of groups (see Wooldridge 2003).

6 Results

This section uses regression models to address the aim of this paper. The estimates are based on the two-step approach discussed above and both least square and IV estimates are reported using the lag of (log) foreign workers and the lagged Israeli unemployment rate as instruments.[21] First, the estimated effects of foreign workers on Palestinian wages are presented followed by the

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[21]The F test for joint significance of the identifying instruments is 36.63, suggesting that the instruments are well correlated with the endogenous variable. Staiger and Stock (1997) propose that strong instruments should have a joint F statistic of around 10.

impact on employment.[22] Separate estimations are made for the West Bank and the Gaza Strip[23], in order to control to what extent Palestinians from the two regions are displaced by foreign workers.[24]

6.1 The effect of foreign workers in Israel on Palestinian wages

This section presents the estimates from the two-step procedure to analyze the impact of foreign workers in Israel from outside the region on average wages paid to Palestinians from the West Bank and Gaza Strip. Given that foreign workers in Israel are likely to effect groups of Palestinian wage earners differently, the regressions are made conditional on those wage earners who are employed locally and those employed in Israel.

The empirical estimates of Eq. 4 are provided in Table 3; the results suggest that the presence of foreign workers in Israel affects wages for Palestinians negatively whether employed domestically or in Israel. However, the estimated coefficients are significant for workers from the Gaza Strip only. The coefficient measuring the effect of foreign workers on wages paid to West Bankers and Gazans employed in the local domestic market are not statistically significant. Only Gazans employed in Israel are significantly affected negatively. Both the least square and IV estimates indicate a large and significant reduction in real daily wages among Gazans employed in Israel. The IV coefficient is larger in absolute value than the OLS coefficient indicating an underestimate of OLS. Miaari and Sauer (2006) find similar results and attribute the sources of bias due to nonrandom selection (downward bias) and sample selection (which biases the coefficients upward).

The results suggest that the Israeli policy of closure will only have a significant negative effect on Gazans employed in Israel. Unlike West Bankers, Gazans employed in Israel seem to be offered lower wages during time of closure. These results indicate that Gazans employed in Israel are displaced to a higher extent compared to West Bankers. The statistical significance of the coefficients for Gazan's employed in Israel may be clouded by the small number of observations or groups; however, the size is common to all other

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[22] The results from the first-step regressions are reported in Tables 6 and 7 in Appendix B.

[23] An *F* test was carried out to control for across-region equality. The test rejects that the estimated parameters from the West Bank regression are statistically equal to the estimated parameters from the Gaza Strip regression.

[24] Additional specifications have been estimated to illuminate the impact of foreign workers on different types of skill group occupations in the economy. Given that Palestinian jobs in Israel are predominantly low-skilled, one might expect heterogeneous effects of foreign workers on different types of skill groups. However, as indicated by the results from these specifications, the effect of foreign workers does not significantly differ.

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Table 3 The impact of foreign workers in Israel on Palestinian wages

First-step estimates: dependent variable $\ln(w)$

| Second step estimates | West Bank | | | | Gaza Strip | | | |
| | Employed locally | | Employed in Israel | | Employed locally | | Employed in Israel | |
Dependent variable $\hat{\mu}_{jt}$	$\bar{\alpha}_{OLS}$	$\hat{\alpha}_{IV}$	$\bar{\alpha}_{OLS}$	$\hat{\alpha}_{IV}$	$\bar{\alpha}_{OLS}$	$\hat{\alpha}_{IV}$	$\bar{\alpha}_{OLS}$	$\hat{\alpha}_{IV}$
Foreign	−0.131	−0.180	−0.026	−0.099	−0.154	−0.179	−0.769**	−0.734**
	(−0.94)	(−1.00)	(−0.30)	(−1.12)	(−1.29)	(−1.46)	(−2.24)	(−2.20)
Closure	−0.0005	−0.0005	−0.0003	−0.0003	0.0002	0.0002	−0.003***	−0.003***
	(−1.01)	(−0.89)	(−0.74)	(−0.76)	(0.49)	(0.47)	(−3.12)	(−3.17)
Number of groups	20	19	20	19	20	19	20	19
$F(K, G − K − 1)$	1.70	1.37	0.49	1.34	0.84	1.07	19.33	19.65
Prob > F	0.2130	0.2830	0.6231	0.2891	0.4508	0.3669	0.0000	0.0000
R-squared	0.1277	0.1041	0.0512	0.0541	0.1379	0.1416	0.6074	0.6102
Hansen test (p value)		9.926		0.004		6.406		1.850
		(0.0016)		(0.9520)		(0.0114)		(0.1738)

t values within brackets. Standard errors are corrected for heteroskedasticity using White's robust standard errors. The table reports selected estimates from the two-step procedure. The regressions are made conditional on workplace location. In the first-step separate regressions were estimated in order to adjust the group mean of the dependent variable, $\ln(w)$, for effects of micro covariates by estimating quarterly fixed effects. And the second step amounts to regress the estimated fixed effects on the aggregate group variables. The instruments in the IV estimations are the lag of foreign workers and the lagged Israeli unemployment rate. Hansen test is an overidentification test of all instruments.

* $p = 10$,
** $p = 5$,
*** $p = 1$

cases.[25] What seems to be more interesting is the magnitude of the effect of foreign workers on employment in Israel for Gazan's.

The negative coefficients indicate that the Israeli demand for Gaza workers has diminished due to a substitution effect between Gazans and foreign workers from outside the region. Angrist (1998) has reported that Israeli employers substituted Palestinians with guest workers, either due to structural changes in the Israeli economy or as a consequence of the first Intifada. However, as these effects are not found for West Bankers employed in Israel, the Israeli substitution of Gazan workers indicates an Israeli separation of the Gazan labor force following an economic and political separation of the Gaza Strip, unlike the West Bank.

The F test is also significant for Gazans employed in Israel; this implies that foreign workers and closure days jointly explain wages for Gaza workers in Israel. The coefficient of multiple determination is unusually low except for the last group. The Hansen tests statistics (at the bottom of the table) for the null hypothesis of instrument validity suggest that the instruments are valid for the models estimating West Bankers and Gazans employed in Israel.

6.2 The effect of foreign workers in Israel on Palestinian employment

Table 4 presents the estimates from the second step of the two-step procedure to analyze the impact of foreign workers in Israel from outside the region on Palestinian employment. In the first step, four separate binominal logit models were estimated in order to adjust the group mean of the dependent variable (probability of being employed as a wage earner) for effects of micro-covariates by estimating quarterly fixed effects. In the second step, the estimated fixed effects are regressed on the aggregate group variables. The table reports the marginal effects of foreign workers and closures on the proportion of West Bankers and Gazans employed in the local and the Israeli market.

The estimated coefficients measuring the impact of foreign workers in Israel on Palestinian employment are all insignificant.[26] These results suggest that the presence of foreign workers in Israel does not affect Palestinian employment. The probabilities of being employed as a wage earner in both the local and Israeli market are not significantly affected by the presence of foreign workers in Israel. However, the estimated effects of closure on employment are all significantly negative. Note that within each region, the marginal effect is stronger on employment in Israel than on domestic employment; the differential impact

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[25]Wooldridge (2006) points that the Donald and Lang approach is "roughly valid" if the common group size is large (those are reported in Tables 6 and 7 in Appendix B) and that the variance of the unobserved cluster effect dominates the variance of the compounded error.

[26]Only the ordinary least square estimates for Gazans employed in Israel are statistically different from zero, however, at the 10% level.

Table 4 The impact of foreign workers in Israel on Palestinian employment

Second step estimates	First step estimates: Dep. var. P(empl. = 1)							
	West Bank				Gaza Strip			
	Employed locally		Employed in Israel		Employed locally		Employed in Israel	
Dependent variable $\hat{\mu}_{jt}$	$\bar{\alpha}_{OLS}$	$\bar{\alpha}_{IV}$	$\bar{\alpha}_{OLS}$	$\bar{\alpha}_{IV}$	$\bar{\alpha}_{OLS}$	$\bar{\alpha}_{IV}$	$\bar{\alpha}_{OLS}$	$\bar{\alpha}_{IV}$
Foreign	−0.203	−0.122	−0.303	−0.204	−0.331	−0.223	−3.38*	−2.63
	(−0.51)	(−0.22)	(−0.27)	(−0.14)	(−0.76)	(−0.47)	(−1.80)	(−1.23)
Closure	−0.003**	−0.003**	−0.010**	−0.010**	−0.004*	−0.004*	−0.022***	−0.022***
	(−2.62)	(−2.55)	(−2.80)	(−2.62)	(−1.79)	(−1.93)	(−3.27)	(−3.20)
Number of groups	20	19	20	19	20	19	20	19
$F(K, G − K−1)$	3.87	3.63	4.39	3.78	2.88	2.57	6.87	5.89
Prob > F	0.0411	0.0501	0.0290	0.0453	0.0835	0.1080	0.0065	0.0121
R-squared	0.2623	0.2585	0.3274	0.3079	0.2649	0.2794	0.5255	0.5016
Hansen test (p value)		5.859		8.123		4.213		4.002
		(0.0155)		(0.0044)		(0.0401)		(0.0455)

t values within brackets. Standard errors are corrected for heteroskedasticity using White's robust standard errors. The table reports selected estimates from an employment model. In the first-step separate regressions were estimated in order to adjust the group mean of the dependent variable for effects of micro covariates by estimating quarterly fixed effects. And the second step amounts to regress the estimated fixed effects on the aggregate group variables. The instruments in the IV estimations are the lag of foreign workers and the lagged Israeli unemployment rate. Hansen test is an overidentification test of all instruments.

* $p = 10$,

** $p = 5$,

*** $p = 1$

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is more striking in Gaza than in the West Bank. But in all cases, Gaza is more negatively influenced than the West Bank. These results are in line with the findings in Aranki (2006), who estimated large and significantly negative effects of closure, suggesting that during times of closure, the probability of getting employed as a wage earner decreases for all Palestinians from the Palestinian territories.

The findings that foreign workers in Israel do not significantly affect Palestinian employment may be due to the fact that the investigated time period is limited to 1999–2003. During this period, drastic reductions in employment in Israel, especially for Gazans, took place in the last quarter of 2000 and early 2001. Beyond this, the number stabilized around 50 to 60 thousand workers. On the other hand, the number of foreign workers rose (with a lag) in early 2001, but then fell more proportionately than did the Palestinian employment in Israel (see Fig. 5). Although insignificant, the effect of foreign workers on domestic employment and on employment in Israel is also negative. The increased labor supply in the domestic market is responsible for the lower probability of finding a job. In addition, the foregone factor income contributes to this finding, possibly with a lag. Friedberg and Sauer (2003) have estimated a rate of substitution between foreign workers and Palestinians from the West Bank and Gaza Strip of 0.365 and 0.857, respectively, between the years 1991 and 1995. During these years, the Israeli economy experienced a huge change in their market for low-skilled labor. The large influx of foreign workers in Israel consequently reduced the Israeli demand for Palestinian workers, and the former Israeli reliance on Palestinian workers diminished. However, as indicated by our findings, the decrease in Palestinian employment in Israel (following the second Intifada) seems to be due to difficulties in getting to work because of border controls, closures and curfews, not because of a substitution effect between Palestinian workers and foreign workers.

Friedberg and Sauer (2003) point that a reasonable explanation for the disparity in the effect of foreign workers on West Bank and Gaza may be attributable to the fact that the Gaza economy is less developed, hence more susceptible to shocks. However, this may partially explain the situation. Figure 5 above shows the two sub-periods that witnessed an increase in foreign workers: 1993–1995 and 1997. The second wave came in faster than the first wave following the 1996 disruptions to the peace process. In contrast, the first wave came after the first uprising (1989–1990), and it was less severe and gradual. As they rightfully point out that closures cause a shortage in Palestinian workers, so Israeli employers lobby to import foreign worker services to replace Palestinian workers. Thus, the number of foreign workers signifies both a change in the taste of Israeli employers as well as a time lag effect to closures. Figure 5 also shows how closures operate more quickly on Palestinian workers than on foreign workers, the decline in Palestinian employment seems to precede the increase in foreign workers. The differential

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impact on Gaza may largely be attributable to the tightness with which Gaza borders are sealed.[27]

The F tests indicate joint significance for both sets of regressors, implying that the regressors jointly explain employment probabilities for Palestinians in both regions. Only for Gazan domestic employment is the F test not significant, suggesting that the regression coefficients are not jointly significant in explaining employment probabilities.

7 Conclusion

Regression analysis above suggests that foreign workers in Israel affect the wages for Palestinians employed in Israel negatively; however, it is only significant for Gaza workers. On the other hand, Palestinian employment opportunities are not significantly influenced by foreign workers but by closure days. This is indicative of the possibility that both variables are caused by an Israeli government policy of reducing reliance on Palestinian labor. The fact that the presence of foreign workers affected Gaza workers' wages only is a manifestation of this decision, since closures are more strictly enforced in Gaza than in the West Bank.

F test results indicate that foreign workers and closure days jointly and negatively affect employment opportunities at the 2–5% level of significance. It is expected that the increase of foreign workers in Israel tends to reduce the probability of being employed in Israel for Palestinians due to the substitution hypothesis. On the other hand, domestic employment opportunities are hampered by two forces: the increased labor supply in the domestic market and the demand effect due to lower factor income.

The evidence presented in this study shows that Palestinian wages are not affected by the presence of foreign workers in Israel (except for Gazans employed in Israel). The presence of foreign workers will put downward pressure on their wages. However, the Israeli policy of closure seems to be the main cause of the substantial reduction in long-run Palestinian employment levels in Israel. In the light of these findings, policy should concentrate on investments that would lead to alternative employment options within the West Bank and Gaza Strip. This is motivated by the smaller magnitude of the effect of foreign workers on domestic labor market outcomes (see Table 2 and 3) than on employment in Israel. Palestinian domestic employment is

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[27] In view of the more recent building of the separation wall around the West Bank, it is plausible that this disparity may vanish as West Bank borders are also now more strictly sealed.

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typically more skilled and has higher average years of schooling compared to employment in Israel.

Appendix A

Table 5 Variable description

Dependent variable	
Wage	The logarithm of real daily wage
P_k	Probability of being employed in region k. Regions indexed by k are the local domestic market and Israel
Explanatory variables	
Macro covariates	
$FOREIGN_t$	The logarithm of the number foreign workers in Israel at time t
$CLOSURE_t$	The percentage of days that the borders between the West Bank and Gaza Strip and Israel were closed during time t (collected by UNSCO)
Micro-covariates	
$D.AGE_{ic}$	Dummy variable indicating if observation i is in age group c. Age groups indexed by c are: age 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, and 60–64
$D.Industry_{id}$	Dummy variable indicating if observation i is employed in industry sector d. Industry sectors indexed by d are: agriculture, manufacturing, construction, commerce, transport, and the service sector.
$D.Empl\_sector_{ie}$	Dummy variable indicating if observation i is employed in employment sector e. Employment sectors indexed by e are: national government employee (NGE) and foreign government/International org. employees (FOR/UNRWA)
Years of schooling$_i$	The individuals' years of schooling
Married$_i$	1 if an individual is married, 0 otherwise
Camp$_i$	1 if an individual resides in a refugee camp, 0 otherwise
Instruments	
Foreign$_{t-1}$	The lag of log foreign workers in Israel
Unemployment rate$_{t-1}$	The lagged Israeli unemployment rate

Appendix B

Table 6 First step estimates of the wage equation

First step estimates: Dep. var. ln(w)	West Bank		Gaza Strip	
	Local wage	Israeli wage	Local wage	Israeli wage
Age group2	0.174***	0.111***	0.108***	0.102
	(0.011)	(0.008)	(0.014)	(0.068)
Age group3	0.233***	0.159***	0.175***	0.271***
	(0.012)	(0.010)	(0.015)	(0.070)
Age group4	0.262***	0.212***	0.245***	0.393***
	(0.014)	(0.011)	(0.016)	(0.070)
Age group5	0.305***	0.229***	0.268***	0.434***
	(0.014)	(0.011)	(0.016)	(0.069)
Age group6	0.367***	0.235***	0.311***	0.454***
	(0.015)	(0.012)	(0.016)	(0.070)
Age group7	0.429***	0.247***	0.361***	0.452***
	(0.015)	(0.013)	(0.018)	(0.070)
Age group8	0.459***	0.236***	0.416***	0.423***
	(0.015)	(0.016)	(0.018)	(0.072)
Age group9	0.469***	0.238***	0.438***	0.493***
	(0.017)	(0.022)	(0.023)	(0.077)
Age group10	0.386***	0.208***	0.451***	0.551***
	(0.030)	(0.031)	(0.042)	(0.082)
Schooling	0.026***	0.012***	0.034***	−0.002
	(0.003)	(0.001)	(0.001)	−0.002
Married	0.107***	0.052***	0.108***	0.051
	(0.007)	(0.007)	(0.008)	(0.037)
Camp	−0.110***	−0.020***	−0.046***	−0.077***
	(0.007)	(0.007)	(0.005)	(0.013)
Agriculture	−0.148***	−0.330***	−0.191***	−0.142***
	(0.023)	(0.014)	(0.017)	(0.047)
Manufacturing	−0.032**	0.014	−0.010	−0.021
	(0.015)	(0.013)	(0.016)	(0.048)
Construction	0.206***	0.123***	−0.022	0.320***
	(0.017)	(0.011)	(0.016)	(0.045)
Commerce	−0.158***	0.070***	−0.179***	0.253***
	(0.014)	(0.013)	(0.019)	(0.050)
Transport	−0.067***	0.063**	−0.076***	0.074
	(0.015)	(0.027)	(0.018)	(0.069)
NGE	−0.286***	0.127	0.037***	−0.461***
	(0.009)	(0.099)	(0.014)	(0.092)
FOR/UNWRA	0.121***	0.140***	0.346***	0.027
	(0.015)	(0.015)	(0.017)	(0.096)
Constant	3.41***	3.97***	2.97***	3.82***
	(0.043)	(0.017)	(0.022)	(0.078)
Time effects	Yes***	Yes***	Yes***	Yes***
R-squared	0.3156	0.3124	0.3834	0.4652
Observations	29,823	14,818	19,267	3,188

Robust standard errors within brackets. The table reports estimates from the first step of the two-step procedure. Separate estimations are made for those who work in the local market, and those who work in the Israeli market (for each region). In the first step separate regressions were estimated in order to adjust the group mean of the dependent variable (reported in each column of the table above) for effects of micro covariates by estimating quarterly fixed effects.
*$p = 10$,
**$p = 5$,
***$p = 1$

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Table 7 First step estimates of four separately estimated binominal logit models

First step estimates: Dep. var. P(empl. = 1)	West Bank		Gaza Strip	
	Employed locally	Employed in Israel	Employed locally	Employed in Israel
Age group2	0.024	0.249***	0.044	0.898***
	(0.030)	(0.036)	(0.060)	(0.168)
Age group3	0.039	0.138***	−0.012	1.38***
	(0.036)	(0.042)	(0.068)	(0.174)
Age group4	−0.172***	0.005	−0.346***	1.77***
	(0.041)	(0.047)	(0.074)	(0.174)
Age group5	−0.153***	−0.238***	−0.618***	2.06***
	(0.042)	(0.049)	(0.074)	(0.176)
Age group6	−0.271***	−0.456***	−0.782***	1.97***
	(0.045)	(0.053)	(0.078)	(0.179)
Age group7	0.344***	−0.511***	−0.765***	1.70***
	(0.050)	(0.059)	(0.081)	(0.183)
Age group8	−0.401***	−0.768***	−0.928***	1.63***
	(0.054)	(0.067)	(0.088)	(0.191)
Age group9	−0.511***	−0.987***	−0.940***	1.07***
	(0.066)	(0.083)	(0.101)	(0.235)
Age group10	−0.665***	−1.35***	−1.20***	1.11***
	(0.092)	(0.107)	(0.143)	(0.271)
Schooling	0.042***	−0.042***	0.051*** (0.004)	−0.030***
	(0.003)	(0.003)	(0.004)	(0.006)
Married	−0.047*	0.309***	0.519***	0.928***
	(0.027)	(0.031)	(0.048)	(0.096)
Camp	0.297***	−0.001	0.054*	−0.105**
	(0.024)	(0.032)	(0.029)	(0.051)
Agriculture	−0.993***	1.48***	0.828***	2.83***
	(0.047)	(0.053)	(0.049)	(0.156)
Manufacturing	1.11***	1.32***	2.08***	3.22***
	(0.029)	(0.051)	(0.048)	(0.157)
Construction	0.318***	2.29***	1.22***	3.77***
	(0.028)	(0.047)	(0.049)	(0.151)
Commerce	0.159***	1.05***	0.702***	1.57***
	(0.030)	(0.051)	(0.051)	(0.166)
Transport	0.515***	−0.621***	1.16***	0.682***
	(0.040)	(0.100)	(0.066)	(0.225)
NGE	4.40***	−3.69***	4.94***	−2.11***
	(0.048)	(0.294)	(0.055)	(0.330)
FOR/UNWRA	1.86***	2.16***	5.04***	−0.707
	(0.056)	(0.076)	(0.118)	(0.448)
Time effects	Yes***	Yes***	Yes***	Yes***
Log pseudolikelihood	−44,787.101	−33,277.493	−18,817.961	−7,007.0542
Pseudo R-sq	0.2513	0.1972	0.4243	0.4051
Observations	96,889	96,889	48,698	48,698

Standard errors within brackets are corrected for heteroskedasticity using White's robust standard errors. The table reports coefficient estimates from the first step of the two-step procedure. In the first step separate regressions were estimated in order to adjust the group mean of the dependent variable (reported in each column of the table above) for effects of micro covariates by estimating quarterly fixed effects.

*$p = 10$,

**$p = 5$,

***$p = 1$

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