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The economic response of rural areas to local supply shock: evidence from the Occupied West Bank*

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ABSTRACT

As the Second Intifada broke out at the end of 2000, Israel severely restricted entry for Palestinians to its labor market, forcing a great section of commuters to return to their local labor markets. This paper examines the economic effect of the return commuting on non-commuters in rural areas of the Occupied West Bank. Utilizing place-of-work, repeated cross-section data, the results show that returned commuting has negative repercussions. Specifically, wages decrease for workers with the same skill type (low skilled). The results also provide evidence that favors the crowd-out effect hypothesis. The estimated probability of unemployment increases for non-commuters with disproportionate effect for job seekers relative to those reportedly employed. Consistent with this result, increases in return commuting prolong unemployment duration for the low skilled. The outcome of this paper helps understand how rural labor markets may respond to labor supply shocks.

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KEYWORDS Return commuting; local labor supply shock; wages; unemployment

1. Introduction

The economic impact of rural migration has been a central interest of economists and policy-makers (see Adams & Page, 2005; Démurger & Xu, 2011; Wang & Fan, 2006). Researchers have mainly emphasized the importance of remittances to diversify income and alleviate poverty (Adams & Page, 2003; De Brauw & Rozelle 2008; Ellis, 1998). Another strand of literature addresses return migration, highlighting the economic performance of returned migrants upon arrival. A mounting volume of research focuses on the wage premium of the returnees (Co, Gang, & Yun, 2000; Coulon & Piracha, 2005) and their occupational choices and entrepreneurial activities (Démurger & Xu, 2011; Dustmann & Kirchkamp, 2002; McCormick & Wahba, 2000; Piracha

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& Vadean, 2010; Wahba & Zenou, 2012). In this context, most cited research has mainly explored the motives behind return migration, modeling the decision to return to reflect self-selection to maximize utility (Borjas & Bratsberg, 1996; Coulon & Piracha, 2005; Dustmann, 1997; Zhao, 2002).[1]

Still, little research addresses how returned migrants affect local labor market outcomes for the non-migrants in rural areas. This paper aims at bridging this gap focusing on the short-run effect on wages and unemployment in rural areas of the occupied West Bank. Right after the break out of the Second Intifada, in September of 2000, the Israeli government placed a closure policy that substantially limited the access of Palestinian commuters, mostly low skilled, into its labor market. Most affected are rural commuters who prior to the closure represented about one-third of the total rural workforce and 60% of total commuters. As the restriction intensified during the first quarter of 2001, the share of rural commuters dropped to 7%. Throughout the following years, the share of returned commuters varied, but for most districts it never reached near the initial level (see Figure 1).

Unlike most of the cited research, the decision for Palestinian commuters to return is involuntary (not based on self-selection) and forced by Israel's closure policy (see Farsakh, 2002). In addition, while commuting restrictions affected both rural and urban areas, I focus on the former in order to simulate how an exogenous influx of returned commuters affects the rural local market, this being the paper's main contribution to the literature. In addition, I expand

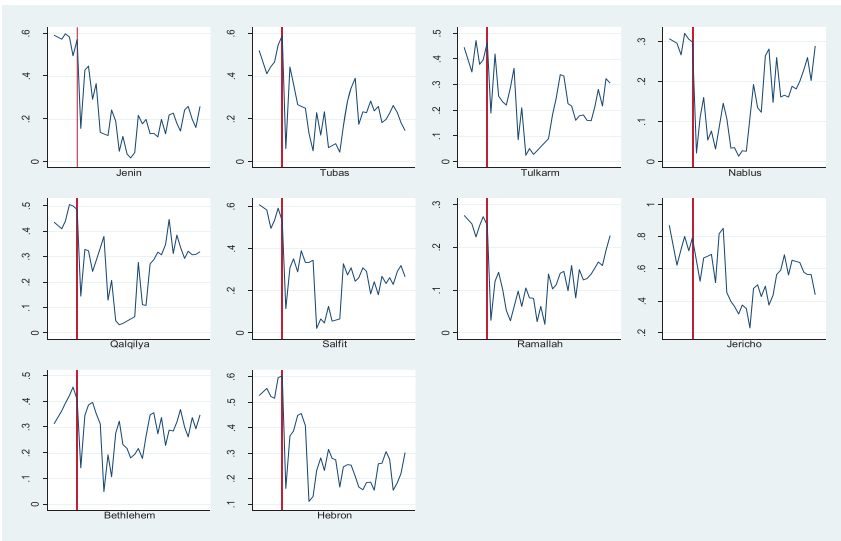

Figure 1. Quarterly changes in the share of rural commuter in the Occupied West Bank during the 1999–2008 period. ‡The reference line marks the breakout of the Second Intifada at the third quarter of 2000.

the analysis to examine whether this shock may interact with the urban labor market. Broadly, the outcome of this research contributes to the literature of rural–urban linkages, mainly in the context of negative demand shocks. It also paves the way for a better understanding of how labor export policies would perform when the risk of forced return migration is high.

While the literature, to the best of my knowledge, lacks theoretical reasoning to explain the economic effect of returned migration on non-migrants (or the effect of returned commuters on non-commuters as in this paper), the theory of immigration can be informative. In a framework of a perfect competitive market, the short-run effect on natives basically depends on whether they are perfect (imperfect) substitutes for immigrants (Borjas, 2006; Ottaviano & Peri, 2012). To the extent that they are perfect substitutes, immigrants are likely to compete with native workers with the same skills. In short, immigrants may be willing to work at lower wages, leading to a decrease in native wages and a reduction in their employability (Bauer, Lofstrom, & Zimmermann, 2000; Edo, 2013; Ottaviano & Peri, 2012). Consistent with this hypothesis, wages and employment outcomes for rural non-commuters are expected to decrease (increase), depending on the type of skills acquired by rural commuters and the extent to which such skills complement or compete with non-commuters.

Utilizing labor force data from the Palestine Census Bureau of Statistics (PCPS), the study draws on the variation over time of rural commuting in the occupied West Bank to examine the short-run impact on wages and unemployment for rural non-commuters. The span of the study is from the second quarter of 2002 until the end of 2008. In this framework, return commuting is measured as the decrease in the logarithmic share of commuters relative to that of the initial period (third quarter of 2000, right before the breakout of the Second Intifada and the associated imposition of the closure policy).

The main identification assumption of this analysis is that the extent of restricting the access of Palestinian commuters determines the level of return commuting. However, I address a possible endogeneity concern that the variation in the commuting share during the Second Intifada may be also affected by local economic conditions. In other words, with a varying level of commuting restriction, the decision to commute back to the Israeli labor market might be affected by economic conditions in rural areas. To tackle this issue, the paper neutralizes the effect of local labor conditions by utilizing the Instrumental Variable (IV) approach with an instrument that predicts the share of rural commuters based on changes in Israel's overall demand for Palestinian workers.

The most conservative results of this paper, those based on the IV estimation, provide evidence of negative effects on labor market outcomes for rural non-commuters. Specifically, increasing the share of returned

commuters by 1%, relative to the initial period, reduces wages for rural non-commuters by 0.7–0.11%, depending on identifying criteria of non-commuters. Consistent with the skill effect hypothesis, the wage decrease is limited to low-skilled workers. As for unemployment, the results favor the crowding-out effect hypothesis; increasing the share of returned commuters by 1% raises the probability of unemployment for rural individuals by 0.07. Markedly, the crowding-out effect is larger for job seekers relative to those reportedly employed. The paper also extends the analysis to investigate the effect on unemployment duration for the low skilled. The results show that increasing the share of returned commuters by 1% increases unemployment duration by 0.22–0.29%.

This paper is not, however, the first to examine the labor market impact of restricting mobility access to Israeli labor market. Utilizing quarterly district data over the second Intifada period (2000–2005), Mansour (2010)[2] found that the associated labor supply shock reduces wages and increases unemployment, mainly for low-skilled workers. In addition to focusing on rural communities, this paper deviates from Masour's in the following fashion. Mansour's documented findings cannot be generalized to infer the effect on rural non-commuters and to rigorously test for the crowding-out effect. The sample he uses does not distinguish past commuters from non-commuters. Thus, the effect on non-commuters is indistinguishable, whereas this paper focuses on the non-commuter sample (see more discussion below). Importantly, this paper also extends the analysis to examine the effect of returned commuting on unemployment duration as well as extending the testing of the crowding-out effect to emphasize the differential effect on job seekers versus those reportedly employed. In addition, Mansour's main identification assumption is that return commuting is independent of local economic conditions, whereas this paper addresses the likelihood that intensity of return commuting is endogenous.

The remainder of the paper is organized as follows: Section 2 presents a brief discussion on the motives for Palestinian workers to commute to the Israeli labor market. Section 3 discusses the source of data, changes in returned commuting, and characteristics of rural workers. Section 4 sets out the empirical wage model and documents the main wage findings. Similarly, Section 5 describes the empirical methodology and findings for the unemployment analysis. Section 6 reports the extent to which the results of the base models are sensitive to modifications in the identifying criterion of returned commuter. Finally, the paper briefly concludes in Section 7.

2. Background on commuting to Israeli labor market

Since occupying the West Bank and Gaza (WBG) in 1967, Israel has implemented a number of policies that reshaped the Palestinian economy.

The main one hinges on eliminating borders with the Israeli labor market (Farsakh, 2002). In the early 1970s, average wages in Israel amounted to 200% relative to the occupied Palestinian territories' (oPt), inducing a rapid inflow of Palestinian commuters into the Israeli labor market. During the first years of the Israeli occupation, the share of commuters peaked at one-third of the total Palestinian workforce. The flow of commuters had, however, been disrupted in periods that witnessed political turmoil, such as in the beginning of the First Intifada in 1987 and the breakout of the first Gulf war in 1991 (see Astrup & Dessus 2005).

After 1991, the Israel government has gradually adopted a closure policy aimed at restricting access to its labor market. It required Palestinian commuters to obtain a special permit based on age, sex, marital status, and security clearance. During the period of 1994–1997, a few years after establishing the Palestinian Authority (PA), the share of Palestinian commuters decreased to about 17%. Nonetheless, the restrictions were partially lifted in the following years (see Arnon & Weinblatt, 2001), increasing the share of commuters by the end of 1999 to 29% of total Palestinian workforce.

The major closure measures took place when the Second Intifada broke out at the end of 2000. The Israeli government restricted mobility across the oPt, declared curfews in many areas, and substantially reduced the number of work permits. These led to a severe restriction on the flow of Palestinian commuters into the Israeli labor market. Figure 1 exhibits the abrupt decrease in the share of rural commuters across the West Bank's districts as the Second Intifada started. Depending on the level of mobility restriction and local economic conditions, the share of commuters has risen and fallen but never picked up to its initial level. As for the Gaza strip, Israel maintained its strict closure policy and completely barred commuting as Hamas took control of Gaza in 2007. Therefore, the analysis of this paper is limited to return commuting in the occupied West Bank.

3. Data

To examine how the influx of returned commuters affects wages and unemployment for non-commuters in rural areas, I utilize place-of-work data[3] for workers in West Bank's rural areas between the second quarter of 2001 and the end of 2008. The pooled data cover the sampled rural workers, commuters and non-commuters in districts' rural areas over 31 quarters. For each district, a rural area comprises all rural localities, amounting to 10 rural areas for the occupied West Bank. The sample excludes the rural area of East Jerusalem as the commuting restrictions do not apply to its citizens. In addition, the sample is limited to workers aged between 15 and 64

and excludes data prior to the second quarter of 2000 and post-2008 as place-of-work data for this period are not readily available. For the wage model, the sample only includes workers employed in the private sector. The source of data is the PCBS' labor force survey, which collects detailed employment and socioeconomic characteristics of individual household members.

Unlike the analysis documented in the immigration literature, commuters cannot be identified with background characteristics, such as ethnicity. Still, the rotation nature of the labor force survey is a key to identify returned commuters. In particular, each household is interviewed twice, over the two consecutive quarters, dropped from the sample for two quarters, and then represented again for another, and last, two consecutive quarters. This represents a 50% overlap of the same sample between both consecutive quarters and across two consecutive years. In this framework, I distinguish between non-commuters and returned commuters based on their place of work in the previous quarter. Rural non-commuters are those who reported their local rural areas as their usual place of work in the current and previous quarter.[4] Still, this methodology is silent about the place of work in earlier periods; and therefore, the analysis may not fully isolate the wage and unemployment effect for the non-commuters. As a robustness check, I use job tenure (period spent working for the same employer) as an alternative criterion.

In terms of labor characteristics,[5] rural non-commuters are generally less educated. The average years of education of the sampled workers amount to 9.6 years. Consistently, the share of skilled workers (those with more than 12 years of education) is about 10%. In terms of industry distribution, about 34.5% of the waged rural workers are employed in manufacturing, 28.5% in construction, 28% in service, and the remainder works in agriculture.[6] At the gender level, female workers represent about 18% of the total employment and mostly work in the service and manufacturing sector.

As for rural commuters to the Israeli labor market, they are overwhelmingly males (98% of total commuters) and low educated with an average of 9 years of schooling. They are also disproportionately working in the construction sector (52%), while the remainder is equally distributed across the other sectors. The overwhelming majority of these commuters are employed in low-skilled jobs (72% are employed in elementary occupations and 16% works in craft and plant-machine occupations). These statistics clearly show that skill characteristics of commuters are similar to low-skilled workers in rural areas. The empirical analysis in the following sections provides evidence that commuters are a perfect substitute for non-commuters.

4. Empirical model

4.1. The wage effect for rural non-commuters

The empirical strategy for estimating the wage model utilizes a modified version of Mincer's earning equation (Mincer, 1974):

$$\log W_{ijq} = \gamma \text{Returned}_{jq} + B_1 Control_{ijq} + \mu_j + \pi_q + e_{ijq}, \quad (1)$$

where LogW_{ijq} is the logarithmic daily wage, measured in new Israeli Shekel, for non-commuter worker '*i*', who is employed in the rural area of district '*j*'[7] and observed in quarter '*q*'. The main independent variable of interest is 'Returned_{jq}' commuters, which is measured as the difference between the logarithmic share of commuters at the initial period (third quarter of 2000) and at quarter '*q*' for rural area '*j*'. This is to show the increase (decrease) in (returned) commuting relative prior to the shock. The share of rural commuter is calculated as the number of commuters relative to a total number of workers residing in the rural area of each district.[8] The estimate '*γ*' reflects the returned commuting elasticity of daily wages. Alternatively, returned commuting can be measured using the logarithm of the number of commuters. Although the results, unreported,[9] do not change qualitatively, I prefer the former measure as it properly accounts for differences in the size (total employment) of the rural areas.

One concern of the wage model is that changes in the influx of past commuters might also pick up a labor demand effect, which is also correlated with closure policy. More specifically, the Israeli government exercised a system of restrictions, after the breakout of the Second Intifada, limiting the mobility of goods and individuals within and across districts in the oPt. The restrictions had taken different forms including permanent and partial checkpoints, roadblocks, barrier gates, and trenches (Cali & Miaari, 2013). A number of reports, published by international institutes such as the World Bank or the IMF,[10] have directly related these restrictions to a substantial decrease in economic activities.[11] In addition to restriction effects, increases in violence intensity may disrupt economic activities and decrease labor demand (Mansour, 2010).

Commuting restrictions may also affect labor demand via an income effect. Remittances decrease substantially as commuters lose their jobs in the Israeli labor market. Therefore, periods with sever commuting restrictions may be accompanied by a negative labor demand shock due to a fall in demand for goods and services. In addition, as violence intensified, people may reduce their consumption spending to increase their precautionary savings. Not controlling for these demand effects may pose a threat to identification. I address this issue via two mechanisms.[12] Firstly, I include quarter (time) dummies to account for overtime changes in demand effects that are

common to all rural areas, such as changes in the intensity of the Second Intifada and level of commuting restrictions.

Secondly, I follow Katz and Murphy (1992) to construct an exogenous labor demand measure (demand shifter) to capture labor demand shocks that vary across rural areas and over time. Specifically, changes in labor demand at a given rural area (j) and quarter (q) are defined as: $\text{Shifter}_{jq} = \sum \pi_{sjq}(\Delta E_{sq})$. The term π_{sjq} is the share of workers in industry s employed in rural area j and measured at the initial period (third quarter of 2000 – right before the Second Intifada). The list of industries includes agriculture, construction, manufacturing, and services. ΔE_{jq} is measured as the decrease in regional (West Bank's) employment growth, for all rural areas, of industry s relative to the initial period, measured in the third quarter of 2000 (right before the break out of the Second Intifada). To ensure erogeneity, I exclude employment in own-rural area j. This measure redistributes regional labor demand shocks across local rural areas, in a given quarter, using the initial employment share as a distributing weight. Thus, a decrease in regional employment of a given industry is expected to affect rural areas with a higher initial share of that industry.

The vector $\mathbf{X}_{ijq}$ controls for workers' demographic and socioeconomic characteristics, including sex, education, marital status, age, and age squared. The vector also includes a list of dummy variables to account for wage differences across industries, which are classified using ISIC's 4 digit level. The vector 'μ_j' includes another list of rural area fixed effects to account for factors that are common to all workers in the same rural area but vary little over time. These include distance to the Israeli labor market. Adnan (2015) shows that geographical location is the main determinant of commuting to the Israeli labor market. Descriptive statistics of the main variables in the wage model are presented in Table A1.

Before presenting the results, I address two main concerns that may affect the estimate of the returned commuters. Relevant to modeling the economic effect of immigration (see Borjas, 2006), returned commuters may not be randomly distributed across local labor markets. In particular, they may cluster in areas with thriving economic conditions, leading to a spurious relationship between wages and influx of returned commuters. The second highlights the possibility that the effect of returned commuters on rural areas might be attenuated by the move-out effect of non-commuters to other areas (urban or rural).

It turned out that these concerns are less likely to affect the results. In particular, the share of returned commuters who moved to other districts of residence, during the study period, is only about 3%. This indicates that non-random distribution of returned commuters seems not to be a major issue. To tackle the move-out effect, I estimate the impact of returned commuters on the likelihood of a non-commuter moving out and working in a different

district or in the urban area of the same district of residence. The model is estimated using the following probit regression:

$$\mathrm{MO}_{ijq} = \alpha_1 \mathrm{Returned}_{jq} + \alpha_2 Control + \mu_j + \pi_q + e_{ijq}. \quad (2)$$

The dependent variable is dichotomous, taking a value of one for those who work in the same rural area of residence and zero for rural non-commuters who work either in urban areas of the same district or in a different district. The control variables include worker's age, level of education, and the demand shifts (Shock_{jq}). The model also controls for quarter (π_q) and rural area (μ_j) fixed effects. The results, unreported, show that the effect is positive but insignificant, with a z-statistic of 0.54. The result is robust even when restricting the sample to low-skilled workers.

To ensure that the findings of the wage model are not driven by the model specification, I controlled for the share of rural workers who commuted to other areas within the occupied West Bank. The results, unreported, remain unchanged. This indicates that the effect of return commuting on rural wages is absorbed locally. The results also remain the same even when assuming that return commuting is endogenous (correlated with rural economic conditions).[13] The insignificant effect can be explained by the mobility restrictions that Israel imposed within and across districts mainly during the first few years of the Second Intifada. Including road blocks and checkpoints, these restrictions substantially increased commuting time and cost and forced people to take lengthy bypass routes (see Mansour, 2010).

4.2. Results for the wage model

Before discussing the results, it is worth noting that the wage model, and other models reported below, combine aggregated level data (share of returned commuters and demand shifts) with individual-level data. Moulton (1986) shows that failing to account for common group errors can bias standard errors downward and accordingly invalidate tests from the OLS estimates. One option to address this concern is by clustering standard errors. Nonetheless, this may not work well in this analysis since the number of West Bank districts is only 10. I alternatively utilize White-Huber standard error and importantly utilize critical values from a t_{G-K-1} distribution, where G is 10 and K (number of aggregated variables) is 2 (see Cameron & Miller, 2010; Cohen & Dupas, 2010).

Table A1 documents the results for the effect of returned commuters on wages of rural non-commuters. Column (1) reports the results for all workers regardless of their skill level. The estimate of the $\mathrm{Returned}_{jq}$ variable is negative and statistically significant at 5%. All else equal, increasing the share of returned commuters by 1% reduces daily wage by 0.08%. As for

the estimates of the control variables, the results show that the effect of the demand shifts variable is negative but marginally significant at 10% level. This variable seems to have a greater influence on employment status (see below). As for the socioeconomic characteristics, wages tend to increase with years of education. Also, wages increase with age, though at a decreasing rate as captured by the age-squared variable.

As indicated above, rural commuters are mostly lows killed. So, to shed light on the nature of skill substitutability between commuter and non-commuter, the wage model is separately estimated for skilled non-commuters (those with more than 12 years of education) and low-skilled non-commuters (those with fewer than 13 years of education). Column (2) of Table A2 reports the result for the skilled, which show that the effect on their wages is negative but statistically insignificant. This finding, however, should be interpreted with caution as the sample size is small for a panel dimension that combines individuals and aggregated level data. Nonetheless, when considering the sample for the low skilled, the findings show a negative and significant effect. The magnitude of the estimated coefficient is similar to that of the entire sample. This indicates that wages decrease only for non-commuter workers with similar skills, signaling that returned commuters are substitutes to this section of non-commuters.

4.3. IV estimation

The main identification assumption for the wage model is that return commuting is independent of the labor market conditions in rural areas. Specifically, changes in the share of returned commuters hinge on changes in restriction intensity. Still, this argument ignores the fact that with a varying level of commuting restriction, the decision to commute back to the Israeli labor market might be affected by economic conditions in rural areas, such as high unemployment and lower wages. To address this issue, I re-estimated the wage model using the IV estimation technique. In the spirit of Bartik (1991) and Moretti (2010), I utilize an instrument that isolates the effect of rural economic conditions by using changes in Israel's overall demand for Palestinian workers. The local share of commuters at the initial period is used as a distribution weight. The instrument is specified as follows:

$$Z = \log[(isr_q - isr_{jq}) \times isr_{jq0}], \tag{3}$$

where isr_q is total Palestinian commuters to the Israeli market in quarter 'q' and isr_{jq0} is the share of commuters in rural area j measured in the initial period (right before the breakout of the Second Intifada). To ensure exogeneity, the number of commuters in own-rural area (isr_{jq}) is purged from the total commuters. The identification assumption of this instrument is that increases in the overall demand of Palestinian commuters would disproportionately

increase the commuting share for rural areas with a greater initial share. Consistent with this argument, the coefficient of the IV is positive, with an estimate of 16.17, and statistically significant at 1%. Importantly, the F-statistic of the first stage is above the conventional level, indicating the instrument is relevant.

The second-stage results qualitatively accord with the OLS estimates. However, the magnitude of the returned commuting effect increases to about 0.11 for the entire sample and for the low-skilled sample.[14] As for the skilled findings, the magnitude of the coefficient increases to about 0.1 but is statistically insignificant. These findings indicate that the documented effect of return commuters holds even if return commuting is regarded as endogenous to economic conditions in rural areas.[15]

In the aforementioned analysis, I restricted the effect of commuting restrictions to rural areas. Nevertheless, as employment competition toughens in these areas, some of the returned commuters may have sought employment in urban areas of the same district. This may sway urban labor market outcomes, possibly depending on the share (size) of this section of individuals. Unfortunately, the labor force survey lacks information on whether rural individuals seek employment in urban areas. But, the underlying effect can be directly examined by re-estimating the IV version of model (1) and limiting the sample to workers in urban areas. The results, unreported, show that the coefficient of rural return commuting is negative but statistically insignificant.[16]

5. The effect of returned commuters on unemployment

5.1. Effect on unemployment status

This section investigates how returned commuters affect employment status for non-commuters in rural areas. It is expected that returned commuters would compete for the same jobs with non-commuters, decreasing the likelihood for the latter to be employed. Similar to the wage model, the testing of this hypothesis utilizes individual-level data for rural workers in each district of the West Bank between the second quarter of 2001 and the end of 2008. The testing methodology uses a probit model to estimate the probability of rural individuals being unemployed following the return of commuters. The sample utilized in this analysis excludes those who reported the Israeli labor market as their place of work in the previous quarter. The sample is also limited to individuals who did not commute to the Israeli labor market in the previous quarter and work or search for work in rural areas. The model is specified in the following fashion:

$$\mathrm{UR}_{ijq} = \lambda_1 \mathrm{Returned}_{jq} + \lambda_2 \mathit{Control}_{ijq} + \mu_j + \pi_q + e_{ijq}. \quad (4)$$

The dependent variable is dichotomous, taking a value of 1 for unemployed individuals and zero for the employed. The independent variable of interest (Returned$_{jq}$) is defined as specified above. The control variables include demand shifts, worker's age, level of education, and marital status. This is in addition to controlling for rural area and quarter fixed effects.

The model is firstly estimated for the entire sample, skilled and low skilled. The results, presented in Table A3, show that the impact of return commuting is positive and significant at the 1% level. Thus, increasing the share of return commuters by 1% increases the probability of unemployment by about 0.025, all else equal. As for the control variable effect, the estimates are consistent with the a priori expectations. The probability of unemployment decreases with an individual's age[17] and years of education, though, males are more likely to be unemployed than females.

The effect on unemployment status is limited to the low-skilled individuals, with an estimated probability of about 0.03. The estimated effect for the skilled sample is about 0.011 but statistically insignificant (see Columns 2 and 3). Table A3 also displays the results for the IV models, which confirm this finding, though the IV estimates are higher (about 0.07). In a nutshell, this finding suggests that the impact of returned commuters favors the crowding-out hypothesis. In the light of the insignificant effect of the skilled sample, the following analysis focuses mainly on the low skilled.

So far, the analysis shows that the return commuting shock affects the wage and unemployment status only for the low-skilled cohort. Importantly, this indicates that the labor demand shock emanating from commuting restrictions does not bias these effects. Put differently, if labor demand shocks confound the return commuting measure, one would expect to observe a significant effect on the skilled cohort, ceteris paribus.

It is worth noting that the specification of model (4) is silent about the extent to which the crowding-out effect operates via competing with the employed versus those seeking jobs. To explore these channels, I split the low-skilled sample into two. The first includes individuals who were employed and worked in the same rural area in the previous quarter. The second sample is limited to those who were unemployed in the previous quarter to account for job seekers. The two samples are utilized to re-estimate model (4). In addition, I modified the model of the former sample in order to control for the type of industry in the previous quarter (agriculture, manufacturing, construction, and services).

The findings document the differential impact of returned commuting. In particular, the OLS estimate is close to 0.1, and statistically significant at 5%, for those unemployed in the previous quarter. On the other hand, the estimate for those previously employed reduces to 0.01 but marginally significant at the 10% level. The IV estimate confirms the differential effect, though the estimates are much larger and statistically significant for both samples

(see Table A4). This shows that returned commuters compete more with job seekers. The results also show that decreases in economic activities, as captured by the demand shifts variable, increase the probability of unemployment only for the previously unemployed model.[18]

5.2. The effect of returned commuters on unemployment duration

This section considers another dimension of unemployment. It specifically investigates how returned commuters affect the unemployment duration for rural job seekers. The underlying mechanism is that job competition between returned commuters and those searching for jobs in their rural locality is expected to increase the employment duration for the latter. The specification of the regression is similar to model (4). The only difference is that the dependent variable is defined as the logarithm of the number of months an unemployed individual has spent searching for a job in rural area *j* and observed in quarter *q*. In this setting, the effect of return commuting is measured conditional on being unemployed.

The OLS findings, reported in Column (1) of Table A5, show that the effect on unemployment duration is positive and statistically significant at the 1% level. This indicates that increasing returned commuters by 1% would increase unemployment duration for the low skilled by 0.17%. The IV estimates are reported in Column (2) of the same table, exhibiting similar findings, but with a greater effect.

6. More robustness check: identifying past commuters

The main theme of this paper addresses the effect of returned commuters on labor market outcomes for non-commuters. Throughout the analysis, non-commuters are identified as those who did not commute to the Israeli labor market in the previous quarter, assuming that this section of workers did not commute in earlier quarters either. However, there is no guarantee that this is exactly the case, and thus the reported estimates may not fully capture the effect on non-commuters.

Alternatively, I utilize job tenure, measured in number of months that a worker has spent at the same job, as a criterion to identify non-commuters for the wage model.[19] I separately re-estimated the wage model for low-skilled workers who have spent more than a year and more than two years at the same job. The findings, for both OLS and IV models, show that the effect of returned commuters is robust, though the magnitude of the commuting effect is smaller, mainly for the IV model (see Table A6).[20]

As for the analysis of unemployment status, I limit the sample to low-skilled workers who did not identify the Israeli labor market as their place of work during the past five quarters. As indicated earlier, this is possible as the

labor force survey identifies the current or usual place of work. The estimates are reported in Table A7 for the low-skilled cohort including the entire sample, those previously employed, and previously unemployed. The results are similar to the base model, reported in Tables A3 and A4, though the magnitude of the return commuting estimate is larger.

7. Conclusion

This paper examines how an exogenous influx of returned commuters affects the rural local market. Specifically, it utilizes commuting restrictions that Israel imposed on Palestinian commuters, during the Second Intifada, to examine the short-run effect on wages and unemployment for non-commuters. The findings show that returned commuters are perfect substitutes for low-skilled non-commuters (similar skill type), leading to a wage decrease for the latter. Consistently, the results favor the crowding-out effect hypothesis; returned commuters compete for the same jobs as rural individuals and increase their probability of being unemployed. Most of this effect is limited to those seeking jobs. In addition, the results also show that unemployment duration increases for low-skilled individuals.

Overall, this paper provides a venue to evaluate labor export policies that countries often utilize to eliminate excess labor supply. The results suggest that this policy might back fire, at least for rural areas, when risks of forced returned migration or commuting are high. In this vein, the results are informing in the context of the Israeli–Palestinian conflict. Specifically, excessive reliance on the Israeli labor market to sustain lower unemployment may not be effective in the long run. The demand for Palestinian workers continues to be governed by the prerequisite of Israel's security conditions.

Notes

1. Economic theories have suggested a number of venues that explain return migration, including the role of accumulated savings abroad and the preference for consumption in the own country (see Dustmann, 2003; Galor & Stark, 1991; Dustmann & Weiss, 2007). Others have given importance to accumulation of human capital. For example, Dustmann (1997) suggests that individuals may return after acquiring skills that are highly rewarded back home.
2. A number of studies have utilized the Palestinian labor force data to examine how labor markets respond to political conflict. For example, Miaari and Sauer (2006) explore how conflict affect wages for Palestinian workers in the Israeli labor market. Cali and Miaari (2013) also estimate the impact of internal closure, across the occupied territories of West Bank, on employment and wages. See also Nandi and Di Miao (2013), Angrist (1996), Farsakh (2002), and Bulmer (2003). Makhool, Daoud, and Elkhafif (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. Daoud (2005) documents

that the closure lowers gender gap in returns to schooling. See also Sayer and Daoud (2010) and Etkes (2012).

3. The wage and unemployment data exclude rural residents who work in urban areas of same district or work in other districts.
4. Rural non-commuters also include those worked in urban areas in previous quarter and currently working in rural areas.
5. The statistics used in describing labor characteristics are averaged throughout the period of study.
6. When considering labor characteristics for all workers, waged and non-waged, the agriculture sector is the main employer with a worker share of 43%. In other words, most of the workers in this sector are non-waged workers.
7. In this research, local labor markets are defined by districts. One concern is that the empirical findings might be sensitive to definition of labor market boundaries (Borjas, 2014). Unfortunately, data on different geographies are lacking. Nonetheless, judging by commuting sheds, the data show that less than 6% of total workers in the sample commute out of their district of residence. In this respect, districts can be regarded as local labor markets. Importantly, as discussed below, return commuting shock has not driven rural non-commuter out of their districts.
8. Constructing the return commuting using 'share' is consistent with the existing literature on immigration (see Borjas, 2003 and Bonin, 2005). Though, these papers define the share of immigrants by education and experience. Unfortunately, the sample used in this paper does not allow construct return commuting share by skill groups.
9. All unreported results in this paper are available upon request from the author.
10. See World Bank (2007, 2010) and UNCTAD (2011).
11. Cali and Miaari (2013) found that the mobility restrictions across and within the West Bank cause negative effect on wages and employment.
12. One option to account for the demand side effect of violence and closure policy is to include in the model some measures of fatality and mobility barriers. Unfortunately, this kind of data is not readily available at the rural level.
13. See Section 4.3 for a detailed discussion on the expected correlation between returned commuting and rural economic conditions, as well as the instrument used to address this issue.
14. In a separate model, I estimated the IV model measuring return commuters as differenced logarithmic number of commuters. The results show that increasing return commuting by 1% decreases average wages for low skilled by 0.1%.
15. I also constructed the IV using more distant initial commuting share (first quarter of 1999). The results, unreported, show a similar effect on wages with an elasticity estimate of 0.9%. Unfortunately, data on commuting share are not readily available for more distant dates.
16. As indicated in the data sections, many rural workers are employed non-wage activities, mainly in the agriculture sector. I investigate whether the return commuting shock alters employment status of rural workers, shifting toward more non-wage employment. In particular, I estimate an IV version of model (1), except that the dependent variable is dichotomous, taking a value of one for waged non-commuter worker and zero for non-waged and non-commuter worker. The results, not reported, show a negative but statistically insignificant effect.
17. In a separate model, I added age square to account for non-linearity of age effect. The results, unreported, remain the same.

18. As indicated in the Introduction, I distinguish this research from Mansour's (2010) based on identifying the effect of return commuting on rural non-commuters, among other issues. This identification appears to be crucial in sorting out the magnitude of the return commuting effect. To show this I re-estimated the IV version of the wage and unemployment status models for the low-skilled cohort using a similar sample to Mansour's; mainly, no distinction between past commuters and non-commuters. Unreported, the return commuting estimate of the wage model drops to 0.051 (about 47% relative to corresponding estimate in Table A2), while the probability estimate for the unemployment status model increased to 0.11 (about 50% of the corresponding estimate in Table A3).
19. On average, local workers spent about 64 months working for same employer. The descriptive analysis shows little difference by skill level (64 months for the low skilled vs. 63.5 month for the skilled). Over the study period, average employment period rose from 61 to 75 months.
20. The reason to limit the sample to maximum employment period of five years is due to the decrease in the sample size.

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Appendix

Table A1. Descriptive statistics of the main variables in the regression models.

Quantitative variables	Average	Standard deviation	Minimum	Maximum
Wage	62.69	33.56	3.84	1153.84
Years of education	9.55	3.3	0	22
Age	30.67	9.99	15	65
Qualitative variables	*Percent*			
Male	83.5			
Females	15.95			
Marital status				
Single	41.83			
Married	56.69			
Other	1.49			
Type of industry				
Agriculture	9.9			
Manufacture	35.98			
Construction	27.43			
Services	26.69			

Table A2. Effect of returned commuting on wages for rural non-commuters, OLS and IV

Variable	All workers OLS -1-	Low skilled OLS -2-	skilled OLS -3-	All workers IV -4-	Low skilled IV -5-	skilled IV -6-
Log share of returned commuters	−0.082 (−2.72)**	−0.074 (−2.38)**	−0.037 (−0.42)	−0.1163 (−3.91)***	−0.1073 (−3.51)***	−0.0961 (−0.92)
Demand shifts	−0.015 (−1.25)	−0.02 (−1.68)	−0.0007 (−0.02)	−0.0166 (−1.36)	−0.021 (−1.76)	−0.003 (−0.10)
Sex	0.39 (6.73)***	0.345 (4.89)***	0.38 (3.61)***	0.389 (6.7)***	0.345 (4.89)***	0.377 (3.53)***
Years of education	0.0207 (6.24)***	0.0131 (3.69)***	0.0675 (2.99)**	0.0207 (6.26)***	0.0131 (3.68)***	0.0688 (3.00)**
Age	0.04 (6.30)***	0.0447 (6.88)***	0.019 (0.62)	0.0414 (6.41)***	0.045 (6.99)***	0.0165 (0.52)
Age squared	−0.0005 (−5.53)***	−0.0005 (−6.35)***	−0.0002 (−0.43)	−0.0005 (−5.63)***	−0.0005 (−6.45)***	−0.0001 (−0.34)
Marital status	Yes	Yes	Yes	Yes	Yes	Yes
Type of industry	Yes	Yes	Yes	Yes	Yes	Yes
Rural area FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	2.99 (16.31)***	2.99 (15.39)***	1.99 (2.89)**	3.02 (11.25)***	3.05 (14.21)***	2.78 (3.47)**
No. of obs.	2729	2357	372	2729	2357	372
Adjusted *R*-sq	0.58	0.57	0.77	0.58	0.57	0.77

Note: t-statistics are reported in parentheses. The standard errors corrected for clustering at the district level. Critical values are from a t-distribution with 7 (10 − 3) degrees of freedom. All regressions are estimated using sampling weights. *Statistically significant at the 0.10 level. **Statistically significant at the 0.05 level. ***Statistically significant at the 0.01 level.

Table A3. Effect of returned commuting on unemployment status for rural non-commuters, OLS and IV.

Variable	All workers Probit 1	Low skilled Probit 2	Skilled Probit 3	All workers IV 4	Low skilled IV 5	Skilled IV 6
Log share of returned commuters	0.0256 (4.63)***	0.0301 (5.00)***	0.0111 (1.03)	0.0591 (7.89)***	0.0712 (8.53)***	0.0195 (1.32)
Demand shifts	0.0064 (2.02)*	0.0107 (2.93)**	−0.0003 (−0.05)	0.0071 (2.28)*	0.0112 (3.7)***	0.0003 (−0.01)
Sex	0.121 (20.10)***	0.172 (22.88)***	−0.0037 (−0.37)	0.121 (20.08)***	0.1723 (22.84)***	−0.0037 (−0.37)
Years of education	−0.0017 (−2.68)**	−0.0011 (−1.07)	−0.0096 (−2.58)**	−0.0017 (−2.68)**	−0.001 (−1.00)	−0.01 (−2.58)**
Age	−0.0027 (−9.35)***	−0.0014 (−1.43)	−0.005 (−7.31)***	−0.0027 (−9.22)***	−0.0014 (−4.29)***	−0.005 (−7.29)***
Marital status	Yes	Yes	Yes	Yes	Yes	Yes
Rural area FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	24,932	19,944	4984	24,932	19,944	4984

Note: z-statistics are reported in parentheses. The standard errors corrected for clustering at the district level. Critical values are from a t-distribution with 7 (10 − 3) degrees of freedom. All regressions are estimated using sampling weights. *Statistically significant at the 0.10 level. **Statistically significant at the 0.05 level. ***Statistically significant at the 0.01 level.

Table A4. Effect on unemployment status differentiating previously unemployed from employed rural workers.

Variable	Previously unemployed Probit 1	Previously unemployed IV Probit 2	Previously employed Probit 3	Previously employed IV Probit 4
Log share of returned commuters	0.0963 (3.35)**	0.1603 (4.22)***	0.0118 (2.00)*	0.0416 (5.26)***
Demand shifts	0.0527 (3.66)***	0.053 (3.67)**	0.0042 (1.15)	0.0047 (1.35)
Sex	0.1532 (2.54)*	0.1563 (2.59)*	0.1196 (16.62)***	0.1193 (16.64)***
Years of education	0.0062 (1.41)	0.0065 (1.49)	−0.0015 (−1.58)	−0.0015 (−1.60)
Age	−0.0009 (−0.60)	−0.0007 (−0.49)	−0.0008 (−2.62)**	−0.0008 (−2.57)**
Marital status	Yes	Yes	Yes	Yes
Rural area FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
No. of obs.	2275	2275	13,777	13,777

Note: z-statistics are reported in parentheses. The standard errors corrected for clustering at the district level. Critical values are from a t-distribution with 7 (10 − 3) degrees of freedom. All regressions are estimated using sampling weights. *Statistically significant at the 0.10 level. **Statistically significant at the 0.05 level. ***Statistically significant at the 0.01 level.

Table A5. Effect of returned commuting on unemployment period for the low skilled.

Variable	Unemployment period-past quarter OLS 1	Unemployment period-past quarter IV 2	Unemployment period-past 5 quarters OLS 3	Unemployment period-past 5 quarters IV 4
Log returned commuters	0.169 (3.52)***	0.2132 (3.65)***	0.1665 (2.02)*	0.2851 (3.03)**
Demand shifts	0.0405 (1.48)	0.0402 (1.47)	−0.0192 (−0.34)	−0.0201 (−0.36)
Sex	−0.0157 (−0.2)	−0.0131 (−0.16)	−0.0412 (−0.35)	−0.041 (−0.35)
Years of education	0.031 (0.45)	0.0027 (0.40)	−0.0029 (−0.30)	−0.0037 (−0.37)
Age	0.0064 (2.77)**	0.0065 (2.80)**	0.0049 (1.41)	0.0049 (1.42)
Marital status	Yes	Yes	Yes	Yes
Type of industry	Yes	Yes	Yes	Yes
Type of occupation	Yes	Yes	Yes	Yes
Rural area FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Constant	0.4111 (2.70)**	2.781 (6.83)***	0.5072 (2.24)**	3.069 (4.58)***
No. of obs.	2222	2222	1031	1031
R-squared	0.12	0.12	0.13	0.13

Note: t-statistics are reported in parentheses. The standard errors corrected for clustering at the district level. Critical values are from a t-distribution with 7 (10 − 3) degrees of freedom. All regressions are estimated using sampling weights. *Statistically significant at the 0.10 level. **Statistically significant at the 0.05 level. ***Statistically significant at the 0.01 level.

Table A6. Effect of returned commuting on wages for low-skilled rural non-commuters, OLS and IV-robustness check.

Variable	More than a year OLS 1	More than 2 years OLS 2	More than a year IV 3	More than 2 years IV 4
Log share of returned commuters	−0.065 (−2.47)**	−0.0608 (−2.05)*	−0.0673 (−2.48)**	−0.076 (−2.59)**
Demand shifts	−0.0134 (−1.32)	−0.0001 (−0.19)	−0.0135 (−1.33)	−0.0049 (−0.35)
Sex	0.3551 (6.51)***	0.3182 (5.59)***	0.3551 (6.51)***	0.3161 (5.45)***
Years of education	0.011 (3.66)***	0.0114 (3.38)***	0.0115 (3.67)***	0.0114 (3.36)**
Age	0.0376 (6.76)***	0.0319 (5.24)***	0.0377 (6.77)***	0.0311 (5.07)***
age_2	−0.0004 (−6.08)***	−0.0004 (−4.68)***	−0.0004 (−6.09)***	−0.0003 (−4.47)***
Marital status	Yes	Yes	Yes	Yes
Type of industry	Yes	Yes	Yes	Yes
Rural area FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Constant	2.89 (34.38)***	3.0471 (20.44)***	3.30 (21.99)***	2.97 (17.17)***

(*Continued*)

Continued.

Variable	More than a year OLS 1	More than 2 years OLS 2	More than a year IV 3	More than 2 years IV 4
No. of obs.	3212	2742	3212	2698
Adjusted *R*-sq	0.56	0.57	0.56	0.58

Note: t-statistics are reported in parentheses. The standard errors corrected for clustering at the district level. Critical values are from a t-distribution with 7 (10 − 3) degrees of freedom. All regressions are estimated using sampling weights. *Statistically significant at the 0.10 level. **Statistically significant at the 0.05 level. ***Statistically significant at the 0.01 level.

Table A7. Effect on unemployment status for the past five quarters: OLS and IV robustness check.

Variables	Low skilled OLS 1	Low-skilled previously unemployed OLS 2	Low-skilled previously employed OLS 3	Low skilled IV 4	Low-skilled previously unemployed IV 5	Low-skilled previously employed IV 6
Log share of returned commuters	0.0274 (3.04)**	0.1864 (3.45)**	0.0132 (1.58)	0.0586 (4.99)***	0.2488 (3.71)***	0.0381 (3.52)***
Demand shifts	0.0056 (0.97)	0.0282 (1.15)	0.0056 (0.89)	0.0058 (1.03)	0.0307 (1.24)	0.0059 (0.96)
Sex	0.1473 (14.10)***	0.1436 (1.65)	0.1171 (11.52)***	0.1473 (14.9)***	0.1475 (1.68)	0.1171 (11.54)***
Years of education	−0.0027 (−2.05)*	0.0106 (1.61)	−0.0036 (−2.85)**	−0.0027 (−2.05)*	0.1077 (1.63)	−0.0037 (−2.87)**
Age	−0.018 (−4.25)***	0.0007 (0.28)	−0.0014 (−3.34)**	−0.0018 (−4.15)***	0.0006 (0.26)	−0.0014 (−3.26)**
Marital status	Y	Y	Y	Y	Y	Y
Type of industry	Y	Y	Y	Y	Y	Y
Type of occupation	Y	Y	Y	Y	Y	Y
Rural area FE	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y
No. of obs.	9474	981	8049	9474	981	8049

Note: z-statistics are reported in parentheses. The standard errors corrected for clustering at the district level. Critical values are from a t-distribution with 7 (10 − 3) degrees of freedom. All regressions are estimated using sampling weights. *Statistically significant at the 0.10 level. **Statistically significant at the 0.05 level. ***Statistically significant at the 0.01 level.