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INVESTIGATING THE PALESTINIAN LABOR MARKET 1999-2010

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INVESTIGATING THE PALESTINIAN LABOR MARKET 2000-2010

Wifag Adnan

A DISSERTATION
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Dissertation Abstract

The recent uprisings in the Middle East came as a huge surprise to the world because we know very little about the economic grievances of these individuals. Since the Palestinian labor market is among the most complex in the region, a thorough analysis of its key features will make a great contribution to our understanding of Middle East labor markets. My dissertation aims to investigate the Palestinian labor market. Largely due to data constraints, little is known about key features of that labor market. However, I have obtained access to under-utilized data to address three major issues that profoundly impact the residents in these areas: inter-industry wage dispersion, the migration decisions of Palestinians, and the social welfare consequences of the Gaza Blockade.

In the first chapter, I examine inter-industry wage dispersion in the West Bank and the Gaza Strip and question the roles of the standard competitive wage model as well as the efficiency wage model. I find that both models play a role in explaining inter-industry wage dispersion in the West Bank and Gaza. Specifically, observable human capital characteristics, unobserved labor quality and labor market segmentation along the public and private sector represent the most suitable explanations for inter-industry wage dispersion.

In the second chapter, the current blockade on the Gaza Strip is used as a natural experiment to quantify the social welfare implications of strictly defined labor mobility restrictions. The results suggest that the blockade produced a level of welfare loss that is equivalent a joint decrease in real domestic and foreign wages by approximately 64% and 18% respectively, when labor markets were integrated.

Finally, in the third chapter, I investigate the impact of politically-determined barriers on labor flows in the West Bank. The findings show that residence-based ID cards exert the greatest force in shaping the decision to migrate as well as the decision to return for male residents of the West Bank. Further, border closures and closure obstacles negatively impact out-migration but play a minimal role in the return-migration decision relative to the expected wage gain from migration.

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Examining Industry Wage Differentials in the Palestinian Territories

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Abstract

It has been widely documented that even after conditioning on human capital variables and a variety of proxies for work conditions, there is a high level of inter-industry wage dispersion in the US and several other developed countries. Unfortunately, due to lack of data availability, industry wage differentials in developing countries have been examined in only a few studies and even these have been constrained by limitations in the data either in terms of their accuracy or level of detail. In this paper, I investigate industry wage differentials in the Palestinian territories—the West Bank and the Gaza Strip—using a rich data set that allows both cross-sectional and longitudinal analyses. This dataset allows me to investigate the extent to which predictions of the competitive wage and efficiency wage models explain inter-industry wage dispersion in the West Bank and the Gaza Strip. Understanding the labor markets in the West Bank and Gaza begins to fill the gap in explaining inter-industry wage differentials in developing countries, but also sheds light on labor markets where the majority of people have experienced great distress due to political and economic instability. I find that both models play a role in explaining inter-industry wage dispersion in the West Bank and Gaza. Specifically, observed, unobserved labor quality and labor market segmentation along the public and private sector represent the most suitable explanations for inter-industry wage dispersion in the Palestinian territories.

I. Introduction

It has been widely documented that industry wage differentials are large and persistent in several countries (Krueger and Summers, 1987; Gittleman and Wolff, 1993). Two major theoretical frameworks used to explain inter-industry wage dispersion are the competitive wage model and the efficiency wage model. The competitive wage model offers several explanations regarding the high level of inter-industry wage dispersion. First, the competitive wage model predicts that industry differentials partially reflect differences in human capital (observable and unobservable) across workers so that high-wage industries have more productive workers. Industry differentials may also be explained by differences in work conditions across workers; this explanation is also known as the theory of equalizing differences. A third explanation is that industry differentials reflect transitory shifts in labor demand across industries where the short-run immobility of labor has not fully adjusted. For example, if high-wage industries experienced a positive demand shock which led to an increase in prices (and wages) and the supply of labor has not shifted rapidly enough so that wages are market-clearing, then inter-industry wage dispersion can arise.

The empirical evidence in the US suggests that high industry differentials have persisted for decades even after accounting for human capital variables and work conditions (Slichter, 1950; Dickens and Katz, 1986). This is inconsistent with the predictions of the standard competitive wage model where workers are paid their marginal product; naturally, these high and persistent industry wage differentials have led to a growing literature on the extent to which efficiency wage theories explain inter-industry wage dispersion (reviewed in Katz, 1986). Efficiency wage theories as

formalized by Shapiro and Stiglitz (1984) and Stiglitz (1986) imply that profits are an increasing function of the wage rate and thus some firms find it lucrative to pay wage premiums. A direct implication is that job (or firm) characteristics that do not directly affect the utility of workers have an impact on the industry wage structure. For instance, inter-industry wage dispersion can emerge if industries are heterogeneous with respect to monitoring technology and turnover costs. Specifically, high-wage industries pay a wage greater than the market-clearing wage to reduce the quit rate or to incentivize workers to increase their productivity level without needing to invest in monitoring technology, thereby decreasing turnover and monitoring costs. This is especially important in the context of labor markets where there is a low probability of detection and formidable training costs. Indeed, some studies have found some evidence in favor of efficiency wages to explain differences in wages across industries (Krueger and Summers, 1988; Katz and Summers, 1989);

Beyond the US, researchers have documented large and persistent industry wage differentials in 14 selected OECD countries over time and space and have also found that the industry wage structure is preserved in terms of rank order (Gittleman and Wolff, 1993). Furthermore, the literature implies that the competitive wage model cannot fully account for inter-industry wage dispersion; additionally, while collective bargaining action and efficiency wage theories play at least a minor role in explaining industry differentials, the existence of high industry wage differentials is still not fully resolved (Dickens and Katz, 1986; Krueger and Summers, 1988; Caju et al, 2010).

Unfortunately, industry wage differentials in developing countries have been examined in only a few studies (Arbache, 2001; Jaffry et al, 2006; Erdil and Yetkiner,

2010). The results of these studies suggest that differences in skill levels across industries and labor market segmentation as explained by efficiency wage theories account for a large portion of inter-industry wage dispersion in developing economies. For example, Erdil and Yetkiner (2010) suggest that despite the fact that industry differentials are high for both developed and developing countries and rank order stability for the industry wage structure is preserved, in OECD countries, worker productivity is the primary driver of inter-industry wage dispersion while establishment size is the main engine for developing countries. Examining inter-industry wage dispersion in developing economies is not only important in that it contributes to our global understanding of industry wages differentials, but also because identifying the causes of industry wage differentials may have policy implications towards mitigating wage inequality and unemployment.

Although the above-mentioned studies are pioneers in studying industry differentials in the developing world, they were constrained by data limitations either in terms of their accuracy or level of detail. For instance, I know of no study that has studied industry wage differentials using a longitudinal dataset in a developing economy which would allow the researcher to address whether the differences in individual attributes of workers across industries contributes to rising wage dispersion. Similarly, for the majority of third world countries, wage or employment information is not available for all industries (usually only manufacturing data are available which limits the analysis on industry differentials).

In this paper, I investigate industry wage differentials in the Palestinian territories—the West Bank and the Gaza Strip—using a rich micro-level panel data set covering the years 2000 to 2010 that allows for both cross-sectional and longitudinal

analyses. The data are collected by the Palestinian Labor Force Survey (PLFS) which includes detailed questions on educational attainment, one digit and two digit industry categories, occupational categories, job tenure, union status, full-time status, public/private sector affiliation, work conditions, pension status, and firm size. The questions addressed in this paper are: How high and persistent is inter-industry wage dispersion in the West Bank and Gaza? How do both territories compare to other nations, developed and developing? How far does the standard competitive wage model and efficiency wage theories go in explaining industry differentials? Can these results be reconciled with the limited evidence available on industry differentials in developing economies?

I find that during the period of study (2008q4-2010), inter-industry wage dispersion in the West Bank is relatively high but comparable to that in developed and other developing countries, while industry differentials in Gaza are high and have increased drastically in the past 10-15 years. For both territories, raw industry differentials are reduced when adjusted for human capital variables, and for Gaza proxies for work conditions reduce wage dispersion as well. Unobservable characteristics also explain a portion of inter-industry wage dispersion in the West Bank and Gaza. Therefore while inter-industry wage dispersion is partially attributed to competitive wage explanations in the West Bank and Gaza, there is a substantial portion of inter-industry wage dispersion that cannot be explained by the standard competitive wage model and warrants additional consideration.

The results also suggest that labor market segmentation explains a portion of inter-industry wage dispersion in the Palestinian territories. One indication of labor

market segmentation is that there is a negative correlation between industry differentials in the public and private sector for both territories. In addition, inter-industry wage dispersion in the public sector is much lower than in the private sector. In fact in Gaza, the public sector pays nearly competitive wages with an inter-industry wage dispersion measure of approximately zero. Furthermore, there is at best tenuous evidence in favor of a turnover model in the West Bank's private sector and Gaza's public sector and some evidence against it in the West Bank's public sector and Gaza's private sector.

The next section offers a brief synopsis of the (limited) international evidence on industry wage differentials and situates industry differentials in the West Bank and the Gaza Strip in an international context. Section III presents a brief theoretical framework that explains the implications of efficiency wage models. Section IV provides a description of the Palestinian Labor Force Survey (PLFS) data and reports summary statistics. Sections V and VI document unadjusted inter-industry wage differentials in the Palestinian territories and consider competitive wage explanations. Sections VII and VIII presents inter-industry wage dispersion for various subsamples to address union-related arguments and efficiency wage considerations; and section IX concludes.

II. International Evidence

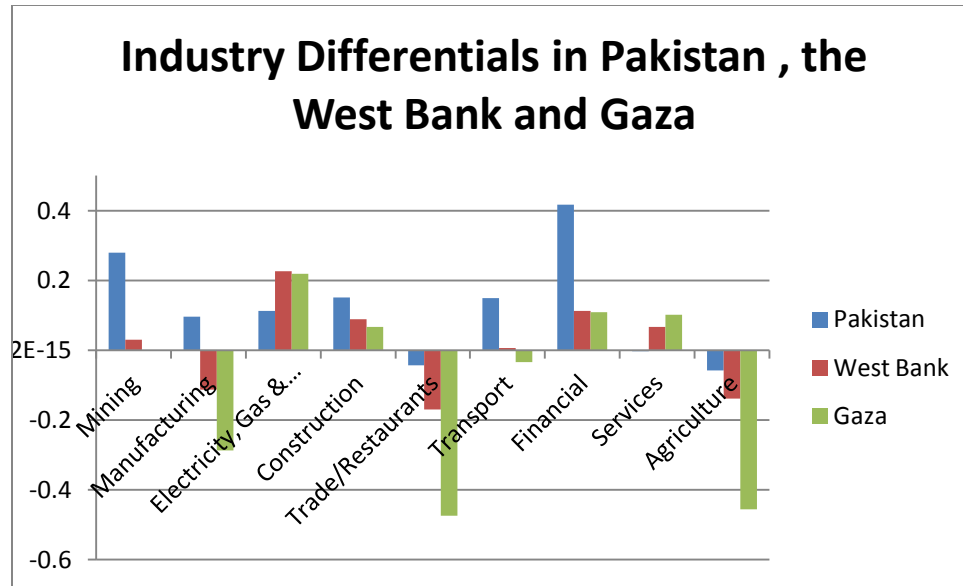
The West Bank and Gaza are located in the Southwest Asia (aka Middle East) where the West Bank borders Jordan and Israel and Gaza borders Israel and Egypt (see Maps 1 and 2). As a useful comparison to developing countries in the region, Pakistan's (one digit) industry differentials (adjusted for education, experience, marital status, occupation and job attributes) are graphed in Figure 1 using data from Jaffry et. al (2006)

along with those of the West Bank and Gaza using data from 2008q4-2010. I estimate industry differentials by: 1) regressing log wages on the 9 one-digit industry dummies and the above-mentioned socio-economic characteristics, 2) calculating the weighted (by employment shares) average of the coefficients of the industry dummies in the regression in step(1) and then 3) subtracting the average in step (2) from each of the industry coefficients obtained in step (1). Industry wage differentials in Gaza are much larger in magnitude in comparison to the West Bank and Pakistan; further, the level of inter-industry wage dispersion, simply measured as the standard deviation of industry differentials, in the West Bank and Pakistan is similar to that of the US (≈ 0.12) as reported in Krueger and Summers (1988) while Gaza's inter-industry wage dispersion is larger¹. The two economies of the West Bank and Gaza have taken divergent paths recently due to the political strife in the region in the past 10-15 years². Given this instability, I focus on the period between the fourth quarter of 2008 and the fourth quarter of 2010 where the labor markets experienced a relatively prolonged period of stability.

Figure 1-Industry Differentials in Pakistan, the West Bank and Gaza

¹ The difference between the measure of inter-industry wage dispersion used here and that in Krueger and Summers (1988) is that the latter measure is calculated by taking into account the size of the standard errors of the industry coefficients (for a more detailed explanation see footnote 7). I also use the measure used in Krueger and Summers (1988) in the remainder of the analysis.

² The intifada (initiated in September 2000) and the Gaza blockade (officialated in June 2007) induced several changes in the Palestinian economies of the West Bank and Gaza. Table II in the appendix highlights the divergence in relevant labor market outcomes between the West Bank and Gaza after the intifada and the Gaza blockade by reporting descriptive statistics during the pre-intifada period (1999), shortly after the onset of the intifada (2002) and the post-Gaza Blockade period (2009) for both territories. While the West Bank and Gaza were always different, the changes between them were exaggerated by the intifada and the blockade. This issue is revisited in Section VI when considering the competitive wage explanation that industry differentials reflect changes in transitory demand shocks across industries.



	Pakistan	West Bank	Gaza
Inter-Industry Wage Dispersion	0.154	0.131	0.273
Correlation with Pakistan's Industry Differentials	1	0.535	0.593

Source: Industry differentials in Pakistan are estimated in Jaffry, Ghulam and Shah (2006) in a pooled estimate of 1990-91 and 2003-04 survey data. For the West Bank and Gaza, industry differentials are computed using Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Wage Dispersion is computed as the standard deviation of industry differentials.

In Table 1, I present raw industry wage differentials for the West Bank and Gaza in 2008q4-2010 as well as the US, Germany and Japan in 1985 (Gittleman and Wolff, 1993).³ Although the differentials presented here for the US are over 25 years old, they are still relevant since industry differentials have been preserved over time (Gittleman and Pierce, 2012). Industry differentials are estimated in the same manner as noted above except they are not adjusted for socio-economic characteristics. Inter-industry wage dispersion, simply measured as the standard deviation of industry wage differentials, is

³Data for the US, Germany and Japan were taken from Gittleman and Wolff (1993); their datasets included a maximum of 20 industries, some of which were missing for Japan and Germany. For the West Bank and Gaza, I matched the two digit industries in the Palestinian Labor Force Survey Data (PLFS) to the 20 industries named above.

much higher in the US, Germany and Gaza than in Japan and the West Bank. Note that unlike the differentials reported in Krueger and Summers (1988), these industry differentials are raw differentials and are not adjusted to account for how large the standard errors on the coefficients of the dummy industry variables are (more on this in footnote 7).

The industry wage structure in the West Bank and Gaza is much more similar to Japan and Germany than the US. Furthermore, the correlation between industry differentials in the West Bank and Japan is almost identical to the correlation of industry wage differentials between Japan and the United States. The (relative) dissimilarity in the industry wage structures between Japan and the US is consistent with Erdil and Yetkiner (2001) who calculate a correlation of 0.48 between the industry differentials in Japan and the United States in 1992 while the corresponding statistic for selected newly industrializing countries (Argentina, Brazil, Chile, Korea, Mexico, Philippines, Singapore and Turkey) and the United States ranges between 0.75 and 0.82. They find that the industry wage structure of developing countries slowly converges to that of the US over time. Therefore, while the correlation between industry differentials in the West Bank and the US is only 0.50, this may be an underestimate since there is a 25 year gap between US data reported in Table 1 (1985) and West Bank data (2008Q4-2010). Note the correlation between Gaza's industry differentials and those of all three advanced economies is much smaller in magnitude relative to the West Bank.

III. Explanations for Inter-Industry Wage Differentials

Competitive Wage Explanations

The competitive wage model postulates that workers are paid according to their marginal products as well as job characteristics that directly affect their level of utility. Several implications from the competitive wage model have been used to explain inter-industry wage dispersion. One competitive wage explanation is that inter-industry wage dispersion reflects differences in human capital and demographic variables across industries. In this case, high-wage industries employ more productive and educated workers. Another explanation is that industry wage differentials may be attributed to transitory demand shocks across sectors and the relatively slow immobility of short-run labor. For example, if some industries experience positive demand shocks, then unless the labor supply in those industries sufficiently shifts rightward, these industries will reward their workers a wage premium which leads to (short run) industry differentials.

A third competitive wage explanation is that industry wage differentials are partially due to compensating wage differentials (Rosen, 1986). According to this explanation, workers with undesirable job characteristics such as hazardous activities, taxing labor, repetitive tasks, and long hours are paid compensating wage differentials to reward them for unfavorable working conditions. If unpleasant working conditions are correlated with industry differentials, then industry wage differentials are picking up compensating wage differentials. Thus controlling for job characteristics that directly affect a worker's utility may explain wage dispersion.

In summary, the competitive wage model implies that once labor has adjusted to demand shocks, equally productive workers are paid the same wage once human capital characteristics and work conditions are controlled for. Data from most modern labor markets however suggests at best a limited role for this model. Seemingly equally-productive workers nonetheless are paid different wages, which has motivated several researchers to develop alternative models. One such model focuses on the role of efficiency wages.

Efficiency Wage Theories

Efficiency wages theories are based on the notion that job or firm characteristics that do not directly affect a worker's utility impact wages. For example, Shapiro and Stiglitz (1984) develop a model where employers with high monitoring costs pay higher wages to induce workers not to shirk. The intuition is that in a competitive wage environment, a worker who shirks will be fired (if detected) but the utility associated with his job loss is not low since in the labor market context of sufficiently low and homogenous monitoring and turnover costs, he will be hired immediately by another firm.⁴

In a simple version of the model, workers are identical and risk-neutral. Let V_E^S be the expected lifetime utility of an employed shirker, V_E^N be the expected lifetime of an employed non-shirker, and V_u be the expected lifetime utility of an unemployed

⁴In addition, since in the model some firms are paying wages above the market clearing wage, employment is not at full employment, contrary to the competitive wage model. If workers know there is a large involuntary unemployment pool, the incentive to exert effort will increase; firms therefore require the involuntary unemployment rate to be sufficiently high in order to serve as a disciplinary device.

individual. The instantaneous utility associated with employment while shirking and not shirking respectively is

$$rV_E^S = w + (b + q)(V_u - V_E^S) \quad (1)$$

$$rV_E^N = w - e + (b)(V_u - V_E^N) \quad (2)$$

where r is the interest rate, w is the wage, b is the exogenous quit rate, q is the probability of being detected shirking and e is the effort required for the job. Workers will not shirk if $V_E^N \geq V_E^S$, which can be rewritten as follows:

$$w \geq rV_u + \frac{(r+b+q)e}{q}. \quad (3)$$

The utility associated with being unemployed is

$$rV_u = \bar{w} + a(V_E - V_u) \quad (4)$$

where $\bar{w}$ represents unemployment benefits and a is the job acquisition rate. The utility associated with being an employed shirker or non-shirker is equal $V_E^S = V_E^N = V_E$ in equilibrium. Equations (2) and (4) are solved simultaneously so that

$$rV_E = \frac{(w-e)(a+r)+\bar{w}b}{a+b+r} \quad (5)$$

$$rV_u = \frac{(w-e)a+\bar{w}(b+r)}{a+b+r} \quad (6)$$

The non-shirking condition above (equation (3)) is now modified to include equation (6) such that:

$$w \geq \bar{w} + e + \frac{(r+b+a)e}{q} \quad (7)$$

Equation (7) sums up the factors that produce a wage distribution for identical workers. Note that the wage is higher when: (1) the probability of detection (q) is low; (2) the greater the amount of effort required (e); (3) the higher the quit rate (b); (4) the higher the interest rate (r); (5) the higher the unemployment benefits ($\bar{w}$); and (6) the higher the job acquisition rate (a).

The efficiency wage model implies that firms pay wages greater than the market-clearing wage to induce greater productivity and discourage workers from shirking or exiting the firm by increasing the cost of job loss. This paper primarily focuses on how the shirking and turnover models can account for industry differentials in the Palestinian territories. That is, whether firms in the West Bank and Gaza pay wage premiums to address: 1) monitoring costs due to a low probability of detection (q), and 2) turnover costs due to a high quit rate (b) or a high job acquisition rate (a).

IV. Data and Descriptive Analysis

The datasets in this paper use micro-level household panel data from the quarterly *Palestinian Labor Force Survey* (PLFS) administered by the Palestinian Central Bureau of Statistics during the period 2008q4-2010. The survey has been administered by the Palestinian Central Bureau of Statistics since 1995, following the establishment of the Palestinian Authority (PA). During each quarter, over 7500 households are interviewed. Although the target population includes all people over the age of 10 years, labor market characteristics are only collected for those who meet the minimum work requirement age of 15 years old. The questionnaire is designed such that households are interviewed for two consecutive quarters and then dropped from the sample for the next two quarters and are then revisited for the following two quarters, allowing one to construct short panels.

In this paper, I restrict the sample to male individuals aged 15-64 years that were surveyed between 2008q4 and 2010.⁵ The response rate for this period was approximately 90%.

In a competitive labor market, wages are determined largely by individual attributes such as educational attainment, labor market experience, job-specific capital and work conditions. In contrast, efficiency wage models imply that a wage distribution may exist for identical workers if firms have heterogeneous monitoring costs. Some of the relevant variables I use to investigate the role of efficiency wage theories in the labor markets of the West Bank and Gaza include the percentage of white collar workers (defined as managers and professionals), percentage of large firms (defined as 16 or more people in the work enterprise), the percentage of workers with deferred payment schedules (pensions), job tenure, and the percentage of people working in the primary (defined as public) sector. To consider the role of collective bargaining and other union-related arguments, I also include the percentage of workers that are unionized.

Table 2 displays the relevant summary statistics for male wage earners in the West Bank and the Gaza Strip by one digit industries. In the West bank, approximately half of male-wage earners are employed in the services industry while the corresponding fraction in the Gaza Strip is about three-quarters. Since the majority of the services industry is included in the public sector, the summary statistics above are consistent with the recent literature which has argued that the Palestinian authority expands the public sector to offset losses in the private sector following periods of conflict (Daoud, 2001;

⁵ I exclude women because they have low labor force participation rates on the order of 16% in the period of study 2008Q4-2010. Furthermore, less than half of the women who were labor force participants were in the wage sector and reported wages.

Sauer and Miaari, 2002; Bulmer, 2003). Private sector contraction over the past 10-15 years is especially prevalent in the construction and manufacturing industries in Gaza⁶.

In both territories educational attainment is the highest in the services industry and the lowest in agriculture. Although wage earners in services have the highest wages in both territories, in the West Bank, wages in services resemble those in the transportation and construction industries. However, in Gaza, there seems to be a much larger disparity between wages in the services industry and other industries. In both regions, there is a large difference in the accumulation of job-specific capital as measured by job tenure between those in the services industry and the average in the remaining industries—approximately 2 years in the West Bank and 3 years in the Gaza Strip.

Almost all wage earners in the services industry in both territories are employed in large work establishments (defined as at least 16 employees). As for the manufacturing industry, approximately 73% and 62% of firms are large in the West Bank and Gaza. In the West Bank, there is a high percentage of small firms in construction and commerce whereas for Gaza, small firms are predominantly in the commerce and transportation industries. White collar workers, public sector workers, and workers who receive pensions are primarily concentrated in services for both territories. Although the transportation industry has a relatively high percentage of white collar workers and workers who receive pensions, the transportation industry as displayed in Table 2 represents approximately 5% of all wage earners in both territories. Patterns of unionization are remarkably different across industries as well as territories. In the West Bank, unionization is the most prevalent in the services (30%) and transportation (22%)

⁶ See Table II in the appendix for more details.

industries while the remaining industries have lower rates of unionization (12%-16%). In the Gaza Strip, all industries have rates of unionization exceeding 40% except for services, which has a unionization rate of only 12%.

V. Observed and Unobserved Differences in Labor

Panel A of Table 3 reports raw industry wage differentials in which the omitted industry is Transportation, Storage and Communications. For the average worker in the West Bank and Gaza, agricultural workers earn approximately 53% less than the average employee in Transportation, Storage and Communications (unreported). Columns (1) and (2) display wage differentials for each territory separately. The magnitudes of the coefficients suggest different levels of inter-industry wage dispersion for the West Bank and Gaza. For example, in the West Bank, workers in the agricultural sector earn about 41% less than the average employee in the Transportation, Storage and Communications industry while the corresponding statistic in Gaza is about 58%. The differences in the magnitudes of the coefficients for manufacturing, commerce, construction and transportation vary widely as well, which implies that wage equations for the West Bank and Gaza should be estimated separately. To formally test this, I ran a chow test and the null hypothesis that there is no difference between industry wage differentials in the West Bank and Gaza is rejected at the 1% level.

Therefore, for the remainder of this paper, I estimate wage equations separately for wage earners in the West Bank and Gaza. Panel B reports the weighted adjusted standard deviation of the industry differentials which is the estimate of inter-industry wage dispersion. As in Krueger and Summers (1988), I calculate dispersion by first

computing the standard deviation of industry wage differentials deviated from the weighted (by employment shares) mean industry wage differential and then accounting for the magnitude of the standard errors⁷. As Panel B indicates, wage dispersion in the West Bank is less than half of that in the Gaza Strip. One concern may be that a large portion of Palestinian wage earners work in the services industry, which may lead to imprecisely estimated industry differentials through a lack of variation across industries thereby producing large standard errors. This is potentially problematic because although the estimated level of wage dispersion described above is a lower bound for the level of wage dispersion across industries due to the omission of the covariance terms (see footnote 7), if the standard errors of industry differentials are sufficiently high, then the bias is much larger. To assess the likely impact of the diminished variation across industries on inter-industry wage dispersion, I also report the adjusted standard deviation for two-digit industries in Panel B of Table 3 which allow for more variation across industries (full results in Appendix; Table I). Note that the adjusted standard deviations for one digit and two digit industries are very similar suggesting that the seeming lack of variation across industries is not generating large bias; therefore, industry differentials estimated from one-digit industries can be used to measure wage dispersion.

In Table 4, columns (1) and (4) reproduce raw industry wage differentials for West Bank and Gaza male wage earners from columns (1) and (2) in Table 3. Columns

⁷The adjusted standard deviation is computed as the square root of the variance of industry wage differentials minus the variance of the standard errors of the industry parameters:

$$SD(\beta) = \sqrt{\text{var}(\hat{\beta}) - \sum_{i=1}^K \frac{\hat{\sigma}_i^2}{K}}$$

Where β represents the vector of industry differentials and $\hat{\sigma}_i^2$ is the variance of the standard errors for each industry i . The extent to how much the adjusted standard deviation is underestimated depends on how large the standard errors of the parameters are. Note that the standard deviation is an underestimate since covariance terms are not accounted for.

(2) and (5) portray wage differentials after controlling for four schooling groups (high school dropout, high school graduate, associate degree, and bachelor degree or higher), potential labor market experience, potential experience squared, living in an urban, rural or refugee camp, marital status, 7 occupation dummies, working in the public sector, year and quarter dummies.⁸ For the West Bank and Gaza, the magnitudes of the coefficients are greatly reduced by the inclusion of human capital and demographic variables. More importantly, wage dispersion declines from 0.18 to 0.11 in the West Bank and from 0.42 to 0.26 in Gaza. In columns (3) and (6), eight tenure variables are added to the regression since wage dispersion may be attributed to differences in job-specific human capital. However, wage dispersion in the West Bank is largely unaffected by the addition of these covariates. In Gaza, wage dispersion increases by a few percentage points which suggests that rather than diminish (and thereby) explain inter-industry wage dispersion, job-specific capital increases it.

Although the primary focus of this paper is to explain industry wage differentials by noting the changes in the measure of inter-industry wage dispersion across different models and explanations, a secondary focus is to note the extent in which the industry wage structure is preserved⁹. Since the literature (see above) widely documents the rank order stability of industry differentials across time and space, examining which models and/or specifications lead to changes in the industry wage structure may increase our understanding of industry wage differentials. To assess whether the industry wage structure is similar across specifications, I compute the correlation between unadjusted

⁸ All specifications in this paper are not sensitive to whether education is measured linearly (years of schooling) or non-linearly (four schooling groups).

⁹ Note that changes in the industry wage structure can occur regardless of the changes in the measure of inter-industry wage dispersion.

and adjusted industry wage differentials which is displayed in Table 4 directly below the estimate of the level of wage dispersion. All correlations are positive and have large magnitudes which strongly suggest that while worker characteristics reduce dispersion, they do not substantially affect the inter-industry wage structure in either territory; this finding is consistent with the findings in Krueger and Summers (1987) for the US labor market in the 1980's.

One way to build on the previous analysis is to account for unobserved labor quality by exploiting the longitudinal nature of the survey. In columns (1) and (4) of Table 5, OLS industry wage differentials are reported for the sample of individuals for whom earnings and employment data were available in the subsequent quarter; in columns (2) and (5), individual fixed effects are included. The specification is identified off of workers who switched (one-digit) industries between quarters. Note that inter-industry wage dispersion in the West Bank fell from 0.13 to 0.02 when individual fixed effects were included while the corresponding statistic in Gaza fell from 0.29 to 0.14. Although coefficients in columns (2) and (5) are attenuated (especially in the West Bank) relative to those in columns (1) and (4), the null hypothesis of the F-test that industry wage differentials jointly equal 0 is rejected at the 1% level for both the West Bank and Gaza.

While unobserved labor quality may partially explain the results in columns (2) and (5), attenuated coefficients may also be a result of measurement error. For example, Mellow and Sider (1983) posit that a large portion of industry switches in the US *Current Population Survey* (CPS) result from classification errors. Unfortunately, due to data limitations, I cannot access employer information to match industries based on employer-

employee classification in the Palestinian territories. However, to reduce the measurement error in columns (2) and (5) I restrict the sample to individuals who are two-digit industry switchers¹⁰ as displayed in the fixed effects specifications in columns (3) and (6). Since the sample sizes are smaller, the standard errors are larger than before but the coefficients are less attenuated than those in columns (2) and (5). Additionally, the F-test that industry wage differentials jointly equal 0 is rejected at the 1% level for the West Bank and Gaza. Although not a direct test, the strong and positive correlation between the levels and fixed effects specifications suggest that unobserved labor quality does not substantially alter the inter-industry wage structure for Gaza but the evidence is more tenuous for the West Bank.

While observed labor quality explains a large portion of inter-industry wage dispersion in the West Bank and Gaza, it does not explain all of it. Additionally, unobserved labor quality explains an even greater portion of inter-industry wage dispersion as well as changes in the industry wage structure especially in the West Bank. However, due to the likelihood of measurement error in industry classification, these results should be viewed with caution.

Other Competitive Wage Explanations

One concern with the evidence presented thus far is that inter-industry wage dispersion may be a reflection of a combination of transitory labor demand shocks across

¹⁰ Estimates of industry differentials in columns (2) and (5) are identified off of one-digit industry switchers. However, in order to be a one-digit industry switcher you must also be a two-digit industry switcher. Unfortunately, due to classification errors, that was not always the case in the dataset. Therefore, I decided to restrict the sample to two-digit industry switchers since it is my suspicion that two-digit industry switchers are more likely to accurately report their one-digit industry affiliation than two-digit industry non-switchers who are also one-digit industry switchers.

industries and a short-run immobility of labor. This is especially relevant in the context of the Palestinian economy, which one can argue has not fully recovered from political disturbances and political barriers that restrict the mobility of labor (Adnan, 2012c)¹¹. To reject the notion of demand shocks and slow labor market adjustment explaining the inter-industry wage structure, one can examine industry differentials during the pre-intifada period 1999-2000Q3.¹² During this prior period, the Palestinian economy was relatively stable and both territories had to varying degrees, labor and product market integration with Israel. Columns (1) and (3) in Table 6 present the results from columns (3) and (6) in Table 4 respectively while columns (2) and (4) present analogous specifications which cover the period 1999-2000Q3.

The results show that industry differentials are slightly larger in magnitude for the West Bank during the pre-intifada period and much smaller in magnitude for Gaza. In addition, wage dispersion is about two percentage points higher in the West Bank during the pre-intifada period and about half its current level in Gaza. The large increase in inter-industry wage dispersion in Gaza is consistent with Gittleman and Wolff (1993), who find that industry wage differentials are strongly and positively correlated with industry's productive growth, GDP growth, capital intensity, and degree of export orientation. All of the above-mentioned factors have been profoundly impacted by recent events especially,

¹¹ After the onset of the intifada (September, 2000), Palestinian residents in the West Bank and Gaza were subjected to a variety of labor mobility restrictions ranging from Israeli border closures where Israel and Israeli settlements were inaccessible to physical closure obstacles (e.g. checkpoints, roadblocks, earth mounds, etc.) sporadically placed to limit and monitor the movement of Palestinians. Furthermore, Palestinian residents in the West Bank and Gaza inherit ID cards issued to them at the age of 15 years by the Israeli Authorities that determine their degree of mobility (Tawil-Souri, 2011, 2012). These cards are especially relevant during times of conflict when border closures and closure obstacles play a large role in labor mobility.

¹² Since the intifada occurred in the fourth quarter of 2000, only the first three quarters of 2000 are included in the sample.

the blockade rendering Gaza's economy essentially closed (Adnan, 2012b). However, despite these changes in overall wage dispersion, the inter-industry wage structure has been preserved for both territories as indicated by the relatively high correlation between the industry differentials (≈ 0.91).¹³ These results are consistent with studies in the US where the industry wage structure has been persistent and correlated for decades (Cullen, 1956 ; Montgomery and Stockton, 1985).

In Table 7, columns (1) and (3) report coefficients from OLS specifications that include all controls except for work conditions. They are analogous to columns (3) and (6) from Table 5 but the sample size is restricted since questions regarding work conditions are included only in the 2009 and 2010 surveys. Note that the exclusion of the last quarter of 2008 barely alters the regression results so that columns (1) and (3) closely resemble columns (3) and (6) from Table 5. In columns (2) and (4), I use seven variables that may plausibly proxy for work conditions: 1) whether an employee wants to change his job because of "bad" working conditions; 2) whether an employee wants to change his job because his work is "too far" from his residence; 3) whether an employee wants to change his job because he thinks his occupation does not suit him¹⁴; 4) whether an employee wants to change his job because he is not satisfied with the duration of the

¹³ The high correlation between industry differentials during the pre-intifada period and the post-blockade period in Gaza suggests that despite the large increase in inter-industry wage dispersion over the past 10-15 years, Gaza's economy reached a new steady state where industry differentials are much larger but have similar rank order stability.

¹⁴ Although one can argue that workers who believe their jobs are not good matches may earn less money because their skills are not suitable for their jobs, I included this measure to address the number of imperfect matches that result from relatively skilled individuals settling for jobs that require a lower set of skills due to the increases in the unemployment rates in the West Bank and Gaza in the past 10-15 years (see Table II in the appendix). Nevertheless, when this control is removed from the regression, the results barely change for both territories.

contract¹⁵; 5) three overtime measures measured as whether an employee works over 40 hours a week; 6) whether an employee works over 60 hours a week; 7) whether an employee works over 80 hours a week.

For wage earners in the West Bank, column (2) shows that industry differentials are almost identical to the specification without controls for work conditions. In addition, the wage dispersion measure is almost the same and the correlation between the two specifications is 0.99 suggesting the industry wage structure is preserved. In contrast, the theory of equalizing differences appears to explain some of the wage differences in Gaza. The coefficients are smaller for all industries except services, which should have the most desirable job characteristics. In addition wage dispersion decreases by four percentage points. That said, the industry wage structure is almost unaltered since the correlation between industry differentials before and after work conditions are included is approximately 0.99. These results are consistent with studies in the US that suggest that compensating wage differentials play a minimal role in explaining wage dispersion (Brown, 1980; Smith, 1979; Rosen, 1985; Krueger and Summers, 1988).

Thus far, human capital controls and work conditions partially explain wage dispersion but inter-industry wage dispersion persists at a minimum of 0.11 for West Bank male wage earners and 0.25 for Gaza male wage earners. Further, unobserved labor quality partly explains the remaining inter-industry wage dispersion in the West Bank and approximately half for Gaza. However, given the likelihood of measurement error in industry classification it is most likely that substantial inter-industry wage dispersion

¹⁵ This answer choice refers to workers who were offered part-time or seasonal work positions; the survey does not distinguish unsatisfied part-time workers from unsatisfied seasonal workers.

remain. As such, in the next sections, I consider the role of unions and efficiency wage theories in explaining their existence.

VI. Union-related Arguments

Inter-industry wage differentials may also be attributed to differences in the percentage of unionized workers across industries. If the level of wages across industries is positively correlated with the level of union density across industries, then the magnitude of wage dispersion would be expected to decrease after controlling for union status. However, as displayed on the first two rows of Table 8, there is almost no change in the level of inter-industry wage dispersion before and after controlling for union status and industry differentials for the two specifications are highly correlated. These results are consistent with the findings in Katz and Summers (1989) who examine the US labor market in the 1980's.

There are two other union-related arguments that have been proposed in the literature to explain changes in industry differentials. The first argument asserts that if the relative bargaining power of unions depends on industry characteristics, this may result in changes in the inter-industry wage structure as well as greater wage dispersion among unionized workers. This is because unions can exploit their bargaining power to raise wages without undergoing large increases in unemployment, which can lead to relatively large differences in the levels of wages across industries (Dickens and Katz, 1986; Katz and Summers, 1989). Therefore, to the extent that unions in the territories have differential bargaining power across industries, unionized workers will have a high level of wage dispersion.

The second union-related argument proposed in the literature is the union threat model, where employers pay workers a wage premium in order to offset the cost of union avoidance (Dickens, 1986). Ruback and Zimmerman (1984) conclude that unionization can lead to lower stock prices and Freeman (1983) shows that unionized firms have lower profits, suggesting that non-unionized firms have strong incentives to avoid unionization. One strategy firms use to avoid unionization is to offer workers a wage premium that is at least equivalent to the union wage premium net the unit cost of unionization (for workers) and at most slightly less than the union wage premium (Foulkes, 1980; Katz, 1986; Dickens, 1986). If the union-threat model characterizes the labor market, I expect non-unionized workers to experience a higher level of inter-industry wage dispersion than union workers if other factors play a relatively smaller role.

To address the relative importance of these two explanations --whether unions have uneven bargaining power across industries or whether some firms pay relatively high wages to avoid unionization--industry differentials are computed for unionized and non-unionized workers separately for both territories. As Table 8 shows, there is greater wage dispersion among union workers than non-union workers in the West Bank, while the reverse is true in Gaza. This suggests that a model where unions have differential bargaining power across industries likely dominates the prominence of the union threat model in the West Bank. As for Gaza, the much higher level of wage dispersion among nonunionized workers is strongly consistent with a union threat model.

Further, within non-union workers, I expect blue collar workers to experience higher levels of inter-industry wage dispersion than white collar workers since blue collar workers pose a greater union threat (Katz, 1986). To further investigate the validity of the

union-threat model, industry differentials are calculated for blue collar and white collar workers that are not unionized. Indeed, blue collar workers experience a higher level of wage dispersion than white collar workers which is at least tenuous evidence in favor of a union threat model in both territories.

More generally, note that in both territories, the industry wage structure is preserved as indicated by the correlation between industry differentials of unionized and non-unionized workers (see columns (3) and (6)). Further, while the industry wage structure of non-unionized blue and white collar workers is preserved in Gaza, the correlation between the industry differentials for the two groups in the West Bank is negative.

VII. Efficiency Wage Considerations

a.) Occupational Status

According to the efficiency wage literature, firms can save on monitoring costs by paying blue collar workers wage premiums since their effort is less observable than white collar workers (Shapiro and Stiglitz, 1984; Katz, 1986). Indeed in Gaza, wage dispersion among blue collar workers is almost 11 percentage points higher than that for white collar workers. In contrast, white collar workers in the West Bank experience greater wage dispersion. If white collar workers in the West Bank experience greater differences in their collective action agreements across industries than is the case for blue collar workers, this phenomenon may dominate the differences in monitoring costs between the two groups which may explain the higher level of wage dispersion among white collar workers.

The arguments proposed to explain differences in inter-industry wage dispersion between blue collar and white collar workers such as the differences in monitoring costs across industries or differences in uneven bargaining power across industries cannot account for the fact that industry differentials between white collar and blue collar workers are strongly and positively correlated. That is, if blue collar workers are difficult to monitor in a given industry and are therefore paid a wage premium to discourage them from shirking, it is not clear why white collar workers in the same industry are also paid a wage premium. Similar patterns in the inter-industry wage structure between white collar and blue collar workers have been partially accredited to sociological models, which posit that firms have an incentive to maintain an internal wage structure.¹⁶

b.) Firm Size

If workers are not sufficiently monitored, they are more likely to shirk, which in turn incurs high costs for a given firm. However, monitoring costs can be expensive and so in order to substitute for expensive monitoring technologies firms may pay workers a wage premium to discourage shirking. Challenges to monitoring a large workforce has been advanced as one hypothesis to explain the wage premium paid to workers in large firms; it is paid as an incentive to not shirk (Oi, 1983)¹⁷. I find that working in a large establishment is associated with a wage premium in the West Bank and Gaza (unreported) but industry differentials are almost identical before and after controlling for establishment size; these results are consistent with Katz (1986) and Krueger and

¹⁶For example, firms may pay their blue collar workers a premium to avert unionization but will pay white collar workers a premium as well to raise group effort (Akerlof, 1982, 1984).

¹⁷ Another explanation for why large firms are associated with a strong and positive wage premium is that they are associated with more product market power, usually proxied by firm profitability measures (Hudson and England, 1985; Dickens and Katz, 1986).

Summers (1988). The fact that there was no change in the level of inter-industry wage dispersion is not surprising if industry affiliation and firm size are uncorrelated. However, one expects wage dispersion to increase with firm size since relatively large firms experience greater variation in monitoring costs than relatively small firms. In the West Bank, wage dispersion in large firms is approximately 30% greater than dispersion in small firms while in Gaza, dispersion in large firms more than doubles dispersion in small firms. Despite the large changes in wage dispersion, the industry wage structure between large and small work establishments is preserved.

c.) Deferred Payment Schedules

An alternative to paying workers a wage premium to induce effort and decrease monitoring costs is to pay workers deferred payments. Employees are paid wages below market-clearing levels in the beginning of their careers and towards the end of their career are paid wages above the market-clearing level so that the lifetime discounted value of their wages within the firm is the discounted competitive wage. In this model, workers are discouraged from shirking in order to receive the larger (discounted value) payment of wages late in their career. A built-in assumption of this model is that firms will not cheat by terminating workers immediately before their deferred compensation is due to dodge payment since establishing an honest reputation is vital. Akerlof and Katz (1986) suggest that deferred payment plans discourage workers from shirking late in their careers but not during the early years of their career. Therefore, I expect firms to pay workers who receive pensions a wage premium early in their career to reduce monitoring costs while paying those who do not receive pensions a wage premium throughout their

entire career. This implies that workers who receive pensions should have a lower level of wage dispersion than those who do not receive pensions.

Indeed in Gaza, the wage dispersion among workers who are offered a pension plan is 0.08 while the analogous statistic for those who are not offered a pension plan is 0.24. The opposite however, is true for the West Bank, where workers who are offered a pension plan have greater measured wage dispersion (0.16) than those who are not offered pension plans (0.08). It is not clear why the results in Gaza are consistent with a shirking model where firms use deferred payment plans as a partial disciplinary device to incentivize workers not to shirk, while such a model does not appear to explain the dispersion of wages in the West Bank. Note that in both territories the industry wage structure is preserved.

d.) Public/Private Sector

A key feature of the Palestinian labor market is labor market segmentation between the public and private sector in the decade after the onset of the intifada in September 2000. The public sector expanded after the intifada to offset losses in the private sector. This was especially the case for Gaza where the domestic private sector suffered large losses and, in addition, residents were prevented from working in Israel after the blockade in June 2007. Miaari (2006) finds that during the pre-intifada period (1998-99) there was a decline in the public wage premium for Gaza workers and a public wage penalty for West Bank workers while after the intifada (2000-2006), public sector wage premiums grew substantially for workers in the West Bank and Gaza. Using an Oaxaca-blinder decomposition and attempting to control for selection, Miaari (2006)

finds that the increase in the public-private wage gap was primarily due to a greater return to skill in the public sector rather than a change in the skill composition of public sector workers. He suggests that a potential concern of this labor market segmentation is the emergence of inefficient labor market behavior where an increasing number of unemployed job seekers queue for high wage, stable public sector jobs with pensions rather than entering an uncertain private sector that is vulnerable to exogenous shocks; this behavior leads to long-term unemployment and is detrimental to the private sector as well as overall growth in the territories.

One indication that labor markets are segmented along the public and private sectors is the negative correlation between the industry differentials of each sector in both territories. This segmentation between the public and private sector resembles dual labor markets where the labor market can be divided into a primary sector with high wages, promotion ladders, and loose monitoring and a secondary sector with low wages, lower upward mobility and stricter supervision (Doeringer and Piore, 1971). If the public (private) sector is analogous to the primary (secondary) sector described above and if industries are heterogeneous with respect to monitoring costs, then one expects public sector workers to experience a higher level of inter-industry wage dispersion than private sector workers¹⁸. However, this is not the case. In fact, in Gaza, the public sector has no inter-industry wage dispersion; in addition, the null hypothesis that industry differentials are equal to 0 cannot be rejected using both one-digit and two-digit industry affiliations¹⁹.

¹⁸ The reason for this is because according to the labor market segmentation described in Doeringer and Piore (1971), private sector workers are strictly supervised while public sector workers are loosely monitored and therefore heterogeneity in monitoring costs across industries will likely lead to higher wage dispersion for public sector workers. This is very similar to the analysis on firm size (see Section VII b).

¹⁹ The lack of wage dispersion in the public sector may arise if there is little to no heterogeneity in monitoring costs across industries in the public sector so that workers are loosely monitored and all

In the West Bank, inter-industry wage dispersion among public and private sector firms is about equal although the level of wage dispersion is slightly lower in the public sector. Further, within the public sector, the F test that industry wage differentials are jointly equal to 0 is rejected at only a marginally significant level.

Overall, I find that inter-industry wage dispersion increases with establishment size, which is consistent with a shirking model. Moreover, the public sector has a lower level of inter-industry wage dispersion than the private sector and in Gaza, there is no sign of inter-industry wage dispersion in the public sector. Although labor market segmentation along public and private sectors resembles dual labor markets, without additional assumptions the results are inconsistent with the shirking model.

e.) Turnover Costs and Job Tenure

In studying the impact of job tenure on earnings, Medoff and Abraham (1980) find that increases in earnings due to job-specific capital exceed increases in productivity, which implies that firms are pressured to share their rents with workers who have longer job tenure. However, others have argued that workers with more job-specific capital earn higher wages because they are in good matches and are less likely to quit (Abraham and Farber, 1986). To the extent that industries are heterogeneous in paying workers with long job tenures high wage premiums to reduce turnover costs, wage dispersion should be larger for workers with more job-specific capital than new-entrants. In the West Bank, workers with more than 2 years of job specific capital experience 30% more wage dispersion than new entrants. In Gaza, however, the difference in wage dispersion

industries pay a wage premium relative to the private sector but within the public sector, there is almost no inter-industry wage dispersion.

between the two groups is only 5%. Furthermore, the industry wage structure for the two groups is preserved in both territories.

One way to test a direct implication of an efficiency wage model is to investigate the relationship between industry differentials and job tenure; a positive correlation would be consistent with firms paying premiums to reduce turnover costs. In the appendix, Panel A of Table III reports industry differentials for a sample of full-time West Bank and Gaza males during 2009-2010 while Panel B reports the correlation between industry differentials and job tenure separately for each territory. In the West Bank, the correlation is positive which is consistent with the turnover model while in Gaza, the correlation is negative. Furthermore, a breakdown of public and private sector employees suggests that the turnover model plays a limited role in the West Bank's private sector and Gaza's public sector and little to no impact in the West Bank's public sector and Gaza's private sector²⁰.

Conclusion

This paper examines inter-industry wage dispersion in the West Bank and Gaza by investigating the role of competitive wage explanations, unionization and efficiency wage theories. I find that while the level of inter-industry wage dispersion in the West Bank resembles that of developed economies and several developing economies, the level of inter-industry wage dispersion in Gaza is much higher. The results indicate that during the period 2008Q4-2010, differences in observable worker and job characteristics reduce

²⁰ These correlations are computed with regressions that do not control for pension status. If the regressions (where industry differentials are calculated) include a control for pension status, all reported correlations in Table III (in the appendix) increase in magnitude (unreported); nonetheless, none of the correlations are statistically significant except in Gaza's private sector where the correlation between industry differentials and industry returns to tenure is -0.89 and statistically significant at the .05 level.

a portion of the level of wage dispersion in the West Bank and Gaza. Using the pre-intifada period (1999-2000Q3) to compare its level of wage dispersion with the post-blockade (2008Q4-2010) period, I find that transitory labor demand shocks do not explain inter-industry wage dispersion in the West Bank. As for Gaza, I find that although wage dispersion increased dramatically over the 10 year period, industry differentials in the two periods were highly correlated, which suggests that short-run demand shocks do not explain inter-industry wage dispersion. Unobservable labor characteristics also play a role in explaining inter-industry wage dispersion. However, future studies should examine the extent to which these results are driven by industry classification errors.

Computations of wage dispersion by subsamples have shed some light on the role of unions and efficiency wage models in the Palestinian labor market. In the West Bank, higher wage dispersion among union workers than non-union workers suggests that a model where unions have uneven bargaining power across industries is more consistent with the labor market than the union threat model, where industries have heterogeneous costs to union avoidance. As for Gaza, the much higher level of wage dispersion among nonunionized workers and blue collar workers is strongly consistent with a union threat model.

Overall, the findings in this paper are consistent with (limited) international evidence that inter-industry wage dispersion increases with establishment size, which is consistent with a shirking model. However, the public sector has a lower level of inter-industry wage dispersion than the private sector. I also find that the turnover model plays

a limited role in the West Bank's private sector and Gaza's public sector and little to no impact in the West Bank's public sector and Gaza's private sector.

While labor market segmentation along the public and private sector is common in several developing economies, the case in Gaza is especially intriguing, where the public sector pays competitive wages and there is no evidence of inter-industry wage dispersion. Future research might usefully address why this is the case and whether Gaza's public sector is an anomaly in developing countries. Identifying the causes of competitive wages and inter-industry wage dispersion may have important policy implications towards decreasing wage inequality and unemployment.

Map 1-The West Bank



Map 2-The Gaza Strip



Table 1- Raw Industry Differentials in the West Bank and Gaza and Developed Economies

Industry	US (1985)	Germany (1985)	Japan (1985)	West Bank 2008Q4-2010	Gaza 2008Q4-2010
Electricity, gas & water	0.553	0.354	0.659	0.383	0.162
Mining	0.525	0.271	-0.177	0.039	-0.763
Basic Metal Products	0.484	0.100	0.497	-0.093	-0.740
Chemicals	0.429	0.261	0.365	-0.012	-0.855
Machinery	0.385	0.137	0.068	-0.169	-0.754
Transportation	0.344	0.037	0.239	0.080	-0.360
Non-metallic products	0.253	0.040	-0.178	-0.031	-0.781
Finance & insurance	0.227	0.232		0.401	0.208
Printing & publishing	0.198	0.039	-0.111	-0.004	-0.411
Food and beverages	0.153	-0.153	-0.457	-0.240	-0.550
Construction	0.149	-0.127	-0.071	-0.021	-0.326
Government services	0.034	0.056	0.500	0.125	0.267
Real estate	0.015			-0.106	-0.851
Other manufactured	-0.038	-0.327	-0.054	-0.134	-0.690
Wood & wood products	-0.065	-0.119		-0.236	-0.763
Community and Social Services	-0.293	-0.282	-0.278	0.164	-0.013
Textiles	-0.310	-0.309	-0.369	-0.257	-0.634
Commerce	-0.314	-0.174		-0.272	-0.820
Restaurants & hotels	-0.484	-0.519		-0.093	-0.763
Agriculture	-0.707	-0.257	-0.539	-0.334	-0.942
Inter-Industry Wage Dispersion	0.353	0.239	0.37	0.201	0.386
Correlation w/US	1	.858	.654	0.498	0.212
Correlation w/Germany			0.690	0.576	0.302
Correlation w/Japan				0.653	0.435

Source: Industry differentials in the US, Germany and Japan are estimated in Gittleman and Wolff (1993). For the West Bank and Gaza, industry differentials are computed using Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS).

Table 2--Summary Statistics by Industry for the West Bank (2008q4-2010)

West Bank	% Employed/ Industry	Years of Schooling	Daily Wage (\$2010)	Age	Tenure (months)	% White Collar	% Large Firm	% Public Sector	% Pension	% Unionized (2009-10)
Agriculture	0.043	8.9	\$16.99	30.8	62.4	0.010	0.51	0.017	0.017	0.144
Manufacturing	0.146	9.7	\$21.94	30.7	80.3	0.079	0.73	0.005	0.125	0.159
Construction	0.158	9.3	\$23.63	32.2	95.7	0.020	0.32	0.002	0.031	0.134
Commerce	0.143	10.5	\$21.26	29.6	55.6	0.107	0.42	0.002	0.135	0.123
Transportation Services	0.047 0.462	10.8 13.2	\$28.46 \$30.26	36.7 36.7	71.5 105.1	0.211 0.575	0.65 0.94	0.035 0.701	0.333 0.870	0.216 0.299
Gaza	% Employed/ Industry	Years of Schooling	Daily Wage (\$2010)	Age	Tenure (months)	% White Collar	% Large Firm	% Public Sector	% Pension	% Unionized (2009-10)
Agriculture	0.064	9.1	\$7.19	32.3	67.0	0.003	0.49	0.016	0.002	0.585
Manufacturing	0.034	9.9	\$10.94	31.8	71.1	0.108	0.62	0.012	0.018	0.438
Construction	0.016	9.8	\$15.30	34	34.4	0.077	0.42	0	0.026	0.507
Commerce	0.078	10.2	\$9.08	30.6	48.1	0.051	0.22	0.004	0.012	0.407
Transportation Services	0.054 0.753	10.4 12.9	\$14.63 \$24.98	36 36.9	62.4 104.7	0.107 0.521	0.29 0.98	0.070 0.836	0.128 0.861	0.524 0.122

Source: Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS).

Table 3--Unadjusted Inter-Industry Wage Differentials for One Digit Industries

Panel A:	West Bank (1)	Gaza (2)
Agriculture	-0.414*** (0.024)	-0.582*** (0.030)
Manufacturing	-0.233*** (0.019)	-0.248*** (0.035)
Construction	-0.102*** (0.019)	0.034 (0.046)
Commerce	-0.301*** (0.020)	-0.443*** (0.028)
Services	0.062*** (0.017)	0.602*** (0.023)
Constant	2.97*** (0.017)	2.27*** (0.022)
Adjusted R-squared	0.098	0.407
Panel B:	West Bank	Gaza
Adjusted Standard Dev. ¹ (One Digit Industries)	0.182 [†]	0.421 [†]
Adjusted Standard Dev. (Two Digit Industries)	0.199 [†]	0.455 [†]
Observations	17,817	9,657

Source: Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS).

¹The standard deviation is weighted by employment shares and is adjusted using the standard errors of industry differentials.

[†]F test that industry wage differentials jointly equal 0 reject at the 0.00001 level.

Table 4--Do Differences in Human Capital and Demographics Explain Inter-Industry Wage Differentials?

Industry	West Bank			Gaza		
	(1)	(2)	(3)	(4)	(5)	(6)
Agriculture	-0.414*** (0.024)	-0.128*** (0.023)	-0.154*** (0.023)	-0.582*** (0.030)	-0.486*** (0.031)	-0.579*** (0.028)
Manufacturing	-0.233*** (0.019)	-0.086*** (0.018)	-0.116*** (0.017)	-0.248*** (0.035)	-0.225*** (0.033)	-0.268*** (0.030)
Construction	-0.102*** (0.019)	0.107*** (0.019)	0.066*** (0.018)	0.034 (0.046)	0.0544 (0.040)	0.103*** (0.037)
Commerce	-0.301*** (0.019)	-0.172*** (0.019)	-0.176*** (0.018)	-0.443*** (0.028)	-0.466*** (0.028)	-0.471*** (0.025)
Services	0.062*** (0.017)	0.092*** (0.018)	0.073*** (0.018)	0.602*** (0.023)	0.142*** (0.026)	0.115*** (0.024)
Constant	2.97*** (0.017)	2.59*** (0.023)	2.62*** (0.023)	2.27*** (0.022)	1.88*** (0.036)	2.02*** (0.033)
Human Capital/ Demographic Variables	No	Yes	Yes	No	Yes	Yes
8 Tenure Variables	No	No	Yes	No	No	Yes
Weighted Adj. Standard Dev. ¹	0.182 [†]	0.113 [†]	0.110 [†]	0.421 [†]	0.264 [†]	0.299 [†]
Correlation with Col(1) and (4)	1	0.806	0.892	1	0.916	0.895
Observations	17,817	17,817	17,817	9,657	9,657	9,657
Adjusted R- squared	0.098	0.352	0.371	0.407	0.596	0.662

Source: Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Columns (1) and (4) are raw differentials taken from Columns (2) and (3) from Table 3. Controls include 4 schooling groups, experience, experience squared, locality type (urban, rural or refugee camp), marital status, 7 occupation dummies, work in the public sector, year dummies and quarter dummies.

¹The standard deviation is weighted by employment shares and is adjusted using the standard errors of industry differentials.

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

[†]F test that industry wage differentials jointly equal 0 reject at the 0.00001 level.

Table 5--Do Differences in Unobserved Labor Quality Explain Inter-Industry Wage Differentials?

	West Bank			Gaza		
	Levels	FE	Switchers	Levels	FE	Switchers
Industry	(1)	(2)	(3)	(4)	(5)	(6)
Agriculture	-0.212*** (0.043)	0.020 (0.045)	0.019 (0.049)	-0.587*** (0.056)	-0.466*** (0.068)	-0.474*** (0.079)
Manufacturing	-0.111*** (0.030)	0.067* (0.039)	0.079* (0.042)	-0.288*** (0.061)	-0.270*** (0.082)	-0.287*** (0.097)
Construction	0.074** (0.032)	0.114*** (0.038)	0.120*** (0.041)	-0.038 (0.084)	-0.176* (0.091)	-0.163 (0.107)
Commerce	-0.205*** (0.031)	0.026 (0.037)	0.030 (0.041)	-0.466*** (0.050)	-0.253*** (0.070)	-0.284*** (0.084)
Service	0.087*** (0.030)	0.091*** (0.035)	0.089** (0.038)	0.168*** (0.045)	-0.125* (0.065)	-0.194** (0.078)
Constant	2.55*** (0.039)	0.039** (0.016)	0.012 (0.042)	1.84*** (0.064)	0.086*** (0.024)	-0.053 (0.083)
Weighted Adj. Standard Dev. ¹	0.130	0.026	0.025	0.288	0.144	0.142
F test	60.03	3.70	3.16	102.41	10.72	7.57
P value	0.00001	0.0024	0.0075	0.00001	0.00001	0.00001
Corr with Col(1) and (4)	1	0.634	0.582	1	0.841	0.790
Observations	5,841	5,841	2,621	3,123	3,123	1,112
Adjusted R-squared	0.381	0.029	0.040	0.590	0.089	0.157

Source: Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Controls include changes in 4 schooling groups, change in experience, change in experience squared, change in tenure and tenure squared, change in locality type (urban, rural or refugee camp), change in marital status, change in occupation for 7 occupations, change in sector (public or private), year dummies and quarter dummies. ¹The standard deviation is weighted by employment shares. Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

¹The standard deviation is weighted by employment shares and is adjusted using the standard errors of industry differentials.

Table 6--Can transitory demand shocks explain inter-industry wage dispersion?

Industry	West Bank		Gaza	
	(2008Q4-2010)	(1999-2000Q3)	(2008Q4-2010)	(1999-2000Q3)
	(1)	(2)	(3)	(4)
Agriculture	-0.154*** (0.023)	-0.016 (0.032)	-0.579*** (0.028)	-0.157*** (0.030)
Manufacturing	-0.116*** (0.017)	-0.006 (0.018)	-0.268*** (0.030)	-0.168*** (0.026)
Construction	0.066*** (0.018)	0.293*** (0.019)	0.103*** (0.037)	0.065** (0.026)
Commerce	-0.176*** (0.018)	-0.071*** (0.020)	-0.471*** (0.025)	-0.277*** (0.028)
Services	0.073*** (0.018)	0.100*** (0.020)	0.115*** (0.024)	0.063** (0.025)
Constant	2.62*** (0.023)	2.57*** (0.025)	2.02*** (0.033)	2.18*** (0.033)
Weighted Adjusted Standard Dev. ¹	0.110 [†]	0.130 [†]	0.299 [†]	0.139 [†]
Correlation with Col (1) and (3)	1	0.788	1	0.910
Observations	17,817	13,615	9,657	8,614
Adjusted R-squared	0.371	0.336	.662	0.490

Source: Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Columns (1) and (3) are replicated from Columns (3) and (6) in Table 5. Controls include 4 schooling groups, experience, experience squared, locality type (urban, rural or refugee camp), marital status, 7 occupation dummies, work in the public sector, year dummies and quarter dummies.

¹The standard deviation is weighted by employment shares and is adjusted using the standard errors of industry differentials.

[†]F test that industry wage differentials jointly equal 0 reject at the 0.00001 level. Standard errors in parentheses (***) p<0.01, ** p<0.05, * p<0.1)

Table 7--Can Compensating Wage Differentials Explain Inter-Industry Wage Dispersion? (2009-2010)

	West Bank		Gaza	
Industry	(1)	(2)	(3)	(4)
Agriculture	-0.156*** (0.024)	-0.144*** (0.024)	-0.577*** (0.029)	-0.409*** (0.030)
Manufacturing	-0.123*** (0.018)	-0.120*** (0.018)	-0.256*** (0.031)	-0.244*** (0.030)
Construction	0.054*** (0.019)	0.072*** (0.019)	0.084** (0.038)	0.088** (0.037)
Commerce	-0.195*** (0.019)	-0.193*** (0.019)	-0.471*** (0.026)	-0.434*** (0.026)
Services	0.068*** (0.019)	0.066*** (0.018)	0.114*** (0.025)	0.143*** (0.025)
Constant	2.55*** (0.022)	2.55*** (0.023)	1.97*** (0.033)	2.01*** (0.034)
Work Conditions	No	Yes	No	Yes
Union Status	No	No	No	No
Weighted Adj. Standard Dev. ¹	0.112 [†]	0.113 [†]	0.294 [†]	0.252 [†]
Correlation with Col(1) and (4)	1	0.996	1	0.986
Observations	15,985	15,985	8,894	8,894
Adjusted R- squared	0.385	0.390	0.667	0.685

Source: Palestinian Labor Force Survey Data (2009-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Controls include 4 schooling groups, experience, experience squared, 8 tenure groups, locality type (urban, rural or refugee camp), marital status, 7 occupation dummies, work in the public sector, year dummies and quarter dummies. Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

¹The standard deviation is weighted by employment shares and is adjusted using the standard errors of industry differentials.

[†]F test that industry wage differentials jointly equal 0 reject at the 0.00001 level.

Table 8-- Samples for Examining Union-Related Arguments

	West Bank			Gaza		
	Employees	Standard Deviation	Correlation ¹	Employees	Standard Deviation	Correlation ¹
Control for Union Status?						
a.) Yes	15,985	0.113**	0.999	8,894	0.252**	0.999
b.) No	15,985	0.113**		8,894	0.249**	
Union						
a.) Unionized	3,472	0.123**	0.701	1,905	0.226**	0.825
b.) Non-unionized	12,508	0.109**		6,989	0.310**	
Nonunionized Occupations						
a.) White Collar	2,928	0.059*	-0.326	3,015	0.231**	0.747
b.) Blue Collar	9,580	0.120**		3,974	0.327**	

Source: Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Controls include 4 schooling groups, experience, experience squared, 8 tenure groups, locality type (urban, rural or refugee camp), marital status, 7 occupation dummies, work in the public sector, year dummies and quarter dummies.

The standard deviation is weighted by employment shares and is adjusted using the standard errors of industry differentials.

**F test that industry wage differentials jointly equal 0 reject at the 0.00001 level.

*F test that industry wage differentials jointly equal 0 reject at the 0.05 level.

¹ This statistic refers to the correlation between the industry differentials of a subsample and its complement.

Table 9--Samples for Considering Efficiency Wage Theories

	West Bank			Gaza		
	Employees	Standard Deviation	Correlation ¹	Employees	Standard Deviation	Correlation ¹
Occupation						
a.) White Collar	5,455	0.136**	0.569	3,937	0.185**	0.854
b.) Blue Collar	12,362	0.109**		5,720	0.292**	
Work Enterprise Size						
a.) Large (16+)	12,588	0.110**	0.839	8,039	0.390**	0.508
b.) Small (<16)	5,229	0.083**		1,618	0.164**	
Deferred Payments						
a.) Pension	8,215	0.159**	0.783	6,356	0.081**	0.823
b.) No Pension	9,601	0.082**		3,301	0.236**	
Sector						
a.) Public Sector	5,836	0.089*	-0.308	6,140	0.000	-0.345
b.) Private Sector	11,981	0.094**		3,157	0.283**	
Tenure						
a.) Tenure < 2 years	4,425	0.100**	0.641	1,882	0.281**	0.732
b.) Tenure ≥ 2 years	13,392	0.132**		7,775	0.296**	

Source: Palestinian Labor Force Survey Data (2008Q4-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Controls include 4 schooling groups, experience, experience squared, 8 tenure groups, locality type (urban, rural or refugee camp), marital status, 7 occupation dummies, work in the public sector, year dummies and quarter dummies.

The standard deviation is weighted by employment shares and is adjusted using the standard errors of industry differentials.

**F test that industry wage differentials jointly equal 0 reject at the 0.00001 level.

*F test that industry wage differentials jointly equal 0 reject at the 0.05 level.

¹ This statistic refers to the correlation between the industry differentials of a subsample and its complement.

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Appendix

Table I-Unadjusted Inter-Industry Wage Differentials for Two Digit Industries

Industry	(1) West Bank	(2) Gaza
Agriculture, hunting and related service activities	-0.334	-0.954
Forestry, logging and related service activities	-0.157	0.104
Fishing, aquaculture and service activities incidental to fishing	0.158	-0.576
Extraction of crude petroleum and natural gas	0.158	0.104
Mining of metal ores	0.042	0.104
Food products and beverages	-0.254	-0.564
Tobacco products	0.237	0.104
Textiles	-0.715	0.104
Wearing apparel	-0.521	-0.37
Luggage, handbags, saddlery, harness and footwear	-0.243	-0.293
Wood products	-0.234	-0.777
Paper products	-0.086	0.329
Publishing and printing	0.032	-0.468
Coke, refined petroleum products and nuclear fuel	0.158	0.104
Chemicals and chemical products	-0.01	-0.869
Rubber and plastics	-0.257	-0.612

products		
Non-metallic mineral products	-0.029	-0.795
Basic metals	0.13	0.104
Metal products	-0.126	-0.754
Machinery and equipment	-0.229	0.104
Office, accounting and computing machinery	-0.077	0.104
Electrical machinery and apparatus	-0.302	-0.717
Radio, television and communication equipment	0.158	0.104
Medical and optical instruments	0.47	-0.97
Motor vehicles and trailers	0.158	0.104
Transport equipment	0.158	0.104
Furniture	-0.161	-0.756
Recycling	-0.027	0.104
Electricity and hot water	0.475	0.153
Collection and distribution of water	0.158	0.104
Construction	-0.022	-0.356
Sale, maintenance and repair of motor vehicles	-0.361	-0.987
Wholesale trade	-0.047	-0.395
Retail trade and repair	-0.297	-0.898
Hotels and Restaurants	-0.091	-0.76
Land Transport	0.049	-0.483
Air Transport	0.423	0.104

Support and Transport Aid	0.322	0.104
Telecommunications	0.122	0.176
Financial intermediation	0.468	0.185
Insurance and pension funding	0.166	0.457
Aid with financial intermediation	0.405	0.104
Real estate activities	-0.104	-0.865
Renting of machinery	-0.083	0.104
Computer related activities	0.183	-0.751
Research and Development	0.543	0.745
Other business activities	0.132	-0.343
Public Administration	0.064	0.257
Education	0.24	0.286
Health and Social Work	0.227	0.262
Sewage and sanitation	-0.28	0.329
Activities of Organizations	0.008	-0.314
Recreational Activities	-0.065	-0.105
Other service activities	-0.017	-1.119
Activities of households	-0.057	-2.069
Extraterritorial bodies	0.289	0.083
Other	0.02	0.036
Weighted Adj. Standard Dev.	.199	.455
Observations	17,817	9,657
R-squared	0.119	0.395

Source: Palestinian Labor Force Survey Data (1999-2009) administered by the Palestinian Central Bureau of Statistics (PCBS).

Table II: Descriptive Statistics during the Pre-Intifada, Post-Intifada and Post-Blockade Period

	Pre-intifada		Post-intifada		Post-blockade	
	West Bank	Gaza	West Bank	Gaza	West Bank	Gaza
Unemployment Rate	0.098	0.182	0.317	0.403	0.183	0.387
% in Public Sector	0.178	0.380	0.306	0.592	0.247	0.659
Employment Shares						
Agriculture	0.054	0.087	0.042	0.068	0.067	0.049
Manufacturing	0.171	0.133	0.159	0.088	0.154	0.036
Construction	0.366	0.238	0.207	0.067	0.240	0.006
Commerce	0.112	0.054	0.121	0.043	0.135	0.080
Transportation	0.028	0.027	0.035	0.015	0.042	0.046
Services	0.268	0.462	0.437	0.718	0.362	0.782

Source: Palestinian Labor Force Survey Data (1999-2009) administered by the Palestinian Central Bureau of Statistics (PCBS).

Table III- Industry Wage Differentials and Industry Returns to Job Tenure (2009-2010)

	West Bank		Gaza	
	Log Wage	Tenure (months)	Log Wage	Tenure (months)
Panel A:	(1)	(2)	(3)	(4)
Agriculture	-0.141*** (0.029)	22.4*** (4.81)	-0.350*** (0.055)	6.17 (8.78)
Manufacturing	-0.116*** (0.019)	29.9*** (3.15)	-0.282*** (0.034)	-5.29 (5.51)
Construction	0.127*** (0.020)	46.9*** (3.38)	0.074 (0.050)	-42.7*** (8.04)
Commerce	-0.139*** (0.020)	10.6*** (3.32)	-0.310*** (0.029)	-10.4** (4.64)
Services	-0.098*** (0.018)	26.1*** (3.06)	0.129*** (0.030)	3.67 (4.75)
Constant	2.53*** (0.024)	-46.2*** (4.04)	1.73*** (0.039)	-1.54 (6.22)
Observations	14,734	14,734	7,374	7,374
R-squared	0.368	0.422	0.647	0.387
Panel B:			West Bank	Gaza
Correlation between Industry Differentials and Industry Returns to Tenure			0.420	-0.317
Public Sector Workers			-0.567	0.194
Private Sector Workers			0.333	-0.563

Source: Palestinian Labor Force Survey Data (2009-2010) administered by the Palestinian Central Bureau of Statistics (PCBS). Controls include 4 schooling groups, experience, experience squared, locality type (urban, rural or refugee camp), marital status, 7 occupation dummies, work in the public sector, large firm, union dummy, year dummies and quarter dummies. Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

The Impact of Labor Mobility Restrictions on Social Welfare: the case of the Blockade
on Gaza

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Abstract

Restrictions on labor mobility across regions have been widely criticized in the literature for reducing social welfare by misallocating labor and increasing inefficiency. Usually, labor mobility is restricted by a variety of legal, social and economic factors; however, although out-migration is sub-optimal, at least out-migration still exists. The case of the Gaza Strip is an anomaly in the literature because out-migration is currently not possible for Gaza workers. Since the blockade became official in June 2007, workers in Gaza have been limited to search for jobs in the domestic sector, as opposed to the pre-intifada period (before September 2000) when approximately 24% of wage earners in the Gaza strip worked in Israel and the settlements. Therefore, the Gaza blockade serves as a natural experiment to pose the following question: What is the impact of ending labor market integration between Gaza and Israel on welfare measures (e.g. GNI) in Gaza? In order to answer this question, this paper estimates a search model with match and bargaining using data from the post-blockade period (2008-2010) and the pre-intifada period (2000Q1-2000Q3) when labor markets were integrated. The results suggest that the level of welfare (analogous to GNI) during a period of absolute labor market segmentation in Gaza is equivalent to a level of welfare during the open period where there is a joint decrease in real domestic wages by 64% and in foreign wages by 18%.

Introduction

Restrictions on labor mobility across regions have been widely criticized in the literature for reducing social welfare by misallocating labor and increasing inefficiency (Hamilton and Whalley (1984), Iregui (2003), Moses and Letnes (2004), Walmsley and Winters (2005)). For instance, Hamilton and Whalley (1984) conclude that the removal of labor mobility restrictions across regions could double world income and that these gains are not only concentrated in developed countries but shared by developing countries as well. Walmsley and Winters (2005) estimate that labor mobility restrictions globally cost over \$150 billion and the misallocation of unskilled labor results in relatively greater costs. In addition, studies investigating the impact of stringent labor mobility restrictions within nations have found similar results. In China, legislation (Hukou system) restricting rural-urban migration is documented as the major cause of under-populated cities, over-populated rural areas, rising rural-urban income inequality and the misallocation of labor (Wu and Treiman (2004), Liu(2005), Whalley and Zang (2007), Chan(2009)).

In some regions, labor mobility may not be legally restricted but has heavy social costs. For example, in Mexico, the strength of migration networks impacts the composition of Mexican migrants (to the US) so that negatively-selected migrants are from regions with strong migration networks (which implies low costs for migrant workers) while positively-selected migrants come from areas with tenuous migration networks (which implies high migration costs) (MacKenzie and Rapaport, 2007). Local networks are invaluable to citizens of impoverished areas where credit markets are absent because they serve as a partial-insurance arrangement against negative (and sometimes exogenous) income shocks. In India, rural jati (caste)-based networks restrict labor mobility by deterring out-migration (and out-marriage) by terminating the mutual insurance arrangement for those who leave the network (Munshi and Rosenzweig, 2007). Therefore, not only is labor mobility in India at a sub-optimal level, but labor is also allocated inefficiently since rural (jati)-caste based networks have heterogeneous benefits and costs to members of their network. In the West Bank, Adnan (2012c) argues that politically-determined barriers as measured by the number of closure days per quarter or

the number of closure obstacles per district per quarter impede labor mobility from the West Bank to Israel and the settlements²¹.

For all the aforementioned studies, labor mobility was restricted by a variety of legal, social and economic factors; however, although out-migration was at a reduced level, at least out-migration still existed. The case of the Gaza Strip (see Map 1) is an anomaly in the literature because out-migration is not possible at all. Prior to the intifada in September 2000, mobility restrictions were rare and workers searched for jobs in both the domestic and foreign (i.e. Israel or the settlements²²) sectors but as mobility restrictions increased over the next decade, workers became increasingly limited to searching for jobs in the domestic sector; this continued until the Gaza blockade became official in June 2007 where the domestic labor market became the only option for workers in Gaza. Therefore, the current political circumstances in Gaza provide a rare opportunity for a natural experiment: What is the impact of absolute segmentation between the labor markets of Gaza and Israel on welfare measures (e.g. an analogous measure of Gross National Income) in Gaza? In order to answer this question, this paper estimates a search model with match and bargaining during the post-blockade period (2008-2010) when Gaza's labor market was segregated from Israel's labor market and the pre-intifada period (2000Q1-2000Q3) when the two labor labor markets were integrated.

In the literature, a variety of techniques have been used to assess the impact of labor mobility restrictions on numerous welfare measures such as world income. The technique employed in this paper estimates the parameters of a one sector job search model during the post-blockade period where Gaza workers can search for jobs in only the domestic sector and estimates the parameters of a two sector job search model during the open (pre-intifada) period where workers searched for jobs in both the domestic and foreign labor markets. One contribution of this paper is that it extends the one sector

²¹ Closure days include the number of days that the Israeli border and the settlements were legally sealed off from the West Bank while closure obstacles represent physical deterrents to labor mobility such as checkpoints, roadblocks and earth mounds. Although these politically-determined barriers impede out-migration, there were alternative routes Palestinian laborers took to work or enter Israel/settlements in the West Bank.

²² From this point forward, in this paper, I refer to the foreign sector as "Israel" although it includes Israel and the settlements. This abbreviation is appropriate since the settlements are Israeli land.

model as well as the estimation procedure developed by Flinn (2005) in order to estimate the parameters for the two sector economy of Gaza during the open period. The parameters of the model are first estimated separately for the open and closed periods in order to estimate net effects of labor market segmentation on various measures of social welfare. Then, the data from both periods are pooled in order to estimate demand-side parameters. To my knowledge, no one has applied such a job search model to evaluate or quantify the impact of labor mobility restrictions on social welfare. Therefore, the major contribution of this paper is to estimate the negative impact of Gaza's isolation on its residents in terms of various welfare measures including real wages. The results suggest that the level of welfare (analogous to GNI) during Gaza's period of isolation is equivalent to a level of welfare during the open period where there is a joint decrease in real domestic wages by 64% and in foreign wages by 18%, suggesting that the blockade had a profound impact on the social welfare of Gaza's residents.

The next section provides an overview of the stylized facts regarding Gaza's labor market while section III describes the data and summary statistics. Section IV reviews the one sector stationary search model and the extension to the two sector case. Section V is a summary of the results and Section VI concludes.

II. Stylized Facts

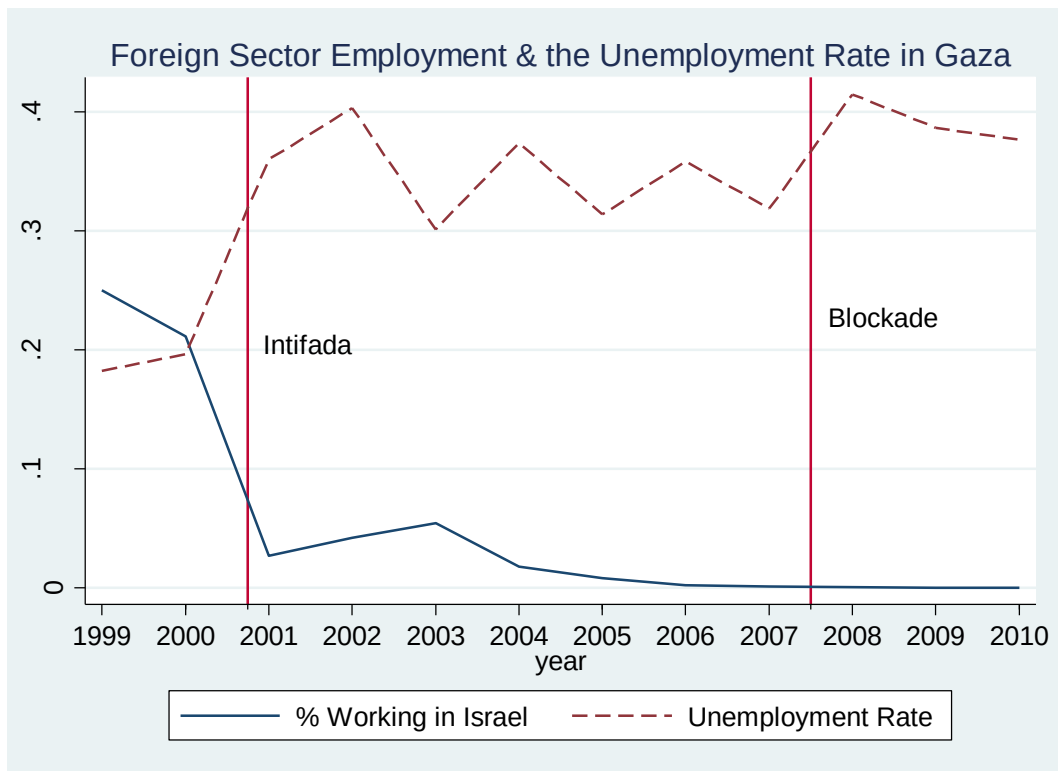
Immediate Consequences of the Second Intifada

This section aims to provide a brief background on the institutional features of Gaza in the past 10-15 years. The model in this paper does not address these features directly; however, by choosing two time periods, one in which Gaza's economy is considered closed and the other in which Gaza's economy is considered open, I aim to indirectly address the institutional differences between the two periods.

In September 2000, there was a Palestinian intifada (uprising) opposing the occupation of Israel. The intifada was followed by a brutal cycle of violence from both sides. An immediate consequence of the intifada was a series of Israeli security measures that resulted in a large decrease in Palestinian labor flows into Israel: the decline in the number of work permits (and renewals) issued to Palestinian workers in Israel, an

increase in border control measures (more on this later) as well as an increase in the number of work permits issued for East-Asian migrant workers in the hopes of replacing Palestinian labor. Furthermore, the domestic labor market could not absorb former Palestinian employees in Israel in addition to sustaining its current employees. Therefore, following the intifada, the percentage of Palestinian wage-earners in the Israeli labor market plummeted while the unemployment rate soared, as depicted in Figure 1 below²³:

Figure 1:



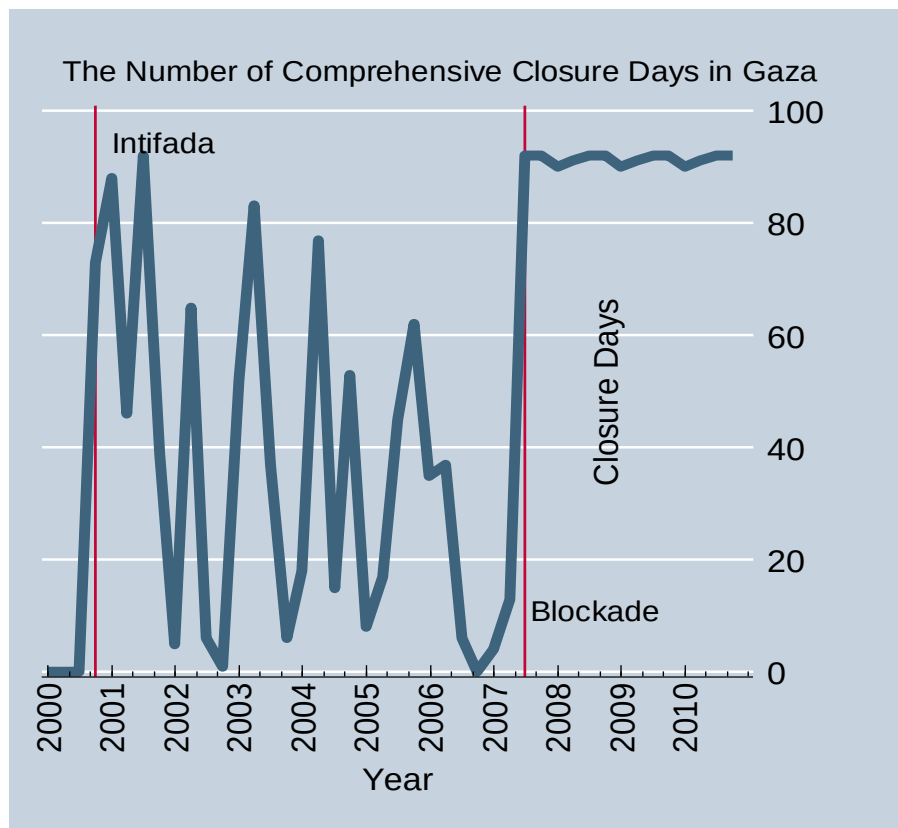
The unemployment rate is defined as the number of individuals seeking work but are unemployed divided by the total number of labor force participants while the employment rate is simply one minus the unemployment rate. Further, foreign sector employment is defined as the number of people working in Israel divided by the total number of employed individuals.

²³ These results are consistent with Bulmer (2003) who argues that unemployment rates are negatively correlated with Palestinian employment in Israel.

Israeli Border Closures

Comprehensive closure days were implemented by Israel to close off the Israeli border from the Palestinian territories. During closure days, the movement of people and goods are prohibited even if Palestinians have legal documentation to work or enter Israel. The number of Israeli border closures in a given quarter deters Palestinians from searching for jobs in Israel simply because crossing the border is complicated by heightened security measures, although it is known that several Palestinians illegally cross to work in Israel or the settlements. This study excludes the West Bank and focuses only on labor market outcomes in the Gaza Strip. The following graph presents the number of comprehensive closure days in each quarter from the year 2000 to 2010 for Gaza residents only²⁴:

Figure 2- The Number of Closure Days per Quarter in Gaza (2000-2010)



Source: B'tselem

²⁴ Data on comprehensive closure days during the period 2000-2007Q2 in the Palestinian territories are obtained from Btselem, an Israeli human rights organization.

The figure demonstrates immense volatility in closure days from one quarter to the next during the second intifada, which began in the fourth quarter of 2000. Spikes in closure days can be explained by controversial political and economic events that took place. Prior to the second intifada in September 2000, there were no comprehensive closure days in the Palestinian territories. In contrast, during the year 2001, Gaza residents experienced quarters where the Israeli border was closed off every day. In August 2005, Israel disengaged from the Gaza Strip by dismantling its settlements and after this point, labor and product market integration between the two economies was severely limited; the blockade, however, did not become official until June 2007. The two most important events in Gaza relevant for this study are the second intifada and the blockade, which are both depicted by vertical reference lines in the graph above.

In the stationary model outlined below, the economy is assumed to be in a steady state. It is difficult to imagine that Gaza's economy was in a steady state between the second intifada and blockade, given the volatility associated with Israel's border closures. Therefore the first three quarters of 2000 will be used to analyze the "open" (pre-intifada) period, which is characterized as an open economy in a steady state. In contrast, during the intifada period, Gaza continues to be an open economy but experiences great volatility and is not at a steady state. During disengagement, stronger restrictions are placed on workers seeking jobs in Israel. As for the closed period, only the years 2008-2010 are used in order to allow an adjustment period of six months after the blockade to ensure that Gaza reached a new steady state. Therefore, data on Gaza residents is divided into four periods: the pre-intifada period, the intifada period, the disengagement period and the post-blockade period. The table below summarizes the four different periods:

Table 1

Period	Time Period	Economy	Steady State?
Pre-Intifada Period	2000Q1-2000Q3	Open	Yes
Intifada Period	2000Q4-2005Q2	Open/Closed	No
Disengagement Period	2005Q3-2007Q2	Closed (in Practice)	Maybe
Post-Blockade Period	2007Q2-2010Q4	Officially Closed	Yes

Since this paper is concerned with analyzing labor market outcomes and welfare measures before the intifada and after the blockade when the economy is in a steady state only periods 1 and 4 are analyzed in the subsequent sections.

III. Data Section

The datasets used in this paper are micro level panel data from the Palestinian Labor Force Survey (PLFS) administered by the Palestinian Central Bureau of Statistics during the period 2000-2010. The Palestinian Labor Force Survey (PLFS) of the West Bank and Gaza Strip is a quarterly household survey that investigates the labor force characteristics of Palestinians living in the territories. The survey has been administered by the Palestinian Central Bureau of Statistics since 1995, following the establishment of the Palestinian Authority (PA). During each quarter, over 7500 households are visited. Although the target population includes all people over the age of 10 years, labor market characteristics are only collected for those who meet the minimum work requirement age of 15 years old. The questionnaire is designed such that households are interviewed for two consecutive quarters and then dropped out of the sample for the next two quarters and then are brought back for the following two quarters, allowing one to construct short longitudinal panels. In this paper, I restrict the sample to individuals aged 15-64 years that are surveyed between 2000 and 2010.²⁵ The response is approximately 90% for the majority of quarters in this time period²⁶.

Descriptive Analysis

Open Period

During the open period, Gaza residents searched for jobs in the local domestic labor market or Israel's foreign labor market. Table 2 displays relevant summary statistics for Gaza residents during the open period. Column (1) reports descriptive

²⁵ I exclude years prior to 2000 because the year 2000 was the first year longitudinal data was available. To avoid mixing labor market and retirement behavior, individuals over the age of 64 are not included in the sample.

²⁶ One drawback of the data is that during the last two quarters of 2001, the response rate was less than 40% due to the cycle of violence that took place during the second intifada (2000Q3-2003). However, as you will see later in this section, I only use data from the following periods: (2000Q1-2000Q3) and (2008Q1-2010Q4).

statistics for the full sample while in columns (2)-(7), the data are disaggregated according to gender, skill-level (where skilled individuals have 12 or more years of schooling) and age. According to Table 2, approximately 15% of employed individuals in Gaza worked in Israel or the settlements and the corresponding percentage for wage sector employees is about 20%²⁷. This suggests that the Israeli labor market was vital to Gaza's economy. Employment in Israel, however, was not uniform among the different groups. While according to the data, no women worked in Israel during the open period examined here, Israel's labor market employed over one quarter of all wage sector employees over the age of 35 and almost 30% of wage sector employees with less than 12 years of schooling.

Nevertheless, labor force participation rates are low and unemployment rates (among labor force participants) are high. The relatively low labor force participation rate in the population is primarily driven by the participation rate for women, which is approximately 13.2%. Less educated and experienced individuals also have low participation rates that amount to less than three quarters of their respective counterparts. The groups that have suffered the most from high unemployment rates are women, individuals less than 35 years old, and individuals with less than 12 years of schooling. The relatively high unemployment rate is primarily attributed to youth unemployment and to a lesser extent unemployment among unskilled individuals since female labor force participants comprise such a small portion of total labor force participants. The duration of ongoing unemployment spells is approximately 2.6 years for the entire sample and is especially large for women (4.9 years) and skilled workers (3.3) years²⁸. Longer unemployment spells among skilled workers is consistent with Angrist (1995),

²⁷ Wage sector employees do not include employers and self-employed individuals.

²⁸ The duration of unemployment spell is imprecisely estimated since the question in the survey asks, "Did...ever work in the past for at least two weeks regularly?" The answer choices during the open period were a.) in the past 12 months, b.) 1-5 years, c.) more than 5 years and d.) No; during the closed period, the answer choices were a.) in the past 12 months, b.) 1-3 years, c.) 3-5 years, d.) No. For answer choices with an interval, I assume that the duration of unemployment spell for each individual is the midpoint of the interval. For example, for the interval 1-5 years, I assume the duration of unemployment spell is approximately 3 years. For open ended intervals like more than 5 years, I assume the duration of unemployment spell is equal to potential labor market experience (=age-years of schooling -6). This imprecise measure should suffice since for the model's estimation all that is required is that the average of the duration of unemployment spells be accurate.

who finds that during the mid to late 1980's, the unemployment rate is inversely related to educational attainment for Palestinians.

For a portion of the unemployed individuals in the sample, the unemployment spell ended by the end of the survey date. These individuals entered a state of employment and are either the domestic or foreign sector. Given the percentage of employees (or wage sector employees) working in the foreign sector for each group, it is not surprising that unskilled and relatively older men are much more likely than their counterparts to work in the foreign sector after leaving the state of unemployment. The reservation wage represents the lowest wage at which an individual prefers working to continuing to search for jobs or exiting the labor force. Since there is no minimum wage, the (observed) reservation log wage is defined as the minimum of all (log) wages observed in the sample and subsamples and is denoted separately for domestic and foreign employees.

In the domestic sector, all groups have the same reservation wage except older workers, who have a higher reservation wage²⁹. In the foreign sector, older workers also have an advantage over other workers but unexpectedly, unskilled workers also have a high reservation wage than other groups and it is equivalent to the reservation wage for older workers in the foreign sector. The distribution of domestic wages for each group shows that more educated and experienced individuals earn higher wages but women earn higher wages than men although the difference is negligible. In the foreign sector, unskilled individuals earn more than skilled individuals although the difference is economically insignificant.

Closed Period

In Gaza, during the closed period 2008Q1-2010Q4, workers could only search for jobs in the domestic labor market. Table 3 presents descriptive statistics for relevant labor

²⁹ The fact that most groups have the same reservation wage is not suggestive of a binding minimum wage. In the data only three people (out of 2341) reported a wage of 0.878 during the open period; however, one individual can belong to more than one group (e.g. all, men, unskilled, young) if the individual is a young unskilled male for example. This is not problematic since 0.878 is not an outlier in the wage data; slight increases/decreases in the reservation wage should not profoundly alter the results; this applies to the foreign sector as well. That said, results may be sensitive to measurement error.

market outcomes during this period. The labor force participation rate decreased by four percentage points but unskilled and young individuals were impacted disproportionately with over a 16% decrease in their labor force participation rates. The unemployment rate almost tripled increasing about 25 percentage points and all groups were negatively affected but the groups who suffered the most were unskilled individuals and relatively older individuals. It is a reasonable outcome that the groups who were the most dependent on the foreign sector for employment would suffer the highest unemployment rates when the foreign sector is closed off. Additionally, the duration of unemployment spells increased by over half a year for the entire sample but decreased sharply for women and skilled workers who had the highest duration of unemployment spells during the open period. Further, labor flows from employment to unemployment increased by over 50% for the entire sample but the sharpest increases were for women, unskilled and inexperienced workers. Employment to unemployment flows are measured as the fraction of employed individuals in quarter q who became unemployed in quarter $q+1$ of the total number of employed individuals in quarter q . As during the open period, women, skilled and older individuals earn higher wages than their counterparts in the domestic labor market but men, unskilled, and relatively older individuals had the highest reservation wages.

IV. Theoretical Framework

A. The One Sector Model

The Gaza blockade was implemented in June 2007 and therefore, during the period of 2008-2010, workers in Gaza search for jobs only in the domestic sector. Therefore this section simply reviews the one sector stationary search model with match and bargaining (see Pissarides, 2000 for a comprehensive review). Throughout this section, labor market decisions such as job termination and the division of match-specific surplus between the firm and the worker are made in the absence of the minimum wage since Gaza residents are not paid a minimum wage in Gaza or Israel. Furthermore, the product market is not considered in this model so that the total output of the firm is the sum of the productivity levels of all workers employed in the firm. Workers can only search for jobs if they are in the state of unemployment and if they exit the state of

employment they must enter the state of unemployment before entering the state of employment, i.e. there is no on-the-job search³⁰. The contact rate, the frequency in which workers meet a potential employer, is Poisson distributed. The model is set in continuous time; therefore the value of employment in Gaza's domestic sector during a short interval of time ε in the closed period is characterized by the following expression, where the first index represents the sector, D for domestic and F for foreign and the second index represents the accessibility of the Israeli labor market, c for closed or o for open (subsection C):

$$E_{D,c}(w_{D,c}) = (1 + \rho\varepsilon)^{-1} \{w_{D,c}\varepsilon + \eta_{D,c}\varepsilon V_{u,c} + (1 - \eta_{D,c}\varepsilon) * E_{D,c}(w_{D,c}) + o(\varepsilon)\} \quad (1)$$

where $E_D(w_{D,c})$ is the value of being employed in the domestic sector during the closed period, $w_{D,c}$ is the wage earned in the domestic sector during the closed period, $(1 + \rho\varepsilon - 1)$ is the discount factor during the interval ε , $\eta_{D,c}$ is the exogenous job extermination rate for domestic jobs during the closed period and $V_{u,c}$ is the value of being unemployed in the domestic sector during the closed period, and $o(\varepsilon)$ is an error term such that $\lim_{\varepsilon \rightarrow 0} \frac{o(\varepsilon)}{\varepsilon} = 0$. Combining like terms and taking the limit as $\varepsilon \rightarrow 0$, the value of employment is simplified to the following expression:

$$E_{D,c}(w_{D,c}) = \frac{w_{D,c} + \eta_{D,c}V_{u,c}}{\rho + \eta_{D,c}}. \quad (2)$$

Before computing the value of unemployment, define the Nash-bargained wage $w_{D,c}$ as:

$$w_{D,c}(\theta_{D,c}, V_{u,c}) = \arg \max_{w_{D,c}} [E_{D,c}(w_{D,c}) - V_{u,c}]^{\alpha_{D,c}} \left[\frac{(\theta_{D,c} - w_{D,c})}{\rho + \eta_{D,c}} \right]^{1 - \alpha_{D,c}} \quad (3)$$

where $\theta_{D,c}$ is the productivity value of the match which is immediately observed by both parties after contact and $\alpha_{D,c}$ represents the relative bargaining power of workers and takes values in the interval $[0,1]$. If $\alpha_{D,c}=1$, then workers have all the bargaining power

³⁰ This is a limitation of the model since the data shows that approximately 50% of new hires (those who have acquired jobs within one year) were already employed when they received new job offers. However, like studies that use the CPS, because only short panels can be constructed using the *Palestinian Labor Force Survey* data, extending the model to include on-the-job search may not contribute substantially to the analysis (Flinn, 2005).

and if $\alpha_{D,c}=0$, firms have all the bargaining power. Substituting expression (2) into expression (3) and solving the maximization problem yields:

$$w_{D,c}(\theta_{D,c}, V_{u,c}) = \alpha_{D,c}\theta_{D,c} + (1 - \alpha_{D,c})\rho V_{u,c}. \quad (4)$$

The value of unemployment in the domestic sector in the interval ε during the closed period is:

$$V_{u,c} = (1 + \rho\varepsilon)^{-1} \{b_{D,c}\varepsilon + \lambda_{D,c}\varepsilon \int \max[V_{u,c}, E_{D,c}(w_{D,c})] + (1 - \lambda_{D,c}\varepsilon) * V_{u,c} + o(\varepsilon)\} \quad (5)$$

where $\lambda_{D,c}$ is the contact rate between workers and firms in the domestic sector during the closed period. To solve for the value of unemployment, first the expression $\max[V_{u,c}, E_{D,c}(w_{D,c})]$ is simplified as follows:

$$\begin{aligned} \max[V_{u,c}, E_{D,c}(w_{D,c})] &= \frac{1}{\rho + \eta_{D,c}} \max[(\rho + \eta_{D,c})V_{u,c}, w_{D,c} + \eta_{D,c}V_{u,c}] \\ &= \frac{\eta_{D,c}V_{u,c}}{\rho + \eta_{D,c}} + \frac{\max[\rho V_{u,c}, w_{D,c}]}{\rho + \eta_{D,c}} = V_{D,c} + \frac{\max[0, w_{D,c} - \rho V_{u,c}]}{\rho + \eta_{D,c}} \end{aligned} \quad (6)$$

The expression above highlights the fact that the value of employment exceeds the value of unemployment only if the wage offered $w_{D,c}$ exceeds the value of $\rho V_{u,c}$; thus, the reservation wage $w_{D,c}^*$ is defined as $\rho V_{u,c}$. After substituting expressions (4) and (6), the value of unemployment is now defined as:

$$\rho V_{u,c} = b_{D,c} + \frac{\alpha_{D,c}\lambda_{D,c}}{\rho + \eta_{D,c}} \int_{\rho V_{u,c}} [\theta_{D,c} - \rho V_{u,c}] dG_{D,c}(\theta_{D,c}) \quad (7)$$

where $b_{D,c}$ can be interpreted as search costs or utility associated with unemployment, and $G_{D,c}(\theta_{D,c})$ is the time-invariant CDF distribution of worker-firm productivity levels.

While $w_{D,c}^*$ is the reservation wage for workers searching for jobs, $\theta_{D,c}^*$ is the reservation productivity level for firms searching for workers such that workers refuse jobs that pay less than $w_{D,c}^*$ and firms reject workers with productivity levels lower than $\theta_{D,c}^*$. The reservation productivity value is determined by the productivity value $\theta_{D,c}$ of workers that are paid the reservation wage $w_{D,c}^*$. When the wage $w_{D,c}$ is evaluated at $w_{D,c}^*$ in expression (4), the reservation productivity value is $\theta_{D,c}^* = w_{D,c}^* = \rho V_{u,c}$.

B. Empirical Strategy during the Closed Period (2008Q1-2010Q4)

In the one sector model, workers are either employed in the domestic sector or unemployed. For unemployed workers, the durations of unemployment spells are observed while for employed workers, wages are observed. In the context of a stationary labor market environment, it is natural to assume that the labor market is memoryless so that the likelihood of receiving an offer is independent of how long it has been since the last offer was received. The likelihood of receiving an offer at time t_c given that an offer has not been received before time t_c is the probability that the firm and worker will make contact and the productivity of the worker is at least equal to the reservation productivity value ($\theta_{D,c} \geq \theta_{D,c}^*$):

$$\frac{q_{U,c}(t_c)}{1 - Q_{U,c}(t_c)} = \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) \quad (8)$$

where $\tilde{G}_{D,c}$ is the survivor function $1 - G_{D,c}$, and $Q_{U,c}(t_c)$ and $q_{U,c}(t_c)$ represent the CDF and PDF of the duration of unemployment spells during the closed period. Since $\lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)$ is a constant $Q_{U,c}(t_c)$ takes the form of a negative exponential so that:

$$\begin{aligned} Q_{U,c}(t_c) &= 1 - \exp(-\lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) t_c) \\ q_{U,c}(t_c) &= \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) \exp(-\lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) t_c) \end{aligned} \quad (9)$$

The unemployment rate $u_{D,c}$ can be solved for by the system of equations:

$$u_{D,c} \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) = e_{D,c} \eta_{D,c} \quad (10)$$

$$u_{D,c} = 1 - e_{D,c} \quad (11)$$

where $e_{D,c}$ is the employment rate. Therefore the unemployment rate can be written as:

$$u_{D,c} = \frac{\eta_{D,c}}{\eta_{D,c} + \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)} \quad (12)$$

The intuition is that the economy is in a steady state and so the unemployment rate (in the long run) is the employment to unemployment flows (the job extermination rate) divided by the sum of the employment to unemployment flows and the unemployment to

employment flows (the probability that a worker and firm make contact and there is a match).

The likelihood of finding an unemployed person in the domestic sector during the closed period with an unemployment spell of duration t_c is:

$$L(t_c, u_{D,c}) = q_U(t_c) * u_{D,c} \quad (15)$$

Similarly, the likelihood of finding an employed person in the domestic sector during the closed period with a wage $w_{D,c}$ is:

$$L(w_{D,c}, e_{D,c}) = \frac{f(w_{D,c})}{F(w_{D,c}^*)} * e_{D,c} \quad (14)$$

The first term is the probability of earning a wage $w_{D,c}$ given that the wage exceeds the reservation wage and the second term is the probability of finding a representative agent in the employment state. Given equation (4), the first term can be rewritten as:

$$\frac{f(w_{D,c})}{F(w_{D,c}^*)} = \frac{g(\tilde{\theta}_{D,c})}{\alpha_{D,c} * \tilde{G}(\theta_{D,c}^*)} \text{ where } \tilde{\theta}_{D,c} = [w_{D,c} - (1 - \alpha_{D,c})\theta_{D,c}^*]/\alpha_{D,c}$$

The likelihood function for all individuals in a random sample during the closed period is reported in the Appendix, along with all other likelihood functions. A consistent estimator of the reservation wage $w_{D,c}^*$ is taken from the data as the minimum value of all wages observed such that:

$$\widehat{w_{D,c}^*} = \min \{w_{D,c,1}, w_{D,c,2} \dots \dots w_{D,c,N_{E,D,c}}\}$$

where $N_{E,D,c}$ is the number of employed workers in the domestic sector during the closed period.

After obtaining estimates for the reservation wage using the data and taking logs of equation (14), maximum likelihood estimators are the solutions to the first order conditions:

$$\frac{\partial \ln L(w_{D,c}, t_c)}{\partial \Gamma} = 0 \quad (15)$$

where $\Gamma = (\eta_{D,c}, \lambda_{D,c}, \mu_{D,c}, \sigma_{D,c})$ is the parameter vector and $\mu_{D,c}$ and $\sigma_{D,c}$ are the means and standard deviations of the productivity parameter $\theta_{D,c}$.

C. The Two Sector Model

Before the onset of the second intifada on September 2000, workers in Gaza searched for jobs in both the domestic sector and Israel, which will be characterized as the foreign sector. In this section, the one sector model developed by Flinn (2005) is extended to two sectors. As before, workers can only search for jobs if they are in the state of unemployment and if they exit the state of employment they must enter the state of unemployment. Given that the model is set in continuous time, the value of employment for Gaza residents in the domestic and foreign sectors during the short interval of time ε is the following:

$$E_{D,o}(w_{D,o}) = (1 + \rho\varepsilon)^{-1} \{w_{D,o}\varepsilon + \eta_{D,o}\varepsilon V_{u,o} + (1 - \eta_{D,o}\varepsilon) * E_{D,o}(w_{D,o}) + o(\varepsilon)\} \quad (16)$$

$$E_{F,o}(w_{F,o}) = (1 + \rho\varepsilon)^{-1} \{(w_{F,o} - k)\varepsilon + \eta_{F,o}\varepsilon V_{u,o} + (1 - \eta_{F,o}\varepsilon) * E_{F,o}(w_{F,o}) + o(\varepsilon)\} \quad (17)$$

where the first index represents the sector, D for domestic and F for foreign and the second index represents the accessibility of Israeli jobs, o for open. Note that while the observed daily wage in the foreign sector is $w_{F,o}$, the real value of the wage for Palestinian commuters is $w_{F,o} - k$ where k represents the fixed additional cost (e.g. transportation, search, social or political cost) of working in Israel or the settlements. Combining like terms and taking the limit as $\varepsilon \rightarrow 0$ yields the following expressions:

$$E_{D,o}(w_{D,o}) = \frac{w_{D,o} + \eta_{D,o}V_{u,o}}{\rho + \eta_{D,o}} \quad (18)$$

$$E_{F,o}(w_{F,o}) = \frac{w_{F,o} - k + \eta_{F,o}V_{u,o}}{\rho + \eta_{F,o}} \quad (19)$$

The Nash-bargained wage for each sector during the open period follows from expression (3). Solving both maximization problems provides the two wage equations during the open period:

$$w_{D,o} = \alpha_{D,o}\theta_{D,o} + (1 - \alpha_{D,o})\rho V_{u,o} = \alpha_{D,o}\theta_{D,o} + (1 - \alpha_{D,o})\theta_{D,o}^* \quad (20)$$

$$w_{F,o} = \alpha_{F,o}\theta_{F,o} + (1 - \alpha_{F,o})\rho V_{u,o} + k = \alpha_{F,o}\theta_{F,o} + (1 - \alpha_{F,o})\theta_{F,o}^* + k \quad (21)$$

The value of unemployment for each sector will have three terms one more than in equation (7) where there was one sector. This is because when a worker is at the state of unemployment, there are three possible states he/she can enter in the future: remain in the unemployed state, enter the domestic employment state or the foreign employment state. Therefore the flow equation for the value of unemployment is:

$$\begin{aligned} V_{u,o} = (1 + \rho\varepsilon)^{-1} \{ & b_{D,o}\varepsilon + \lambda_{D,o}\varepsilon \int \max[V_{u,o}, E_{D,o}(w_{D,o})] \\ & + \lambda_{F,o}\varepsilon \int \max[V_{u,o}, E_{F,o}(w_{F,o} - k)] + (1 - \lambda_{D,o}\varepsilon - \lambda_{F,o}\varepsilon) * V_{u,o} + o(\varepsilon) \} . \end{aligned} \quad (22)$$

As in the one sector case, the reservation wages are solved for by simplifying the maximization problem. The reservation wage in the domestic sector is simply equivalent to the value of unemployment multiplied by the discount rate ρ . Similarly, the foreign sector reservation wage is equal to the domestic sector reservation wage plus the fixed cost of commuting which implies the real value of the reservation wage is equal to the domestic wage. Using equations (20) and (21), it is straightforward to infer that the reservation productivity value is equal in both sectors; these relationships are captured by the two equations: $\theta_{D,o}^* = w_{D,o}^* = \rho V_{u,o}$ and $\theta_{F,o}^* = w_{F,o}^* - k = \rho V_{u,o}$.

Taking the limit as $\varepsilon \rightarrow 0$, the value of unemployment can be simplified as:

$$\begin{aligned} \rho V_{u,o} = & b_{D,o} + \frac{\alpha_{D,o}\lambda_{D,o}}{\rho + \eta_{D,o}} \int_{\rho V_{u,o}} [\theta_{D,o} - \rho V_{u,o}] dG_{D,o}(\theta_{D,o}) \\ & + \frac{\alpha_{F,o}\lambda_{F,o}}{\rho + \eta_{F,o}} \int_{\rho V_{u,o}} [\theta_{F,o} - \rho V_{u,o}] dG_{F,o}(\theta_{F,o}) . \end{aligned} \quad (23)$$

D. Empirical Strategy during the Open Period (2000Q1-2000Q3)

In the one sector model, workers were divided into two groups, workers who were unemployed whose duration of unemployment is observed and employed workers whose wage is observed. In the two sector model, workers are divided into five groups, those who are working in the domestic sector with an observed wage $w_{D,o}$, those who are

working in the foreign sector with an observed wage $w_{F,o}$, those who are seeking employment and have not found employment by the last time they are observed, those who are seeking employment and have entered the domestic employment state, and those who are seeking employment and have entered the foreign employment state. As before, the labor market is memoryless and the hazard is constant so that the likelihood of receiving an offer at time t_o given that an offer has not been received before time t_o is the probability that a domestic firm and worker will make contact and the productivity of the worker is at least equal to the reservation productivity value for the domestic firms ($\theta_{D,o} \geq \theta_{D,o}^* = \rho V_{u,o}$) or the probability that a foreign firm and a worker will make contact and the productivity of the worker is at least equal to the reservation productivity value for foreign firms ($\theta_{F,o} \geq \theta_{F,o}^* = \rho V_{u,o}$):

$$\frac{q_{U,o}(t_o)}{1 - Q_{U,o}(t_o)} = \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) . \quad (24)$$

As before, the CDF of worker-firm productivity levels for both sectors takes the form of a negative exponential since the hazard is a positive constant:

$$Q_{U,o}(t_o) = 1 - (\exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] * t_o)$$

$$q_{U,o}(t_o) = (\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)) * (\exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] * t_o) .$$

Unlike the one sector case, in the two sector case those whose unemployment spells have ended are in one of two states; either they are employed in the domestic sector or in the foreign sector. This additional information is critical since it is necessary in order to identify the model. Thus, given that a spell of unemployment ends by the end of the survey date, the probability that a worker will be found in the domestic sector or the foreign sector are given by:

$$P(\text{domestic} | \text{spell ends}) = \frac{\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)}{\lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)}$$

$$P(\text{foreign} | \text{spell ends}) = \frac{\lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)}{\lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)}$$

In the two sector model, the employment flow equations for each sector are used to solve for the unemployment rate during the open period:

$$u_o \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) = e_{D,o} \eta_{D,o} \quad (25)$$

$$u_o \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) = e_{F,o} \eta_{F,o} \quad (26)$$

$$u_o = 1 - e_{D,o} - e_{F,o} \quad (27)$$

where $e_{D,o}$ and $e_{F,o}$ are the percentage of workers employed in the domestic and foreign sectors respectively. The three systems of equations yield the following unemployment rate and employment rates:

$$u_o = \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \quad (28)$$

$$e_{D,o} = \frac{\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \quad (29)$$

$$e_{F,o} = \frac{\lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \quad (30)$$

The joint likelihood of finding an unemployed person during the open period with an unemployment spell of duration t_o and given the unemployment spell ends the worker joins the domestic sector is:

$$L(t_o, u_o, \text{domestic} | \text{spell ends}) = q_{U,o}(t_o) P(\text{domestic} | \text{spell ends}) u_o \quad (31)$$

The joint likelihood of finding an unemployed person during the open period with an unemployment spell of duration t_o and given the unemployment spell ends the worker joins the foreign sector is:

$$L(t_o, u_o, \text{foreign} | \text{spell ends}) = q_{U,o}(t_o) P(\text{foreign} | \text{spell ends}) u_o \quad (32)$$

The joint likelihood of finding an unemployed person during the open period with an unemployment spell of duration t_o and the unemployment spell does not end is:

$$L(t_o, u_o) = q_{U,o}(t_o)u_o \quad (33)$$

The likelihood of finding an employed person in the domestic sector during the open period with a wage $w_{D,o}$ is:

$$L(w_{D,o}, e_{D,o}) = \frac{f(w_{D,o})}{\bar{F}(w_{D,o}^*)} * e_{D,o} \quad (34)$$

The likelihood of finding an employed person in the foreign sector during the open period with a wage $w_{F,o}$ is:

$$L(w_{F,o}, e_{F,o}) = \frac{f(w_{F,o})}{\bar{F}(w_{F,o}^*)} * e_{F,o} \quad (35)$$

As noted above, the likelihood function for the representative sample of N_o individuals is in the appendix, along with the other likelihood functions.

Estimates of the reservation wages $w_{D,o}^*$ and $w_{F,o}^*$ are taken from the data as the minimum values of all domestic and foreign wages such that:

$$\widehat{w_{D,o}^*} = \min\{w_{D,o,1}, w_{D,o,2} \dots \dots \dots w_{D,C,N_{E,D,o}}\} \quad (37)$$

$$\widehat{w_{F,o}^*} = \min\{w_{F,o,1}, w_{F,o,2} \dots \dots \dots w_{F,O,N_{E,F,o}}\} \quad (38)$$

$$k = \widehat{w_{F,o}^*} - \widehat{w_{D,o}^*} \quad (39)$$

where $N_{E,D,o}$ and $N_{E,F,o}$ are the number of employed workers in the domestic and foreign sector during the open period. After plugging in estimates of the reservation wages and taking logs of equation (36), the parameters of the model can be estimated. Maximum likelihood estimators are the solutions to the first order conditions:

$$\frac{\partial \ln L(w_{D,o}, w_{F,o}, t_o)}{\partial \Gamma'} = 0 \quad (40)$$

where $\Gamma' = (\lambda_{D,o}, \eta_{D,o}, \mu_{D,o}, \sigma_{D,o}, \lambda_{F,o}, \eta_{F,o}, \mu_{F,o}, \sigma_{F,o})$ is the parameter vector.

V. Results

In this section, I first estimate the model parameters during the open and closed period. Then, I conduct a comparative static exercise by using the domestic parameter estimates from open period to predict labor market outcomes during the closed period. In order to predict labor market outcomes, I impose the restriction $\lambda_{F,c} = 0$, which represents the blockade on the Gaza Strip and endogenize the labor force participation rate.

To further our understanding of the labor market, I estimate demand-side parameters by endogenizing the domestic contact rate through the use of two distinct matching technologies. Finally, I use the estimates of these results to quantify the economic cost of immobile labor and conduct a sensitivity analysis to assess how robust the results are given changes in the bargaining power parameter.

Open Period (2000Q1-2000Q3)

Table 4 displays estimates of the parameter vector Γ' along with the corresponding standard errors. In the first column, the parameters are estimated for the entire sample and in the remaining columns the model is estimated for other demographic groups. In the dataset, female Gaza residents do not report working in Israel and therefore, for this population, only the domestic parameters will be estimated. Initially, the bargaining power parameter for all sectors during all periods is set equal to 0.5 since it is the most standard procedure in the literature when demand-side information is not available as is the case here (Flinn and Heckman (1982), Eckstein and Wolpin (1995)). Setting the bargaining power parameter to 0.5 suggests there is no power dynamic between firms and workers, which may be optimistic given the limited work opportunities for workers in Gaza. Therefore, in the results section, I conduct a sensitivity analysis to investigate how robust the results are to changes in the estimates of workers' bargaining power. The estimated values of $\lambda_{D,o}$ and $\lambda_{F,o}$ suggest that offers arrive approximately every 3.15 years (1/.317) in the domestic market on average and every

14.71 (1/.068) years in the foreign labor market on average.³¹ On the one hand, men, unskilled workers and inexperienced workers are offered domestic jobs more frequently than their counterparts. On the other hand, their dismissal rate is also much higher than their counterparts suggesting these groups have higher levels of labor mobility. For example the point estimates for the dismissal rates in the domestic market suggest that the average job tenure is approximately 11 years for younger workers and 38 years for older workers.

In the foreign labor market, job offers arrive more often for older workers and dismissals for this group are more infrequent as well. Similarly, unskilled workers have a greater advantage over skilled workers in the foreign labor market with higher arrival rates and relatively comparable dismissal rates. Since the bargaining power parameter, $\alpha_{D,o} = \alpha_{F,o} = .5$ for all groups, the point estimates of the means and standard deviations of the productivity parameter for each sector, $\mu_{D,o}, \mu_{F,o}, \sigma_{D,o}, \sigma_{F,o}$, are monotonically increasing in the mean wage and standard deviation of the wage in Table 2 for all groups. As before, women, skilled workers and older workers are more productive (they earn higher wages and have similar reservation wages as their counterparts) in the domestic labor market. In the foreign labor market, however, although unskilled workers and older workers had an earnings advantage over their counterparts (see Table 2) skilled workers were more productive than unskilled workers due to the relatively high commute costs of unskilled workers. The standard errors suggest that all parameters are precisely estimated in this model.

Closed Period (2008Q1-2010Q4)

Table 5 reports parameter estimates from the model for the domestic labor market during the closed period. A comparison of Tables 4 and 5 immediately reveal that differences in labor market outcomes described in the data section are primarily driven by

³¹ This is consistent with the solution to the first order conditions of the log likelihood function (with respect to $\lambda_{D,o}$ and $\lambda_{F,o}$), which simplifies to the equation that the ratio of job offers received in the domestic market to those received in the foreign market equals the ratio of workers observed entering the domestic market to those entering the foreign market after exiting the state of unemployment $(\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) / \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) = N_{U,o,ends,D} / N_{U,o,ends,F})$. Parameter estimates in Table 4 simplify the left hand ratio to approximately 4.65 while according to the all category in Table 2, the right hand ratio is equal to $186/40 = 4.65$.

the fact that the job termination rate more than tripled for all groups. This fact is worth discussing since the sharp rise in the job extermination rate is exogenous in the model and has a profound impact on the remaining analysis uncovered in this paper. Part of the increase in the dismissal rate can be explained by the rise in the employment to unemployment flows between the open period and closed period. However, it is clear that the dismissal rate (as measured in the model in Tables 4 and 5) increased much more drastically than the percentage of employed individuals who subsequently became unemployed. One surprising outcome is that as the unemployment rate in the entire sample increased from approximately 14% to 39% between the open and closed periods, the domestic dismissal rate tripled but the domestic contact rate barely changed (from 0.317 to 0.307). One would have expected the increase in the unemployment rate to be explained by both a higher dismissal rate and a significantly lower contact rate, which is consistent with the increase in the duration of unemployment spells observed in the data. However, the removal of the foreign sector and the increase in the duration of unemployment spells (almost) offset each other so that the domestic contact rate is almost equal in the entire sample.

Although the contact rate slightly decreased for the entire sample, there is a lot of heterogeneity. While the contact rate increased for females, skilled workers and experienced workers, it decreased for the remaining groups especially unskilled workers. Furthermore, the mean productivity parameter grew by approximately 5-10% for all groups suggesting there was a shift in the composition of workers as well as more competition given that workers now search in only one labor market. As will be shown in the subsection on Welfare Empirics, an increase in productivity among Gaza residents should not be confused with an increase in social welfare.

Comparative Static Exercise

After obtaining estimates of the model's parameters during the open period, one can use these parameter estimates to predict labor market outcomes when Israel implements the blockade on the Gaza Strip by setting $\lambda_{F,c} = 0$. The assumption is that domestic parameters remain unchanged after the change in border policy. Table 6 reports the predictions for labor market outcomes for this comparative static exercise. Note that

women have the same labor market outcomes as they did before the policy change since they were not represented in the foreign labor market; thus, they will be excluded in the analysis for this subsection. The reservation wage is solved for using equation (7), which is in turn used with domestic parameter estimates to solve for the unemployment rate and (log) wage distribution. While the reservation wage is different across groups, it has decreased for all groups and is not highly variable across groups. The unemployment rate increased by approximately two percentage points and women, unskilled workers and younger workers continue to have the higher unemployment rates than their counterparts. The wage distribution for all groups shifted to the left due to lower reservation wages.

In order to predict the labor force participation rate when the blockade is in effect, I impose structure on the labor force participation decision. The labor force participation decision during the open period is defined as:

$$d_o = \begin{cases} 1 & \text{if } \rho V_o \leq \rho V_{u,o} \\ 0 & \text{if } \rho V_o > \rho V_{u,o} \end{cases} \quad (41)$$

where ρV_o is the flow value of being out of the labor market. On average, workers in an open economy will participate in the labor force if their flow value of not participating is less than the reservation wage. Therefore, the labor force participation rate in the open period can be written as:

$$Prob(d_o = 1) = Prob(\rho V_o \leq \rho V_{u,o}) = H(\rho V_{u,o}) \quad (42)$$

where $H()$ is the CDF of the flow value of the outside option, ρV_o . Analogously, the labor force participation rate can be written in the closed period as:

$$Prob(d_c = 1) = Prob(\rho V_o \leq \rho V_{u,c}) = H(\rho V_{u,c}) \quad (43)$$

Assuming ρV_o has a lognormal distribution the two parameters $\mu_{\rho V_o}$, $\sigma_{\rho V_o}$ can be recovered from the system of equations (equations (42) and (43)) given the labor force participation rates and the reservation wages during both periods.

The parameter estimates representing the mean and standard deviation of the flow value of being out of the labor market are larger than the reservation wage for all groups

except men. For women, the flow value is extremely large, suggesting that women place greater value in participating in activities outside the labor force than other groups. The extreme values for men and women reflect the large difference in the labor force participation rates between the two groups. The predicted labor force participation rate decreased for all groups using participation rates in the open period as a standard. As expected, the largest decreases in the participation rate were experienced by men, unskilled workers and older workers; this is not surprising since these groups were more dependent on Israel's labor market for employment, discourage labor force participation rate.

In order to measure the model's degree of accuracy in predicting labor market outcomes, the statistics predicted by the model in Table 6 are compared to the actual labor market outcomes in Gaza when border closures were enforced (Table 3). With the exception of women, the model correctly predicted that the reservation wage would decrease for all groups. However, the model predicted that skilled workers have a higher reservation wage, but their reservation wage is about half of the value of the reservation wage for unskilled workers. Furthermore, the magnitude of the predicted unemployment rate is less than one half of the actual unemployment rate during the closed period and understates unemployment for all groups. The model's predictions were inaccurate but the qualitative message that younger workers, women and unskilled workers suffered the most from high unemployment rates is correct. This suggests that the built-in assumption in the comparative exercise that domestic parameters in the likelihood function are constant after the change in border policies took place is not valid, as indicated by the differences in parameter estimates during the open and closed periods reported in Tables 4 and 5 respectively.

Mean wages are larger than the model predicted in the static exercise. In the static exercise, the wage distribution shifted to the left for all groups due to the decline in reservation wages for all groups. However, during the closed period, the reservation wages decreased but mean wages increased, suggesting that other changes occurred that may not be fully captured by the static exercise (e.g. change in the composition of workers in the domestic sector leading to increases in productivity etc). Unlike the case

for the unemployment rate, the predicted labor force participation rates in the static exercise were relatively accurate in determining the labor force participation in the closed period. The predicted values for the participation rates were between the actual labor force participation rates during the open period and closed period.

Endogenous (Domestic) Contact Rates

Thus far, the analysis has focused on the supply side of the labor market. In this section, I model domestic firms' decisions to create vacancies for workers in Gaza during the open period. The same analysis follows for the closed period.

Assume there exists a constant returns to scale (CRS) matching technology during the open period such that:

$$M(u_o l_o, v_o) = v_o \left(1 - \exp\left(-\frac{u_o l_o}{v_o}\right) \right) \quad (44)$$

where $u_o l_o$ is the population unemployment rate and v_o is the job vacancies rate. From the perspective of searchers, the contact rate is the average number of matches divided by the population unemployment rate:

$$\lambda_{s,o} = \frac{v_o \left(1 - \exp\left(-\frac{u_o l_o}{v_o}\right) \right)}{u_o l_o} \quad (45)$$

Similarly, from the firms' perspective, the contact rate is the average number of matches divided by the vacancy rate or:

$$\lambda_{f,o} = 1 - \exp\left(-\frac{u_o l_o}{v_o}\right) \quad (46)$$

Therefore, the expected value of creating a vacancy is:

$$\rho V_v = -\psi_o + \lambda_{f,o} \tilde{G}_{D,o}(\theta_{D,o})(J_{D,o} - V_v) \quad (47)$$

where ρV_v is the firms' flow value of not filling up the vacancy, ψ_o is the flow cost of creating a vacancy ($\psi_o > 0$), $\lambda_{f,o} \tilde{G}_{D,o}(\theta_{D,o})$ is the rate at which firms fill up a vacancy, and J is the expected value of a filled vacancy:

$$J_{D,o} = \int \frac{\theta_{D,o} - w_{D,o}}{\rho + \eta_{D,o}} * \frac{g(\theta_{D,o})}{G(\theta_{D,o}^*)} \quad (48)$$

The free entry condition for firms is to create vacancies until the expected value of creating a vacancy is zero which simplifies equation (47) to:

$$\psi_o = \lambda_{f,o} \tilde{G}_{D,o}(\theta_{D,o}) J_{D,o} \quad (49)$$

Since an estimate of $u_o l_o$ can be derived from the data, and a consistent estimator of $\lambda_{s,o}$ is provided by the model, equation (45) can be used to estimate the vacancy rate. Given the vacancy rate and other parameters of the model, the flow cost of creating a vacancy can be estimated by equation (49). The same procedure is followed for uncovering the demand side parameters during the closed period.

In the above analysis, demand side parameters are easily estimated because the matching function did not have any unknown parameters other than the vacancy rate. However, if the matching function has additional unknown parameters, more assumptions are required to uncover the demand side parameters. Both matching functions are considered in this paper since there is no consensus in the literature as to which matching function is more accurate. Consider a Cobb-Douglas CRS matching technology such that

$$M(u_o l_o, v_o) = (u_o l_o)^\omega v_o^{1-\omega} \quad (50)$$

for some $\omega \in (0,1)$.

The contact rates from the perspective of searchers and firms are:

$$\lambda_{s,o} = (u_o l_o)^{\omega-1} v_o^{1-\omega} \quad (51)$$

$$\lambda_{f,o} = (u_o l_o)^\omega v_o^{-\omega} \quad (52)$$

Unlike the previous case, estimates of $u_o l_o$ and $\lambda_{s,o}$ are not sufficient to estimate v_o and ψ_o . One way to proceed is by pooling the data from both periods and restricting the cost of creating a vacancy to be the same during the open and closed periods ($\psi_o = \psi_c$).

According to equation (49),

$$\lambda_{f,o} \tilde{G}_{D,o}(\theta_{D,o}) J_{D,o} = \lambda_{f,c} \tilde{G}_{D,c}(\theta_{D,c}) J_{D,c} \quad (53)$$

Therefore given $u_o l_o$, $u_c l_c$, $\lambda_{s,o}$, $\lambda_{s,c}$, the Cobb-Douglas parameter can be estimated by the following equation:

$$\lambda_{s,o}^{\frac{-\omega}{1-\omega}} \tilde{G}_{D,o}(\theta_{D,o}) J_{D,o} = \lambda_{s,c}^{\frac{-\omega}{1-\omega}} \tilde{G}_{D,c}(\theta_{D,c}) J_{D,c} \quad (54)$$

Given an estimate of ω , equations (51) and (49) can be used to estimate the vacancy rate for each period as well as the flow cost of creating a vacancy respectively.

In Table 7, estimates of the demand side parameters for the “All” category are displayed in columns (1) and (2) during the open and closed period respectively using the CRS matching technology, $M(u_o l_o, v_o) = v_o \left(1 - \exp\left(-\frac{u_o l_o}{v_o}\right)\right)$. The estimated vacancy rate during the open period is 0.019 which is approximately one-third of the population unemployment rate 0.058. These estimates are consistent with Flinn (2010) who focuses on the population of 16-24 year olds using US CPS data. During the closed period, the vacancy rate increased to approximately 0.044; the rise in the steady state vacancy rate after the blockade is expected given the surge in the population unemployment rate.³² The flow cost of creating a vacancy (ψ) is larger in the open period than the closed period, which is primarily attributed to the fact that the expected value of a filled vacancy is greater during the open period³³. The elasticity of the matching function with respect to the population unemployment rate is approximately 0.049 during the open period and 0.038 during the closed period. These estimates suggest that at the appropriate equilibrium levels during each period, the productivity gain from an additional vacancy is 19-25 times as high as the productivity gain from an additional unemployed searcher. The elasticity measures noted above are extremely low relative to the range (0.2, 0.4) presented in the literature (see Petrongolo and Pissarides (2001) for a comprehensive review).

³² The steady state vacancy rate and the population unemployment rate grew almost uniformly between the open and closed period. In fact, during the closed period, the vacancy rate is about three-tenths of the population unemployment rate, 0.144.

³³ The difference between the expected value of a filled vacancy in the open period ($J_{D,o}$) versus the closed period ($J_{D,c}$) is mainly attributed to the steep rise in the job extermination rate during the closed period ($\eta_{D,c}$).

Column (3) presents estimates of demand-side parameters using pooled data from both periods and a CRS Cobb-Douglas matching function. The steady state vacancy rates are almost negligible in the pooled sample. However, like before, the vacancy rate during the closed period is larger than the vacancy rate during the open period. The flow cost of creating a vacancy is large and incomparable to estimates in columns (1) and (2). The match elasticity with respect to the population unemployment rate, which in the case of a Cobb Douglas matching function is simply the Cobb Douglas parameter (ω), is 0.91. This estimate contradicts the match elasticity estimates in columns (1) and (2) where the majority of match creation productivity are ascribed to additional vacancies. Almost all estimates in column (3) are perverse in that they are too high or too low. One reason might be due to how the Cobb-Douglas parameter is estimated. In equation (54), the Cobb Douglas parameter is estimated without restricting any of the model's parameters other than the flow cost of creating a vacancy. Usually, the job extermination rate is restricted to be equal in the two periods of the pooled sample but in this analysis, since the results were primarily driven by the increase in the job extermination rate during the closed period, imposing such structure makes the model less credible. Since it is highly likely that the estimate of the Cobb-Douglas parameter is inaccurate, it follows that the steady state vacancy rates and the flow cost of creating a vacancy are inaccurate.³⁴

Note that with the exception of the flow cost of creating a vacancy (ψ), estimates in columns (1) and (2) are robust to changes in the bargaining parameter (α). Additionally, since it is assumed throughout the entire paper that workers in Gaza's domestic sector had more bargaining power during the open period than the closed period ($\alpha_{D,o} \geq \alpha_{D,c}$), then it must be the case that the expected value of a filled vacancy is larger during the open period ($J_{D,o} > J_{D,c}$). Similarly, in column (3), the Cobb Douglas parameter barely changes for all values where the bargaining parameter is equal in both periods, and when the bargaining power parameter during the open period is strictly larger than in the closed period ($\alpha_{D,o} > \alpha_{D,c}$), the Cobb-Douglas parameter exceeds 1.

Welfare Empirics

³⁴ When evaluating the Cobb Douglas parameter at 0.2, the vacancy rates and the flow cost of creating a vacancy are similar to the values reported in columns (1) and (2).

The goal of this paper is to quantify the economic cost of immobile labor. Several welfare measures are used to measure the impact of the Blockade on Gaza residents. The most intuitive welfare measure is Gross National Income (GNI) since GNI is a common economic indicator. GNI consists of domestic output plus wages and profits earned abroad. In the case of the Gaza Strip and in the context of this model (where labor is the only input in a firm's production function), an analogous measure of GNI is calculated in the following way:

$$GNI (Open) = l_o * e_{D,o} (\overline{\mu_{D,o}} + \overline{w_{D,o}}) + l_o * e_{F,o} * \overline{w_{F,o}}$$

$$GNI (CS) = l_{CS} * e_{D,CS} (\overline{\mu_{D,o}} + \overline{w_{D,CS}})$$

$$GNI (Closed) = l_c * e_{D,c} (\overline{\mu_{D,c}} + \overline{w_{D,c}})$$

where l_o and l_c represent the labor force participation rates during the open and closed periods respectively. CS denotes the values that were predicted using the comparative static exercise and the bars indicate average values. Although GNI is a common welfare measure, one criticism of GNI is that it does not account for the welfare levels of unemployed workers and non-participants. Other economic indicators such as the unemployment rate and the labor force participation rate demonstrate the relative sizes of the groups who have these characteristics but do not inform us on the distribution of welfare among these populations.

One way to remedy this and account for all individuals is by introducing a Benthamite social welfare function, which will allow us to incorporate the unemployment rate and the labor force participation rate as well as the average welfare level for these groups. Three welfare measures derived from a Benthamite social welfare function are the Rawlsian Criterion (RC), the Total Welfare Measure (TW) and the Participants Welfare (PW) Measure. These measures are computed during the open period in the following way:

$$RC_o = V_{u,o}$$

$$TW_o = (1 - l_o) * \overline{V_o} + l_o * u_o * V_{u,o} + l_o * e_{D,o} * (\overline{E_{D,o}} + \overline{J_{D,o}}) + l_o * e_{F,o} * \overline{E_{F,o}}$$

$$PW_o = l_o * u_o * V_{u,o} + l_o * e_{D,o} * (\overline{E_{D,o}} + \overline{J_{D,o}}) + l_o * e_{F,o} * \overline{E_{F,o}}$$

The calculations for the comparative static exercise and the closed period immediately follow. The first welfare measure equates welfare with the value of unemployed search (the reservation wage/ ρ). The motivation for using this welfare measure is to capture an estimate of welfare for individuals who are seeking jobs but are not able to attain employment and therefore, presumably have the lowest welfare value. The total welfare measure aims to capture a complete welfare measure by accounting for all people in a society; the first term is the portion of people outside the labor force times the expected value of not participating in the labor market. The second term refers to the population unemployment rate multiplied by the value of unemployed search. The third term refers to the population domestic employment rate multiplied by the sum of the expected value of domestic employment and expected value of filling a vacancy.³⁵ Finally, the fourth term refers to the population foreign employment rate multiplied by the expected value of foreign employment. The Participants Welfare (PW) measure simply excludes the first term so that only labor force participants are included. This will be the focus of the analysis in this paper since the welfare level of non-participants (V_o) is arbitrarily determined. In the appendix, Table I summarizes estimates of the value of outside labor force option, unemployment, employment in both sectors and filled vacancies for the open period, the comparative static exercise and the closed period. Table II reports all four welfare measures during the open period, closed period and the comparative static exercise.

Table 8 reports the welfare loss (%) between the comparative static exercise and the open period as well as the welfare loss (%) between the closed period and the open period. The results suggest the blockade had a profound impact on Gaza, where welfare losses during the closed period ranged between 22.6% and 53.9% depending on the measure used. When actual welfare losses (the percentage difference between social welfare during the closed and open period) are compared to predicted welfare losses (the percentage difference between welfare levels predicted using flow values from the comparative static exercise and during the closed period), the differences are stark for all

³⁵ In equilibrium, the number of employed individuals and the number of filled vacancies are equal.

measures except the Rawlsian criterion. This is because while the comparative static exercise was relatively accurate in predicting labor force participation rates and reservation wages, it understated the unemployment rate by an order of 2.5 for all groups and the job extermination rate by approximately an order of 3 for all groups, thereby underestimating the losses incurred after the blockade.

Sensitivity Analysis

In all the previous analyses, the bargaining power parameter is assumed to be 0.5 for workers in the domestic sector during both periods as well as workers in the foreign sector. An inaccurate estimate of the bargaining power parameter directly affects the mean of the productivity parameter θ , which in turn affects estimates of social welfare estimated in the previous subsection. For example if the bargaining power parameter is underestimated then the average productivity of workers (and the expected value of a filled vacancy J) is underestimated as well which means that welfare losses are overstated³⁶. Further, this paper assumes that employees in domestic firms during the open period have at least as much bargaining power than they did during the closed period and that at no point in time does the bargaining power parameter exceed 0.5. This is because during the open period, (potential) employees had more labor force options which were largely unavailable after the blockade was implemented such as seeking work in Israel or working in a domestic firm which has frequent business transactions with Israel. Therefore in the sensitivity analysis, I only consider the cases in which $\alpha_{D,o} \geq \alpha_{D,c}$.

Table 9 reports the Net Participants' Welfare Losses (%) between the Open and Closed Period for different values of the bargaining power parameters ($\alpha_{D,o}, \alpha_{D,c}$). For values where the bargaining power parameters are equal in the two periods, $\alpha_{D,o} = \alpha_{D,c}$, welfare losses are relatively large. However, the magnitude of the loss declines the lower the estimate of the bargaining power parameter. Table 9 suggests that even if the bargaining power of workers is sufficiently low (0.1) in both periods, welfare losses range between 25% and 63% depending on the demographic group.

³⁶ Since this paper does not address the productivity of Israeli firms or welfare levels in Israel, the bargaining power parameter for workers in the foreign sector is not discussed.

The magnitude of the welfare loss decreases at a more rapid pace with an increase in the difference between the estimates of the bargaining power parameters. When $\alpha_{D,o} - \alpha_{D,c} = 0.1$, although the losses are still large in magnitude, they are much smaller than when the bargaining power parameter were assumed to be equal. In fact, when $(\alpha_{D,o}, \alpha_{D,c})$ is (0.2, 0.1) the results show that skilled and older workers experience a welfare gain after the blockade. When the difference between the two bargaining power parameters is estimated to be 0.2 and $\alpha_{D,o} \geq 0.4$, welfare losses are relatively substantial, although when $\alpha_{D,o}=0.4$, skilled and older employees experience slight welfare gains after the blockade. When the difference between the two bargaining power parameters is estimated to be 0.3 and $\alpha_{D,o}=0.5$, then the magnitude of the welfare loss is economically significant only for women, unskilled and inexperienced workers but is almost completely offset by the welfare gains experienced by men, skilled and experienced workers. When $\alpha_{D,o}=0.4$, all groups are shown to experience welfare gains after the blockade; it is unlikely that workers lost such a large share of their bargaining power in the domestic labor market after the blockade. In conclusion, welfare losses between the open and closed period are relatively substantial as long as the bargaining power parameter in the closed period is at least 0.2 ($\alpha_{D,o} \geq 0.2$) and the difference between the two bargaining power parameters is at most 0.2 ($\alpha_{D,o} - \alpha_{D,c} \leq 0.2$).³⁷

VI. Discussion and Conclusion

Loss in social welfare is difficult to define. A more concrete way to identify what the welfare losses in Tables 8 and 9 capture is by estimating the reduction in wages necessary to incur an equivalent amount of social welfare loss as the blockade. In this paper, I do this exercise by assuming that the blockade did not occur and then estimate the decrease in average wage(s) necessary in the open period to reach the level of welfare

³⁷ It is unlikely that on average, workers in Gaza have a bargaining power parameter that is less than 0.2 although there may be a lot of heterogeneity across individuals (e.g. union status, socio-economic status, etc). Further, public sector expansion and the rise in the public wage premium in Gaza following the intifada (Miaari, 2006) and the blockade (Adnan, 2012a) indicates that workers in Gaza have some bargaining power with the largest employer in Gaza-the government. This also suggests that although workers' bargaining power decreased between the open period and the blockade, it probably was not very large to begin with. The specifications associated with $(\alpha_{D,o}, \alpha_{D,c})=(0.3,0.2)$ and $(\alpha_{D,o}, \alpha_{D,c})=(0.5,0.3)$ in Table 9 are probably the most accurate.

in the closed period. In the first two rows of Table 10, the average values of the real domestic and foreign wages are reported. The next two rows of Table 10 display the estimates of the average domestic and foreign wage required during the open period to produce the same level of welfare as in the closed period conditional on the constancy of all other variables and labor market outcomes (average match value, unemployment rate, % working in the foreign sector, labor force participation rates). Note that in this specification, there is a lower bound of \$1 for the daily domestic wage ($\ln \text{ wage}=0$) and a lower bound of \$2.7 for the daily foreign wage ($\ln \text{ wage}=1$; which barely covers commute costs). The domestic wage (0.98) for the “all” category is slightly higher than the reservation wage (0.88). Older workers and skilled workers have a clear advantage over other groups; however for domestic sector employees, who include approximately 74% of older wage-earners in Gaza and 89% of skilled wage-earners, the reduction in domestic wages is about one-third for older workers while the reduction for skilled workers is over 40%. The decline in foreign wages is not substantial but given that commute costs are fixed (assuming $k=1$), the real value of the foreign wage is reduced by a higher percentage.³⁸ In the “all” category, Table 10 implies that the level of welfare (analogous to GNI) during a period of absolute labor market segmentation in Gaza is equivalent to a level of welfare during the open period where there is a joint decrease in real domestic wages by 64% and in foreign wages (net of commute costs assuming $k=1$) by 18%³⁹.

The remainder of Table 10 displays the average wages in the domestic and foreign sectors conditional on the assumption that the level of Participants Welfare during the open period is equivalent to the corresponding measure during the closed period. The bargaining power parameter during the open period is assumed to be 0.5 while the level of bargaining power is allowed to vary during the closed period. The table shows that in order to preserve the same level of welfare during both periods, average wages in both sectors must decrease substantially for all groups when the difference between the

³⁸ For example, the average foreign wage for older workers is estimated to be 3.36 in Table 8 which is not much lower than their actual average foreign wage (3.61). However, given that commute costs are constant, the decrease in wages experienced by older workers is not $(3.61-3.36)/3.605=6.9\%$ but $(2.61-2.36)/2.61=9.57\%$.

³⁹ In Table 10, subgroups whose wage estimates are not equal to the set lower bounds, the solutions are not unique. Nevertheless, the range of solutions is relatively small.

bargaining power parameters is less than or equal to 0.2. When the difference between the bargaining power parameters is 0.3, the model suggests that men, skilled and older workers must earn higher wages because the level of welfare increased after the blockade⁴⁰.

It is highly unlikely that the difference in the bargaining power parameter is so large for Gaza workers in the domestic sector between the two periods. Future research should incorporate demand side information in order to estimate the bargaining power parameter. The decrease in average domestic and foreign wages that amount to the loss of social (PW) welfare are substantial for the majority of estimates of the bargaining power parameter under the condition: $\alpha_{D,o} \geq \alpha_{D,c}$. Although wage subsidies may increase social welfare for Gaza residents temporarily, this is not a long term solution since Gaza's economy suffers from isolation and dependence on Israel's economy. Further, it seems that Gaza's economy cannot sustain itself without labor and product market integration with neighboring countries like Israel and Egypt. Since these countries implemented the blockade on Gaza, a major concern is that it is impossible to disentangle Gaza's economic woes from its political ones.

⁴⁰ This is expected since estimates of welfare losses using the PW measure in Table 9 predict that men, skilled and older workers experience welfare gains when $(\alpha_{D,o}, \alpha_{D,c})=(0.5, 0.2)$.

Map 1-The Gaza Strip



Table 2--Descriptive Statistics during the Open Period (2000Q1-2000Q3)

	All	Men	Women	Skilled	Unskilled	Age<35	Age≥ 35
Number Employed (D)	2668	2371	297	1304	1364	1500	1168
Number Employed (F)	474	474	0	134	340	210	264
% Employed in Foreign sector	0.151	0.167	0	0.093	0.200	0.123	0.184
Number in Wage Sector (D)	1876	1702	174	1064	812	1135	741
Number in Wage Sector (F)	465	465	0	132	333	209	256
% of Wage sector in Foreign	0.199	0.215	0	0.11	0.291	0.156	0.257
LF Participation Rate	0.414	0.687	0.132	0.506	0.363	0.366	0.502
Total Unemployed	510	437	73	226	284	382	128
Unemployment Rate	0.140	0.133	0.197	0.136	0.143	0.183	0.082
Unemployment Spell (years)	2.60	2.22	4.86	3.28	2.06	2.51	2.85
Employment-Unemp Flows	0.079	0.085	0.027	0.055	0.099	0.099	0.056
Unemp Spell Ended by Survey	226	207	19	78	148	162	64
Employed in Domestic	186	168	18	68	118	143	43
Employed in Foreign	40	39	1	10	30	19	21
Monetary Unit: US \$ (2010)							
Mean Log Wage (D)	2.713	2.712	2.722	2.865	2.413	2.573	2.927
Standard Dev.(D)	0.449	0.437	0.535	0.429	0.395	0.393	0.446
Mean Log Wage (F)	3.526	3.526	-----	3.511	3.531	3.428	3.605
Standard Deviation Log Wage(F)	0.399	0.399	-----	0.472	0.367	0.464	0.316
Reservation Log Wage (D)	0.878	0.878	0.878	0.878	0.878	0.878	1.284
Reservation Log Wage (F)	2.057	2.057	-----	2.057	2.239	2.057	2.239
k (fixed commute cost)	1.179	1.179	-----	1.179	1.361	1.179	0.955

Source: Palestinian Labor Force Survey Data (2000-2000Q3)

Table 3--Descriptive Statistics during the Closed Period (2008-2010)

	All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
Employed	6409	5625	784	3695	2714	2873	3536
Wage Sector	4985	4270	715	3198	1787	2304	2681
L F Participation Rate	0.370	0.611	0.118	0.464	0.306	0.319	0.457
Unemployed	4099	3476	623	1669	2430	2762	1337
Unemployment Rate	0.390	0.382	0.443	0.311	0.472	0.490	0.274
Unemployment Spell (years)	3.26	3.20	3.56	3.09	3.37	3.13	3.52
Employment-Unemp Flows	0.122	0.125	0.099	0.084	0.174	0.164	0.088
Monetary Unit: US \$ (2010)							
Reservation Log Wage	0.405	0.692	0.405	0.405	0.692	0.405	0.692
Mean Log Wage	2.79	2.78	2.82	2.97	2.46	2.58	2.96
Standard Deviation Log Wage	0.628	0.627	0.631	0.563	0.604	0.595	0.604

Source: Palestinian Labor Force Survey Data (2008Q1-2010Q4).

Table 4--Model Estimates during Open Period ($\alpha_{D,o} = \alpha_{F,o}=.5$, $\rho=.1$)

Parameters	All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
$\lambda_{D,o}$	0.317 (0.017)	0.365 (0.021)	0.206 (0.024)	0.266 (0.021)	0.388 (0.028)	0.351 (0.021)	0.236 (0.029)
$\eta_{D,o}$	0.061 (0.004)	0.067 (0.005)	0.051 (0.009)	0.046 (0.005)	0.081 (0.008)	0.090 (0.007)	0.026 (0.004)
$\mu_{D,o}$	4.55 (0.021)	4.55 (0.021)	4.57 (0.081)	4.85 (0.026)	4.15 (0.028)	4.27 (0.023)	4.57 (0.033)
$\sigma_{D,o}$	0.899 (0.015)	0.881 (0.015)	1.07 (0.057)	0.857 (0.019)	0.790 (0.020)	0.787 (0.017)	0.893 (0.023)
$\lambda_{F,o}$	0.068 (0.010)	0.085 (0.013)	-----	0.039 (0.013)	0.099 (0.020)	0.0467 (0.012)	0.115 (0.023)
$\eta_{F,o}$	0.073 (0.012)	0.078 (0.013)	-----	0.066 (0.021)	0.082 (0.016)	0.085 (0.020)	0.056 (0.013)
$\mu_{F,o}$	3.82 (0.037)	3.82 (0.043)	-----	3.78 (0.125)	3.46 (0.081)	3.62 (0.125)	4.02 (0.040)
$\sigma_{F,o}$	0.798 (0.026)	0.798 (0.033)	-----	0.945 (0.096)	0.733 (0.058)	0.933 (0.090)	0.630 (0.030)

Source: Palestinian Labor Force Survey Data (2000-2000Q3). Standard errors are in parentheses.

Table 5--Model Estimates during Closed Period ($\alpha_{D,c}=.5$, $\rho=.1$)

Parameters	All	Men	Women	Skilled	Unskilled	Age<35	Age $\geq$ 35
$\lambda_{D,c}$	0.307 (0.005)	0.313 (0.005)	0.281 (0.011)	0.323 (0.008)	0.298 (0.006)	0.319 (0.006)	0.284 (0.008)
$\eta_{D,c}$	0.196 (0.005)	0.193 (0.005)	0.223 (0.015)	0.146 (0.006)	0.266 (0.009)	0.307 (0.010)	0.108 (0.005)
$\mu_{D,c}$	5.17 (0.018)	4.87 (0.019)	5.24 (0.047)	5.54 (0.020)	4.22 (0.029)	4.76 (0.025)	5.23 (0.023)
$\sigma_{D,c}$	1.26 (0.013)	1.26 (0.014)	1.26 (0.033)	1.13 (0.014)	1.21 (0.020)	1.19 (0.018)	1.21 (0.016)

Source: Palestinian Labor Force Survey Data (2008Q1-2010Q4). Standard errors are in parentheses.

Table 6--Model Predictions of Labor Outcomes Post-Blockade ($\lambda_F = 0$)

Comparative Static Exercise	All	Men	Women	Skilled	Unskilled	Age<35	Age $\geq$ 35
Reservation Wage	0.615	0.581	0.878	0.730	0.614	0.813	0.803
Unemployment rate	0.160	0.156	0.197	0.148	0.172	0.204	0.099
Mean Wage	2.58	2.56	2.72	2.79	2.38	2.54	2.69
Standard Deviation wage	0.450	0.440	0.535	0.429	0.395	0.394	0.446
$\mu_{\rho V_O}$	1.78	0.437	8.64	0.811	1.29	2.14	1.26
$\sigma_{\rho V_O}$	4.13	0.905	6.95	4.49	1.19	3.69	5.24
LF Participation Rate	0.389	0.563	0.132	0.493	0.283	0.359	0.465

Note: Table 6 reports the model's predictions of labor market outcomes using a comparative static exercise. To conduct this comparative static exercise, I use the parameter estimates during the open period in order to predict labor market outcomes when Israel implements the blockade on the Gaza Strip, setting $\lambda_{F,c} = 0$. Additionally, I assume that domestic parameters remain unchanged after the change in border policy.

Table 7—Point Estimates of Demand-side Parameters

	Open Period (1)	Closed Period (2)	Pooled (3)
$v_{D,o}$	0.019	--	7.38E-08
$v_{D,c}$	--	0.044	1.26E-07
Ψ	10.80	7.73	2831104
Match Elasticity	0.049	0.038	--
ω	--	--	0.915

Source: Palestinian Labor Force Survey Data (2000Q1-2000Q3) and (2008Q1-2010Q4). The Match elasticity in columns (1) and (2) is computed by deriving the elasticity of the matching function $M(ul, v) = v \left(1 - \exp\left(-\frac{ul}{v}\right)\right)$ with respect to the population unemployment rate and evaluating it at the equilibrium values. In column (3) the data from both periods are pooled and the matching function is Cobb-Douglas so that the match elasticity with respect to the population unemployment rate is equivalent to the Cobb-Douglas parameter.

Table 8 –Net Welfare Losses Relative to the Open Period

Panel A: Net Welfare Loss Between Open Period and Comparative Static Exercise (%)							
Welfare Measures	All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
Rawlsian Criterion	30.0	33.8	0	16.9	30.1	7.40	37.5
Total Welfare (TW)	-0.383	12.1	0	-0.565	2.22	-0.860	-1.35
Participants Welfare (PW)	3.39	16.2	0	-0.032	18.2	-0.429	0.970
GNI Welfare Estimate	-0.388	12.1	0	-1.23	13.4	-3.18	-1.54
Net Welfare Loss Between Open and Closed Period (%)							
Rawlsian Criterion	53.9	21.2	53.9	53.9	21.2	53.9	46.1
Total Welfare (TW)	22.8	39.6	1.29	33.7	20.3	18.1	24.0
Participants Welfare (PW)	52.2	44.6	60.7	44.7	51.9	61.8	36.6
GNI Welfare Estimate	22.6	24.9	31.4	14.3	38.9	36.6	9.25

Note: Table 8 reports the welfare loss (%) between the comparative static exercise and the open period as well as the welfare loss (%) between the closed period and the open period. These losses are computed using Table II in the appendix, which reports all four welfare measures during the open period, closed period and the comparative static exercise.

Table 9--Sensitivity Analysis: Net PW Loss (%) for different values of $(\alpha_{D,o}, \alpha_{D,c})$

Constraint: $\alpha_{D,o} = \alpha_{D,c}$							
$(\alpha_{D,o}, \alpha_{D,c})$	All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
(0.5,0.5)	52.2	44.6	60.7	44.7	51.9	61.8	36.6
(0.4,0.4)	51.1	45.0	60.7	43.4	52.8	61.4	34.5
(0.3,0.3)	49.9	45.4	60.8	42.3	53.8	61.0	32.3
(0.2,0.2)	48.3	46.0	60.9	40.8	55.3	60.5	28.6
(0.1,0.1)	46.4	46.7	63.0	39.1	58.1	61.7	24.6
Constraint: $\alpha_{D,o} - \alpha_{D,c} = .1$							
(0.5,0.4)	43.7	36.9	54.2	33.9	46.8	56.3	25.6
(0.4,0.3)	38.9	33.7	51.6	28.2	45.2	53.4	18.8
(0.3,0.2)	29.8	26.9	45.9	17.6	41.1	47.6	4.90
(0.2,0.1)	3.88	4.92	28.6	-12.4	26.3	30.1	-32.1
Constraint: $\alpha_{D,o} - \alpha_{D,c} = .2$							
(0.5,0.3)	29.7	23.9	43.5	15.9	38.3	47.2	7.77
(0.4,0.2)	14.4	11.2	33.1	-2.47	30.1	37.3	-14.0
(0.3,0.1)	-30.6	-28.7	1.30	-56.5	3.00	7.14	-76.0
Constraint: $\alpha_{D,o} - \alpha_{D,c} = .3$							
(0.5,0.2)	1.46	-1.89	22.0	-20.0	21.3	28.9	-29.5
(0.4,0.1)	-59.2	-56.3	-22.1	-94.6	-15.1	-11.1	-111

Note: Table 9 reports the Net Participants' Welfare Losses (%) between the Open and Closed Period for different values of the bargaining power parameters $(\alpha_{D,o}, \alpha_{D,c})$. It is assumed that Palestinian workers in Gaza had at least the same amount of bargaining power during the open period as in the closed period ($\alpha_{D,o} \geq \alpha_{D,c}$). First, the bargaining power parameters are considered equal in the two periods, $\alpha_{D,o} = \alpha_{D,c}$. Next, (PW) welfare losses are computed when the difference between the two bargaining power parameters during the open and closed period is 0.1, then 0.2 and 0.3.

Table 10--What is the Equivalence of the Blockade in terms of Real Wages?

		All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
Wages in Open Period	$\overline{w_{D,o}}$	2.71	2.71	2.72	2.87	2.41	2.57	2.93
	$\overline{w_{F,o}}$	3.53	3.53	0.00	3.51	3.53	3.43	3.61
Constraints: GNI is Equal in Both Periods, $w_{D,o} \geq 0, w_{F,o} \geq 1, \alpha_{D,o} = \alpha_{D,c} = .5$								
	$\overline{w_{D,o}}$	0.98	0.81	0.43	1.72	0.00	0.00	2.21
	$\overline{w_{F,o}}$	3.10	3.01	1.00	3.37	1.81	2.53	3.36
($\alpha_{D,o}, \alpha_{D,c}$) Constraints: PW is Equal in Both Periods, $w_{D,o} \geq 0, w_{F,o} \geq 1$								
(0.5,0.5)	$\overline{w_{D,o}}$	0.14	0.59	0.00	0.54	0.20	-0.46	1.43
	$\overline{w_{F,o}}$	1.00	1.04	1.00	1.06	1.00	0.00	1.06
(0.5,0.4)	$\overline{w_{D,o}}$	0.64	1.06	0.00	1.16	0.51	-0.31	2.09
	$\overline{w_{F,o}}$	1.05	1.06	1.08	1.07	1.02	0.94	1.07
(0.5,0.3)	$\overline{w_{D,o}}$	1.45	1.81	0.45	2.20	0.97	0.22	2.46
	$\overline{w_{F,o}}$	1.24	1.25	1.08	1.18	1.20	1.00	3.61
(0.5,0.2)	$\overline{w_{D,o}}$	2.63	2.83	1.57	4.03	1.08	0.85	4.71
	$\overline{w_{F,o}}$	3.53	3.53	0.00	3.51	3.53	3.43	3.61

In the first two rows of Table 10, the average values of the real domestic and foreign wages are reported. The next two rows of Table 10 display the estimates of the average domestic and foreign wage required during the open period to produce the same level of welfare as in the closed period conditional on the constancy of all other variables and labor market outcomes. Note that in this specification, there is a lower bound of \$1 for the daily domestic wage (ln wage=0) and a lower bound of \$2.7 for the daily foreign wage (ln wage=1; which barely covers commute costs).

The remainder of Table 10 displays the average wages in the domestic and foreign sectors conditional on the assumption that the level of Participants Welfare during the open period is equivalent to the corresponding measure during the closed period. The bargaining power parameter during the open period is assumed to be 0.5 while the level of bargaining power is allowed to vary during the closed period.

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Appendix (Log Likelihood Functions)

Closed Period

The likelihood of finding an unemployed person in the domestic sector during the closed period with an unemployment spell of duration t_c is:

$$L(t_c, u_{D,c}) = q_U(t_c) * u_{D,c} = \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) \exp(-\lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) t_c) * \frac{\eta_{D,c}}{\eta_{D,c} + \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)}$$

Similarly, the likelihood of finding an employed person in the domestic sector during the closed period with a wage $w_{D,c}$ is:

$$L(w_{D,c}, e_{D,c}) = \frac{f(w_{D,c})}{\tilde{F}(w_{D,c}^*)} * e_{D,c} = \frac{f(w_{D,c})}{\tilde{F}(w_{D,c}^*)} * \frac{\lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)}{\eta_{D,c} + \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)} \quad (13)$$

Therefore, the likelihood function for random sample of $N_{D,c}$ individuals is:

$$L(w_{D,c}, t_{D,c}) = \prod_{i \in S_{E,D,c}} \frac{g(\tilde{\theta}_{D,c})}{\alpha_{D,c} * \tilde{G}(\theta_{D,c}^*)} * \frac{\lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)}{\eta_{D,c} + \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)} \prod_{i \in S_{U,D,c}} \frac{\eta_{D,c} \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) \exp(-\lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*) t_c)}{\eta_{D,c} + \lambda_{D,c} \tilde{G}_{D,c}(\theta_{D,c}^*)} \quad (14)$$

where S_i are the number of sample members who are in state i at the time of the survey.

Open Period

The joint likelihood of finding an unemployed person during the open period with an unemployment spell of duration t_o and given the unemployment spell ends the worker joins the domestic sector is:

$$\begin{aligned} L(t_o, u_o, \text{domestic} | \text{spell ends}) &= q_{U,o}(t_o) P(\text{domestic} | \text{spell ends}) u_o \\ &= [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] * (\exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] * t_o) \\ &\quad * \frac{\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)}{\lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)} * \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \\ &= \\ &\quad \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) * \exp(-[\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{D,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] t_o) * \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \end{aligned} \quad (31)$$

The joint likelihood of finding an unemployed person during the open period with an unemployment spell of duration t_o and given the unemployment spell ends the worker joins the foreign sector is:

$$\begin{aligned}
L(t_o, u_o, \text{foreign} | \text{spell ends}) &= q_{U,o}(t_o) P(\text{foreign} | \text{spell ends}) u_o \\
&= \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] t_o * \\
&\quad \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \quad (32)
\end{aligned}$$

The joint likelihood of finding an unemployed person during the open period with an unemployment spell of duration t_o and the unemployment spell does not end is:

$$\begin{aligned}
L(t_o, u_o, \text{domestic} | \text{spell does not end}) &= q_{U,o}(t_o) u_o \\
&= [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] * \\
&\quad * (\exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*)] * t_o) * \\
&\quad \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \quad (33)
\end{aligned}$$

The likelihood of finding an employed person in the domestic sector during the open period with a wage $w_{D,o}$ is:

$$L(w_{D,o}, e_{D,o}) = \frac{f(w_{D,o})}{\tilde{F}(w_{D,o}^*)} * e_{D,o} = \frac{g(\tilde{\theta}_{D,o})}{\alpha_{D,o} * \tilde{G}(\theta_{D,o}^*)} * \frac{\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \quad (34)$$

The likelihood of finding an employed person in the foreign sector during the open period with a wage $w_{F,o}$ is:

$$L(w_{F,o}, e_{F,o}) = \frac{f(w_{F,o})}{\tilde{F}(w_{F,o}^*)} * e_{F,o} = \frac{g(\tilde{\theta}_{F,o})}{\alpha_{F,o} * \tilde{G}(\theta_{F,o}^*)} * \frac{\lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \quad (35)$$

Thus, the likelihood function for the representative sample of N_o individuals is:

$$\begin{aligned}
& L(w_{D,o}, w_{F,o}, t_o) \\
&= \prod_{i \in S_{E,D,o}} \frac{g(\tilde{\theta}_{D,o})}{\alpha_{D,o} * \tilde{G}(\theta_{D,o}^*)} * \frac{\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \\
&* \prod_{i \in S_{E,F,o}} \frac{g(\tilde{\theta}_{F,o})}{\alpha_{F,o} * \tilde{G}(\theta_{F,o}^*)} * \frac{\lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \\
&* \prod_{i \in S_{U,o, no\ end}} [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)] \\
&\quad * (\exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)] * t_o) \\
&\quad * \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \\
&* \prod_{i \in S_{U,o, ends,D}} \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)] t_o \\
&\quad * \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}} \\
&* \prod_{i \in S_{U,o, ends,F}} \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \exp - [\lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*)] t_o \\
&\quad * \frac{\eta_{D,o} \eta_{F,o}}{\eta_{D,o} \eta_{F,o} + \lambda_{D,o} \tilde{G}_{D,o}(\theta_{D,o}^*) \eta_{F,o} + \lambda_{F,o} \tilde{G}_{F,o}(\theta_{F,o}^*) \eta_{D,o}}
\end{aligned}
\tag{36}$$

where S_i are the number of sample members who are in state i at the time of the survey.

Appendix Tables

Table I-Estimates of the Value of Outside Labor Force Option, Unemployment, Employment in Both Sectors and Average Productivity by Period and Demographic Group

Open	All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
V_o	17.750	4.370	86.410	8.110	12.940	21.430	12.580
$V_{u,o}$	8.780	8.780	8.780	8.780	8.780	8.780	12.840
$E_{D,o}$	20.178	19.762	20.992	22.390	17.261	17.701	25.880
$E_{F,o}$	17.271	17.033	-----	17.539	15.879	16.191	21.596
$\mu_{D,o}$	4.547	4.545	4.567	4.853	4.148	4.268	4.569
$J_{D,o}$	11.37	10.96	11.47	13.59	8.77	8.396	12.997
Comparative Static	All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
V_o	17.750	4.370	86.410	8.110	12.940	21.430	12.580
$V_{u,c}$	6.150	5.810	8.780	7.300	6.140	8.130	8.030
$E_{D,c}$	18.361	17.678	20.992	21.416	15.897	17.225	22.974
$\mu_{D,c}$	4.547	4.545	4.567	4.853	4.148	4.268	4.569
$J_{D,c}$	12.192	11.85	11.47	14.104	9.486	8.561	14.903
Closed	All	Men	Women	Skilled	Unskilled	Age<35	Age≥35
V_o	17.750	4.370	86.410	8.110	12.94	21.43	12.58
$V_{u,c}$	4.050	6.920	4.050	4.050	6.920	4.050	6.920
$E_{D,c}$	12.094	14.046	11.539	14.477	11.742	9.404	17.824
$\mu_{D,c}$	5.167	4.868	5.243	5.535	4.22	4.763	5.228
$J_{D,c}$	8.039	7.122	7.187	10.422	4.817	5.344	10.893

Table II--Estimates of Welfare Measures during Open Period, Calibrated Exercise and Closed Period ($\alpha_{D,o} = \alpha_{F,o}=.5$, $\rho=.1$)

Panel A: Welfare Measures	All	Men	Women	Skilled	Unskilled	Age<35	Age $\geq$ 35
Open Period							
Rawlsian Criterion	8.78	8.78	8.78	8.78	8.78	8.78	12.8
Total Welfare (TW)	21.1	18.7	78.7	19.5	15.9	21.5	22.7
Participants Welfare (PW)	10.7	17.3	3.67	15.45	7.64	7.93	16.4
GNI Welfare	2.32	3.85	0.773	3.17	1.77	1.89	2.99
Comparative Static Exercise							
Rawlsian Criterion	6.15	5.81	8.78	7.30	6.14	8.13	8.03
Total Welfare (TW)	21.2	16.5	78.7	19.6	15.5	21.7	23.0
Participants Welfare (PW)	10.4	14.5	3.67	15.5	6.25	7.96	16.2
GNI Welfare	2.33	3.38	0.773	3.21	1.53	1.95	3.04
Closed Period							
Rawlsian Criterion	4.05	6.92	4.05	4.05	6.92	4.05	6.92
Total Welfare (TW)	16.3	11.3	77.7	12.9	12.7	17.6	17.2
Participants Welfare (PW)	5.13	9.61	1.44	8.55	3.68	3.03	10.4
GNI Welfare	1.80	2.89	0.530	2.72	1.08	1.20	2.72

The Impact of Politically-Determined Barriers on Labor Flows: The Case of West
Bank Residents

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Abstract

The mobility of labor is a key step to attaining efficient labor allocation as well as enhancing economic development and growth. One way labor mobility can lead to efficient outcomes is by encouraging out-migration from labor-intensive countries to capital-intensive countries. And yet, the political climate can interfere with how labor is allocated across sectors in the economy. In this paper, I examine the impact of politically-determined barriers on labor mobility by studying the migration decisions of West Bank residents.

The findings show that residence-based ID cards play a large role in shaping the decision to migrate as well as the decision to return for male residents of the West Bank. Further, border closures and closure obstacles negatively impact out-migration but play a minimal role in the decision to return to work in the domestic sector relative to the expected wage gain from migration. These trends suggest that labor mobility restrictions have a more profound effect on employment decisions for West Bank residents before they gain employment in the host country than afterwards.

I. Introduction

The mobility of labor is a key step to attaining efficient labor allocation as well as enhancing economic development and growth. One way labor mobility can lead to efficient outcomes is by encouraging out-migration from labor-intensive countries to capital-intensive countries (Hamilton and Whalley (1984); Iregui (2003)). And yet, the political climate can interfere with how labor is allocated across sectors in the economy.

Economic theory posits that individuals migrate if the expected benefit from migration exceeds the expected costs (Sjaastad (1962)). Therefore, as will be discussed in further detail in the literature review, the migration decision involves evaluating the difference between the expected wage in the host country and the current wage in the source country, differences in social welfare benefits (e.g. government housing in the host country vs. living in one's parent's house in the source country), the monetary cost of migrating, loss in social capital, and the cost of acquiring skills necessary to thrive in a new job and labor market (e.g. learning a new language or on-the-job training) (Chiquiar and Hanson (2005); Rosenzweig (2007); Gould and Moav (2009)). As such, migrants are a non-random subsample of the population since seeking to migrate involves a wide variety of familial, cultural, legal, social and economic factors. In regions where conflict is commonplace the political climate may also impact the migration decision.

In this paper, I examine the impact of politically-determined barriers on labor mobility by studying the migration decision of West Bank residents. The West Bank is a natural context to investigate the role of politically-determined barriers on labor flows. Firstly, following the eruption of the second intifada (uprising) in September 2000, Israel heightened security measures leading to several forms of labor mobility restrictions on West Bank residents. Another advantage of setting this study in the West Bank is the availability of micro-level household panel data from the 2000-2010 waves of the *Palestinian Labor Force Survey* (PLFS). These data allow the econometrician to observe the earnings and employment statuses of West Bank residents both in the home country (West

Bank) and the destination country (Israel); and secondly, the data are longitudinal which means that I can estimate the economic tradeoffs for the immigration decision (and the decision to return) better than most past studies. Finally, a third advantage of studying migration patterns in the West Bank is that the unique political circumstances in the region separating West Bank residents from Israeli residents allow a more accurate and complete analysis of labor flows because the data provides (at least theoretically) a representative sample of migrants and return-migrants.

The goal of this paper is to expand the empirical evidence on the determinants of migration by incorporating political factors. The analysis proceeds in the following steps. First, I estimate the expected wage gain from migration by computing counterfactual wage densities using the method of Dinardo, Fortin, and Limieux (1996). Then, proxies for politically-determined barriers are included to estimate the value-added of these barriers on the decision to migrate. Finally, I include a variety of demographic and socio-economic controls for a sample of West Bank residents observed working in the West Bank to address omitted variable bias. Note that each step is replicated for a sample of West Bank residents observed working in Israel or Israeli settlements in order to explore the determinants of return-migration as well.

The results demonstrate that for West Bank residents, the decision to migrate is largely predicted by politically-determined barriers relative to the expected wage gain. One drawback of the *Palestinian Labor Force Survey*, the primary dataset used in this paper, is that migrants who work in Israel cannot be distinguished from those who work in Israeli settlements. However, using a supplemental survey on Jerusalem residents which distinguishes between working in Israel and the settlements, I find that if a migrant worker is narrowly defined such that only individuals observed working in Israel are considered migrants, the evidence is suggestive that labor mobility restrictions play an even greater role in impeding out-migration. The findings in this paper are consistent with international studies that ascribe inefficiency in labor markets to restrictions on

labor mobility across regions (Hamilton and Whalley (1984), Iregui (2003), Walmsley and Winters (2005)). The findings also show that politically-determined barriers play a minimal role in the decision to return relative to the expected wage gain.

The next section provides a brief synopsis of the literature. The first part of section III defines migrant and return migrants in the West Bank and the remainder of the section is background information on the barriers to labor mobility in the context of the West Bank. Section IV describes the quarterly labor force survey data for Palestinian residents of the West Bank. Section V develops the theoretical framework and the empirical strategy used throughout this paper. Section VI presents the results and section VII checks the robustness of the results when the definition of a migrant or a return migrant is altered; section VIII concludes.

II. Literature Review

Conventional economic theory posits that an individual will choose to immigrate if the net benefits exceed the net costs. In broad terms, benefits include the expected wage that an individual would earn in the host country and costs include pecuniary and social costs associated with migration. However, such a basic model does not provide much insight into heterogeneity in the likelihood of migration among potential immigrants. There are two dominant models that economists have used to study such heterogeneity. One model, often referred to as the Roy Model (Roy (1951)), was applied to the immigration decision by Borjas (1987) and suggests that who decides to immigrate depends on the relative wage distributions of the source and host countries. That is, low-skilled immigrants are attracted to countries with less inequality than their country of origin, while high-skilled immigrants are attracted to countries with higher inequality than their respective source country. The intuition is straightforward: more equal countries directly or indirectly “tax” individuals at the top of the wage distribution and redistribute to low-wage earners, thereby generating a more compressed wage distribution. Thus, low-wage earners potentially gain from more concentrated wage distributions and have

higher economic incentives to migrate to countries where wages are relatively equally distributed. The same logic is used to argue that high-skilled workers will migrate to countries with a higher rate of return to skill as evidenced by a more unequal income distribution. While the model is quite stylized -- relying on some strong simplifying assumptions such as that migration costs do not increase or decrease with skill level -- it has much intuitive appeal.

One challenge to the Roy model is that there is suggestive evidence that migrants who leave developing countries with high income inequality to countries with lower income inequality are more likely to be high-wage and skilled workers (Feliciano (2005); Grogger and Hanson (2008); Belot and Hatton (2008); Rosenzweig (2007)). This is contrary to the predictions of the Roy model. To reconcile the literature, Gould and Moav (2009) propose that the Roy model is a more accurate predictor of selection for internal migration patterns in the United States (Borjas, Bronars and Trejo (1992); Abramitzky (2007)) as opposed to international migration patterns because international moves involve additional costs of migration, including cultural barriers, wars, language requirements, the presence of local networks in the host and source countries, immigration policy in the host country and perceptions or biases of the host country in the source country.

An alternative model for heterogeneity in the migration decision posits that migration costs are not constant across individuals and play a relatively large role in the migration decision. Migration costs can impede out-migration for credit-constrained individuals who cannot access capital markets; this is especially relevant for potential immigrants in developing economies. To the extent that credit market constraints lead to higher borrowing costs for low-wage earners, the cost of immigration is greater for low-income individuals as well (Chiquiar and Hanson, (2005)). For example, as Fernandez (2011) argues, Mexican migrants (to the US) from rural areas are positively selected while those from urban areas are negatively selected because individuals in rural areas are less likely to have access to capital markets. Similarly, the strength of migration

networks impacts the composition of Mexican migrants so that negatively-selected migrants are from regions with strong migration networks in the host country (which implies lower costs for migrant workers) while positively selected migrants come from areas with tenuous migration networks in the host country (which implies higher migration costs) (MacKenzie and Rapaport, (2007)).

Of course, migration costs can also include the political situation in each country, thereby producing political barriers to migration. The major contribution of this paper is to incorporate such costs in the migration decision.

III. Background

A. Definition of a Palestinian Migrant

There are several features which distinguish the case of Palestinian migrant workers from other cases where Roy's model and (other) extensions are usually tested in the literature. Given the nature of the Palestinian-Israeli conflict, Palestinian migrant workers must commute to Israel or the settlements daily because they are not allowed to reside in Israel or the settlements. Therefore, one may question whether Palestinians are really migrants or merely commuters. There are various definitions of a 'migrant worker' across the world, depending on the definition a particular country uses and/or the political context in question. I use the United Nation's broad definition of a migrant worker as "a person who is engaged or has been engaged in a remunerated activity in a State of which he or she is not a national." Palestinian migrant workers qualify since they are not citizens of Israel but work on neighboring Israeli land (see Map), which includes Israel proper as well as Israeli settlements (denoted by triangles on the Map) in the West Bank.

B. Border Closures and Closure Obstacles

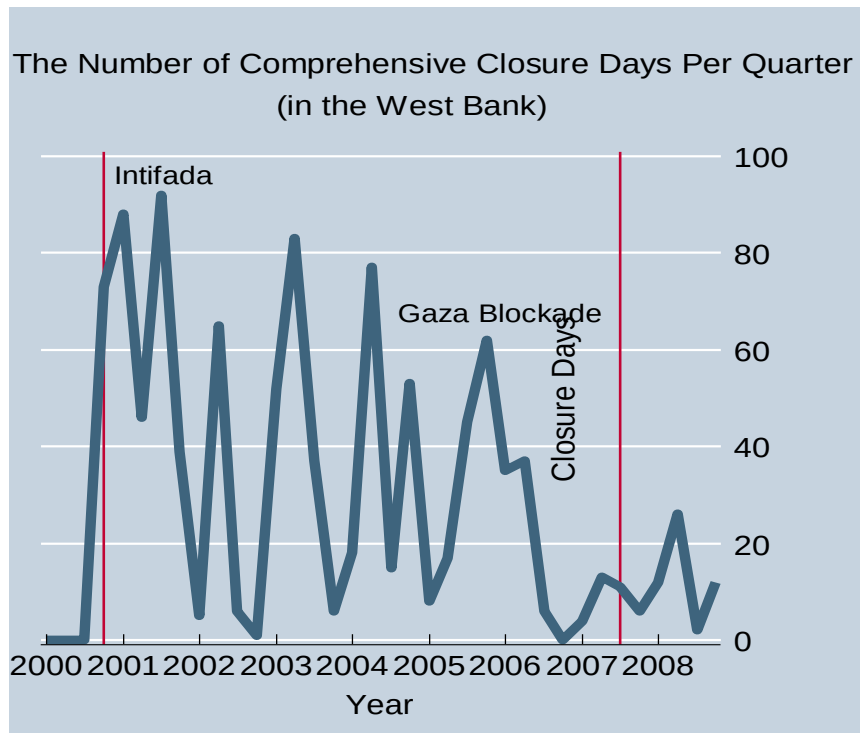
Another convention that is specific to Palestinian-Israeli migration is the source and nature of the primary form of migration costs across West Bank residents. The sources of migration costs identified in the literature include foregone earnings, fixed cost of relocating, learning another language, country-

specific skills, credit constraints, migration networks and residence permits. In the context of the West Bank, a major source of migration costs is a combination of physical barriers that limit and may even prohibit Palestinian labor from entering Israel and/or the settlements due to political or security reasons. The three main types of politically-determined barriers used throughout this paper are: a.) the number of closure obstacles per West Bank district per quarter, b.) the number of comprehensive closure days per quarter, and c.) the ID card/permit status of an individual worker.

The number of comprehensive closure days per quarter reflects the number of days the Israeli border was completely closed off from the Palestinian territories⁴¹. During closure days, the movement of people and goods are prohibited even if Palestinians have legal documentation to work or enter Israel and/or the settlements. Nevertheless, some Palestinians continue to work on Israeli land during closure days by crossing illegally or through informal arrangements with Israeli officials and security personnel. The following graph presents the number of comprehensive closure days in each quarter from 2000 to 2008:

Figure 1-

⁴¹Data on comprehensive closures in the Palestinian territories (the West Bank and Gaza) are obtained from B'tselem, an Israeli human rights organization.



Source: B'tselem (2008)

The figure demonstrates immense volatility from one quarter to the next during the second intifada, which began in the third quarter of 2000 and continued almost until Israel's blockade of Gaza in June 2007⁴²; both events are depicted by vertical reference lines in the graph above. Spikes in closure days can be explained by major political events that took place. In the first three quarters of the year 2000, there were no comprehensive closure days in the Palestinian territories. In contrast, in 2001, Palestinians experienced quarters where every day the Israeli border was closed; these closures were partially in response to violence by Palestinian extremists during the fourth quarter of 2000. In March 2002, Israel launched Operation Defense Shield in response to suicide bombings in Israel; it was the largest military incursion on the Palestinians since the Arab-Israeli war of 1967. This explains the spike in the second quarter of 2002. The spike in closure

⁴²The end date of the second intifada is disputed since the violence has only partially subsided over the years and increased again recently. However, the death of Arafat, the president of the Palestinian territories, for over three decades, in November 2004 and Israel's disengagement from Gaza which was completed in August 2005 are used as the most common markers for the end of the second intifada. Therefore, I used the average date---the first quarter of 2005---as a marker for the end of the second intifada.

days during the second quarter of 2003 can be explained by the cycle of violence after Israel's plan to start building the separation wall⁴³. In this paper, the blockade in Gaza, in which Gaza was completely closed to Israel (Adnan, 2012b), the West Bank and Egypt, is relevant only in that labor and product market integration between the West Bank and Gaza fully ceased.

Another impediment to labor mobility is the presence of closure obstacles⁴⁴. Closure obstacles are physical obstacles primarily intended to separate Palestinian areas from Israel proper and Israeli settlements. The most common form of closure obstacles are checkpoints manned by Israeli soldiers to ensure Palestinians enter Israel or Israeli settlements legally (more on this in the next subsection--ID Card/permit status). As the intensity of the conflict grows, searches at checkpoints become more time consuming and thorough producing long queues for employees going to and from work. Other examples of closure obstacles include earth mounds, road blocks, trenches, road gates. The most permanent and costly closure obstacle for both Israel and the West Bank is the separation wall; like other closure obstacles, the official purpose of building the separation wall was to secure Israelis from Palestinian violence.⁴⁵ The number of closure obstacles per district per quarter depends on the geography of the district, as well as recent political events. Closure obstacles usually separate Palestinian areas from Israel proper and Israeli settlements but if (for example) Israeli Defense Forces suspect the presence of local terrorist networks, closure obstacles can be used to separate Palestinian areas from each other.

⁴³The existence and frequency of border closures are not only driven by direct acts of violence from Palestinians. Clearly, if a suicide bomber attacks or attempts to attack Israeli civilians, border closures are implemented. However, border closures also take place during special occasions such as Jewish holidays, large Israeli protests or the mourning of a famous figure to curb Israeli fears that a Palestinian attack--exploiting the mass gathering of Israelis-- takes place.

⁴⁴Data on closure obstacles during the period 2004-2010 are obtained from the United Nation Office of Coordination and Humanitarian Affairs (OCHA).

⁴⁵ The separation barrier (also known as the wall) was built to separate the West Bank from Israel proper but was not built on the green line--the 1949 armistice line (see map). The 1949 armistice line defines the borders of Israel proper and the West Bank today. The barrier along the West Bank is under great scrutiny because approximately 12% of the West Bank is on the Israeli side of the wall.

C. ID Card/Permit Status

Another politically-determined cost to migration is a resident's ID card. For West Bank residents, there are two types of ID cards: a Jerusalem ID card and a West Bank ID card. A Palestinian obtains a Jerusalem ID card if his/her parents lived within the borders of Jerusalem when Israel occupied the West Bank in 1967 following the Arab-Israeli war. Otherwise, a Palestinian is issued a West Bank ID card, administered by the Palestinian Authority (PA). Jerusalem ID cardholders have lower migration costs than West Bank ID cardholders because Jerusalem ID cardholders are permanent residents of Israel, enjoy national insurance and social benefits, and are free to move and work throughout Israel, the settlements and the West Bank without entry or work permits (respectively). In addition, during times of political instability, their mobility is less affected by closure days and closure obstacles than the mobility of West Bank ID cardholders. Jerusalem ID cardholders are also allowed to work in Israel and are protected by Israeli labor law, which grants them at least the Israeli minimum wage plus benefits. West Bank ID cardholders must not only obtain work permits to work in Israel or the settlements but must also renew them every three months. The alternative is to work in Israel or the settlements without a work permit and become an undocumented worker. The process of acquiring and renewing work permits and/or working illegally is cumbersome especially during times of political instability as security measures are heightened.

In summary, West Bank residents have either a Jerusalem ID or a West Bank ID which is determined by their parents' residence status in 1967. Jerusalem ID cards facilitate movement (relative to PA ID cards) within areas in the West Bank and especially between the West Bank and Israel or the settlements; for migrants working in Israel or the settlements, having a work permit facilitates movement between the West Bank and Israel relative to not having a working permit (i.e. working illegally).

IV. Data

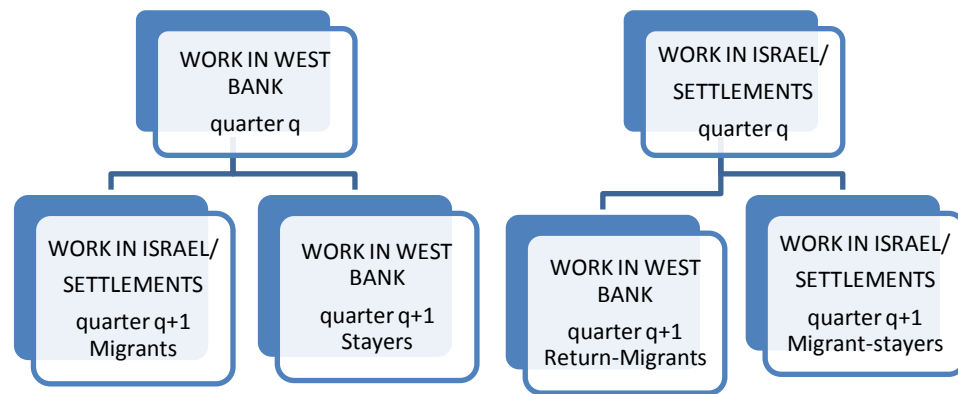
A. Palestinian Labor Force Survey (PLFS)

The primary datasets I use in this paper are micro level panel data from the *Palestinian Labor Force Survey* administered by the Palestinian Central Bureau of Statistics during the period 2000-2010. The PLFS of the West Bank and Gaza Strip is a quarterly household survey that investigates the labor force characteristics of Palestinians living in the territories. The survey has been administered by the Palestinian Central Bureau of Statistics since 1995, following the establishment of the Palestinian Authority (PA). During each quarter, over 7500 households are interviewed. Although the target population includes all people over the age of 10 years, labor market characteristics are only collected for those who meet the minimum work requirement age of 15 years old. The questionnaire is designed such that households are interviewed for two consecutive quarters, dropped for the next two quarters and then re-interviewed for the following two quarters, allowing one to construct short longitudinal panels. In this paper, I restrict the sample to males between the ages of 15-64 years that were surveyed between 2000 and 2010.⁴⁶ In general the response rate was approximately 90%. One drawback of the data however is that during the last two quarters of 2001, the response rate was less than 40% due to the cycle of extreme violence that took place during this period.

For the proceeding analysis, a migrant worker is defined as a wage earner who works in the West Bank in quarter q and then works in Israel or the settlements in quarter $q+1$. Similarly, a return migrant is defined as a wage earner who works in Israel or the settlements in quarter q and then works in the West Bank in quarter $q+1$. As depicted in Figure 1, characteristics of migrants and stayers are observed in the West Bank in quarter q and characteristics of return-migrants and migrant-stayers are observed in Israel or the settlements in quarter q .

⁴⁶ I exclude women because they generally have low labor force participation rates and conditional on being employed, women are concentrated in the domestic sector which does not allow sufficient variation to explore the migration decision. I exclude years prior to 2000 because 2000 was the first year longitudinal data was available. Prior to 1999 the data was only cross-sectional; in 1999, the housing and person ID's were not consistent and cannot not be matched across units of time.

Figure 2



Due to the unique political circumstances in the West Bank, migrant workers must commute to Israeli land and return home daily to the West Bank because it is illegal for Palestinians in the territories to ‘move’ to Israel or an Israeli settlement. In contrast, in the majority of countries where migration is studied, migrants are not accurately represented in the data since they have the choice to commute to the host country, move alone to the host country, or move with their families or households. Therefore, unlike several other datasets where migrants are undercounted because they or their entire households moved to the host country⁴⁷, this dataset does not encounter this problem. At least theoretically,

⁴⁷ For example, Chiquiar and Hanson (2005) investigate the migration decision for Mexican immigrants using US census data, which is known to under-count Mexican immigrants (Hanson, 2006). Studies (McKenzie and Rapoport (2007a); Orrenius and Zavodny (2005)) using data from Mexico (e.g. Mexican Migration Project) were problematic in that the data was from one region in Mexico and was not nationally representative. In addition, none of these studies have longitudinal data. Ibarra and Lubotsky (2007) use the Mexican census they estimate the schooling level of Mexican migrants based on family members left behind but miss migrants who move with their entire households to the United States. Moraga (2007) and (2009) study the decision of Mexicans to migrate using the ENET dataset, which is a nationally representative and longitudinal dataset but Mexican migrants are under-counted because the ENET misses households or individual

the PLFS data provides a representative sample of migrant wage-earners and return-migrant wage-earners.

Additionally, these data have several unique features in the context of testing different models of migration. For example, longitudinal data allow the econometrician to observe wages and other observable characteristics of migrant workers in the source country (West Bank) during the quarter before migration. Similarly, characteristics of return-migrants are observed in the host country (Israel) during the quarter before the migrant worker returns. Secondly, information about migrants' employment and earnings in Israel is included for both documented and undocumented migrant workers so that illegal migrant workers are not misrepresented either.

A major drawback of the PLFS data is that although ID type and permit status are observed for migrants, ID type is not observed for workers in the West Bank. Therefore ID type and permit status cannot be incorporated in the analysis concerning the decision to migrate since data for ID type is not available for stayers while permit status is not applicable since West Bank residents do not need work permits to work in the West Bank. Another shortcoming of the PLFS data is that migrant workers in Israel cannot be distinguished from migrant workers in the Israeli settlements. Because of these two disadvantages of the PLFS data—lack of data on ID type for domestic workers in the West Bank and insufficient detail on the migrants' place of work (Israel or the settlements)—I supplement the analysis with the Social Survey of Jerusalem (SSJ) data.

B.) Social Survey of Jerusalem (SSJ)

The 2005 wave of the Social Survey of Jerusalem is administered by the Palestinian Central Bureau of Statistics (PCBS). The target population was all Palestinians who reside in the greater Jerusalem area (area J1 or J2) for at least 6 months out of the year. The sampling frame is comprised of enumeration areas in

migrants that moved to the United States. The ENET also misses return-migrants who come back and do not return to their original households but create new households.

the Jerusalem governorate, where the frame of Area J1 was derived from the listing project in 1999 and the frame of Area J2 was derived from the Population, Housing, and Establishments Census in 1997. Data collection was initiated on April 12, 2005 and completed on June 13, 2005. The dataset includes a total of 3300 households of which 2240 households resided in J1 and 1060 households resided in J2. The sample is restricted to male workers between the ages of 15 and 64 years old. The overall response rate was 75%⁴⁸.

These data are richer than the PLFS data in that Palestinians who work in the settlements (16% of all migrant workers in this dataset) can be differentiated from those who work in Israel. Furthermore, everyone reports whether they possess a Jerusalem ID card or a West Bank ID card which is important since ID cards not only impact employment opportunities in Israel but those in the West Bank as well. Since the decision to migrate and return depend on the relative costs and benefits of working in the domestic and foreign sectors, data on ID type is important. That being said, there are two major disadvantages of the SSJ data: the data are not longitudinal and are nationally representative since they only cover residents of the greater Jerusalem area.

V. Methodology

A. Theoretical Framework

I model an individual's decision to migrate as a cost-benefit analysis such that Palestinians are assumed to seek work in Israel when the Israeli daily wage exceeds the Palestinian wage net of the total migration costs. Thus, the wage distribution of migrant workers in the West Bank (0) is compared to the wage distribution they face in Israel/settlements⁴⁹ (1). These two distributions are as

⁴⁸ This is a relatively low response rate and was primarily due to closures in the region as well as the building of the separation barrier. The response rate in the 2003 wave of the same survey was approximately 89%.

⁴⁹ Note that the wage distribution West Bank residents face in Israel/settlements in this paper is not the same wage distribution a Jewish or Palestinian citizen of Israel faces in Israel or the settlements. For example, the wage distribution West Bank residents face in Israel or the settlements does not have a spike at the Israeli minimum wage since West Bank residents are not Israeli citizens and are treated differently by the state than Jewish and Arab citizens of Israel.

follows:

$$\log w_{0idt} = \mu_0 + \delta_0 X_{idt} + \epsilon_{0idt} \quad (1)$$

$$\log w_{1idt} = \mu_1 + \delta_1 X_{idt} + \epsilon_{1idt} \quad (2)$$

$$\epsilon_0 \sim N(0, \sigma_0^2) \epsilon_1 \sim N(0, \sigma_1^2)$$

where X_{idt} is a set of demographic and socio-economic covariates for individual i in district d in quarter t that potentially contribute to the migration decision. Then, the probability of working in Israel/settlements is:

$$P(I > 0) = P(\mu_1 - \mu_0 + (\delta_1 - \delta_0)X_{idt} + \epsilon_{1idt} - \epsilon_{0idt} > 0) \quad (3)$$

In this analysis migration costs vary across individuals, districts of residence and time (measured in quarters). Let C_{idt} denote the costs of migration for individual i residing in district d during quarter t ⁵⁰. If there are no barriers to commuting, commute costs are simply a function of the distance between an individual's residence and Israel or the settlements. To proxy for the relative commute cost of working on Israeli land relative to the West Bank, I created a binary variable that is equal to 1 if the individual resides in a district that borders Israel proper and 0 otherwise. Individuals who live in a district that borders Israel have a geographic advantage to their counterparts and are expected to have a higher likelihood of becoming migrant workers. However, this measure of commute costs is undermined by the fact that Israeli settlements are located on the West Bank. For example, Palestinians who live in close proximity to Israeli settlements but live far away from Israel's border are considered to live far away from Israeli land⁵¹.

Migration costs also include politically-determined barriers in the form of the number of border closure days per quarter and the number of closure obstacles per district per quarter. When Israel implements border closures, migrants'

⁵⁰ For the analysis concerning migrants and stayers the costs of migration are represented by C_{dt} so that costs are not indexed by the individual. However, for return-migrants, the costs of migration are represented by C_{idt} because costs for return migrants include ID card and work permit status.

⁵¹ If the PLFS data allowed the researcher to distinguish between migrants who work in Israel and those who work in the settlements, this issue could have been resolved.

commuting costs rise due to additional transportation costs associated with long queues at the border and time-consuming investigations.⁵² Similarly, a high number of closure days or obstacles such as checkpoints and roadblocks increase job search costs associated with working in Israel/settlements relative to the West Bank. The consequences of closure obstacles and closure days are exacerbated for individuals who possess West Bank ID cards (relative to Jerusalem ID cards) and especially for individuals who do not have a valid work permit to enter Israel or the settlements. Regional variables are also included to capture the variation across regions in migration opportunities (e.g. the number of settlements) as well as local opportunities. The probability of migrating is then:

$$P(I > 0) = P(\mu_1 - \mu_0 + (\delta_1 - \delta_0)X_{idt} + \epsilon_{1idt} - \epsilon_{0idt} - \gamma C_{idt} > 0) \quad (4)$$

where C_{idt} is a set of covariates that includes whether an individual lives in a district that borders Israel, region dummies, politically-determined barriers, and interaction terms between region dummies and politically determined barriers; γ is the parameter vector for the set of covariates C_{idt} .

B. Empirical Strategy

The model above can be rewritten as a probit model in the following way:

$$Y_{idt}^* = \beta X_{idt} + \gamma C_{idt} + \epsilon_{idt} \quad (5)$$

where Y^* is a latent variable greater than 0 if an individual migrates next quarter. X_{it} represents a set of covariates such as years of schooling, potential labor market experience, experience squared, marital status, locality type (i.e. urban, rural, refugee camp), public/private sector, industry and occupation effects for individual i in quarter t . C_{idt} represents total migration costs which include a dummy variable for whether or not an individual lives in a district that borders Israel, the number of closure obstacles, and interaction terms between the number

⁵²During the aftermath of the intifada, Israeli foreign policy encouraged foreign migrants to work in Israel by increasing the issuance of foreign work permits. This was viewed by Palestinians as an attempt to substitute Palestinian labor. Given the high rates of Palestinian absences and low rates of punctuality in Israeli jobs due to uncertainty at the Israeli border, Palestinian fears of being replaced as Israel's low-skilled labor supply are sensible.

of closure obstacles and regional residence dummies (Northern area of the West Bank, Central, South, Jerusalem). An alternative analysis to using the number of closure obstacles for politically-determined barriers is to use closure days per quarter where the set of covariates used are a quartic in the number of closure days and interaction terms between closure days and regional residence dummies⁵³. Although the results for both analyses are qualitatively similar, in this paper, I display results only for the analysis using the number of closure obstacles since closure obstacles vary across districts and quarters while closure days vary only over quarters; this means that the period of study for this paper will cover the period 2004-2010 (see footnote 4).

The McFadden R squared takes on values in the interval 0-1 and measures the extent in which the model accurately fits the data. Changes in this measure of statistic across specifications shed light on which factors most heavily explain the decision to migrate in the West Bank. I also implement this model to study return-migrants and migrant-stayers, all of which are observed working in Israel or the settlements at quarter q . For this analysis, I am also able to examine the role of the possessing Jerusalem ID cards, West Bank ID cards and work permits on the decision to return from migration.

C. Endogeneity?

One potential problem with this specification that must be addressed is whether the measures of politically-determined barriers in this paper are endogenous to the error term in equation (5). For example, if Israeli implementation of the number of closure obstacles and/or closure days is driven by Palestinian aggression towards Israel, which in turn negatively affects Israel's economy, then individuals may choose to stay in the West Bank due to lower future expectations of Israeli wages. This implies that the coefficients of

⁵³ It turns out that when incorporating politically-determined barriers into the regression analysis, the results concerning the impact of closure days on the migration decision are very sensitive to the parametric form of the closure day variable.

politically-determined barriers in equation (5) are downward biased. While a possibility, I do not believe such endogeneity is a large factor for several reasons.

Firstly, closure days are imposed on the West Bank if a Palestinian attacks a group of Israelis directly (through a suicide bomb, a rocket or any other measure of violence) or when the perceived threat is high according to Israeli officials. The perceived threat level however is measured through a wide variety of factors such as altercations between Palestinians and Israeli settlers in the West Bank, increases in the Palestinian incarceration rate, increases in Palestinian unemployment and Jewish holidays. While all of these factors may have varying effects on Israel's economy, a study by Fielding and Shortland (2005) shows the decline in tourism can account for almost the entire difference in the budget deficits between 1999 and 2004.⁵⁴ Since Palestinian residents of the West Bank rarely worked in Israel's tourism industry, the spillover effect of the intifada (post-September 2000) on Palestinians' decision to migrate through a downward turn in Israel's economy is likely small.

Additionally, Israeli sectors where Palestinians usually worked—such as agriculture and construction—incurred losses of approximately 2% after the intifada. Some have argued that these losses cannot be attributed to bombings in cafes and buses but a result of Palestinian workers' inaccessibility to Israel and the settlements due to labor mobility restrictions following heightened security measures. For example, consistent with a perceived shortage of Palestinian workers, Israel increased the number of foreign work permits issued during the aftermath of the second intifada in an attempt to replace Palestinian labor with temporary foreign guest workers (Bulmer, 2003; Miaari, 2003).

Another argument is that the product market was also impacted by the intifada since goods were not traded as regularly as during the pre-intifada period. The decline in Israeli exports to the West Bank could have indeed affected all Israeli sectors to varying degrees but that the intifada actually had a much

⁵⁴After 2004, Palestinian violence towards Israel subsided due to the building of the West Bank barrier.

stronger and more comprehensive impact on the economy of the West Bank than Israel's economy. In fact, according to the Bank of Israel, losses in Israel were between 0.7% and 1.8% of GDP in 2003; in the West Bank however, GDP decreased by 24.4% between 1999 and the end of 2002 (Aljuni, 2003; Merli, 2003). Therefore, it is not likely the case that the ongoing cycle of violence discouraged out-migration because Israeli jobs became a relatively less lucrative opportunity for West Bank Palestinians. In fact, given the deterioration of the West Bank economy, the expected wage gain from working in Israel was probably greater after the intifada than before the intifada. Thus, it is likely that the coefficients for closure days and closure obstacles in the specification are biased upwards, underestimating the impact of closures on the migration decision.

Like the number of closure days and closure obstacles, a potential concern is the endogeneity of Jerusalem ID cards and work permits. If Jerusalem ID cards and work permits are distributed according to one's level of wealth for instance, then their parameter estimates may partially pick up the effect of wealth endowment on the decision to migrate. Historically, Jerusalem ID cards were distributed according to the residence status of one's parents. A West Bank Palestinian can only obtain a Jerusalem ID card if his/her parents lived within the borders of (Arab) Jerusalem when Israel occupied the West Bank in 1967. Otherwise, Palestinians inherit a West Bank ID card from their parents.

Since Jerusalem was the largest metropolitan area in the West Bank, some may be concerned that residents of Jerusalem in 1967 were not representative of the population in the West Bank. Specifically, the concern lies in that current residents of Jerusalem are a non-random sample of current West Bank residents and may have more (or less) migration opportunities for reasons other than having a Jerusalem ID card (i.e. ability, savings, family connections, etc.). Whether residents of (Arab) Jerusalem in 1967 were representative of the population in the West Bank or not in terms of characteristics that are relevant to the (return) migration decision requires data that pre-dates the 1967 Israeli occupation of the West Bank. Unfortunately there is no such data to assess whether Jerusalem

residents are comparable in terms of demographic and socio-economic characteristics to residents in the remaining areas of the West Bank. Given that historically urban areas such as Hebron and Nablus were also hubs of economic activity in the West Bank, it is unlikely that residents of Jerusalem had significantly greater migration opportunities than other residents in 1967 to generate substantial bias in the current results.

As for work permits, while there is no official protocol for what Palestinians must do to obtain and renew work permits in a timely manner, there is weak anecdotal evidence that Israel's Civil Administration favors certain demographic groups (married, over 40 years old, non-refugees, etc) over others and that the (unofficial) policies varied over time. To address the potential bias due to endogeneity from different types of ID cards and work permits, I include controls for demographic and socio-economic characteristics.

D. Computing the Expected Wage Gain

A key hypothesized determinant of the decision to migrate is the expected economic gain from migration. I compute the expected return to migration for migrants, stayers, return-migrants and migrant-stayers as follows. Let the actual wage distribution of migrants and stayers be represented by:

$$g_{i,1}(w) = \int f_{i,1}(w|x)h_{i,1}(x)dx; i = s, m \quad (6)$$

where $f_{i,1}(w|x)$ represents how the wage, w , responds to changes in observable characteristics and $h_{i,1}(w|x)$ is the density of characteristics at location 1 for stayers ($i=s$) and migrants ($i=m$). Note that for both migrants and stayers, location 0 is the West Bank but location 1 refers to Israel or the settlements for migrants ($i=m$) and location 1 refers to the West Bank for stayers ($i=s$). The counterfactual wage distribution for stayers is computed by assuming stayers are rewarded for their characteristics exactly like migrants. In order to control for a quarterly time trend all actual wage and counter-factual wage distributions are deviated from the quarter average. Formally, the counterfactual wage distribution deviated from the average for stayers is:

$$\hat{g}_{s,1}(w) = \int f_{m,1}(w|x)h_{s,1}(x)dx \quad (7)$$

In order to estimate this counterfactual wage distribution, Dinardo Fortin and Lemieux (1996) rewrite the density as:

$$\hat{g}_{s,1}(w) = \int f_{m,1}(w|x)h_{s,1}(x)dx = \int f_{m,1}(w|x)h_{m,1}(x) \frac{h_{s,1}(x)}{h_{m,1}(x)} dx \quad (8)$$

The above equation is equivalent to computing the actual wage distribution of migrants using equation(6) and then reweighting it by $= \frac{h_{s,1}(x)}{h_{m,1}(x)} = \frac{\frac{P(s|x)}{1-P(s|x)}}{\frac{P(s)}{1-P(s)}} \cdot P(s)$ simply represents the portion of stayers in the sample and $P(s|x)$ can be estimated from a probit model. The dependent variable is 1 if a Palestinian works in Israel/settlements the following quarter and 0 otherwise. Whether or not a Palestinian becomes a migrant worker the next quarter is regressed on the years of schooling, potential labor market experience, experience squared, locality type, industry, working in the private sector, industry and occupation fixed effects.

Similarly, the counterfactual wage distribution for migrants from the West Bank had they been paid like stayers is:

$$\hat{g}_{m,1}(w) = \int f_{s,1}(w|x)h_{m,1}(x)dx$$

Therefore the expected return to migration for migrants is the difference between their actual wage in Israel in location 1 (deviated from the quarter average) and their counterfactual wage in the West Bank (deviated from the quarter average). For stayers, the expected wage gain is the difference between their counterfactual wage in Israel (deviated from the quarter average) and their actual wage in the West Bank (deviated from the quarter average):

$$\text{Expected Wage gain for migrants} = g_{m,1}(w) - \hat{g}_{m,1}(w)$$

$$\text{Expected Wage gain for stayers} = \hat{g}_{s,1}(w) - g_{s,1}(w)$$

I repeat this exercise for return migrants and migrant stayers. The expected wage gain for migrant-stayers is their actual wage in Israel or the settlements(deviated from the quarter average) minus the counterfactual wage in

the West Bank (deviated from the quarter average). Similarly, for return migrants the expected wage gain is their counterfactual wage in Israel or the settlements (deviated from the quarter average) minus their actual wage in the West Bank (deviated from the quarter average):

$$\text{Expected Wage gain for migrant-stayers} = g_{ms,1}(w) - \hat{g}_{ms,1}(w)$$

$$\text{Expected Wage gain for return-migrants} = \hat{g}_{rm,1}(w) - g_{rm,1}(w)$$

VI. Results

A. Descriptive Statistics for Migrants and Stayers

Tables 1 and 2 report summary statistics for migrants, stayers, return-migrants and migrant-stayers for the sample studied in this paper, male West Bank residents between the ages of 15 and 64 during the entire period 2000-2010. Migrants are 3.3 years younger than stayers and are more likely to be single while stayers are more frequently household heads. On average, migrants have over 2 years of schooling less than stayers; about three-quarters of migrants (unreported) have a middle-school diploma or less compared to 40% of stayers. Further, as opposed to only 3% of migrants who are college-educated, the corresponding statistic for stayers is 20%. In the context of the West Bank, Palestinians either reside in an urban area, rural area or refugee camp. While migrants are more likely to live in rural areas than urban areas relative to stayers, they are also slightly less likely to have refugee status or live in refugee camps.

Since marriage, educational attainment, and experience are usually positively correlated with earnings, it is unexpected to observe that the daily wage for migrants in the quarter before migration, reported in US \$2005, is about \$3 higher than stayers upon migration. After taking jobs in Israel or the settlements, the gap between migrants and stayers widens to approximately \$8.50 a day. Though migrants earn a higher daily wage, their monthly wage is almost equivalent to that of stayers since they work about 4 fewer days per month. This may suggest that migrants have fewer stable work opportunities in the domestic sector providing them with a greater incentive to seek work in Israel or the

settlements. The private sector in the territories suffered losses during the intifada due to the uncertainty and volatility in the market as well as a limited safety net (Miaari, 2006). Wages and employment in the private sector were extremely volatile while public sector jobs have more job security. This is consistent with the notion that workers in the private sector have less job security (shorter tenure spells) but high wage premiums for wage earners at the high end of the wage distribution (Miaari, 2006). Furthermore, over 45% of migrants are in the construction industry, which has one of the highest industry premiums in the Palestinian labor market (for a breakdown of industry and occupational status for each group, see Table I in the appendix). Migrants, however are also over-represented in agriculture and under-represented in services. In terms of occupational status, migrant workers were concentrated in elementary occupations and craftsmanship and trade. For stayers, the most common occupational status was professionals and clerks at 35% and all the remaining occupations were represented with the exception of work related to skilled agricultural and fishery.

Whether there is conflict or not, choosing to work in Israel incurs additional commute costs; clearly, these costs are exacerbated by conflict. Approximately 46% of migrants and 40% of stayers live in districts that border Israel. Upon migration, migrants experience an average of 26.5 closure days per quarter while stayers experience an average of 28 days of closure suggesting that individuals are more likely to migrate during quarters where there a fewer number of closure days. Porous borders also facilitate job searches in Israel or the settlements for potential Palestinian migrants. In fact, data on the number of closure obstacles per district per quarter shows that migrants have an average of approximately 47.2 closure obstacles in their district of residence during the quarter upon migration while stayers have 56.2 closure obstacles.

B. Descriptive Statistics for Return-migrants and Migrant-Stayers

Return-migrants are more likely to be single and less likely to be household heads than migrant-stayers. Furthermore, return-migrants are about 2

years younger than stayers and have a schooling distribution slightly to the left of migrant-stayers. Locality type and refugee status are about the same for both groups. Moreover, return-migrants have a job tenure that is one year shorter than migrant-stayers and make about \$3.30 dollars less a day. In addition, they work about a day and one-third less per month than migrant-stayers. Both groups predominantly work in Israel's private sector, though return-migrants are over-represented (relative to migrant-stayers) in agriculture and construction and under-represented in manufacturing and commerce. This is consistent with anecdotal evidence that agriculture and construction industries are characterized by a large number of seasonal and temporary workers.

The simple measure of commute costs, measured by whether or not a district borders Israel, varies between return-migrants and migrant-stayers as migrant-stayers are 16 percentage points more likely to live in a district that borders Israel. As shown in the table, the difference between the average number of closure days and closure obstacles for the two groups is negligible. These summary statistics contrast the previous summary statistics reported for migrants and stayers. This may suggest that cost factors that explain the decision to migrate may differ from those that explain the decision to return from migration. The last measure of cost in this analysis is ID type and permit status, which vary widely between the migrant-stayers and return-migrant. The portion of return-migrants with Jerusalem ID cards are about half of the percentage of migrant-stayers with Jerusalem ID cards. Reversibly, illegal migrants comprise about 31.2% of migrant-stayers and 52.3% of return-migrants.

C. What Drives the Migration Decision?-The Expected Wage Gain or Costs?

In conventional migration models, the expected wage gain due to economic variables increases the likelihood of migration and the expected wage loss due to economic variables increases the likelihood of return-migration. The expected wage gain is calculated using a probit specification (where socio-economic and demographic controls include years of schooling, experience, experience squared, locality type, marital status, household head, refugee status,

living in a district that borders Israel, industry and occupation fixed effects) for all workers and full-time workers for all four groups: migrants, stayers, return-migrants and migrant-stayers.

Table 3 displays the marginal effects (at the mean) for a probit model for migrant workers and stayers as well as full-time workers. In column (1), the only regressors are the expected wage gain and living in a district that borders Israel. The point estimate on the expected wage gain suggests that a one percentage point increase in the expected gain increases the likelihood of becoming a migrant worker by 1.5 percentage points but the point estimate is statistically insignificant. Living in a district that borders Israel increases the likelihood of becoming a migrant worker by a statistically significant 0.7 percentage points. Column (2) includes proxy measures for mobility restrictions where the proxies for mobility restrictions include the number of closure obstacles per district per quarter and interaction terms between regions—Northern West Bank, Southern West Bank and the Central West Bank--and the number of closure obstacles per district per quarter where the Greater Jerusalem Area is the reference regional group.

Note that increases in the number of closure obstacles raise the likelihood of migration for residents of the Greater Jerusalem Area. The (unexpected) sign may be a reflection of the fact that residents of the greater Jerusalem Area are more likely to have Jerusalem ID cards and as the conflict progresses and the number of closure obstacles increases, Jerusalem residents exploit the use of their Jerusalem ID cards by working in Israel/settlements as the local economy deteriorates. For all other regions, proxies for mobility restrictions have the expected signs and are statistically significant. A marginal increase in 100 closure obstacles per district per quarter reduces the likelihood of becoming a migrant worker by 2 percentage points for wage-earners residing in the Northern area of the West Bank, 0.8 points for residents in the Southern West Bank and 1.5 points for residents in the Central West Bank.

When proxy measures for mobility restrictions are included the point estimates for the expected wage gain and living in a district that borders Israel are

both attenuated and are both statistically insignificant. The sign of the point estimate of the expected wage gain implies there is some inefficiency; specifically, those who expected to benefit the most from migration are not expected to become migrant workers and the expected wage gain from migration explains little to no variation for the decision to migrate. Similarly, individuals whose costs of migration are mitigated by living in close proximity to Israel are less likely to migrate. Furthermore, the McFadden R² increases by approximately nine-folds suggesting that the expected wage gain calculated by accounting for socio-economic characteristics and living in close proximity to Israel's border have little to no explanatory power in the decision to migrate relative to politically-determined barriers.

I repeat the exercise above (unreported) for the period 2000-2008 in order to use alternative proxies for mobility restrictions: a quartic in the number of closure days per quarter and interaction terms between regions—Northern West Bank, Southern West Bank and the Central West Bank--and the number of closure days per quarter where the Greater Jerusalem Area is the reference regional group. The findings suggest that the marginal effect of a 90 day increase in the number of closure days (which has actually occurred during the worst stages of the intifada as shown in Figure 2) increase the probability of migration by 4.3 percentage points for residents of the Greater Jerusalem Area and by 4.1 percentage points for residents of the Northern West Bank, 0.9 points for residents of the Southern West Bank, and 1.1 points for residents of the Central West Bank.⁵⁵ These results corroborate the findings above for the period 2004-2010 since labor mobility restrictions-- whether measured by the number of closure days per quarter or the number of closure obstacles per district per quarter--impede out-migration in all regions of the West Bank except the Greater Jerusalem Area. Since the findings from the 2000-2008 period largely mirror

⁵⁵Note that during both periods 2000-2008 and 2004-2010, the results suggest that Southern residents of the West Bank who are seeking migration opportunities are less likely to be affected by mobility restrictions than their counterparts in the Northern and Central areas; this may be attributed to the presence of larger settlement blocs in the Southern West Bank which facilitate finding work in the settlements and increasing the likelihood of migration.

those from the 2000-2004, from this point forward, only results from the 2004-2010 period are discussed.

Above, I have argued that controlling for socio-economic characteristics can ameliorate the bias arising from the potential endogeneity of ID cards and work permits. Additionally, controlling for socio-economic characteristics can partially address the omitted variable bias arising from the endogeneity of an individual's district of residence as well as the number of closure obstacles. Therefore, in column (3), the probability that a West Bank resident will become a migrant next quarter is regressed on years of schooling, experience, experience squared, locality type, marital status, household head, refugee status, living in a district that borders Israel, industry and occupation fixed effects (coefficients for socio-economic characteristics are reported in Table II in the appendix); In column (4), the same specification is restricted to a sample of migrants and stayers who work full-time.

As depicted in column (3), the point estimates of closure obstacles and the interaction terms between closure obstacles and regional variables are all statistically significant after the inclusion of socio-economic variables. As before, increases in the number of closure obstacles unexpectedly raise the likelihood of migration for residents of the Greater Jerusalem Area but the point estimate in this specification is much smaller in magnitude. This result is somewhat reassuring since it suggests that the (unexpected) positive point estimate for closure obstacles residing in the Greater Jerusalem Area in column (2) is upward biased. While the magnitude of the impact of closure obstacles on the likelihood of migration for other regions is smaller in column (3) than column (2), the attenuation does not substantially alter the results. In fact, the inclusion of socio-economic controls did not alter the point estimate for Central West Bank residents. As in column (2), changes in the expected wage gain and living in close proximity to Israel have little to no impact on the migration decision. Finally, the point estimates for full-time workers are almost equivalent to that of other specifications (column (4)).

Note that socio-economic characteristics have a significant amount of explanatory power, causing a drastic increase in the McFadden R² between columns (2) and (3). As Table II in the appendix shows, the majority of socio-economic and demographic variables have little to no impact on the decision to migrate with the exception of industry affiliation in the quarter before migration. The services industry is the omitted category and represents the industry in which migrants are least likely to exit when becoming migrant workers in Israel or the settlements. The economically and statistically significant point estimates for the agriculture and construction industries are consistent with the notion that Palestinian labor in Israel is primarily low-skilled elementary occupations in construction and agriculture.

D. What Drives Return Migration?-The Expected Wage Gain or Costs?

Table 4 displays the marginal effects (at the mean) for a probit model for return-migrants and migrant-stayers as well as full-time workers. For return-migrants, a one percentage point marginal increase in the expected wage gain from migration reduces the likelihood of returning by a statistically significant 21.4 percentage points. Residents who live in close proximity to Israel are 3.7 percentage points less likely to return to the West Bank. The point estimate for the expected wage gain is unaltered when closure obstacles and interaction terms of closure obstacles and regions are included as regressors. This is not surprising since the magnitude and statistical significance of all point estimates imply that closure obstacles have a minimal impact on return-migration. Moreover, the F test that closure obstacles and the interaction terms between closure obstacles and regional residence are jointly equal to zero cannot be rejected⁵⁶.

When ID type and permit status are included in column (3), the point estimates for the expected wage gain is slightly attenuated. Note that having a work permit reduces the likelihood of returning more than having a Jerusalem ID card relative to undocumented workers. Nevertheless, the point estimates for both

⁵⁶ This is true for all specifications in Tables 4 and 6.

covariates, ID type and work permit status, are large and statistically significant, which suggests that return migrants are more deterred by lack of legal documentation to enter Israel or the settlements and less so by physical mobility restrictions as shown by the point estimates for closure obstacles. In fact, the variation in the decision to return as measured by the McFadden R2 barely increases after physical mobility restrictions are included (column 2) but increases by one-third when ID type and permit status are regressors (column 3).

In column (4), socio-economic controls are included in the regression analysis to partially address the potential endogeneity of politically-determined barriers, especially ID type and work permits. The qualitative nature of the results barely changed but one interesting result is that ID cards now play a larger role than work permits in the return-migration decision. That said, both point estimates are similar and are not significantly different from each other in both specifications. Unlike the case for migrants and stayers, decisions regarding labor flows for return-migrants and migrant-stayers are strongly impacted by the expected wage gain and living in close proximity to Israel. These estimates are robust to the inclusion of socio-economic controls and then restricting the sample size to full-time workers as well. The implication is that once residents succeed in gaining employment on Israeli land, they are less likely to be deterred (and return to the domestic sector) by politically-determined barriers or other conflict-related costs as by economic losses. Another major difference between the analysis here and that of migrants and stayers is that socio-economic characteristics have very little explanatory power, as suggested by the minute increase in the McFadden R2 between columns (3) and (4).

As shown in Table II in the appendix, human capital and demographic variables play a small role in the return-migration decision; even industry affiliation does not contribute much in explaining the decision to return from migration. The point estimates for commerce and manufacturing suggest that industry affiliation with either industry reduces the likelihood of returning by approximately 3% and 4% respectively relative to stayers. However affiliation

with other industries is more or less similar in terms of predicting labor flows back to the West Bank. When the sample is restricted to full-time workers, the results are almost identical. Note that these variables have at best modest explanatory power as opposed to the analysis regarding migrants and stayers.

On the one hand, these results are surprising given the large differences in wages (in quarter q reported in Table 1) between return-migrants and migrant-stayers. Specifically, one expects the differences in wages between these two groups to be a reflection of differences in human capital, locality type, refugee status, marital status, public/private sector or industry affiliation. On the other hand, it is sensible that these factors do not explain differences in Israeli wages earned since the accumulation of human capital (and other skills) in the West Bank may not directly translate to higher productivity and wages in Israeli firms. In fact, Friedberg (2000) finds that the earnings differential between Israeli natives and immigrants (within Israel which does not include the Palestinian territories) can be fully explained by differences in how the human capital accumulation acquired abroad is valued across immigrants' nations of origin. The migration analysis (columns (1)-(2)) demonstrates that workers affiliated with the agriculture and construction industries were more likely to become migrant workers, suggesting job-specific capital in those industries are more transferable to corresponding industries in the host (Israel/settlements) labor market.

VII. Robustness Checks

a.) Alter Definition of a Migrant Worker (observed working in Israel or the settlements in $y+1$)

This section provides an assessment of whether the analysis above is sensitive to the definition of a migrant worker. Thus far, migrant workers are individuals who are observed working in the West Bank in quarter q and in Israel or the settlements in quarter $q+1$. In this section, migrant workers are defined as individuals who are observed working in the West Bank in year y and in Israel or the settlements in year $y+1$. Similarly, the definition of a return migrant refers to

individuals working in Israel in year y and in the West Bank in year $y+1$. The results will shed light on whether politically-determined barriers impact labor flows one year later. This is especially relevant in the context of expensive and time-consuming job search costs in the Israeli labor market. Tables 5 and 6 present sensitivity analysis results that correspond to the results in Tables 3 and 4.

The expected wage gain one year prior to migration is a stronger predictor of migration than the expected wage gain one quarter prior to migration. Although the point estimate is attenuated when proxies for mobility restrictions and socio-economic characteristics are controlled for, the impact of a one percentage point increase in the expected wage gain increases the likelihood of migration by (statistically significant) 3.9 percentage points for the full-sample and 3.1 percentage points for full-time workers (Table 5). One can argue that this is due to measurement error since quarterly changes in wages are noisier than annual ones. However, the data implies that differences in migrants' expected wage gain and that of stayers is much larger during a one year interval than during a quarter, primarily due to the rapid growth of Israeli wages for migrant workers. As before, politically-determined barriers have a significant impact on the likelihood of migration and explain a considerable portion of the variation in the decision to migrate. This is an intriguing result since one might be tempted to think that if an individual experiences a relatively large number of closure obstacles in district d in quarter q , this may discourage his/her migration decision in quarter $q+1$ but the effect is attenuated or eliminated if one considers the severity of mobility restrictions a year in advance. One explanation may be that it takes individuals a longer time to acquire Israeli jobs (applying for work permits, saving for start-up costs such as transportation costs and other costs) in the presence of conflict since crossing over to Israeli land to search for jobs becomes more time-consuming and financially burdensome.

The expected wage gain one year prior to returning continues to be a strong predictor of returning to the West Bank even after mobility restrictions and socio-economic controls are included in the regression. The point estimate of the expected wage gain (-0.276) when the definition of a return-migrant is altered

resembles the point estimate (-0.204) using the original definition of a return-migrant. Unlike the case for migrants who are newly employed in Israel's labor market, Israeli wages for Palestinians employed in Israel (whether migrant-stayers or return-migrants) grew less rapidly; therefore, an increase in the expected wage gain whether measured a quarter or a year prior to migration had about the same impact on the likelihood of returning. This result suggests that the above analysis on migrants and stayers is not primarily driven by the greater amount of measurement error in quarterly changes in wages.

While living in close proximity to Israel has almost no effect on the decision to return, the economic and statistical significance of the point estimates for ID type and permit status indicate that legal documentation has even more influence on the decision to return one year in advance than in the short-term.

b.) Heterogeneity among Migrant Workers?

There are two important elements missing from Tables 3-6. Firstly, the *Palestinian Labor Force Survey* (PLFS) does not allow one to distinguish West Bank residents who work in Israel from those that work in Israeli settlements. This is problematic since the wage premium is presumably higher in Israel proper and because Israeli firms located in the settlements are less likely to adhere to Israeli labor law, resulting in poor working conditions, lower wages and less benefits for Palestinian migrants (Amro, 2008; Alinat, 2009; Taghrid, 2011). Secondly, the PLFS question regarding what type of ID card a resident has is asked only for those who have already attained a job in Israel or the settlements. It is not possible to know which ID card stayers possess and thus ID type cannot be included in the regressions for migrants and stayers. This is problematic since the pervasiveness of closure obstacles and its impact on labor flows can be ameliorated or exacerbated depending on one's ID card and permit status.

Thus, I utilize the 2005 wave of the *Social Survey of Jerusalem*. These data are richer in that Palestinians who work in the settlements (16% of all migrant workers in this dataset) can be differentiated from those who work in Israel. Furthermore, everyone reports whether they possess a Jerusalem ID card or

a West Bank (PA) ID card. With these data, several questions can be further examined: Does the expected wage gain influence the decision to work in the settlements relative to the West Bank? If so, how does this compare to the impact of the expected wage gain on becoming a migrant worker in Israel relative to working locally? Additionally, how do ID cards and other politically-determined barriers impact the likelihood of working in the settlements relative to the domestic sector as well as the likelihood of working in Israel relative to the domestic sector?

To verify the two datasets provide similar results given the same specification, Table 7 presents three probit model specifications using the same set of socio-economic controls (as listed above). The probit model for the first column is estimated using the 2005 wave of the *Palestinian Labor Force Survey*. In the second column, the sample is restricted to Jerusalem residents; finally, the probit model for the third column is estimated using the 2005 wave of the *Social Survey of Jerusalem*. To create model specifications with the same dependent variable, I set the dependent variable equal to 1 if an individual works in Israel or the settlements or 0 otherwise. This is because individuals who worked in Israel cannot be distinguished from those who work in the settlements in the labor force survey data. Furthermore, I cannot distinguish stayers from migrants and return-migrants from migrant-stayers because the Jerusalem data are not longitudinal. As for independent variables, I can neither control for the number of physical barriers since those that vary over time and districts cannot be applied to the cross-sectional Jerusalem data nor can I control for ID type since the labor force survey data only includes ID type for those who work in Israel or the settlements. Therefore the specifications in Table 7 in columns (1)-(3) only include socio-economic controls. The results show that when restricting the sample to Jerusalem residents, the *Palestinian Labor Force Survey* data provides similar results as the *Social Survey of Jerusalem* data.

To estimate the impact of the expected wage gain and politically-determined barriers on the likelihood of becoming a migrant worker for more than one destination option (Israel or an Israeli settlement), a multinomial logit model

is estimated where the reference group refers to wage earners who work in a West Bank firm. A multinomial logit model is appropriate because the dependent variable, place of work, is a categorical variable which cannot be ordered in a natural way. An undesirable assumption of multinomial logit estimations is the Independence of Irrelevant Alternatives (IIA). The assumption implies that the odds of working in Israel over the domestic sector do not change if an additional alternative (settlements) is introduced. Tests suggest this assumption does not hold in these data ⁵⁷; nevertheless, previous attempts to relax the IIA led some researchers to conclude that applying the more complex nested or mixed logit models resulted in small changes in the model's estimation while being much more computationally burdensome (Dahlberg and Eklöf (2003)) .

Table 8 presents the marginal effects from three multinomial logit estimations. In the first model (columns (1) and (2)), politically-determined barriers are not considered while the second model includes proxies for politically-determined barriers. The third model is similar to the second model with the exception that the sample is restricted to full-time workers only. The dependent variable in columns (1),(3) and (5) is 1 if a Jerusalem resident is observed working in Israeli settlements and 0 if observed working in the West Bank. The dependent variable in columns (2), (4) and (6) is 1 if a Jerusalem resident is observed working in Israel and 0 if observed working in the West Bank. Omitted categories include individuals who possess a West Bank ID card and those who live on the Israeli side of the wall; for the region of residence, the omitted category is the Jerusalem 2 area.

In columns (1) and (2), the multinomial logit is estimated using one

⁵⁷To test the extent to which this assumption is valid, the ratio of workers in Israel relative to the domestic sector in 2003 is compared to the corresponding ratio in 2005 using the 2003 and 2005 waves of the Social Survey of Jerusalem (SSJ); this is because working in the settlements was almost an absent alternative in 2003 in Jerusalem and became a stronger alternative in 2005. Indeed in 2003, only 1.3% of male wage earners in Jerusalem worked in Israeli settlements while the corresponding statistic in 2005 is 6.05%. In 2003, 42.2% of male wage earners in Jerusalem worked in Israel and 56.5% worked in the domestic sector while in 2005, 34.3% worked in Israel and 59.7% worked in the West Bank. Therefore odds ratio of working in the West bank over Israel increased from 1.33 in 2003 to 1.74 in 2005, which implies a strong limitation to using the multinomial logit.

regressor, the expected wage gain. While the change in the expected wage gain does not result in a change in working in the settlements relative to the West Bank, a one percentage point marginal increase in the expected wage gain increases the likelihood of working in Israel by 6.7%. In columns (3) and (4), three regressors are added: a dummy variable equal to 1 if a resident has a Jerusalem (ID) card, a dummy variable equal to 1 if a resident lives on the West Bank side of the Wall (presumably, access to Israel and some of the settlements is more difficult, see Map), and a dummy variable equal to 1 if a resident lives in East Jerusalem or the J1 area (where the majority of the population possesses Jerusalem ID cards since historically, Jerusalem ID cards were offered to residents of the J1 area).

The expected wage gain is economically and statistically significant in column (3) suggesting that an increase in the expected wage gain results in a greater likelihood of working in the settlements relative to the West Bank after controlling for ID card, residence relative to the wall, and region of residence in Jerusalem; this result contrasts the lack of influence of the expected wage gain on working in the settlements without additional regressors (column (1)). The economic and statistical significance of the expected wage gain in column (3) when additional regressors are included is primarily explained by the fact that Jerusalem ID card holders earn higher wages and are also less likely to work in the settlements, which means the estimate in column(1) is biased downwards. The impact of the expected wage gain on working in Israel continues to be statistically significant but is attenuated due to the fact that Jerusalem ID card holders are more likely to work in Israel and earn higher wages.

Although the expected wage gain is influential in the migration decision for both types of migrants, Jerusalem ID cardholders are less likely to work in the settlements by 13% and more likely to work in Israel by 29.6%. Similarly, living on the West Bank side of the wall increases the likelihood of working in the settlements and decreases the likelihood of working in Israel. Note how the variation explained by the covariates in columns (3)-(4) increased by more than four-folds relative to columns (1)-(2), suggesting that politically-determined

barriers explain an additional 300% of the variation explained by the expected wage gain.

When the sample of wage-earners is restricted to full-time workers, the impact of the expected wage gain, ID type and an individual's residence with respect to the wall are attenuated when comparing workers in the settlements to those in the domestic sector (column (5)). The expected wage gain is economically and statistically insignificant and the impact of having a Jerusalem ID card is diminished by one-third. In contrast, when full-time workers in the West Bank are compared to those working in Israel, the estimates are exacerbated so that the point estimates for the expected wage gain, owning a Jerusalem ID and the relative residence with respect to the wall are larger in magnitude. The results in Table 8 are robust to the inclusion of socio-economic controls (unreported).

These results suggest that among Jerusalem residents, wage-earners in Israeli settlements have lower expected wage gains and are more restricted than those who work in Israel when wage-earners employed in the West Bank are the reference group. Moreover, the differences between the two types of migrant workers are exacerbated for full-time employees. These trends may not be unique to residents of the greater Jerusalem area but are perhaps applicable to residents of the remaining areas of the West Bank. Thus, the inability to distinguish between the two types of migrant workers in the Palestinian Labor Force Survey (PLFS) confines the researcher to examine labor flows for only a broad definition of migrant workers. This limitation is unfortunate because as the preliminary analysis in this section suggests, in the context of Palestinian migration, there is a great deal of heterogeneity between the two major types of migration (Israel versus the settlements).

VIII. Conclusion

Whether or not individuals migrate from one country or area to the other is critical to both furthering our understanding of the economic decisions of individuals and more importantly policy discussions. A close examination of who migrates can lead to a better understanding of the welfare impacts of migration on

both the source and host countries. This paper calls for a discussion concerning the welfare impacts of labor flows, which are highly influenced by Israeli security measures on Palestinian residents in the West Bank. This is especially relevant in the context of recent calls for West Bank autonomy, escalated by the Israeli blockade of the other Palestinian territory, the Gaza Strip, which was initiated in June 2007 and continues to the present.

This paper finds that in the West Bank the presence of politically-determined barriers, measured by the number of closure days per quarter, the number of closure obstacles per district per quarter and the ID card/ permit status of individual residents have a significantly negative impact on the migration decisions of workers. The findings show that proxies for labor mobility restrictions play a large role in shaping the decision to migrate as well as the decision to return for male residents of the West Bank. For West Bank residents, the decision to migrate is largely predicted by politically-determined barriers relative to the expected wage gain but if workers already work on Israeli land, politically-determined barriers play a more minimal role in the decision to return relative to the expected wage gain. Additionally, if migrant workers are categorized into two types so that individuals observed working in Israel proper are differentiated from those working in the settlements, the evidence suggests that labor mobility restrictions play a greater (smaller) role in impeding out-migration when the former (latter) type of migrant workers is compared to stayers.

Differential mobility costs also are an important input to estimates and discussions of welfare, economic development and inequality. Evidence in this paper suggests that there is a high level of inequality between Jerusalem (ID) cardholders and PA (ID) cardholders due to greater labor mobility costs of PA ID cardholders. This may be a concern for a variety of reasons. For example, if high-skilled West Bank residents with relatively easy access to Israel (e.g. JID cardholders) are selected to work in Israeli firms, rises in wage inequality are expected across skill groups in the West Bank. On the other hand, to the extent

that Israeli firms have high demand for unskilled or semi-skilled Palestinian labor, low-skilled West Bank residents with relatively easy access to Israel (e.g. JID cardholders) are lured by the Israeli wage premium; this leads to strong disincentives for these Palestinians to acquire additional skills, which is detrimental to the economic development of a future independent Palestinian state. Either way, differential mobility costs can lead to inefficient outcomes for the West Bank economy.

Map



Table 1- Descriptive Statistics on Socio-Economic Variables

Socio-Economic Variables	Migrant	Stayers	Return Migrants	Migrant-Stayers
Age	31.2 (9.94)	34.5 (10.8)	30.6 (9.72)	32.6 (9.99)
Years of schooling	9.27 (2.87)	11.6 (3.88)	9.26 (2.84)	9.29 (2.87)
Head of Household	0.585 (0.493)	0.644 (0.479)	0.563 (0.496)	0.637 (0.481)
Married	0.648 (0.478)	0.711 (0.454)	0.647 (0.478)	0.709 (0.454)
Refugee	0.436 (0.496)	0.443 (0.497)	0.405 (0.491)	0.396 (0.489)
Locality Type:				
Urban	0.356 (0.479)	0.442 (0.497)	0.398 (0.490)	0.419 (0.493)
Rural	0.512 (0.500)	0.409 (0.492)	0.509 (0.500)	0.469 (0.499)
Refugee Camp	0.132 (0.339)	0.149 (0.356)	0.094 (0.292)	0.112 (0.315)
Daily wage at quarter q (\$2005)	21.7 (10.4)	19.0 (16.3)	27.5 (10.8)	30.9 (11.4)
Daily wage at quarter q+1 (\$2005)	27.5 (11.4)	19.1 (17.6)	22.0 (10.5)	31.3 (12.8)
Job Tenure in months	71.0 (82.2)	89.2 (87.9)	75.3 (78.0)	87.0 (86.6)
Work days/month	19.2 (6.54)	23.2 (5.08)	18.9 (6.21)	20.3 (5.73)
Hours Worked/ Week	42.0 (13.0)	42.0 (14.8)	41.8 (12.6)	42.6 (11.2)
Public Sector	0.025 (0.157)	0.438 (0.496)	0.001 (0.038)	0.001 (0.031)
Sample Size	749	24230	692	7186

Source: Palestinian Labor Force Quarter Survey Data: 2000-2010 from the Palestinian Central Bureau of Statistics (PCBS).

Table 2- Descriptive Statistics on Commute Cost Variables

Commute Cost Variables	Migrant	Stayers	Return Migrants	Migrant-Stayers
Region of Residence:				
Northern Region of West Bank	0.249 (0.433)	0.368 (0.482)	0.251 (0.434)	0.221 (0.415)
Southern Region of West Bank	0.285 (0.452)	0.285 (0.452)	0.320 (0.467)	0.218 (0.413)
Central Region of West Bank	0.209 (0.407)	0.246 (0.431)	0.176 (0.381)	0.185 (0.388)
(Greater) Jerusalem of the West Bank	0.256 (0.437)	0.100 (0.301)	0.254 (0.435)	0.377 (0.485)
District on Israeli Border	0.460 (0.499)	0.404 (0.491)	0.422 (0.494)	0.582 (0.493)
Mobility Restrictions:				
Closure Days per Quarter	26.6 (29.4)	28.1 (28.0)	24.4 (28.4)	25.3 (28.3)
Closure Obstacles per district per Quarter	47.2 (39.6)	56.2 (46.2)	47.7 (39.3)	45.9 (37.3)
North*Closure Obstacles	11.0 (25.0)	17.4 (33.1)	12.0 (27.8)	9.08 (23.8)
South*Closure Obstacles	16.5 (41.3)	20.3 (46.7)	15.7 (39.3)	12.8 (38.7)
Central*Closure Obstacles	9.7 (23.8)	14.4 (30.3)	9.0 (24.0)	8.04 (20.7)
ID type and Permit Status:				
Jerusalem ID card (JID)	--	--	0.189 (0.392)	0.354 (0.478)
West Bank (PA) ID with work permit	--	--	0.288 (0.453)	0.334 (0.472)
West Bank (PA) ID without work permit	--	--	0.523 (0.500)	0.312 (0.463)
Expected Wage Gain (in Logs US\$ 2005 Wage)	0.191 (0.128)	0.186 (0.150)	0.136 (0.114)	0.212 (0.166)
Sample Size	749	24230	692	7186

Source: Palestinian Labor Force Quarter Survey Data: 2000-2010 from the Palestinian Central Bureau of Statistics (PCBS). Data for the number of Closure Days are obtained from Btselem (Data available from 2000-2008 only) and Closure Obstacles are obtained from the United Nations Office of Coordination and Humanitarian Affairs (Data available from 2004-2010 only). Standard Deviations in parentheses.

Table 3—How Do Politically-determined Barriers Affect the Migration Decision Relative to the Expected Wage Gain conditional on Socio-economic Characteristics (2004-2010)?

Probit (Y=1) if Migrants	Migrants and Stayers (Wage Earners Only)			Full-time Workers
Marginal Effects	(1)	(2)	(3)	(4)
Expected Wage Gain	0.015 (0.009)	0.004 (0.009)	-0.001 (0.005)	-0.005 (0.005)
Israeli Border	0.007*** (0.003)	-0.003 (0.004)	0.002 (0.002)	0.003 (0.002)
Closure Obstacles/100		0.056*** (0.011)	0.023*** (0.006)	0.024*** (0.006)
North*Closure Obstacles /100		-0.076*** (0.011)	-0.035*** (0.006)	-0.038*** (0.006)
South*Closure Obstacles/100		-0.064*** (0.011)	-0.027*** (0.006)	-0.028*** (0.006)
Central*Closure Obstacles/100		-0.071*** (0.001)	-0.038*** (0.006)	-0.039*** (0.006)
Socio-Economic Controls?	No	No	Yes	Yes
Observations	15520	15520	15520	12956
McFadden R2	0.003	0.023	0.195	0.207

Source: Palestinian Labor Force Quarterly Survey Data: 2004-2010 from the Palestinian Central Bureau of Statistics (PCBS). The dependent variable in columns (1)-(3) is 1 if a West Bank resident is observed working in the West Bank in quarter q and working in Israel or the settlements in quarter q+1 and 0 if observed working in the West Bank in both quarters. The dependent variable in column (4) is the same as the dependent variable in columns (1)-(3) but the sample is restricted to full-time workers only. Omitted categories include those who do not live in a district that borders Israel; for the region of residence, the omitted category is the Greater Jerusalem Area. Socioeconomic controls include years of schooling, experience, experience squared, marital status, locality type (urban, rural, refugee camp), sector (public or private), six industry dummies and seven occupation dummies. (Standard errors in parentheses)*** p<0.01, ** p<0.05, * p<0.1)

Table 4-- How Do Politically-determined Barriers Affect the Return-Migration Decision Relative to the Expected Wage Gain conditional on Socio-economic Characteristics (2004-2010)?

Probit (Y=1) if Return-Migrant	Return-Migrants / Migrant-Stayers (Wage Earners Only)				Full-time Workers
Marginal Effects	(1)	(2)	(3)	(4)	(5)
Expected Wage Gain	-0.214*** (0.026)	-0.214*** (0.027)	-0.200*** (0.027)	-0.204*** (0.027)	-0.193*** (0.029)
Israeli border	-0.037*** (0.008)	-0.050*** (0.014)	-0.041*** (0.013)	-0.034*** (0.014)	-0.033** (0.015)
Jerusalem (ID) card			-0.042*** (0.015)	-0.052*** (0.015)	-0.033* (0.018)
PA ID with work permit			-0.054*** (0.008)	-0.048*** (0.009)	-0.046*** (0.010)
Closure Obstacles/100		0.035 (0.032)	0.050 (0.043)	0.044 (0.043)	-0.000 (0.047)
North*Closure Obstacles/100		-0.021 (0.032)	-0.029 (0.043)	-0.015 (0.044)	0.027 (0.048)
South*Closure Obstacles/100		-0.039 (0.033)	-0.056 (0.043)	-0.054 (0.044)	-0.001 (0.0476)
Central*Closure Obstacles/100		0.001 (0.027)	0.009 (0.039)	0.003 (0.039)	0.059 (0.044)
Socio-Economic Controls?	No	No	No	Yes	Yes
Observations	4733	4733	4733	4733	4008
McFadden R2	0.036	0.038	0.051	0.064	0.062

Source: Palestinian Labor Force Quarterly Survey Data: 2004-2010. The dependent variable in columns (1)-(4) is 1 if a West Bank resident is observed working in Israel or the settlements in quarter q and working in the West Bank in quarter q+1 and 0 if observed working in Israel or the settlements in both quarters. The dependent variable in column (5) is the same as the dependent variable in columns (1)-(4) but the sample is restricted to full-time workers only. Omitted categories include those who do not live in a district that borders Israel, and individuals who work in Israel without a work permit; for the region of residence, the omitted category is the Greater Jerusalem Area. Socioeconomic controls include years of schooling, experience, experience squared, marital status, locality type (urban, rural, refugee camp), sector (public or private), six industry dummies and seven occupation dummies. (Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1)

Table 5—Robustness Checks I- Is the Analysis Sensitive to Differences in the Definition of a Migrant (Observed working in Israel one year after observed working in the West Bank)?

Probit (Y=1) if Migrants	Migrants and Stayers (Wage Earners only)			Full-time Workers
Marginal Effects	(1)	(2)	(3)	(4)
Expected Wage Gain	0.110*** (0.012)	0.083*** (0.012)	0.039*** (0.007)	0.031*** (0.006)
Israeli border	0.017*** (0.004)	-0.003 (0.005)	0.006** (0.003)	0.006** (0.003)
Closure Obstacles/100		0.099*** (0.015)	0.039*** (0.008)	0.036*** (0.008)
North*Closure Obstacles/100		-0.128*** (0.015)	-0.054*** (0.008)	-0.050*** (0.008)
South*Closure Obstacles/100		-0.113*** (0.015)	-0.046*** (0.008)	-0.040*** (0.008)
Central*Closure Obstacles		-0.117*** (0.013)	-0.061*** (0.008)	-0.055*** (0.008)
Socio-Economic Controls?	No	No	Yes	Yes
Observations	13482	13482	13482	11229
McFadden R2	0.022	0.047	0.233	0.245

Source: Palestinian Labor Force Quarterly Survey Data: 2004-2010 from the Palestinian Central Bureau of Statistics (PCBS). The dependent variable in columns (1)-(2) is 1 if a West Bank resident is observed working in the West Bank in year y and working in Israel or the settlements in year y+1 and 0 if observed working in the West Bank in both years. The dependent variable in column (3) is the same as the dependent variable in columns (1)-(2) but the sample is restricted to full-time workers only. Omitted categories include those who do not live in a district that borders Israel; for the region of residence, the omitted category is the Greater Jerusalem Area. Socio-economic controls include years of schooling, experience, experience squared, marital status, locality type (urban, rural, refugee camp), sector (public or private), six industry dummies and seven occupation dummies. (Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1)

Table 6-- Robustness Checks I-- Is the Analysis Sensitive to Differences in the Definition of a Return-Migrant (Observed working in the West Bank one year after observed working in Israel)?

Probit (Y=1) if Return-Migrant	Return-Migrants/Migrant-Stayers (Wage Earners Only)				Full-time Workers
Marginal Effects	(1)	(2)	(3)	(4)	(5)
Expected Wage Gain	-0.301*** (0.028)	-0.292*** (0.028)	-0.268*** (0.029)	-0.276*** (0.029)	-0.264*** (0.030)
Israeli border	-0.017 (0.010)	-0.013 (0.016)	-0.001 (0.015)	0.009 (0.015)	0.006 (0.016)
Jerusalem (ID) card			-0.080*** (0.018)	-0.114*** (0.018)	-0.098*** (0.021)
PA ID with permit			-0.074*** (0.011)	-0.073*** (0.011)	-0.076*** (0.012)
Closure Obstacles/100		-0.039 (0.040)	0.023 (0.055)	0.018 (0.055)	-0.084 (0.061)
North*Closure Obstacles/100		0.015 (0.040)	-0.0452 (0.056)	-0.032 (0.056)	0.048 (0.062)
South*Closure Obstacles/100		0.035 (0.041)	-0.029 (0.055)	-0.021 (0.056)	0.083 (0.062)
Central*Closure Obstacles/100		0.048 (0.034)	-0.014 (0.050)	-0.005 (0.0505)	0.081 (0.057)
Socio-Economic Controls?	No	No	No	Yes	Yes
Observations	4163	4163	4163	4163	3532
McFadden R2	0.041	0.042	0.057	0.079	0.088

Source: Palestinian Labor Force Quarterly Survey Data: 2004-2010. The dependent variable in columns (1)-(3) is 1 if a West Bank resident is observed working in Israel or the settlements in year y and working in the West Bank in year y+1 and 0 if observed working in Israel or the settlements in both years. The dependent variable in column (4) is the same as the dependent variable in columns (1)-(3) but the sample is restricted to full-time workers only. Omitted categories include those who do not live in a district that borders Israel, and individuals who work in Israel without a work permit; for the region of residence, the omitted category is the Greater Jerusalem Area. Socio-economic controls include years of schooling, experience, experience squared, marital status, locality type (urban, rural, refugee camp), sector (public or private), six industry dummies and seven occupation dummies. (Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1)

Table 7—How Comparable are the Palestinian Labor Force Survey (PLFS) and the Social Survey of Jerusalem (SSJ) for the year 2005?

	Probit (Y=1) if Works in Israel/Settlements		
Marginal Effects	PLFS (1)	PLFS (2)	SSJ (3)
Years of schooling	0.005* (0.003)	-0.006 (0.010)	-0.008 (0.006)
Experience	0.004 (0.003)	0.012 (0.011)	-0.003 (0.005)
Experience^2	-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)
Refugee	0.004 (0.018)	0.072 (0.061)	-0.052 (0.032)
Married	0.044* (0.024)	0.003 (0.091)	0.018 (0.050)
Head of household	-0.030 (0.027)	-0.147* (0.087)	0.063 (0.048)
Rural	-0.017 (0.014)	-0.253*** (0.059)	-0.115*** (0.035)
Camp	-0.050** (0.021)	-0.125 (0.083)	0.070 (0.062)
Work in Private Sector	-0.052* (0.031)	-0.268*** (0.070)	-0.548*** (0.018)
Agriculture	0.595*** (0.0515)		0.196 (0.136)
Manufacturing	0.313*** (0.0461)	0.335*** (0.0695)	0.326*** (0.0561)
Construction	0.443*** (0.0452)	0.277*** (0.0760)	0.400*** (0.0470)
Commerce	0.406*** (0.0477)	0.434*** (0.0606)	0.344*** (0.0460)
Transportation	0.0439 (0.0548)	-0.0496 (0.126)	0.165* (0.0928)
Observations	3475	522	1567
McFadden R2	0.207	0.064	0.195

Source: Palestinian Labor Force Quarterly Survey Data: 2004-2010 from the Palestinian Central Bureau of Statistics (PCBS). The dependent variable in columns (1)-(3) is 1 if a resident works in Israel/settlements in the year 2005. The data in columns (1) and (2) is taken from the 2005 wave of the *Palestinian Labor Force Survey* and the sample in column (2) is restricted to Jerusalem residents. The data in column (3) is taken from the 2005 wave of the *Social Survey of Jerusalem*. Controls also include seven occupation dummies (Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1)

Table 8-- Robustness Checks II-- Is the Analysis Sensitive to Differences in the Definition of a Migrant--Working in Israel vs. the Settlements--(Jerusalem Residents-2005)?

Multinomial Logit- Marginal Effects	All Wage Earners				Full-time Workers	
	Settlements	Israel	Settlements	Israel	Settlements	Israel
	(1)	(2)	(3)	(4)	(5)	(6)
Expected Wage Gain	0.004 (0.004)	0.067*** (0.009)	0.016*** (0.004)	0.025*** (0.009)	0.004 (0.003)	0.037*** (0.011)
Jerusalem ID Card			-0.130*** (0.041)	0.296*** (0.036)	-0.087** (0.039)	0.318*** (0.043)
Live on West Bank Side of the Wall			0.047*** (0.013)	-0.085*** (0.025)	0.047*** (0.015)	-0.116*** (0.028)
Live in East Jerusalem (J1) area			-0.044* (0.025)	0.177*** (0.044)	-0.046* (0.025)	0.178*** (0.051)
Observations	1567		1567		1040	
McFadden R2	0.027		0.119		0.181	

Source: Social Survey of Jerusalem (2005) from the Palestinian Central Bureau of Statistics (PCBS). The table above displays marginal effects for three multinomial logits: columns (1)-(2), (3)-(4) and (5)-(6). In all cases the reference group in the dependent variable includes wage earners employed in a West Bank firm. The dependent variable in columns (1) and (3) is 1 if a Jerusalem resident is observed working in the settlements and 0 if observed working in the West Bank. The dependent variable in columns (2) and (4) is 1 if a Jerusalem resident is observed working in Israel and 0 if observed working in the West Bank. Omitted categories include individuals who possess a West Bank (PA) ID card and those who live on the Israeli side of the wall; for the region of residence, the omitted category is the Jerusalem 2 area. The dependent variables in columns (5)-(6) are the same as the dependent variable in columns (3) and (4) but workers are restricted to full-time workers only.
(Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1)

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Appendix

Table I- Summary Statistics on Industry and Occupational Status

Variables	Migrant	Stayers	Return Migrants	Migrant-Stayers
Industry				
Agriculture	0.109 (0.312)	0.017 (0.129)	0.137 (0.344)	0.097 (0.296)
Manufacturing	0.151 (0.358)	0.149 (0.356)	0.125 (0.331)	0.199 (0.399)
Construction	0.465 (0.499)	0.102 (0.303)	0.532 (0.499)	0.434 (0.496)
Commerce, Hotels and Restaurants	0.129 (0.336)	0.114 (0.317)	0.107 (0.309)	0.168 (0.374)
Transportation and Communication	0.045 (0.208)	0.038 (0.190)	0.020 (0.141)	0.018 (0.132)
Services	0.100 (0.300)	0.581 (0.493)	0.079 (0.270)	0.083 (0.277)
Occupational Status				
Politicians & Managers	0.003 (0.052)	0.045 (0.207)	0.000 (0.000)	0.001 (0.029)
Professionals & Clerks	0.045 (0.208)	0.351 (0.477)	0.027 (0.163)	0.031 (0.174)
Service, Shop & Market Workers	0.085 (0.280)	0.163 (0.369)	0.039 (0.194)	0.067 (0.250)
Skilled Agricultural & Fishery Workers	0.016 (0.126)	0.003 (0.056)	0.016 (0.125)	0.009 (0.096)
Craft and Related Trade Workers	0.251 (0.434)	0.137 (0.344)	0.310 (0.463)	0.348 (0.476)
Plant and Machine Operators	0.099 (0.298)	0.094 (0.292)	0.071 (0.256)	0.100 (0.300)
Elementary Occupations	0.501 (0.500)	0.207 (0.405)	0.537 (0.499)	0.444 (0.497)
Sample Size	749	24230	692	7186

Source: Palestinian Labor Force Quarter Survey Data: 2000-2010 from the Palestinian Central Bureau of Statistics (PCBS).

Table II—The Effect of Socio-Economic Factors on the Decision to Migrate (2004-2010)

	Probit (Y=1) if Migrant		Probit (Y=1) if Return-Migrant	
Marginal Effects	All (1)	Full-time (2)	All (3)	Full-time (4)
Years of schooling	0.000 (0.000)	0.000 (0.000)	-0.000 (0.002)	-0.000 (0.002)
Experience	0.001** (0.000)	0.001** (0.000)	-0.000 (0.002)	-0.001 (0.002)
Experience^2	-0.000 (0.000)	-0.000* (0.000)	-0.000 (0.000)	0.000 (0.000)
Refugee	0.002 (0.002)	0.002 (0.002)	0.008 (0.008)	0.006 (0.009)
Married	-0.008** (0.004)	-0.006 (0.004)	0.019 (0.014)	0.019 (0.015)
Head of household	0.003 (0.003)	0.002 (0.003)	-0.010 (0.016)	-0.011 (0.017)
Rural	0.007** (0.002)	0.005** (0.002)	-0.029*** (0.009)	-0.028*** (0.010)
Camp	-0.002 (0.002)	0.001 (0.002)	-0.006 (0.014)	-0.004 (0.014)
Work in Private Sector	0.009*** (0.003)	0.010** (0.004)	-0.006 (0.024)	-0.005 (0.023)
Agriculture	0.117*** (0.028)	0.139*** (0.034)	-0.005 (0.020)	-0.014 (0.018)
Manufacturing	0.016** (0.006)	0.019*** (0.007)	-0.041*** (0.015)	-0.044*** (0.015)
Construction	0.068*** (0.014)	0.075*** (0.018)	-0.005 (0.018)	-0.005 (0.018)
Commerce	0.019*** (0.007)	0.017** (0.007)	-0.033** (0.015)	-0.030** (0.015)
Transportation	0.026** (0.011)	0.027** (0.015)	0.013 (0.036)	0.008 (0.034)
Observations	15520	12956	4733	4008
McFadden R2	0.195	0.207	0.064	0.062

Source: Palestinian Labor Force Quarterly Survey Data: 2004-2010 from the Palestinian Central Bureau of Statistics (PCBS). The dependent variable in columns (1)-(2) is 1 if a West Bank resident is observed working in the West Bank in quarter q and working in Israel/settlements in quarter q+1 and 0 if observed working in the West Bank in both quarters. The dependent variable in column (3)-(4) is 1 if a West Bank resident is observed working in Israel/settlements in quarter q and working in the West Bank in quarter q+1 and 0 if observed working in Israel/settlements in both quarters. Omitted categories include single, non-refugees, urban locality type, public sector and services industry. Additional controls include 7 occupation dummies and a time trend. (Standard errors in parentheses)*** p<0.01, ** p<0.05, * p<0.1)