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WAGE DIFFERENTIAL BETWEEN URBAN AND RURAL PALESTINE: THE SHADOW OF PALESTINIAN- ISRAELI CONFLICT

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Abstract

The objective of this paper is to explore the impact of Israel's development restrictions on average wages in area C, in Palestine. Utilizing an extensive labor force data, we show that area C workers earn 8 percent less than workers in A & B areas. When controlling for worker's observed characteristics, the area C wage differential estimate drops by a half. We extend our analysis to compare average rural wages between area C and non-area C workers. We provide evidence that the wage difference between area C and non-area C rural workers is statistically insignificant, indicating that the area C wage differential we observe is attributed to rural effect. This particular result indicates that the impact of the Israeli restrictions on area C wages is neutralized. Evidently, we show that negative labor supply shock (commuting) is a potential mechanism to neutralize wages. Specifically, we show that area C residents are more likely to commute than their peers in other rural areas.

JEL Classification: J3, R2

Keywords: Wage Differentials, Urban and Rural Palestine

ملخص

الهدف من هذه الورقة هو استكشاف تأثير القيود المفروضة من إسرائيل على متوسط الأجور في منطقة C فى فلسطين. وبالاستفادة من البيانات واسعة النطاق لقوة العمل، تبين لنا أن كسب العمال فى منطقة C هو بنسبة 8 في المئة عن نظيرهم في المناطق أ و ب. وعند التحكم فى خصائص العامل لوحظ أن تقدير الفرق في الأجور فى منطقة C نقص بمقدار النصف. نتقدم بتحليلنا لمقارنة متوسط الأجور في المناطق الريفية بين العمال فى منطقة C وغير منطقة C. نقدم نقدم أدلة على أن الفرق في أجور العمال الريفيين بين منطقة C وغير منطقة C غير ذات أهمية إحصائية، مشيرين إلى أن الفرق في أجور العمال فى منطقة C يرجع إلى تأثير المنطقة الريفية. تشير هذه النتيجة خاصة إلى تأثير القيود الإسرائيلية على الأجور فى منطقة C وتحييدها. وبالدليل، نظهر أن الصدمة السلبية لعرض العمالة (التنقل) هو آلية ممكنة لتحييد الأجور. وعلى وجه التحديد، نظهر أن سكان المنطقة C هم أكثر عرضة للتنقل من أقرانهم في المناطق الريفية الأخرى.

1. Introduction

According to Oslo peace accords, signed between Israel and PLO in 1993, The West Bank has been divided into three distinct areas; A, B, and C. Area A covers about 18 percent of the West Bank and includes major populated areas (cities). Area B consists of 22 percent of West Bank, accommodating large rural areas. Area C, on the other hand, consists of 60 percent of West Bank's land, which is mostly rural and sparsely populated, accommodating around 180,000 people (about 7 percent of the West Banks' population).[1]

What distinguishes the three areas is Israel's vs. Palestinian Authority's (PA) level of security and civil control. Specifically, PA assumes full control of area A. In area B, Israel retains security control, while PA is responsible for all sorts of civil issues. Nonetheless, Israel retains full security control and many aspects of civil services in area C, including planning, construction, and infrastructure. Still, the PA is held responsible to provide education and health services for area C residents.[2] The partition of West Bank into these areas has been meant to be transitory. Particularly, according to Oslo peace accords, Israel had to transfer civil and security control over to the Palestinian authority in the few years that followed signing the peace accords in 1993. However, Israel's withdrawal from Area C has never been implemented in the name of security.

Area C is economically important to Palestinians. The fertility of its agricultural land and the availability of aquifers are vital to serve the basic food needs of Palestinians. Area C is also vital in terms of natural resources. In fact it is considered a backyard for an urban expansion (World Bank 2008). Yet, area C is considered economically under-developed in which the strict Israeli measures are main contributing factors. Construction or any development activity requires the approval of the Israeli authority. Currently, Israel bans development activities in about 70 percent of the area.

Israel has devised a number of restriction measures in Area C. Specifically; Israel has defined around 40 percent of area C as state land where Palestinians are prohibited to carry on any construction or development activities. Israel has exclusively allocated this land to build and expand Israeli settlements, military activities, and infrastructure. In addition, Israel has designated 30 percent of area C, mainly in Jordan valley areas, as a military zone and natural reserves. Nearly 5000 Palestinians live in 38 communities of this area in which construction is prohibited by the Israeli authorities.[3] Other Israeli measures include banning construction within 70 meters along each side of regional roads that are intended to serve West Bank settlers. As for the remaining 30 percent of area C, Israel imposes severe restrictions on construction activities, except for built up communities, which constitute less than 1 percent of this area.

A World Bank report (2008) shows that during the 2000-2007 period, less than 6 percent of the 1,624 construction requests were approved. On the other hand, area C residents are exposed to high risk of housing and infrastructure demolition of facilities that did not receive approval from the Israeli authority. During the same period, Israel executed 1,663 demolitions out of 4993 demolition orders. Israel's restrictions on area C also extend to the PA's public infrastructure projects, which are often delayed or refused. The report also discusses the negative impact of Israeli restrictions on several economic sectors, mainly the agriculture sector. Markedly, the significant number of roadblocks, checkpoints, and the

[1] United nation (2011); Humanitarian Factsheet on Area C of the West Bank: (http://www.ochaopt.org/documents/ocha_opt_Area_C_Fact_Sheet_July_2011.pdf).

[2] For an extensive description of area C and the development restrictions that Israel imposes see B'Tselem's 2013 report: “Acting the Landlord: Israel's Policy in Area C, the West Bank”.

[3] The source of data is the United Nations Office for the Coordination of Humanitarian Affairs in the occupied Palestinian territories (OCHA).

stretching separation walls has reduced farmer's accessibility to their agricultural land and market, leading to increasing transportation cost. The World Bank report also discusses the limitations of industrial development in area C. Permits for industrial facilities, including industrial zones, are rare hampering the expansion and establishing of industrial activities. This is in addition to severe waste disposal problems and extra transportation cost from and to area C. The combination of construction and industrial restrictions as well as the rising rate of actual and threats to demolition (both construction and infrastructure facilities) represent business disincentives, which hinder economic development in area C.

The objective of this study is to examine the impact of the restrictions on wages in area C. In this paper we show that the average daily wage of area C workers is 8 percent less than that of area C commuters and workers in A & B areas. However, existing literature (see below) suggest that workers' socio economic characteristics are potential factors that explain workers' wage gap. Indeed, the share of area C residents who hold 13 years of education or more is 13 percent, which is almost half the share in area A and B. Other factors that affect such wage disparity are differences in spatial distribution of industry composition. Particularly, rural average wages might be lower if less paying industries are disproportionately located in rural areas. Indeed, 38.5 percent of rural workers belong to the agricultural sector in area C, compared with 12 percent in area A and B.[4]

With these differences in worker characteristics in place, an outcome of this paper is to clarify the extent to which observed economic and demographic characteristics of workers in area C contribute to area C wage differential. Still, since Israel's restrictions in area C covers part of rural areas in the West Bank, the main objective of this paper is to show whether this wage penalty (wage differential) goes beyond the well-documented urban-rural wage differential phenomenon.

Urban - rural wage differential has been a central topic in economics. A mounting literature, mainly related to labor and regional economics, has been dedicated to explaining the mechanism that drives this economic phenomenon. Economists often suggest that urban wage premium is attributed to the positive impact of urban agglomeration on worker's productivity (Combes et al. 2008; Rosenthal and Strange 2003). The agglomeration effect is likely working via city's role in enhancing learning and knowledge spillover between firms and workers (Glaeser 1999; Moretti 2004; Gleaser and Resseger 2010).

Another explanation for the urban-rural wage differential is the coordination hypothesis, which states that agglomeration economies facilitate worker-firm matching due to city's higher job opening rate and reduced time and cost of job search. This indicates that cities increase the probability for workers to find a good job offer (Kim 1990; Helsely and Strange 1990; Yankow 2006). Other researchers highlight the significance of the sorting effect. This hypothesis indicates that urban wage premium is related to the role of cities, as center of consumption and urban amenities are more able to attract skilled workers (Fallah and Partridge 2006; Combes et al 2008; Mion and Naticchioni 2009; Matano and Natichchioni 2011).[5] Put this differently, spatial differences in stock of human capital, favouring urban areas might be a contributing factor to the urban wage premium.

[4] Area C also tends to slightly differ in terms of employment status. Specifically, labor force participation in area C is 44 percent, which is 3 percent greater than other areas. Also, unemployment rate is lower in area C by about 1 percent, hitting 8.2 percent of the labor force. Nevertheless, the higher rate of joining the labor market in area C might reflect a tendency to mitigate a worse economic condition. Specifically, it is likely that more area C household members are willing to join the labor market to overcome the lower wages.

[5] Other researchers link spatial differences in wages to market access (close proximity to consumers). Specifically, Hering and Poncet, 2010,Fallah et. al 2010) increases in worker demand in cities with greater market access lead an increase in average wages. Several researchers have also emphasized the rule of learning in cities to enhance labor productivity.

To model the impact of Israeli restriction on area C wages, we present a simple theoretical model that regard restricting development in area C as a disincentive to attract firms or expand existing businesses, leading to a negative effect on area C average wages (negative labor demand shock) in the short run. Still, we also show that the decrease in area C average wages induces area C workers to commute to other areas, raising area C's average wages in the long run. However, the extent to which area C equilibrium wage is restored in the long run would basically depend on the magnitude of area C labor supply response to the initial demand negative shock, making the impact of area C wages an empirical question.

To empirically examine the wage differential of area C workers, we utilize extensive individual level data from the Palestine Census Bureau of Statistics (PCBS) labor force survey and apply pooled OLS technique. We first explore the wage differential of area C workers relative to area A & B workers. In this regard, we show that the wage penalty faced by workers in area C is 8 percent. Results also show that when controlling for worker characteristics, the magnitude of area C’s negative wage differential drops by half, indicating the importance of the importance of workers’ socio economic characteristics in explaining the wage gap. We further explore area C wage differential by limiting the data to area C observations in which the wage differential for area C workers is estimated only relative to area C commuters. The findings confirm the negative wage differential for area C workers.

One concern regarding the estimated wage differential is that it might be (partially) driven by the effect of unobserved worker characteristics. To explore this avenue, we utilize Oaxaca-Blinder decomposition technique, which reveals that worker's observed characteristics explain around 26 percent of the wage differential relative to area C commuters. The remaining effect is captured by workers’ unobserved effects.

We then address our main research question i.e., whether area C restrictions impose wage penalty on area C workers relative to the other rural (non-area C) workers. We first estimate the wage differential between urban and rural workers (including area C workers). The results clearly show a negative wage effect for rural workers. We then restrict the sample to rural workers, such that the wage differential estimate is defined as the wage difference between rural workers in area C and rural workers in non-area C. Markedly, the wage differential estimate is insignificant indicating that the lower average wage in area C reflects rural effect. As a sensitivity check, we show that our results are robust when considering sample selectivity concerns.

The statistically insignificant wage differences between area C and non-area C workers goes in line with our theoretical expectations that negative labor supply shock in area C is likely neutralizing the negative wage effect (restoring initial equilibrium wage relative to that in non-area C rural area) in area C. Consistent with the labor supply mechanism, we utilize probit model and show that area C residents are more likely to commute compared to non-area C rural residents.

The remainder of this paper is organized as follows. Section 2 displays a simple theoretical model that discusses the possible outcomes of the Israeli restrictions on area C wages. Section 3 discusses the empirical strategy, including data description and model specifications. Results are discussed in section 4 and 5. Section 6 summarizes and concludes.

2. Theoretical Model

Theoretically, the effect on reducing average wages in area C relative to other rural areas can be modelled using neo-classical labor demand and supply theory. Assuming that workers in area C and non area C rural areas operate in the same labor market prior to any labor demand or supply shock, which in our case is development restrictions imposed by Israeli authority.

We also assume that the distribution of skills and industry types are similar in both areas.[6] Accordingly, we assume that workers in both areas earn the same equilibrium wage (w^*).

We think of the development restrictions in area C as a disincentive for businesses to operate in this area. With the restrictions in place, area C can be regarded as a separate labor market from that non-area C rural areas as well as urban areas. In this regard, the restrictions represent a negative labor demand shock that is expected to decrease the average wage in area C to w', where $w' < w^*$ in which the level of w' depends on the magnitude of the negative demand shock, as well as the labor demand and supply elasticities. Still, in the long run, we expect that the decrease in area C's average wage would induce area C workers to commute to the other areas leading to a negative shift in area C's labor supply. This would ultimately yield an increase in area C equilibrium average wage from w' to w''.

Whether the increase in the average wage w'', from the negative shift in labor supply, would restore the initial equilibrium ($w'' = w^*$) basically depends on the relative demand and supply shifts (shocks), holding demand and supply elasticity constant. This factor determines the increase in wage that needs to clear the labor market in area C. Specifically, the greater the magnitude of the negative labor supply shock, the greater is the increase in in w''. The outcome of this simple model shows that the effect of Israeli restrictions cannot be determined a priori, making this quest an empirical exercise. See the appendix for a simplistic mathematical model that relates area C restrictions to change in equilibrium wage.

The above argument, however, assumes zero effect on the wages in non-area C rural areas. We can relax this assumption. However, in this case, workers' migration/commuting from area C would increase labor supply in non-area C rural area, leading to a decrease in non-area C average wage. The magnitude of wage decrease positively depends on the share of migrants/commuter relative to the work force in non-area C rural areas as well as labor demand and supply elasticises. If the share of the migrants/commuter labor were large, then we would expect that migration/commuting effect would lead to a new wage equilibrium that is the same in both areas. Here again, the net effect of area C restriction can only be determined empirically.[7]

3. Empirical Methodology

This paper utilizes quarterly PCBS's labor force- individual level data over the 2001-2008 period. Our sample excludes Gaza's workers as area C is only located in the West Bank. This study also excludes observations for workers who report place of work as Israel or Israeli settlements in West Bank. The quarterly average share of this worker category is 11 percent of the total workforce. Nonetheless, using pooled OLS regression, we find that working in Israeli labor market earns a Palestinian worker an average of 72 percent wage premium.[8] Thus, the reason behind excluding these workers is to avoid an estimation bias that would mask the urban-rural wage differential. Nonetheless, excluding those who work in Israel,

[6] The difference in industry distribution between area C workers and non-area C rural workers is relatively minimal. In particular, about 62 percent of area C workers are employed in the agricultural sector versus 52 percent for non-area C rural workers. Also, 8.4 percent and 7 percent of area C workers are employed in commerce, hotels and other services (except for transportation, storage, and communications) as opposed to 4.2 percent and 11 percent, respectively for the other group. Nonetheless, worker distribution for the other sectors (construction and manufacturing) is similar in both cases. Moreover, in terms of differences in education attainment, the average years of education for area C workers is 7.17, which is around 1.3 year less for non-area C rural workers.

[7] We exclude urban areas from our analysis. This is because assuming that urban and rural (including area C workers) sustain the same equilibrium average wage would violate the urban-rural wage differential context. However, we can still assume that the negative labor supply shock in area C would induce workers to migrate/commute to urban areas. This would just imply that the effect on average wages in non-area C workers would be lesser.

[8] The pooled OLS regression is specified such that worker's wage is regressed on a dummy variable that distinguishes workers based on place of work (Israel or Israeli settlements versus local Palestinian labor market, among other variables (district dummies, industry and occupation dummies).

reduce the sample size to 60,766 observations, out of which 2,371 observations belong to area C sample.

The empirical strategy is to estimate the Mincer's earning Equation (Mincer 1974) in which worker's wage is a function of worker's demographic, human capital, and socioeconomic characteristics. The model is specified as:

$$\log w_{itj} = C_i \gamma + X_{itj} B + d_j + q_t + e_{it} \qquad (1)$$

Where the dependent variable $\log w_{itj}$ is the logarithm of daily wage for worker *i* in quarter *t* and district *j*. The dummy variable "C" takes a value of 1 for area C workers and 0 otherwise. Area C-work dummy variable captures the wage differential for area C workers. Nonetheless, in some specifications we also add area C-residence dummy variable, which takes a value of 1 for area C residents and zero for residents in A & B area. The rationale of including area C residence dummy variable is to examine whether commuting to A & B area offsets area C wage differential. However, our place of work data is only available at the locality level. Therefore, we are able to only identify area C workers who report their place of work as a place of residence. However, a recent PCBS survey (2011) shows that most of area C commuters report their place of work in area A and B.

In order to investigate the relative importance of worker characteristics versus location effect, we add vector X_{itj}, which includes the usual worker's demographic, socioeconomic, and job characteristics. These include gender, which is a dummy variable that takes the value of 1 for females and zero for males. Another dummy variable is also added to classify workers based on their marital status, which takes the value 1 for married workers and zero otherwise. We also differentiate gender based on marital status by interacting the gender with the marital status variables.

We also include workers' age to reflect experience and age square to account for the life cycle wage differential. Adding years of education variable also controls for education attainment. Another set of dummy variables include workers' type of industry to account for cross industry wage differences. The industry vector includes agriculture, hunting and finishing; mining, quarrying, and manufacturing; construction, commerce, hotels, and restaurants; transportation, storage and communication; and services and other branches. The reference (omitted) industry is agriculture. We also add 7 occupation dummies to control for observable career-skill differences. The occupation group include: legislators, senior officials and managers; professionals, technicians, associates and clerks; skilled agricultural and fishery workers; craft and related trade workers; plant and machine operators and assemblers; and elementary occupations. The reference group is elementary occupations.

An employment status vector is included to distinguish workers based on the type of employer. This includes 8 categories: public sector, formal private sector, informal private sector, foreign government, UNURWA, international organization, not-for profit organization, and others, which represents the omitted group. Another employment status dummy variable is also included to distinguish between part-time and full-time workers in which the former is the reference group.

Model (1) also includes district fixed effect dummies to control for cross-district differences that vary little over time. In addition, we include a set of regional dummies to (partially) accounts for wage differential between cities, rural towns, and refugee camps. Finally, time (quarter) dummies are added to account for national shocks, such as the breakout of the Second Intifada in September of 2000, national demand shocks due to frequent financial difficulties, such as withholding Palestinian's tax returns by Israel, that have gusted affected the Palestinian authority. The descriptive statistics of main explanatory variables are displayed in Table (1).

The estimation strategy of this paper consists of multiple steps. The first is to estimate the wage differential for area C workers relative to those mainly working in A & B areas. In this regression analysis, we also add a dummy variable for area C residence to explore the impact of commuting effect to A & B areas. As a robustness check, we estimate the wage differential between area C workers and area C commuters. We do so by estimating a separate regression model in which the sample is limited to area C residents (area C workers and commuters).

Due to data limitations, we are unable to control the unobserved workers' characteristics that might affect wage differences across workers. One example of such characteristics is innate ability that differs across workers and is not obvious to econometricians. To estimate the extent to which area C wage differential is attributed to unobserved worker characteristics, we utilize Oaxaca-Blinder decomposition technique, which separates the wage gap into explained part (worker's endowment effect) and unexplained part, referring to unobserved worker's characteristics.

The final regression analysis addresses our main research question, which investigates the impact of area C restrictions on imposing extra wage penalty (lower wage) beyond rural effect. Restricting the observations to rural workers does this. In this analysis, Area C wage differential is estimated relative to those working in non-area C rural areas (area B workers). A negative and statistically significant of the area C-work dummy variable would then confirm that area C negative wage effect only pertains to area C workers. This study also conducts a robustness analysis to show if the results are sensitive to model specifications. Specifically, we address the selectivity concern, which might bias the estimates if the distribution of employed individuals is not random or if there are other factors that affect the probability of joining the workforce.

4. Estimation Results

4.1 Results of the base model

In this section, we mostly focus on area C wage differential results, though we briefly discuss notable results associated with the control variables. However, one potential problem is that residuals might be spatially correlated, which would underestimate the standard errors of the estimates. To correct for this potential problem we use the GLS model, such that the error terms are assumed to be correlated within geographical clusters and uncorrelated across cluster. The geographical clusters are defined as worker's locality of residence.

The results are reported in Table (2). Column (1) presents the estimates of a parsimonious version of model (1) in which *log wage* is regressed on area C-work dummy, area C-residence dummy, quarter dummies, and set of geographical dummies (districts and urban, rural, and refugee camp). The estimate of area C wage differential in the parsimonious model will be compared to that of the base model (equation 1, col 2). The rationale for this exercise is to explore the extent to which workers' characteristics explain the area C wage differential.

In column (1), the coefficient of the area C-work dummy, which represents the wage differential, is negative and significant at 5 percent level, with an estimate of 0.08. This indicates that on average, area C workers, earns about 8 percent less than area C commuters and area A & B workers. However, the estimate of area C-residence dummy is negative but statistically insignificant; indicating that commuting to an A & B area offsets area wage differential between area C commuters and workers in an A & B area.

Nonetheless, when controlling for worker's observable characteristics as specified in model (1), the result for area C-residence dummy remains the same, while the negative estimate of area C-work wage estimate drops to 0.046 and becomes statistically significant at the 10 percent (see Column 2). This, however, shows that more than 40 percent of the negative wage differential of area C workers is captured by the differences in worker's observed characteristics. As a robustness check for the area C wage penalty, we restrict the sample to area C observations and re-estimate the model (1). The aim of this exercise is to isolate any unmeasured differences in characteristics between area C and A & B workers. In this specification, the estimate of area C-work dummy measures the wage differential between area C workers and area C commuters. The results in Column (3) show that area C-work estimate is negative and highly significant. The estimate of area C-work indicates that area C workers earn about 7.5 percent less than area C commuters, holding worker's characteristics constant.

As for the results of the control variables, Column (2) shows that, as expected, the estimate of education variable is positive and highly significant. The results also show that returns to education increase with years of education, *ceteris paribus*. Moreover, the age effect is positive and highly significant. The results also show that the age effect also exhibit a non-linear effect with a negative and highly significant reflecting wage's life cycle pattern. As expected, the results also exhibits gender wage differential. Particularly, the estimate of female workers, relative to male workers, is negative and highly significant. In addition, marital status affects average wage differences. Specifically married workers appear to earn a higher than average wage. When distinguishing gender effect based on marital status, the results show that married female workers earn a higher than average wage relative to single female workers.

4.2 Observed versus unobserved worker characteristics effect

Due to lack of data, we are unable to control for unobserved worker characteristics, which might be correlated with worker's decision of work place. For example, it could be the case that more able workers are more likely to commute to urban areas, where average wages are higher than in area C. Consequently, the area C wage differential might (at least partially) reflect the sorting effect, which in other words means that (part of) area C wage differential might only reflect unobserved worker characteristics. To estimate the extent to which wage differences between area C workers and area C commuters that is not explained by observed workers' characteristics, we use the Blinder-Oaxaca decomposition technique.

Blinder (1973) and Oaxaca (1973) provide an algorithm for the decomposition of wage differential, which is based in our case on estimating a separate wage equation for those working in area C and area C commuters. Blinder-Oaxaca wage decomposition equation is specified as follows:

$$LnW_{AB} - LnW_{C} = (\bar{X}_{C} - \bar{X}_{AB})' B_{AB} + \bar{X}_{AB}(B_{AB} - B_{C}) + (\bar{X}_{AB} - \bar{X}_{C})(B_{AB} - B_{C}) \qquad (2)$$

The left hand side term of equation (2) is the difference in mean log wage between area C worker and area C commuters. The right hand side consists of three parts. The first (the difference in endowment effect between the two worker groups, weighted by the parameter estimates (B_i) from area C commuter model (the reference group) captures the explained part of the wage model that is attributed to differences in worker's characteristics (endowment effect).

The second term refers to the wage differential that is attributed to differences in estimated coefficients of both models. The third term is an interaction term that accounts for the differences in endowment and coefficient effects. However, the second and third terms together constitute the unexplained part (residual) of the wage differential.

The results are reported in Table (3), which separately shows the estimates of the wage model for area C workers and area C commuters. The findings show that estimate of the wage determinants for both models are similar to the base model (reported in Table (2), Column (3). An exception is the parameter estimate associated with female marriage status. It becomes statistically insignificant in the area C-work model. Nonetheless, the decomposition analysis shows that around 30 percent of the wage differential is attributed to differences in workers' observed characteristics.

4.3 Area C wage differential: rural or restriction effect?

So far, the regression analysis in the previous section does not censure whether area C's negative wage differential, relative to area C commuters, is driven by the restriction effect. This is because almost all area C localities locate in rural areas. Therefore, it could be the case that the wage differential only reflects the rural effect. To explore this avenue, we first estimate an urban-rural wage differential. This shows whether working in rural areas, including area C, imposes a wage penalty relative to working in urban areas. Then, to isolate the rural effect from area C restriction effect, we limit the sample to rural workers, i.e. those working in area C and non-area C rural area (area B). Accordingly, if area C-work estimate is negative and statistically significant, then we can conclude that indeed area C restrictions have a negative effect on area C workers. On the other hand, if the estimate is insignificant, then the reported area C wage differential in Columns (1) to (4) just reflects urban-rural wage differential.

The results for urban-rural wage differential are reported in Table (2), Column (4). The coefficient of rural dummy is negative and highly significant, indicating rural workers earn 12.7 percent less than the average wage for urban workers, holding differences in worker's observed characteristics constant. As for rural sample model, the results reported in Table (2), Column (5) show that the coefficient of the area C-work dummy is positive but insignificant indicating that the area C wage differential reflects rural effect.

This result confirms our theoretical expectations that negative labor supply shock in area C is likely neutralizing the restriction's negative wage effect (restoring initial equilibrium wage relative to non-area C rural area). To explore the mechanism of negative labor supply shock in area C, we estimate a probit model to examine likelihood for area C workers to commute relative to non-area C rural residents. The rationale for restricting the sample to rural areas is firstly to concur with the wage model of the rural sample, and also to purge all unobserved differences between rural and urban residents that might bias our commuting estimate. The probit model is specified as follows:

$$Commute_{it} = C_i\beta + X^*_{it}B + d_i + q_t + e_{it} \ . \qquad ......(3)$$

Where the dependent variable ($Commute_{it}$) takes a value of 1 for those working in the same locality of residence and zero for commuting workers. The key independent variable is the area C dummy, which takes a value of 1 for area C residents and zero for non-area C rural residents. The vector X^*_{it} includes a number of socioeconomic and demographic control variables, including years of education, age, age squared, gender, marital status, as well as quarter and district dummy variables. Similar to the wage equation, the sample is restricted to the 2001-2008 period for rural workers above 14 years old and who do not work in Israel or Israeli settlements in West Bank.

The results, reported in Table (5), show that the coefficient of area C dummy is negative and significant with an estimate magnitude of 0.24. This indicates area C residents are more likely to commute relative to the other rural residents, *ceteris paribus*. The estimate of area C dummy shows that the commuting probability for area C workers increases by 6 percent. This result provides some evidence that the Israeli restrictions on area C induce workers to commute, probably reducing the negative effect on area C wages.

5. Robustness Check: Selectivity Bias

The wage differential estimates we reported in the previous section are based on observed wages only for employed individuals. This might indicate that the sample of working individuals is not random if there are other variables that affect the probability of joining the labor force, leading to inconsistent and biased estimates (selectivity bias). To address this issue, we utilize Heckman (1976) two-stage approach, which would allow us to test for selectivity bias.

The first stage estimation of Heckman model is based on estimating an employment participation model using probit estimation technique, such that

$$L_i = H_i \mu + \varepsilon_i \quad .... \tag{4}$$

Where L_i is a latent variable that equals 1 if worker *i* is employed and zero otherwise.[9] H_i is a vector of explanatory variables that affect working decision, including years of education, age, gender, marital status, and married female. The estimates from the probit model will be used to construct the inverse Mills ratio that is conventionally used to correct for the sample selection, if any, in the wage equation.

The estimates for Heckman's first stage model is reported Table (6). We estimate Heckman model for all reported "base" models in Table (1). The results show that all employment participation factors in all the models are statistically significant. We find that workers with a greater number of years of education are more likely to join the work force. [10] Also, the results show that married individuals are more likely to get employed. On the other, the effects of age variable, female, and married female are negatively related with the probability of joining the labor force, *ceteris paribus*.

The selectivity parameter (λ) is presented in the bottom of Table (7). The results show that the sign of λ is positive for all models except for the rural sample model (Column (4)). Yet, in all models, λ is statistically insignificant. This indicates that selectivity concerns were not driving our findings. The results of Heckman's second stage model (the wage model) is reported in Table (7), which show that the estimate of area C wage differential, as well as those of the control variables, are similar to the OLS model reported in Table (2).

6. Conclusion

Area C is economically important to the Palestinians. The fertility of its agricultural land, the availability of aquifers as well as the rich mining reserves are vital to the Palestinian economy. Still, area C is considered under-developed due to Israel's strict construction and development restrictions. The PA, since its establishment in 1994, has no municipal or planning control over area C. Israeli authority should permit building infrastructure. Currently, Israel bans expanding construction, which deters development projects in about 70 percent of the area.

The objective of this study is to examine the effect of these restrictions on average wages in area C. We present a simple theoretical model, which shows that the impact on average wages in area C depends on the response of area C labor supply to the negative demand shock of area C restriction. To empirically examine the wage differential of area C workers, we utilize extensive individual level data from PCBS labor force survey and apply pooled

[9] In unreported model, we estimated Heckman first stage model in which selection is via worker decision to join the labor force. This particularly relevant in Palestine as the labor force participation for females is low, reaching about 13 percent in 2008. However, the results show that area C wage differential results are unaffected.

[10] We were not able to run the Heckman model. With the specification of the OLS rural model, the log likelihood of the selection model is not concave. To ease this problem, we replace the education attainment in the selection with 9 education categories. The results show that the selectivity parameter (λ) is negative and significant. Still, in confirming the OLS finding, the coefficient of area C dummy is statistically insignificant.

OLS technique. We provide evidence that area C workers suffer a wage penalty of about 8 percent relative to mainly workers in A & B areas. The results also show that when controlling for worker characteristics, the magnitude of area C negative wage differential drops significantly. This signals the importance government policies, such as subsidizing educational attainment and funding skill-upgrading programs that would decrease wage inequality between urban and rural areas.

We extend our analysis to compare average rural wages between area C and non-area C workers. We provide evidence that the wage difference between area C and non-area C rural workers is statistically insignificant, indicating that the area C wage differential we observe is attributed to rural effect. This result indicates that the impact of the Israeli restrictions on area C wages is neutralized. Evidently, we show that negative labor supply shock (commuting) is a potential mechanism. Specifically, we show that area C residents are more likely to commute than their peers in other rural areas.

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Table 1: Descriptive Statistics

	Area A & B		Area C	
Variable	**Mean***	**Standard deviation**	**Mean**	**Standard deviation**
Daily Wage	**85.94**	59.02	77.15	62.46
Education attainment				
Illiterate	0.025	0.010	0.072	0.043
Less than elementary	0.068	0.010	0.114	0.031
Elementary	0.190	0.021	0.251	0.045
Primary	0.300	0.021	0.324	0.049
Secondary	0.162	0.007	0.108	0.034
Diploma	0.085	0.008	0.051	0.018
Bechalor	0.149	0.024	0.070	0.025
Post Graduate Diploma	0.002	0.001	0.000	0.001
Master	0.014	0.004	0.008	0.006
PhD	0.004	0.001	0.002	0.003
Employment Status				
Full time employment	0.290	0.028	0.328	0.053
Part time employment	0.026	0.007	0.034	0.016
Unemployment rate	0.094	0.021	0.082	0.028
Labor Force Participation	0.410	0.984	0.444	0.960
Type of Industry				
Agriculture	0.130	0.024	0.351	0.101
Manufacturing	0.128	0.012	0.129	0.034
Construction	0.135	0.037	0.157	0.034
Commerce	0.196	0.013	0.118	0.032
Transportation, Communication, and Storage	0.056	0.006	0.051	0.018
Other Services	0.355	0.032	0.194	0.052
Type of Occupation				
Legislators, senior , & managers	0.042	0.008	0.032	0.016
Professionals	0.234	0.022	0.131	0.042
Technicians, associates and clerks	0.187	0.036	0.097	0.029
Skilled agricultural and fishery workers	0.108	0.027	0.266	0.112
Craft and related trade workers	0.176	0.025	0.155	0.032
Plant and machine operators and assemblers	0.086	0.007	0.091	0.028
Elementary occupations	0.167	0.041	0.229	0.044

Notes: *The mean refers to average proportion over the sample period

Table 2: Area C wage Differential Models: Pooled OLS Estimation

Variable	Entire sample-I 1	Entire sample-II 2	Area C-sample 3	Rural vs. Urban 4	Area C within Rural 5
Area C- residence	-0.046	0.001			
	-0.99*	0.04			
Area C- work	-0.080	-0.046	-0.072		0.061
	-2.09	-1.75	-2.58		1.12
Rural area				-0.127464	
				-11.23	
Years of Education		0.035	0.025	0.034	0.027
		22.34	6.68	22.28	11.49
Age		0.033	0.027	0.033	0.039
		10.75	3.07	10.73	7.42
Age-square		-0.0003	-0.0002	-0.0003	-0.0004
		-7.69	-2.08	-7.62	-6.08
Married		0.056	0.055	0.058	-0.042
		6.15	1.63	6.4	-1.53
Female		-0.357	-0.318	-0.352	-0.6
		-25.73	-5.51	-25.54	-15.51
Married Female		0.093	0.061	0.1	0.258
		5.81	1.09	6.17	5.75
Industry dummies	No	Yes	Yes	Yes	Yes
Occupation dummies	No	Yes	Yes	Yes	Yes
Employment status dummies	No	Yes	Yes	Yes	Yes
Urban/rural/refugee camp dummies	No	Yes	Yes	YEs	No
District dummies	Yes	Yes	Yes	Yes	Yes
Quarter (round) dummies	Yes	Yes	Yes	Yes	Yes
Constant	4.742	3.425	3.273	3.436	3.498
	104.3	45.48	22.46	45.74	22.69
N	60756	60722	2371	60722	7412
R-sq	0.1	0.42	0.41	0.42	0.32

Notes: * The figure underneath each estimate refers to t-statistics.

Table 3: Wage Model for Area C commuters and Area C workers

Variable	Area c commuters	Area C workers
Years of Education	0.024	0.028
	6.99*	5.44
Age	0.025	0.036
	3.94	3.8
Age- square	-0.0002	-0.0004
	-2.52	-3.03
Part time	-0.068	-0.184
	-1.93	-4.08
Married	0.076	-0.020
	2.43	-0.42
Female	-0.270	-0.408
	-7.57	-7.29
Married Female	0.006	0.182
	0.12	2.42
Industry dummies	Yes	Yes
Occupation dummies	Yes	Yes
Employment status dummies	Yes	Yes
District dummies	Yes	Yes
Quarter (round) dummies	Yes	Yes
Constant	3.168	2.731
	19.7	10.27
N	1689	682
R-square	0.5	0.4

Notes: * The figure underneath each estimate refers to t-statistics.

Table 4: Blinder- Oaxaca Wage Decomposition Analysis

	Log wage
Area C commuters	4.197
	368.58*
Area C workers	4.121
	223.63
Log Wage Difference	0.076
	3.51
Decomposition of Log wage Difference	
Explained by Difference in Worker Characteristics	
Endowments	0.023
	1.46
Log wage Differences due to unobserved effect	
Coefficients	0.115
	4.61
Interaction	-0.062
	-2.75

Notes: * The figure underneath each estimate refers to z-statistics.

Table 5: Commuting Differential: Area C vs. None-area C Rural Workers

Variable	Commuting
Area C. place of residence	-0.240
	-2.69*
Years of Education	-0.033
	-13.04
Age	0.096
	36.93
Age-square	-0.001
	-38.97
Married	0.197
	8.45
Female	-0.645
	-18.5
Married Female	-0.018
	-0.64
District dummies	Yes
Quarter (round) dummies	Yes
Constant	-1.4
	-6.75
Pseudo R-square	0.14
N	191179

Notes: * The figure underneath each estimate refers to z-statistics.

Table 6: Heckman's First Stage Selection Model

Variable	Entire sample	Area C sample	Rural vs. Urban	Rural sample
Years of Education	0.126	0.102	0.126	
	37.15*	7.61	37.14	
Education categories				Yes†
Age	0.0002	-0.0038	0.0002	-0.015
	0.26	-1.57	0.26	-7.88
Married	0.929	0.967	0.929	0.464
	46.21	14.7	46.22	9.03
Female	-0.504	-0.532	-0.504	-0.161
	-18.19	-6.67	-18.19	-2.57
Married Female	-1.058	-1.185	-1.074	-1.020
	-41.13	-15.96	-41.13	-13.53
Constant	-2.21	-1.86	-2.21	1.59
	-28.77	-8.15	-28.77	4.95
N	350467	16271	350467	18010

Notes: * The figure underneath each estimate refers to z-statistics. † We were not able to run Heckman model. With the specification of the OLS rural model, the log likelihood of the selection model is not concave. To ease this problem, we replace the education attainment in the selection with 9 education categories.

Table 7: Heckman's Second Stage- Area C Wage Differential Model

Variable	Entire sample 1	Area C sample 2	Rural vs. Urban 3	Rural Sample 4
Area C- residence	0.001			
	0.04*			
Area C- work	-0.046	-0.072		0.042
	-1.75	-2.62		0.99
Rural area			-0.127	
			-11.24	
Years of Education	0.036	0.027	0.036	0.013
	17	6.36	16.88	4.31
Age	0.033	0.027	0.033	0.038
	10.79	3.1	10.77	8.23
Age-square	-0.0003	-0.0002	-0.0003	-0.0004
	-7.72	-2.1	-7.65	-6.09
Married	0.065	0.07	0.068	-0.134
	5.97	2.09	6.21	-4.99
Female	-0.362	-0.327	-0.358	-0.465
	-26.64	-5.76	-26.43	-13.55
Married Female	0.083	0.042	0.089	0.442
	4.59	0.74	4.85	9.96
Industry dummies	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Employment status dummies	Yes	Yes	Yes	Yes
Urban/rural/refugee camp dummies	Yes	Yes	No	Yes
District dummies	Yes	Yes	Yes	Yes
Quarter (round) dummies	Yes	Yes	Yes	Yes
Constant	2.74	2.912	2.744	3.08
	42.89	20.64	42.32	29.67
λ	0.014	0.022	0.015	-0.348
	0.011	0.019	0.011	0.026
N	60722	2371	60722	7412

Notes: * The figure underneath each estimate refers to t-statistics.

Appendix

Assume that the labor demand of area C is linear and specified as D = a - bW and Labor supply is specified as S = c - gW, where the parameters b < 0 and g > 0 are the slopes for demand and supply, respectively. The slopes also, to a great extent reflect the degree of elasticity.[11] Utilizing labor market clearing condition (D=S), the equilibrium wage can be written as:

$$W^* = \frac{a - cb - g}{} \ldots\ldots\ldots (1')$$

The effect of a negative labor demand shock on the equilibrium wage can be modeled as a decrease in the intercept "a". A comparative static analysis of the equilibrium wage can show the new equilibrium wage W' *, depends on the size of the shock and the magnitude of b and g. Specifically:

$dW^* = \frac{1b-g}{} da \ldots\ldots\ldots\ldots (2')$The positive effect of the negative labor supply on the new equilibrium wage (W') can be modeled as a decrease in c, such that $dW^* = -\frac{1}{b-g} dc \ldots\ldots\ldots\ldots (3')$

Holding b and g constant, whether the initial equilibrium wage is restored depends on the size of the negative supply shock.

[11] The elasticity of the linear demand can be written as:(- 1/ b) * W/D. Therefore, for a given wage level, the greater the slope, the smaller is elasticity. Also, the elasticity of labor supply can be written as: (-1/ g) * W/D.