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The Effect of Labour-Demand Shocks on Women's Participation in the Labor Force: Evidence from Palestine

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ABSTRACT *Two interesting facts emerge from the Palestinian labour market. Educational attainment for women swiftly expanded during the 1999–2011 period, but the labour force participation rate for educated women stagnated—disproportionately so for young educated women. We investigate whether changes in labour demand has contributed to women's sluggish labour force participation. Our empirical analysis used quarterly labour-force data published by Palestine Central Bureau of Statistics between 2005 and 2011. To explore the causal effect of labour demand shocks, we use Bartik instrumental variable approach. Our analysis provides evidence that changes in the labour demand for educated women, rather than improvement in overall demand, affect their labour force participation. This research has important policy implications regarding the economic empowerment of educated women in Palestine suggesting that improvement in overall demand may not benefit educated women and that boosting demand for this specific cohort is what matters.*

1. Introduction

A voluminous literature documents changes in women's labour force participation (LFP) rate across a number of countries (Olivetti & Petrongolo, 2016; Verick, 2014). A main strand of research has focussed on increases in educational attainment as a key factor in the rise of women's LFP rate, largely in developed countries (see Klasen & Pieters, 2012; Thévenon, 2013). Still, in many developing countries, the LFP rate seems to grow little or even to decrease for educated women. This observation is well documented in several East Asian countries (see Andrabi, Das, & Khwaja, 2012; Klasen & Pieters, 2015; Verick, 2014). Assaad, Hendy, Lassassi, and Yassin (2018) draw a similar analogy in several Middle East and North African (MENA) countries. They show that women's LFP rate has stagnated in Tunisia, Algeria, and Morocco; countries in which women's educational attainment is high. Also, Andrabi et al., 2012) show that increases in educational attainment for women in Pakistan did not translate into higher LFP.

Palestine follows a similar trend. In particular, the LFP rate for educated women in 2011 levelled at 47%. Despite gains in educational attainment, which has almost doubled from 17% since 1999, their pattern of participation was sluggish in earlier years. Undoubtedly, supply-side factors play an important role in explaining this pattern. However, the trends observed in the labour market of the occupied West Bank suggest some role for the demand-side factors. Specifically, over the 1999–2011 period, job opportunities

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became scarcer for educated women, and their employment rate significantly decreased post the Second Intifada between 2000 and 2004; a drop that overwhelmingly affected young educated women (see Section 2.2 for more discussion).

To date, little research has sought to establish the cause for the stagnation in the LFP rate of educated women observed in many developing countries.[1] This research attempts to fill that gap by exploring the role of demand-side factors using the occupied West Bank of Palestine as a case study.

The theoretical motivation of our research is based on the theory of 'discouraged worker effect,' which dates to Becker (1965), Mincer (1966), and Dernburg and Strand (1966). This theory suggests that labour supply is higher when the labour market is tight and lower when it is slack. During poor labour-market conditions (for example, a recession), workers give up searching for jobs and become discouraged. The underlying reason is that the utility associated with searching is lower than the utility of remaining out of the labour force (see Benati, 2001; Dagsvik, Kornstad, & Skjerpen, 2013).

Empirically, our research aims to quantify the effect of changes in labour demand on LFP of educated women in the occupied West Bank with a specific focus on the young cohort. To highlight the extent of the underlying effect, we compare how they respond to changes in labour demand relative to peer men. We draw upon quarterly data collected by the Palestinian Central Burau of Statistics (PCBS) from the occupied West Bank's districts between 2005 and 2011, firstly using the employment growth rate in all economic activities (overall demand effect). To address the endogenous nature of labour demand, we employed the shift share developed by Bartik (1991) as an instrument variable. The results show that employment elasticity is positive and statistically significant only for older educated groups.

However, a concern is inherent in using overall employment as a measure of changes in labour demand such that it may mask group-specific-demand effects on LFP. The descriptive analysis shows that demand for educated workers is largely generated from the services sector and that employment distribution within this sector is heterogeneous across groups. This may indicate that linkages between changes in labour demand and LFP are group-specific. To test this hypothesis, we examine the effect of gender-specific demand changes in the services sector. We provide causal evidence that changes in demand for educated women affect women's LFP, and accordingly the decline in labour demand for women workers in recent years may well contribute to their sluggish LFP. The results suggest that decreasing employment by 1% for the young educated women decreases their LFP rate by 1.3%, while a similar decrease in employment for older educated women decreases their rate of participation by 0.7%.

We descriptively show that employment opportunities for young educated women have decreased relative to those available to peer men. We then examine whether job competition among the two groups is a driving factor. The empirical findings reject this hypothesis. In sum, the outcome of our research provides evidence that LFP for young educated women does not respond to changes in overall employment and that only demand shifts in sectors that employ women matter. In this respect, policies that enhance demand for this cohort are expected to boost their labour market linkages.

This paper contributes to scarce but growing literature that links changes in labour demand to woman LFP (see Olivetti & Petrongolo, 2016).[2] Existing research focuses on structural transformation (see Akbulut, 2011) and trade integration (see Gaddis & Pieters, 2017). Still, these papers mainly correspond to developed countries. Only few studies have empirically explored linkages between demand and women's LFP in a developing country context. The studies by Kapsos, Silberman, and Bourmpoula (2014), Klasen and Pieters (2015), and Assaad et al. (2018) explore factors that are associated with the continued low woman LFP in India and MENA countries, respectively, and highlight the importance of the demand-side factor.[3] Our research addresses similar questions, but in contrast to those studies which are largely based on correlation analysis, we use a credible source of identification in the intent of establishing a causal linkage.

The remainder of the paper is organised as follows: Section 2 describes some key patterns in the labour market of the occupied West Bank to motivate the regression analysis. It also documents the data source and methodology that we use to model the linkage between labour demand and LFP. Section 3 presents the results, while Section 4 concludes and briefly provides policy recommendations.

2. Empirical setting

2.1. Data

The labour force data we use is collected and published quarterly by the PCBS. The labour force data covers employment and socioeconomic characteristics of a nationally representative sample of household members. We use various aggregated measures (variables), using population estimates of individuals between 19 and 54 years of age. These variables are constructed using PCBS sampling weights. The sample excludes data from the Gaza Strip because it was exposed to a sharp differential shock during the period of analysis. In 2007, Hamas militarily controlled the Gaza Strip, forming a separate government. Subsequently, Israel imposed a prolonging blockade and waged three wars against Palestinians in the Gaza Strip, sliding its economy into a deep recession (see Fallah, 2018). This leaves our analysis to eleven districts in the occupied West Bank.

Our descriptive analysis is based on quarterly district-level data gathered between 1999 and 2011. However, we restrict the regression analysis to 2005–2011 period, just after the Second Intifada uprising.[4] We exclude the Second Intifada period because labour-market conditions were then highly affected by political upheavals, mobility restrictions within the West Bank, and restrictions on commuting to the Israeli labour market (Mansour, 2010). Such shocks are difficult to control for in the context of our research objectives. The total number of quarter-district observations used to estimate the empirical model is 275. Descriptive statistics for variables used in the empirical analysis are presented in Table (1) in the appendix. (All tables and graphs are reported in the appendix).

2.2. Patterns of labour demand and labour force participation in the occupied West Bank

To motivate the econometric analysis, this section presents some key patterns in the labour market of the occupied West Bank during the period of study. Data from the PCBS's labour force survey of 2011 show a clear gender gap in LFP rate-favouring men as well as a distinct pattern in which level of education appears to be a decisive factor for women. LFP rate for women levelled at 26%. Markedly, grouping women by level of education shows that LFP rate for more educated women amounted to 47%, as indicated above, vs. 15% for the low-educated group. In contrast, both educated and low-educated men scored a high LFP rate, suggesting that level of education is less relevant to them. Markedly, The LFP rate for educated women has been sluggish in recent years, especially for the young group (aged 19–29). Between 1999 and 2011, the LFP rate decreased from 43% to 37% for the latter, while it bounced to about 60% for the older group (aged 30–54).

In this paper, we highlight the demand effect to explain the stagnation of the LFP of educated women. To establish this linkage, we relied heavily on descriptive statistics to explore the main shocks that have affected the Palestinian economy between 1999 and 2011. The main shock occurred during the Second Intifada, which broke out at the end of 2000 and lasted until the end of 2004. During this period, the Palestinian labour-market conditions deteriorated substantially. As violence increased, Israel imposed a system of internal and external closures across the occupied West Bank and severely restricted the access of Palestinian workers to the Israeli labour market (see Mansour, 2010; Fallah, 2018). With these negative shocks, unemployment rose to an average annual rate of 27%.

As the effect of the Second Intifada diminished and Israel gradually lifted mobility restrictions, labour-market conditions improved such that both employment rate and the LFP rate started to recover for almost all groups. Distinctly, labour-market conditions did not improve for young educated women; their LFP rate followed a sluggish path (see Figure 1, which compares over time changes in LFP rate across educated groups). We hypothesise that the decline in labour demand is a contributing factor.

After the end of the Second Intifada, job opportunities become scarcer for educated women; their employment rate, calculated relative to LFP, decreased from 81% to 66%. The young group is the main loser in this case: their employment rate dropped from 77% to 48%, though the rate remained stable at around 85% for the older educated group. On the other hand, employment rate for the educated men has relatively improved (see Figure 2).

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LFP growth rate – young educated Women	275	0.081	0.384	−0.682	2.854
LFP growth rate – older educated Women	275	0.062	0.277	−0.618	1.379
LFP growth rate – young educated Men	275	0.065	0.319	−0.669	1.595
LFP growth rate – young educated Men	275	0.030	0.205	−0.491	1.277
Service Employment Growth Rate	275	0.020	0.106	−0.253	0.611
Overall Employment Growth Rate	275	0.018	0.122	−0.326	0.492
Bartik Instrument: All industries	275	0.027	0.087	−0.179	0.315
Bartik Instrument: All Service industries	275	0.012	0.028	−0.041	0.186
Bartik Instrument: Young Educated Women	275	0.021	0.071	−0.165	0.288
Bartik Instrument: Young educated men	275	0.020	0.059	−0.124	0.330
Bartik Instrument: Older Educated Women	275	0.021	0.071	−0.116	0.317
Bartik Instrument: Older Educated Men	275	0.016	0.047	−0.095	0.224
Growth of educational attainment-Men	275	0.025	0.132	−0.378	0.451
Growth of educational attainment-Women	275	0.035	0.158	−0.384	0.525
Growth of educational attainment-Young Men	275	0.037	0.185	−0.525	0.833
Growth of educational attainment-Older Women	275	0.040	0.199	−0.477	0.990
Growth of educational attainment-Older Men	275	0.029	0.193	−0.497	1.324
Growth of educational attainment-Young Women	275	0.035	0.158	−0.384	0.525
Age share 15–25	275	0.377	0.024	0.315	0.444
Age share, 26–35	275	0.234	0.020	0.190	0.291
Age share 36–45	275	0.175	0.014	0.136	0.214
Age share 46 55	275	0.105	0.011	0.072	0.135
Age share 56–65	275	0.055	0.009	0.033	0.083
Urban share	275	0.522	0.160	0.262	0.858
Rural share	275	0.398	0.169	0.113	0.738
Household Size	275	5.470	0.943	1.035	6.684
Mean wage of household head	275	126.854	27.927	81.072	258.965
Share of Married Educated Women	275	0.490	0.088	0.230	0.682
Share of Married Older Educated Women	275	0.796	0.095	0.417	1.000
Share of Married Young Educated Women	275	0.327	0.102	0.042	0.588

Notes: The variables included in the data are aggregated measures of population estimates of individuals between19 and 54 years of age. Data areare drawn from the PCBS 1999–2011 Labour Force Survey.

One way to explore the nature of changes in labour demand for young educated women is to compare their employment rate with that of young educated men. Employment share for young educated women, relative to young educated men, declined after the end of Second Intifada from 97% to 60% in 2011.[5] This is largely accounted for by a decrease in demand for young educated women in commerce, the fastest growing service sector. In particular, the share of commerce jobs created for young educated workers increased from 17% to 24% over this period, but most of these new jobs have been accounted for by young educated men. This trend is documented in Figures (3) and (4), which track distribution of jobs created for each group across service subsectors over the 1999–2011 period. More discussion below shows that the service sector is the main employer of educated workers.

The decline in the demand for young educated women can also be attributed to negative employment shocks in public education. Notably, the public sector employs about half of all educated women. Within this sector, about 85% of women are employed in education. After the end of the Second Intifada, the Palestinian government disproportionately expanded employment of security personnel to quell tensions in the occupied Palestinian territories and curb rising unemployment. The financial stress that the Palestinian government has experienced in recent years has possibly restricted its ability to expand employment proportionately in other public sub-sectors to meet the rising supply of new graduates (World Bank, 2012). Figure (6) documents the relative employment decline in public education compared to other public sub-sectors.

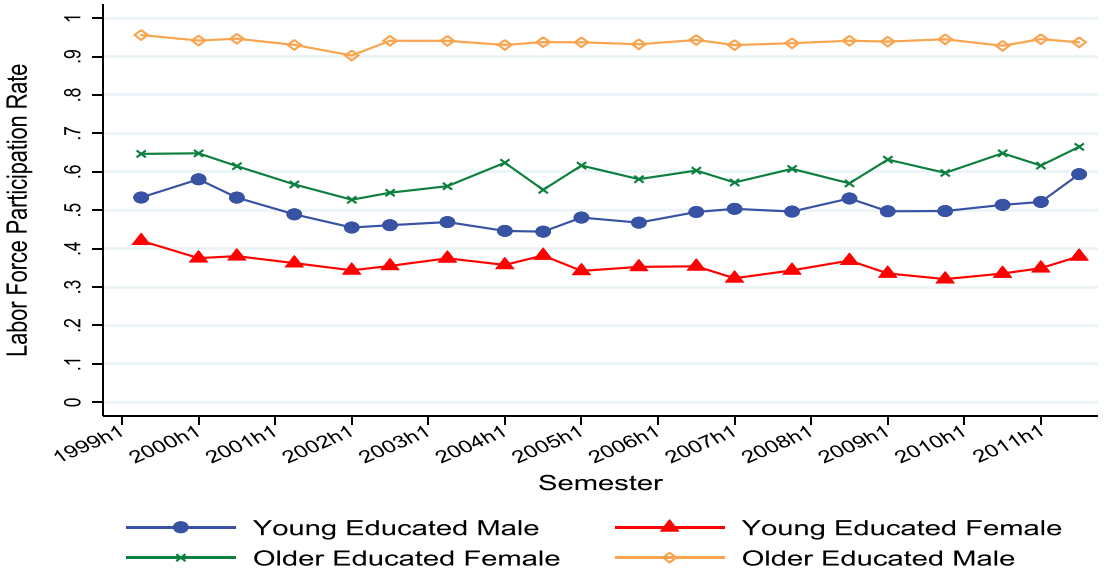

Figure 1. Patterns of LFP by age and gender for educated individuals in the West Bank, 1999–2011.

This figure plots changes over time in the LFP rate of low-educated individuals by age and gender. The data are taken from the PCBS 1999–2011 Labour Force Survey. The LFP rate of the various groups is calculated semi-annually. The young group included individuals between 19 and 29 years of age, while individuals in the older group are between 30 and 54. Educated groups are defined as those with more than twelve years of education.

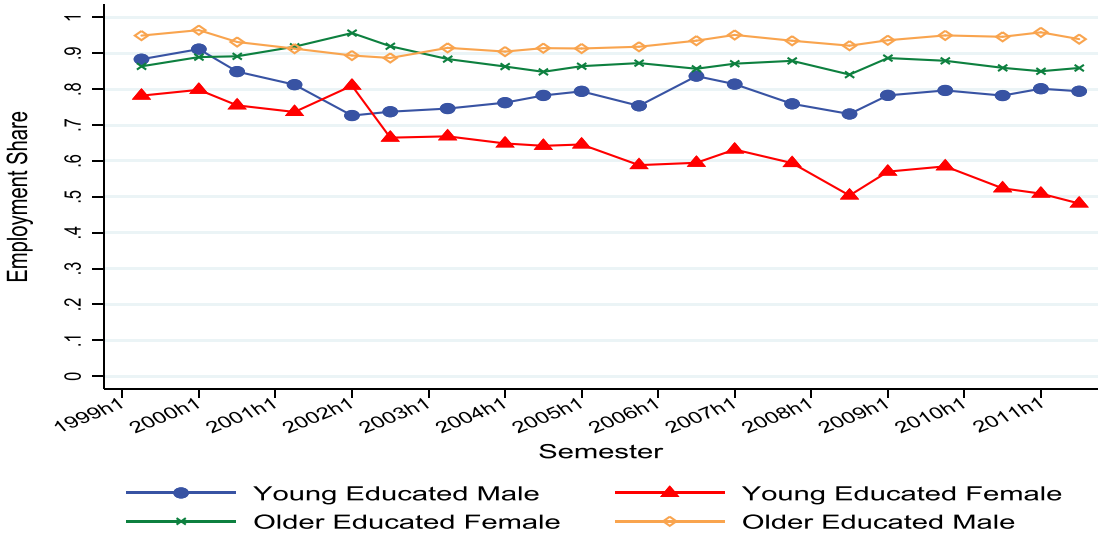

Figure 2. Patterns of employment rate by age and gender for educated individuals in the West Bank, 1999–2011.

Notes: This figure plots changes over time in the employment share of educated individuals by age and gender. The data are taken from the PCBS 1999–2011 Labour Force Survey. Groups' employment shares are calculated semi-annually as the number of employed divided by the number of labour force participants. The young group included individuals between the ages of 19 and 29, while the older group included individuals between the ages of 30 and 54. The educated group included individuals with more than twelve years of education.

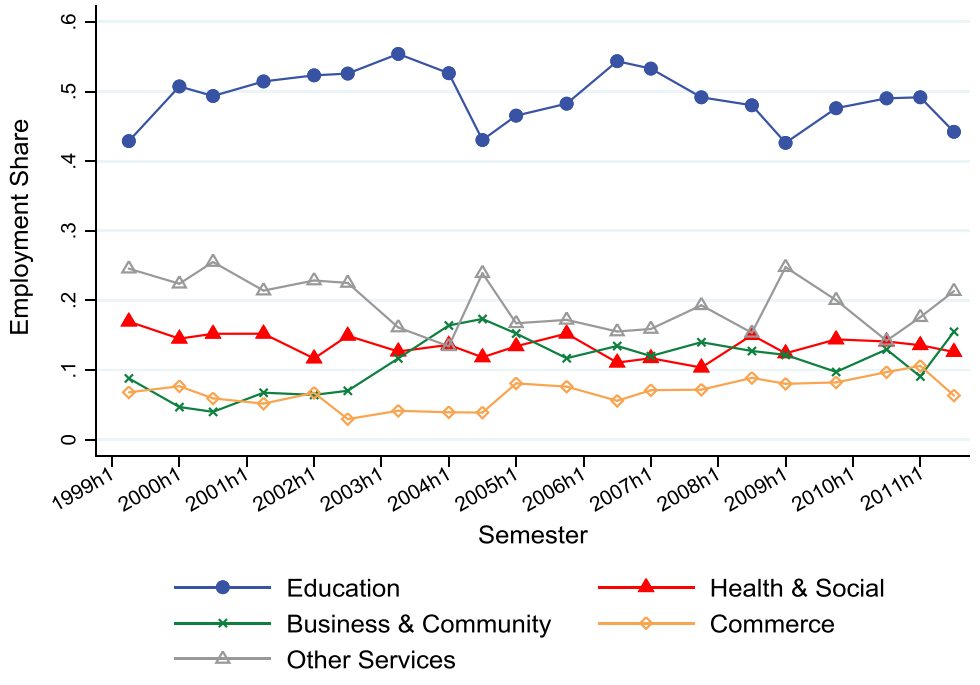

Figure 3. Distribution of service subsectors for young educated women, 1999–2011.

Notes: This figure plots the distribution of jobs created for young educated women across service subsectors. Data are drawn from the PCBS 1999–2011 Labour Force Survey. Employment shares are calculated semi-annually as the number of young educated women employed in each subsector divided by overall service employment for young educated women. The young group included individuals between the ages of 19 and 29. The educated group included individuals with more than twelve years of education. Commerce includes activities related to retail and wholesale. Business & Community includes activities related to real estate; other businesses; computer activities; other community, social, personal activities; and other service activities. Health and Social includes health and social work.

In sum, the sluggish LFP rate for educated women is accompanied by a decline in labour demand after the Second Intifada, which more profoundly affected young educated women. The next section presents the econometric approach that we use to quantify the relationship between labour demand shocks and LFP for this group.

2.3. LFP and the impact of the labour demand changes

The main purpose of our analysis is to examine how changes in local labour demand affected the LFP of educated women, with special focus on young educated women. In order to explore the extent to which they have responded to changes in labour demand, we expand our modelling to cover the analogous group of men (that is young and older educated men).[6]

2.3.1. Baseline econometric model. We utilise the following fixed effects regression model to capture the relationship between local labour demand and LFP:

$$\Delta\%\mathrm{LFP}_{dq} = \mathrm{B}_0 + \mathbf{B_1}\Delta\%\mathrm{EMP}_{dq} + \mathbf{B_2}\mathbf{X}_{dq} + \mu_d + \pi_q + \mathbf{B_3}\tau_{\mathrm{dq}} + \mathrm{e}_{dq} \quad (1)$$

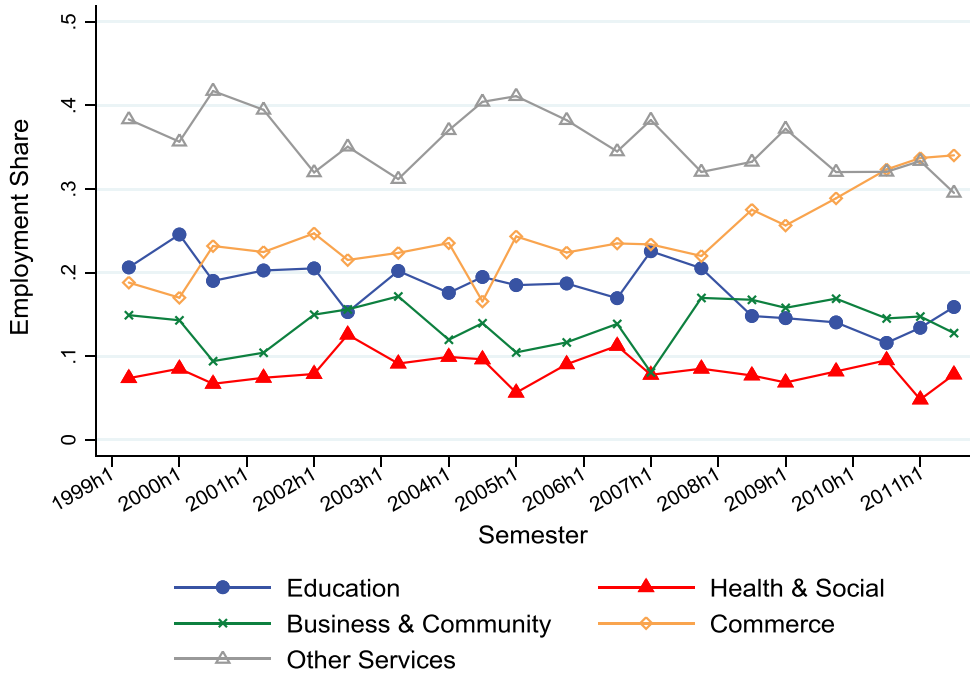

Figure 4. Distribution of service subsectors for young educated men, 1999–2011.

Notes: This figure plots distribution of jobs created for young educated men across service subsectors. Data are drawn from the PCBS 1999–2011 Labour Force Survey. Employment shares are calculated semi-annually and calculated as number of young educated men employed in each subsector divided by overall service employment for young educated men. The young group included individuals between the ages of 19 and 29. The educated group included individuals with more than twelve years of education. Commerce includes activities related to retail and wholesale. Business & Community includes activities related to real estate; other businesses; computer activities; other community, social, personal activities; and other service activities. Health and Social includes health and social work.

The dependent variable ($\Delta\%LFP_{dq}$) is the rate of growth of labour force participants in district d and observed in quarter q and q_{t-1}. Similarly, we use employment growth rate ($\Delta\%EMP_{jq}$) to measure changes in labour demand. The estimated coefficient '$\mathbf{B_1}$' is an elasticity, measuring the effect of employment growth rate on LFP growth rate. Consistent with the discouraged-worker effect, the interpretation of that parameter is that increases in employment growth (labour demand) would induce more individuals to join the labour market. In the following analysis, we firstly measure employment growth by using data from all economic activities. The elasticity estimate then reflectes the effect of overall changes in local labour demand. Next, we explore how LFP for each group respondes to changes in group-specific demand in the services sector -the main employer of educated workers.

Vector $\mathbf{X}_{dq}$ is a set of controls at the district level, including the share of population living in urban and rural areas in which the effect is measured relative to the share of population living in refugee camps (the reference group). It also includes age, using the share of the labour force that belonged to the following categories: 21–25, 26–35, 36–45, 46–50, 50–65, and older than 65. Individuals younger than 21 are the reference group. The control variables also cover other labour-force determinants including share of married women per group, only for models based on women, and average household size and average income for the household head.

We also control for growth rate of the number of educated individuals (education growth rate) that completed 12 years of education. This is in order to account for district's over time changes in LFP

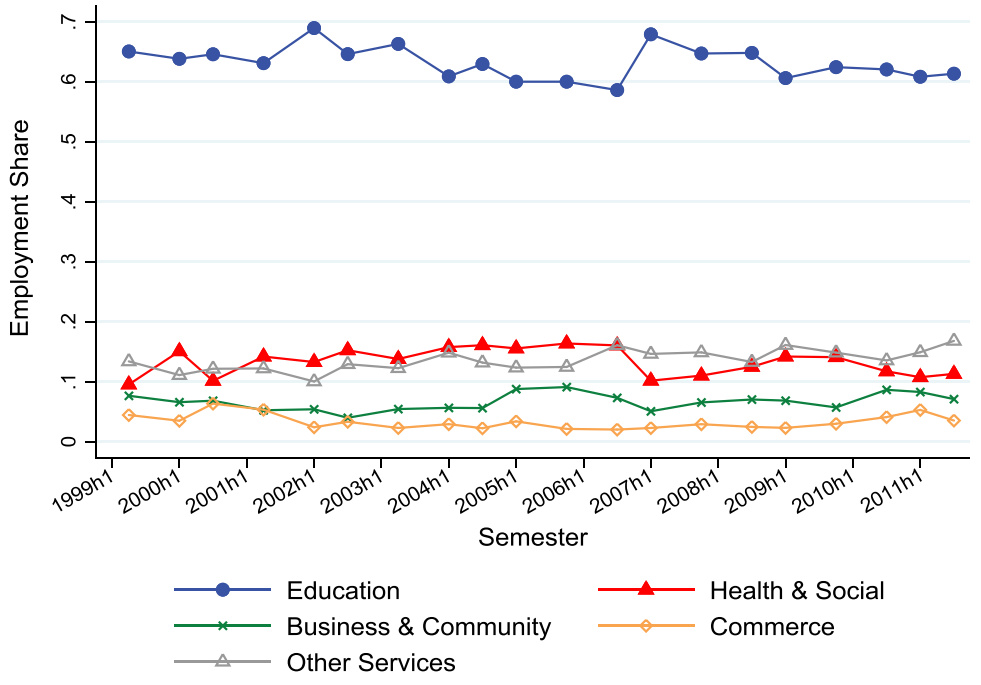

Figure 5. Distribution of service subsectors for older educated women, 1999–2011.

Notes: This figure plots distribution of jobs created for older educated women across service subsectors. Data are drawn from the PCBS 1999–2011 Labour Force Survey. Employment shares are calculated semi-annually and calculated as number of older educated women employed in each subsector divided by overall service employment for older educated women. The older group included individuals between the ages of 19 and 29. The educated group included individuals with more than twelve years of education. Commerce includes activities related to retail and wholesale. Business & Community includes activities related to real estate; other businesses; computer activities; other community, social, personal activities; and other service activities. Health and Social includes health and social work.

due to changes in enrolling in higher education. While the estimate of the education growth is likely biased as school decisions are linked to labour-market outcomes, we refrain from empirically addressing the underlying endogeneity concern since it is used only as a control variable.

Vector μ_d included district dummy variables (district fixed effects) to control for factors that are common to all women in a given district and which varied little over time. These factors included cultural barriers particular to certain communities. Vector π_q included quarter dummy variables to control time-variant national shocks that affected all women in the same fashion. We also included a district linear trend τ_{jq} (year by district) to account for linear changes over time at the district level.[7]

Since we utilise small number of panels (11 districts) and long time series, the error terms are likely auto-correlated. We did test for autocorrelation using 'actest' stata command developed by Baum and Schaffer (2013). The null hypothesis is that the error terms are not auto-correlated is rejected for all estimated models. To correct for the autocorrelation, we estimated Kernel Bartlett-based heteroskedastic and autocorrelation consistent standard errors. The kernel estimation assumes that autocorrelated disturbances disappear after a maximum number of lags. The latter is determined using the 'actest' stata command and reported at the bottom of the Tables (2 to 4).

2.3.2. Labour demand shocks and the endogeneity problem: a 'Bartik' instrumental variable approach. Because employment growth also reflects labour supply shocks, the direct simultaneity

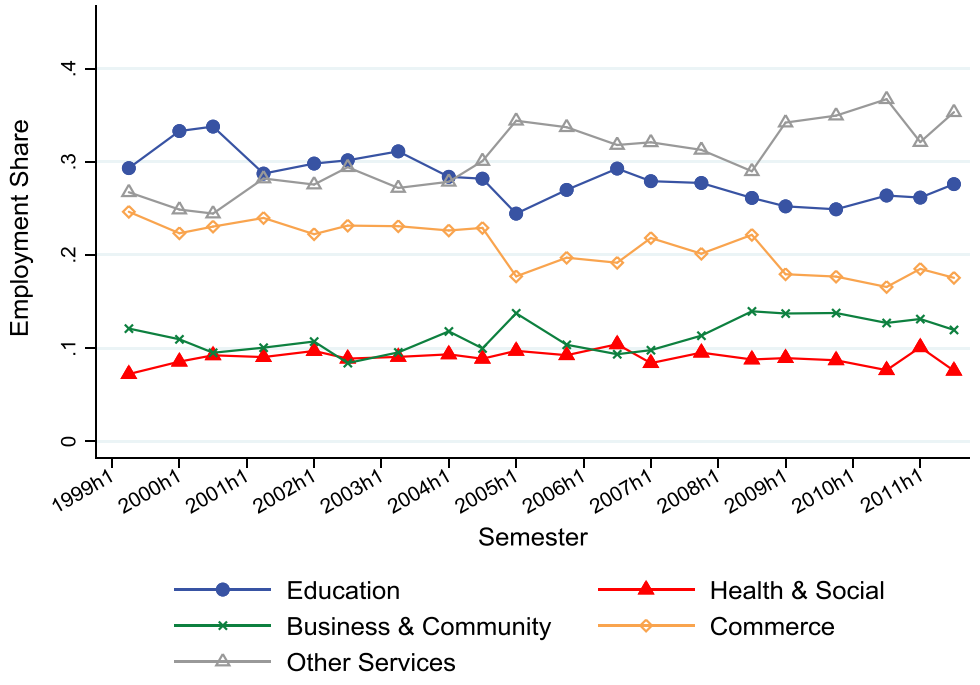

Figure 6. Distribution of employment in the public sector, 1999–2011.

Notes: This figure plots employment distribution in the public sector. Data are drawn from the PCBS Labour Force Survey, 1999–2011. Employment shares are calculated semi-annually. The young group included individuals between the ages of 19 and 29. The educated group included individuals with more than twelve years of education. Health and Social includes health and social work.

between $\Delta\%LFP_{dq}$ and $\Delta\%EMP_{dq}$ is likely a main concern for identifying $\mathbf{B_1}$ in Equiation (1). An increase in labour supply, for example, may stimulate more employment as a consequence of drops in equilibrium wages. To address this concern, we estimate model (1) using an instrumental variable (IV) approach. In the spirit of Bartik (1991)we use a shift-share instrument (popularised as 'Bartik shift-share instrument') to isolate exogenous labour-demand shocks. We construct the instrument for $\Delta\%EMP_{dq}$ such that it redistributes the West Bank's employment growth across districts, using a district's initial employment share (prior to the Second Intifada) as allocation weight.

Specifically, the Bartik instrument is specified as follows:

$$\text{Bartik}_{dq} = \sum G_{jq} * \left(E_{jdq_0}/E_{dq_0}\right) \tag{2}$$

The first term (G_{jq}) is the West Bank's employment growth in sector j, observed in quarter q_t-q_{t-1}; and E_{jdq0}/E_{jq0} is the 'initial share' measured as employment of industry j in district d relative total employment of that district at the initial period (first quarter of 1999). To alleviate the concern that the use of own-district employment could mechanically increase the predictive power of the shock, we leave district d (own district) out of the growth rate 'G_{jq}'. The Bartik instrument, thus, predicts what employment growth in a given district d (for example, Hebron) would have evolved to if the district-sector activity shares had remained the same as in the initial quarter and sector employment had grown at the same rate as in the rest of the West Bank. To construct the Bartik instrument we use 12, two-digit sectors.[8]

Table 2. Effect of aggragate employment on LFP, by age and educated groups, IV estimates

VARIABLES	(1) Young Educated Women	(2) Young Educated Women	(3) Young Educated Men	(4) Young Educated Men	(5) Older Educated Women	(6) Older Educated Women	(7) Older educated Men	(8) Older educated Men
Overall Employment Growth Rate	1.485**	0.804	1.069*	0.047	1.289**	1.164**	1.313**	0.446**
	(0.586)	(0.657)	(0.577)	(0.413)	(0.599)	(0.526)	(0.518)	(0.198)
Education Growth Rate		1.102***		1.208***		0.806***		0.963***
		(0.264)		(0.108)		(0.084)		(0.040)
Age Shares	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Share of Urban Residents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Share of rural Residents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average household Wage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Share of Married Women	Yes	Yes	No	No	Yes	Yes	No	No
District Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District Linear Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
First stage results								
Estimate of Shift Share Index	−0.66	−0.637	−0.672	−0.620	−0.685	−0.668	−0.672	−0.622
	(0.208)	(0.209)	(0.217)	(0.218)	(0.21)	(0.209)	(0.204)	(0.195)
F-statistics	10.09	9.28	9.55	8.05	10.63	10.21	10.81	10.18
No. of lags	6	6	6	6	6	6	3	3
Observations	275	275	275	275	275	275	275	275
R-squared	0.228	0.385	0.300	0.626	0.153	0.454	0.030	0.885

Notes: The variables in the table are aggregated measures of population estimates of individuals included in the sample. Data are drawn from the PCBS 1999–2011 Labour Force Survey. This table presents the IV estimates from the regression model in Equation (1). For a given group, the dependent variable is the growth rate of labour force participants in district j and observed in quarter q and q_{t-1}. Employment growth rate measures labour demand shocks for that group, who are employed in district j and observed in quarter q and q_{t-1}. The instrument variable is calculated as $IV_{dq} = \sum G_{jq}* (E_{jdq0}/E_{jdq0})$. The first term ($G_{jq}$) is the West Bank's employment growth in sector j and observed in quarter (q_t-q_{t-1}) over the, 2005–2011 period. To ensure exogeneity, the first term excluded those working in their home districts. The distribution weight was the initial employment share of sector j in subjects' home districts (measured in the first quarter of1999). Employment from twelve subsectors is used to calculate the instrument. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3. Effect of gender-specific (service) employment on LFP, by age and educated groups: IV estimates

	−1	−2	−3	−4	−5	−6	−7	−8
VARIABLES	Young Educated Women	Young Educated Women	Young Educated Men	Young Educated Men	Older Educated Women	Older Educated Women	Older educated Men	Older educated Men
Overall Employment Growth Rate	1.632***	1.268**	0.581*	−0.019	1.188***	0.700**	0.761***	0.044
	(0.577)	(0.551)	(0.353)	(0.289)	(0.269)	(0.222)	(0.221)	(0.111)
Education Growth Rate		0.947***		1.21***		0.766***		1.004***
		(0.250)		(0.104)		(0.079)		(0.035)
Age Shares	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Share of Urban Residents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Share of rural Residents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average household Wage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Share of Married Women	Yes	Yes	No	No	Yes	Yes	No	No
District Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District Linear Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
First stage results								
Estimate of Shift Share Index	−0.879	−0.827	−1.289	−1.21	−1.57	−1.5	−2.19	−2.109
	(0.253)	(0.238)	(0.216)	(0.197)	(0.265)	(0.245)	(0.302)	(0.304)
F-statistics	12.04	12.05	35.66	37.71	35.18	37.56	52.71	48.03
No. of lags	6	6	6	6	6	6	3	3
Observations	275	275	275	275	275	275	275	275
R-squared	0.246	0.371	0.320	0.624	0.258	0.541	0.139	0.899

Notes: The variables in the table are aggregated measures of population estimates of individuals included in the sample. Data are drawn from the PCBS 1999–2011 Labour Force Survey. This table presents the IV estimates from the regression model in Equation (1). For a given group, the dependent variable is the growth rate of labour force participants in district j and observed in quarter q and q_{t-1}. Employment growth rate measures labour demand shocks for that group, who are employed in district j and observed in quarter q and q_{t-1}. The instrument variable is calculated as $IV_{dq} = \sum G_{jq} * (E_{jdq0}/E_{jdq0})$.The first term ($G_{jq}$) is the West Bank's employment growth in sector j and observed in quarter (q_t-q_{t-1}) over the 2005–2011 period. To ensure exogeneity, the first term excluded those working in their home districts. The distribution weight is the initial employment share of sector j in subjects' home districts (measured in the first quarter of 1999). Employment from twelve subsectors is used to calculate the instrument. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4. Effect of employment of educated men on employment and LFP of young educated women, IV estimates

	(1)	(2)	(3)	(4)
VARIABLES	Employment Growth	Employment Growth	LFP Growth	LFP Growth
Service Employment Growth Rate	2.221*	1.240	0.964**	0.470
	(1.212)	(1.033)	(0.400)	(0.394)
Education Growth Rate		2.158***		1.086***
		(0.636)		(0.258)
Age Shares	Yes	Yes	Yes	Yes
Share of Urban Residents	Yes	Yes	Yes	Yes
Share of rural Residents	Yes	Yes	Yes	Yes
Household Size	Yes	Yes	Yes	Yes
Average household Wage	Yes	Yes	Yes	Yes
Share of Married Women	Yes	Yes	Yes	Yes
District Fixed Effects	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes
District Linear Trend	Yes	Yes	Yes	Yes
First stage results				
Estimate of Shift Share Index	−1.28	−1.236	−1.28	−1.206
	(0.2)	(0.164)	(0.201)	(0.196)
F-statistics	40.66	56.73	40.37	37.78
No. of lags	5	5	6	6
Observations	275	275	275	275
R-squared	0.272	0.333	0.248	0.368

Notes: The variables in the table are aggregated measures of population estimates of individuals included in the sample. Date are drawn from the PCBS 1999–2011 Labour Force Survey. This table presents the IV estimates from the regression model in Equation (4). For a given group, the dependent variable is the growth rate of labour force participants in district j and observed in quarter q and q_{t-1}. Employment growth rate measures labour demand shocks for that group, who are employed in district j and observed in quarter q and q_{t-1}. The instrument variable is calculated as $IV_{dq} = \sum G_{jq} * (E_{jdq0}/E_{jdq0})$. The first term ($G_{jq}$) is the West Bank's employment growth in sector j and observed in quarter (q_t-q_{t-1}) over the 2005–2011 period. To ensure exogeneity, the first term excluded those working in their home districts. The distribution weight is the initial employment share of sector j in subjects' home districts (measured in the first quarter of 1999). Employment from twelve subsectors is used to calculate the instrument. Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Goldsmith-Pinkham, Sorkin, and Swift (2020), showed that identification of Bartik shift-share instrument is based on the exogeneity of the 'initial shares', while the national sector growth serves to improve predictive power of the instrument.[9] Thereby, the identification assumption for the Bartik instrument to produce causal estimates is that that the 'initial shares' are uncorralated with the error terms. Importantly, measuring the 'initial shares' in the beginning of 1999 ensures that they are exogenous to the shocks took place during and in the aftermath of the Second Intifada that are captured by the error terms. As explained above, the shocks have altered industry composition, mainly in the public sector, and altered labour market performance across groups, mainly for the young educated females.

3. Results

3.1. Linkages between employment growth and LFP growth

To explore whether changes in the overall labour demand exerts heterogeneous effect across the education/age groups, we estimate model (1) for the following groups: young educated women, young educated men, older educated women, and older educated men. To this end, the dependent variable, as well as the share of married women and education growth rate, is measured per group.

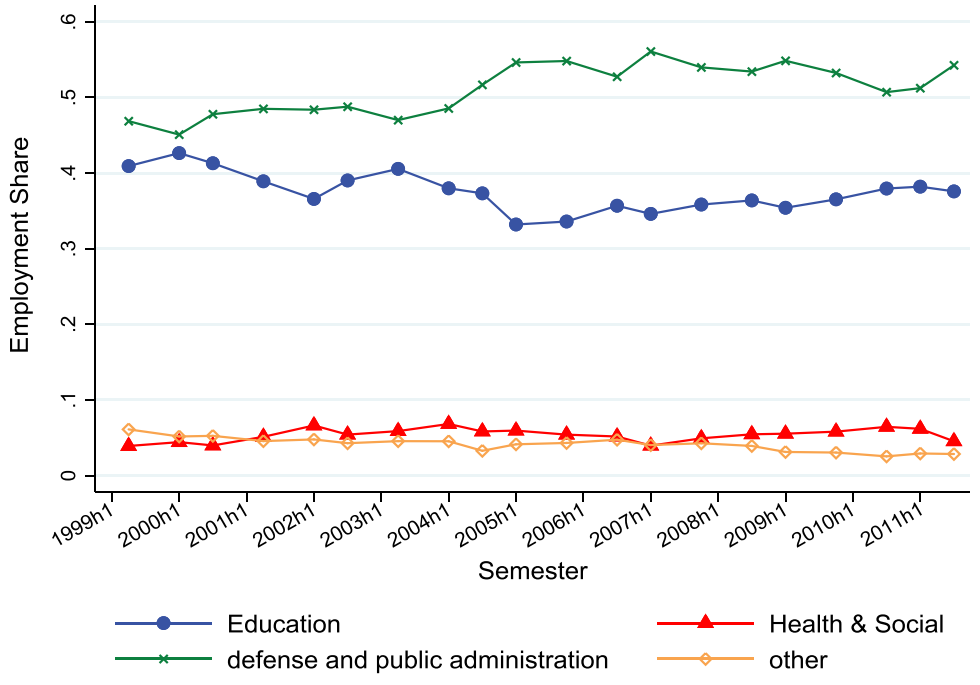

Figure 7. Distribution of service subsectors for older educated men, 1999–2011.

Notes: This figure plots distribution of jobs created for older educated men across service subsectors. Data are drawn from the PCBS 1999–2011 Labour Force Survey. Employment shares are calculated semi-annually and calculated as number of older educated men employed in each subsector divided by overall service employment for older educated men. The older group included individuals between the ages of 19 and 29. The educated group included individuals with more than twelve years of education. Commerce includes activities related to retail and wholesale. Business & Community includes activities related to real estate; other businesses; computer activities; other community, social, personal activities; and other service activities. Health and Social includes health and social work.

The results are reported in Table 2. To save space, we limit the discussion to the employment elasticity estimates with additional emphasis only on the estimate of education growth rate. Columns (1), (3), (5), and (7) present the estimates without controlling for the latter. The first stage estimates show that the coefficient of the instrumental variable is statistically significant at 1% and that the F-statistics is above 10 for most of the model specifications. The second stage findings show that the elasticity estimates for all reported models are positive and statistically significant. Nonetheless, once education growth rate is included, the elasticity estimates remain statistically significant only for the older cohorts (See Columns 2, 4, 6, and 8). This suggests that education growth rate might act a confounding factor.

So far, the findings show that overall changes in labour demand exerted little effect on young educated groups, but an important concern in using overall employment is that it may mask group-specific demand effects. Carefully investigating employment distribution across groups reveals interesting patterns. First, most of the educated woman (an average of 90% over the study period) are employed in the services sector. The corresponding rate for young educated men is lower at about 74%. In this same period, the share of service-sector jobs created for young educated women declined steadily from 43% to 27%, while it rose from 25% to 35% for older educated women.[10] Second, the employment distribution within the services sector differs across groups. For example, the education sector is dominated by educated women, mainly older women. Nonetheless, commerce is the main employer of young educated men vs. this sector and education for the older educated men (see

Figures 3 to 7). These patterns suggest that differential labour demand within the services sector affected these groups differently.

To explore this venue, we estimate a modified version of Model (1) such that overall employment growth is replaced with employment growth in the service sector. To account for changes in group-specific demand, we reconstruct the instrumental variable, as shown in Equation (4) to reflect cross-industry changes in service employment per group (see Aizer, 2010; Schaller, 2016) as follows:

$$Bartik_{gdq} = \sum G_{jq} * \left(E_{jgdq_0}/E_{gdq_0}\right) \tag{3}$$

Similar to the IV specification in Equation (2), the first term 'G_{jq}' is the overall employment change in service subsector j. The 'initial share' of this equation (E_{jgdq0}/E_{gdq0}) is measured as the number of young educated women employed in service subsector j in district d in the initial period (first quarter of 1999), relative to total number of young educated women who are employed in district d and observed in the initial period. The underlying instruments measure group's predicted service employment growth at the district level.

The first stage estimates, documented at the bottom of Table 3, show that coefficient of the instrument is statistically significant at 1% and F-statistics for all models are above 10, indicating that the instrument is strong.

The IV results, reported in the same table, show differential effects across groups. Without controlling for group education growth rate, the elasticity estimates are positive and statistically significant for all models. Once education growth rate is controlled for, the elasticity estimates dropped for women but remained statistically significant. The estimate of the young educated group is markedly larger in magnitude (1.3 relative to 0.7 for older educated women), reflecting a greater response to changes in labour demand. This shows that LFP of the young educated women only respond to changes in the labour demand of this group.

The elasticity estimates for men dropped substantially, turning negative for young educated men but becoming statistically insignificant. This finding indicates that changes in LFP of educated men are largely driven by education growth rate and may also suggest that using overall employment to measure labour demand, as shown in Table 2, overestimated the elasticity estimate for older educated men.

3.2. Changes in labour market conditions for men and the effects on women's LFP

Despite substantial increase in women's educational attainment in recent years, we show that the LFP rate of young educated women has stagnated. The drop in their labour demand, mainly in the public sector, is a key factor. We also provide descriptive evidence that the documented decrease in demand for women workers in the services sector coincided with an increase in the demand for men.

But does a demand bias towards men have negative effects on women? Our analysis of this question is carried out in the spirit of Maurer and Potlogea (2020). We first examine how increases in the demand for young educated men affect employment growth of young educated women. This helps explain the impact on women's LFP. The specification of this model is similar to that of the group-specific models:

$$\Delta\%\text{FEMP}_{dq} = \text{B}_0 + \mathbf{B_1}\Delta\%\text{Service}_{dq} + \mathbf{B_2}\mathbf{X}_{dq} + \mu_d + \pi_q + \text{B}_3\tau_{\text{dq}} + \text{e}_{\text{dq}} \tag{4}$$

The main difference is that the dependent variable is the employment growth rate in district d of young educated women. $\Delta\%\text{Service}_{\boldsymbol{dq}}$ is the service employment growth rate in which the instrumental variable captures the service employment growth of young educated men. The elasticity estimate of this variable (cross-group elasticity) measures the extent to which changes in demand for young educated men in the services sector affects changes in labour demand for young educated women. As with our exercise in previous section, we first estimate the model without including education growth rate. The results in Column (1) of Table 4 show that cross-group elasticity is

positive and statistically significant. Still, once we control for the education effect, the magnitude of the estimates dropps and become statistically insignificant (see Column 2).

This finding suggests that job competition between two groups is weak at best. In other words, the documented decline in the demand for young educated women is likely driven by the decline in the demand for their skills. This finding may also indicate that the sluggish LFP of this group is unconnected to job competition with the young educated men. To test this hypothesis, we estimated a modified version of model (3) in which the dependent variable is the LFP growth rate for young educated women. Consistent with the findings of Maurer and Potlogea (2020), the cross-elasticity estimate became statistically insignificant, holding education growth and the other controls constant (see Columns 3 and 4).

4. Conclusions

Two noteworthy facts emerge from the Palestinian labour market. While the educational attainment of women has swiftly expanded during recent years, the LFP rate for young educated women has stagnated. Using descriptive analysis, we show that this phenomenon is associated with a decline in demand for this group. Our econometric estimates reveal supporting findings. First, changes in demand for young educated women causally affect their LFP. The results suggest that limited job opportunities, reflected in a lower employment share, reduce the LFP of this group. Interestingly, the decrease in demand for young educated women is not driven by job competition with young educated men. The results also suggest that LFP for young educated women is not affected by overall changes in labour demand, possibly indicating that general improvement in the labour market may not lift all boats. The far-reaching message is that policies that boost demand for young educated women are vital to enhance their linkages to the labour market.

As shown in our analysis, more young educated women are employed in the public sector and the decrease in women's public-employment share has likely decreased their LFP. A typical policy would be to urge the Palestinian government to hire more young educated women. At the same time, expanding public employment beyond current levels could be challenging because of the chronic financial stress that affects the government. The government could nonetheless adopt a more gender-balanced policy to boost employment for young educated women in subsectors dominated by men.

Another potential intervention is an employment/wage subsidy. This policy boosts labour demand by sharing employment cost with firms. This can be implemented through different channels, including tax cuts applied to firms that hire a minimum number of young educated women or adopt a gender-balanced employment practices. The government could also create partnerships with international donors to initiate temporary (contract-based) employment programmes for young educated women.

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Notes

1. See Verick (2014) for a review of women's participation in the labour force in the MENA region.
2. Economists often look at supply side effects, highlighting the role of social and cultural barriers for women workers (see for example, Olsen, 2006): lack of childcare facilities and institutional child support (see for example Bick, 2015), spouse's level of income, expected market wage, and fertility (Klasen & Pieters, 2012).

3. Assaad et al. (2018) explain what they referred to as the 'MENA paradox,' which reflects a decrease in the LFP rate for educated women. They suggest that the finding could be explained by negative demand shocks from sectors that typically employed educated women – namely, the public sector.
4. Still, we use data for the first quarter of year 1999 to construct the instrumental variable, see more discussion in Section 2.3.1.
5. Relative employment for young educated women is calculated as number of employed young educated women divided by number of employed young educated men.
6. LFP rate of low-educated women is minimal during the study period, and thus sorting out exogenous variations in the demand for their labour is problematic. As a result, we exclud them from our analysis. We also exclud low-educated men because their labour-market outcomes are largely driven by demand from the Israeli labour market (Mansour, 2010) and they are thus less comparable to educated women; our group of interest.
7. We include in the equatin (1) quarter fixed effects and district linear trend to (partially) account for persistencies in LFP growth. However, we estimated a separate model, to account for the LFP persistent shocks at the district-quarter level, through including the lagged depenedent variable in all estimated models. The results show that the linkages between employment growth and LFP growth are robust. The estimates are available from the authors up on request.
8. We used ISIC-Rev 3.1 two-digit sectors to construct the instrument. These included: 1) sales (50), wholesale (51), and hotel & restaurants (55); 2) retail (52); 3) transportation (60) and telecommunications (64); 4) real estate activities (70), other business (74), computer activities (72), and other community, social, and personal activities and other service activities (91, 92, and 99); 5) public administration and defence (75); 6) education (80); 7) health and social work (85); 8) agriculture and forestry (1 and 2); 9) manufacture of food & beverages (15), manufacture of textiles (17), tanning and dressing of leather (19), and manufacture of furniture (36); 10) manufacture of paper (21), manufacture of other non-metallic mineral products (26), and manufacture of basic metals (27); 11) construction (45); 12) other mining and quarrying (14), manufacture of radio, TV, and communication equipment and apparatus (32), manufacture of medicals (33), recycling (37), electricity, gas, steam and hot water supply (40), and collection, purification, and distribution of water (41).
9. For more discussion on the identification of Bartik shift-share Instrument, see: https://blogs.worldbank.org/impactevaluations/rethinking-identification-under-bartik-shift-share-instrument.
10. The share of service jobs is calculated as the number of jobs created for women in a given group divided by the total employment of that group.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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