Labor exports from Palestine to Israel: a boon or bane for the West Bank economy

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1. Introduction
1.1. Background

The labour market in the West Bank is dominated by employment opportunities for Palestinians in Israel. In 2011, some 14 percent of the employed persons in the West Bank were employed in Israel and accounted for some 22 percent of all labour income realised by West Bank workers; even though it has been estimated that wages for West Bank workers in Israel are 20 – 40% lower than those of Israeli workers for the same jobs (Arnon and Bamya, 2007). As such, West Bank workers are a relatively cheap source of labour to the Israeli economy, although competition between West Bank and Israeli labour is limited. In fact, West Bank employees in Israel are largely confined to the low-skill and manual sectors of construction, agriculture, and some low-tech industries and services (Miaari and Sauer, 2011), where the domestic Israeli labour supply falls short of demand (Rosenhek, 2006). Despite the wages earned in Israel being relatively low by Israeli standards, they are relatively high compared to wages in the West Bank. Consequently, there are strong incentives for Palestinians to seek employment in Israel, even for relatively highly skilled Palestinians.

Israel has imposed tight restrictions on the free movement of people, goods and services between the Israeli and Palestinian territories since 1991 and the Gulf war (Aranki, 2006). Access to the Israeli labour market for Palestinians is controlled by individual work permits that are issued in response to requests from Israeli employers and are conditional upon a security clearance from the Israeli military establishment. The security clearance is bound to personal status criteria presumed to reduce the likelihood of the Palestinian worker to be involved in attacks against Israelis. The conditions for this security clearance change frequently without prior notice (Etkes, 2012). However, the demand for Palestinian labour in Israel, and the Israeli settlements in the West Bank, exceeds the supply of labour permits; hence it is estimated that between 2005 and 2015 an average 38% of Palestinian workers in Israel and its West Bank settlements did not have permits (PCBS, 2016).

The labour market in Israel for Palestinians is an administered market, the operation of which is subject to political decisions taken in Israel over which the Palestinian National Authority (PNA) has little or no control. Thus, the West Bank labour market and economy experiences substantial fluctuations when access for Palestinians to the Israeli labour market is changed by legislative fiat. Nevertheless, Palestinian workers enjoy a preference in the Israeli labour markets over other foreign workers, because they are considered more experienced and have a longer employment history with Israeli employers (Arnon and Weinblatt, 2001). Subsequently, the Palestinian employment in Israel is likely to remain sizeable, at least in the short term. In the long term, i.e. a final status perspective, a group of Israeli and Palestinian academics, experts, and officials elaborated the "Economic Road Map", where they call for a restored flow of Palestinian workers into Israel that is stable, predictable, and coordinated with the PNA, with security restrictions kept at the minimum necessary (Aix Group, 2004).

This study explores the implications for the West Bank economy consequent upon an increase in access to the Israeli labour market. Previous studies that analyzed the effects of improved Palestinian access to the Israeli labor markets either did not account for the multiplier effects of the additional labor income earned in Israel (Bulmer, 2003; Etkes, 2012; Mansour, 2010) or addressed the research problem from the perspective of the Israeli economy (Flaig et al., 2013). Subsequently, the present study recognizes the importance of developing a model for the West Bank with detailed representation of the linkages between the Israeli and the Palestinian labor markets in order to investigate the economy-wide implications of increased labor flows to Israel more adequately. The study uses a Computable General Equilibrium (CGE) modelling framework. CGE models are well suited for such an analysis as they allow for the assessment of how individual impact channels influence the performance and the structure of the whole economy (Arndt *et al.*, 2012). For the purpose of this study, a standard general equilibrium model is modified, and calibrated with a unique Social Accounting Matrix (SAM) for the West Bank. The study simulates a return of Palestinian employment in Israel to its *pre-intifada* level of 1999, which is considered as a period of existing but low security restrictions to the movement of Palestinian labor into Israel, and could mirror Palestinian future employment level in Israel in a final status.

The rest of this paper is organised as follows. In the next section, two, details about the database, the model, the macroeconomic closures, and factor market clearing conditions are reported. Section three provides details about the simulations. The results and their analyses are reported in section four, which also includes a subsection that reports on the results of the sensitivity analyses. The concluding section, five, considers the policy implications and concluding comments.

2. Method
2.1. Data

The database used in this study is a unique Social Accounting Matrix (SAM) for the West Bank economy, which is currently the only Palestinian territory with workers employed in Israel. The SAM is extensively disaggregated, and comprises 183 accounts. It has a multiple product-activity set up with 48 commodity groups produced by 36 activities. Two foreign accounts are included for Israel and the rest of the world to depict the customs envelope between Palestine and Israel and the interdependency of their labor markets. The SAM encompasses 33 production factor accounts, among which 30 are labor groups, besides two accounts for capital and land. Foreign labor is separated from the domestic labor, which is further disaggregated based on skill level and gender. Male workers who represent the quasi totality of Palestinian labor in Israel are further categorized based on eligibility for a work permit in Israel. Three levels of eligibility are considered based on social characteristics such as age and marital status: ineligible, weakly and highly eligible. There are 20 household groups classified based on income quintile (measured as expenditure per adult equivalent), and socioeconomic characteristics of their active members. The SAM is fully documented in Agbahey et al. (2016).

2.2. Model description

The model used in this study is a modified version of the standard STAGE-2 model by McDonald and Thierfelder (2013). STAGE-2 belongs to a suite of single-country SAM-based CGE models. For this study, the standard STAGE-2 model is modified to depict some special features of the Palestinian economy and its interaction with the rest of the world. First, a multiple trade partner specification is introduced to separate Israel from the other trade partners. This model extension is set up in a generalized way that can support more than two trade partners. Second, the domestic production module is modified to accommodate a seven-level production process that reflects the composition of the labor force in the West Bank. Each level of the production process involves CES functions (see Figure 1).

The model adopts a segmentation approach of the labor market, whereby homogenous labor types as defined by nationality (foreign versus Palestinian), skill, gender and eligibility for a work permit in Israel are allocated to different blocks of activities. An advantage of the segmentation approach is that it explicitly accounts for labor heterogeneity and ensures that workers with notionally identical characteristics can earn different wages depending on their sector of employment. This feature makes the model working more realistic given the empirical evidence that workers with same education level and other socioeconomic features do not earn the same wages across sectors of employment (Flaig, 2014). However, a limitation of this approach is that workers are restricted to their initial market segment. When the market segment includes several activities, the worker can respond to wage changes and move between activities within the segment but there is no cross-segment mobility (Lofgren and Cicowiez, 2017). For male workers four blocks of activities are considered: agriculture, manufacturing, construction and services. As less than 1% of female workers are employed in the construction sector, only three blocks of activities are considered for them: agriculture, manufacturing and services.

Figure 1. Production module nesting
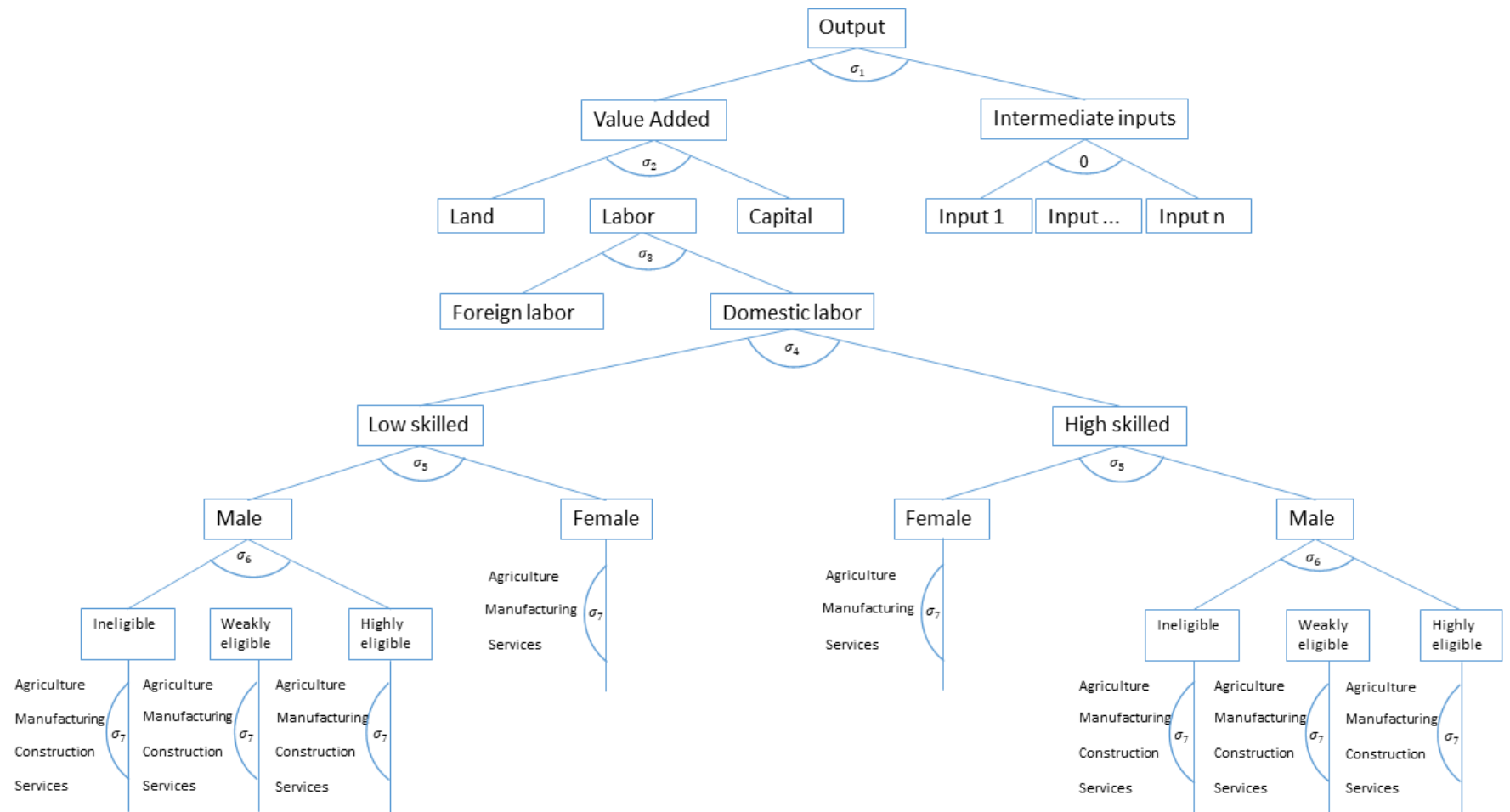
2.3.   Macroeconomic closure conditions

The factor market closures are such that capital and land are fully employed and mobile across sectors and their prices are flexible. While capital is employed in all sectors, land is used only by the agricultural sectors. In contrast to land and capital, labor is not fully employed. Explicit unemployment for labor is considered because the Palestinian labor market is characterized by a relatively high unemployment rate. In the base period, 17% of total labor supply are unemployed, 73% are employed in the domestic market and the remaining 10% are employed in Israel (Agbahey et al., 2016). Unemployment of labor is modelled following the neoclassical supply and demand theory, which implies that unemployment results from a mismatch between supply and demand due to the market wage being higher than the equilibrium wage. Hence, the stock of unemployed labor is considered as a spare capacity that can enter into production without needing to increase wage. To avoid an unlimited movement into employment, the stock of unemployed labor in each market segment is determined based on official statistics for the West Bank in 2011 (PCBS, 2012). Subsequently, labor is drawn out of unemployment to enter the production system at a fixed wage until the stock of unemployed labor is empty. From that point onwards, any further labor demand is translated into wage increase, reflecting full employment with wage balancing the supply and demand of labor in each market segment. Labor is assumed mobile across sectors within each market segment, but immobile across market segments.

The reality of the West Bank being a small player in the world market is depicted with the small country assumption, which implies that the West Bank is a price taker. The model is investment-driven as investments in the Palestinian economy are largely exogenous. The share of investments in final demand is fixed because a better economic environment in the West Bank and lower tension with Israel will generate economic growth, higher final demand, and provide a secured environment that will attract more foreign investments (Naqib, 2003). To keep the balance between savings and investments, household and enterprise savings rates vary equiproportionately. Government savings are fixed and the direct tax rate adjusts multiplicatively to maintain the balance. The income tax rates in the base period are in the range of 0.1% to 0.2% for all the household groups. The choice to let the direct tax rate adjust and not any other tax rate is based on the progressivity of the direct tax rate, which is absent in the other tax instruments. Government consumption is a fixed share of final demand, such that when final demand increases as the economy expands, government consumption follows suit. This assumption is grounded in the tendency of the public sector in the West Bank to expand quickly (UNCTAD, 2006). To close the foreign market, the current account is fixed to avoid any changes in borrowing from foreign funds, while keeping all the welfare effects in the solution period. A Palestinian national currency is assumed with floating exchange rate, as it is assumed that Palestine in a final status would choose the highest monetary autonomy (Yoshino et al., 2004). Finally, the CPI serves as numeraire in the model.

2.4.   Factor market clearing conditions

To allow factor mobility between the domestic market and the Israeli market, the clearing condition for the factor market equilibrium is modified to incorporate the demand for domestic factor abroad. Accordingly, a new parameter $fd\_w(f, w)$ is created to capture the demand of factor f in foreign region w. The new factor market clearing condition is as follows:

$$FS(f) = \sum_{a} FD(f, a) + UNEMP(f) + \sum_{w} fd\_w(f, w)$$

Where $FS(f)$ is the total supply of factor f, $FD(f, a)$ is the demand of factor f by activity a in the domestic market, $UNEMP(f)$ is the size of the unemployed factor f, and $fd\_w(f, w)$ is the demand for factor f in foreign region w.

The initial value of the parameter $fd\_w(f, w)$ is calibrated to the baseline data through a satellite account that captures the physical quantities of factor used in both the domestic and the foreign markets. As a parameter, the demand for domestic factor in the foreign market can be increased or decreased exogenously. This assumes that the change in the demand for domestic factor in the foreign market is met, regardless of the domestic conditions. While such assumption might not fit all the cases, it reflects well the Palestinian employment in Israel, which is mostly driven the demand in the Israeli economy. In fact, the wages receive by the Palestinian workers in Israel are substantially higher than the average wage in the West Bank. Moreover, the high unemployment in the West Bank ensures that any increase in the labor demand in Israel will be met.

3. Simulations

After assuring that the model replicates the original data that represents the economy in 2011, which is called "base" scenario, three counterfactual scenarios are introduced. Scenario 1 simulates a return to the *pre-intifada* level of Palestinian employment in Israel characterized by existing but low restrictions. In 1999, before the second Palestinian uprising, the number of Palestinians from the West Bank employed in Israel amounted to 99,974 workers. It could be argued that the two economies have grown over time and that for economic reasons both the demand and supply of Palestinian workers in Israel surpass this pre-intifada absolute number. However, a group of Palestinian and Israeli officials and researchers acknowledge that for political reasons it is unlikely that the number of Palestinians permitted to work in Israel in the future exceed the pre-2000 levels (Aix Group, 2004). Therefore, the 1999 absolute number of Palestinians working in Israel serve as reference for scenario 1. In this scenario, total factor supply is assumed unchanged. Factor income earned by the Palestinians working in Israel is increased in the same proportions as their number (Table 1). Scenario 2 assesses the effect of the same increase in the total number of Palestinians working in Israel with the only difference that for male workers, the additional number of commuters to Israel is only sourced from those who are eligible for a work permit in Israel.

Scenario 3 simulates the same shock as in scenario 1, assuming an increase in the total labor force. In fact, there is a consensus among the experts from the Palestinian Central Bureau of Statistics (PCBS) that an increase in the number of Palestinians commuting to Israel for work will stimulate people currently outside the labor force to join the labor force. This assessment is supported by the low participation rate in the labor force that stands at 46% in 2011 for the West Bank. This rate is especially low among women (19%) as compared to men (71%) (PCBS, 2012). Therefore, the increase in the labor force may come from women previously engaged in household duties, or from the economically active people who switch from attending educational institutions to join the labor force. Evidence for a growth in the Palestinian labor force in case Israel grants more work permits for Palestinians is also found in Etkes (2012) who shows that part of the new permit holders come from outside the labor force. Based on these insights, scenario 3 replicates the same shock as in scenario 1 with an increase of the total labor force by an exemplary amount of 5%. Table 1 summarizes the base values and the simulations conduced on the size of the Palestinian working population in Israel, the factor income from Israel and the size of the total labor force. The table present values for aggregated labor groups.

Table 1. Base values of and shocks to Palestinians working in Israel, factor income from Israel and size of the total labor force

	Palestinians working in Israel (base in absolute numbers; scenarios in % change)				Factor income from Israel (base in million US$; scenarios in % change)				Total labor force (base in absolute numbers; scenarios in % change)			
	Base	Scen. 1	Scen. 2	Scen. 3	Base	Scen. 1	Scen. 2	Scen. 3	Base	Scen. 1	Scen. 2	Scen. 3
Low-skilled ineligible males	17,364	+35.7%	-	+35.7%	239.95	+35.7%	-	+35.7%	156,268	-	-	+5.0%
Low-skilled weakly eligible males	19,065	+35.7%	+49.7%	+35.7%	278.61	+35.7%	+49.7%	+35.7%	91,064	-	-	+5.0%
Low-skilled highly eligible males	29,128	+35.7%	+49.7%	+35.7%	442.2	+35.7%	+49.7%	+35.7%	179,135	-	-	+5.0%
Low-skilled females	1,162	+35.7%	+35.7%	+35.7%	18.04	+35.7%	+35.7%	+35.7%	79,265	-	-	+5.0%
High-skilled ineligible males	3,123	+35.7%	-	+35.7%	46.79	+35.7%	-	+35.7%	46,051	-	-	+5.0%
High-skilled weakly eligible males	1,254	+35.7%	+49.7%	+35.7%	20.68	+35.7%	+49.7%	+35.7%	23,547	-	-	+5.0%
High-skilled highly eligible males	2,559	+35.7%	+49.7%	+35.7%	47.01	+35.7%	+49.7%	+35.7%	55,476	-	-	+5.0%
High-skilled females	32	+35.7%	+35.7%	+35.7%	0.54	+35.7%	+35.7%	+35.7%	87,342	-	-	+5.0%
Total	73,687	+35.7%	+35.7%	+35.7%	1,094	+35.7%	+35.7%	+35.7%	718,148	-	-	+5.0%

4. Results

This section starts by discussing the effects of scenario 1 on the factors market, followed by output and consumption. Afterwards, it discusses the macroeconomic and welfare effects. The section ends with a discussion of the effects of scenarios 2 and 3, compared to those of scenario 1. In this section, due to space contingency results are mostly displayed for aggregated categories, although the study uses a very detailed SAM in many respects[1].

4.1.   Effects on the factors market

The increase in the number of Palestinians working in Israel triggers three main effects in the domestic labor market: i) people moving out of unemployment to start working in Israel, ii) people moving out of employment in the domestic market to start working in Israel, and iii) people moving out of unemployment to start working in the domestic market. The net effect on unemployment is a reduction of the unemployed population by 45% (Figure 2). This means a drop in the unemployment rate from the initial 17% of the total labor force to 9%. Unemployment drops more for the low-skilled (by 49%) than for the high-skilled labor (by 35%). This finding stems from the fact that two thirds of Palestinian workers in Israel are low skilled. Subsequently, increasing Palestinian labor demand in Israel has a stronger effect on unemployment of the low-skilled workers. Figure 2 also points to unemployment decreasing more for the male population (by 52%) than for the female population (by 25%). This finding has to be related to the fact that the quasi totality of Palestinian labor in Israel is made of men. Across sectors, unemployment decreases the most in absolute terms for workers in the service sector. However, in relative terms, unemployment falls so sharply in the construction sector that full employment is achieved. This finding needs to be put into perspective with the construction sector being the main employer of Palestinians in Israel. In the Baseline, 56% of all Palestinians employed in Israel work in the construction sector.

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[1] More detailed results can be provided upon request.

Figure 2. Number of unemployed in the Base & Scenario 1 (in 1,000) as well as change (in 1,000 & %)
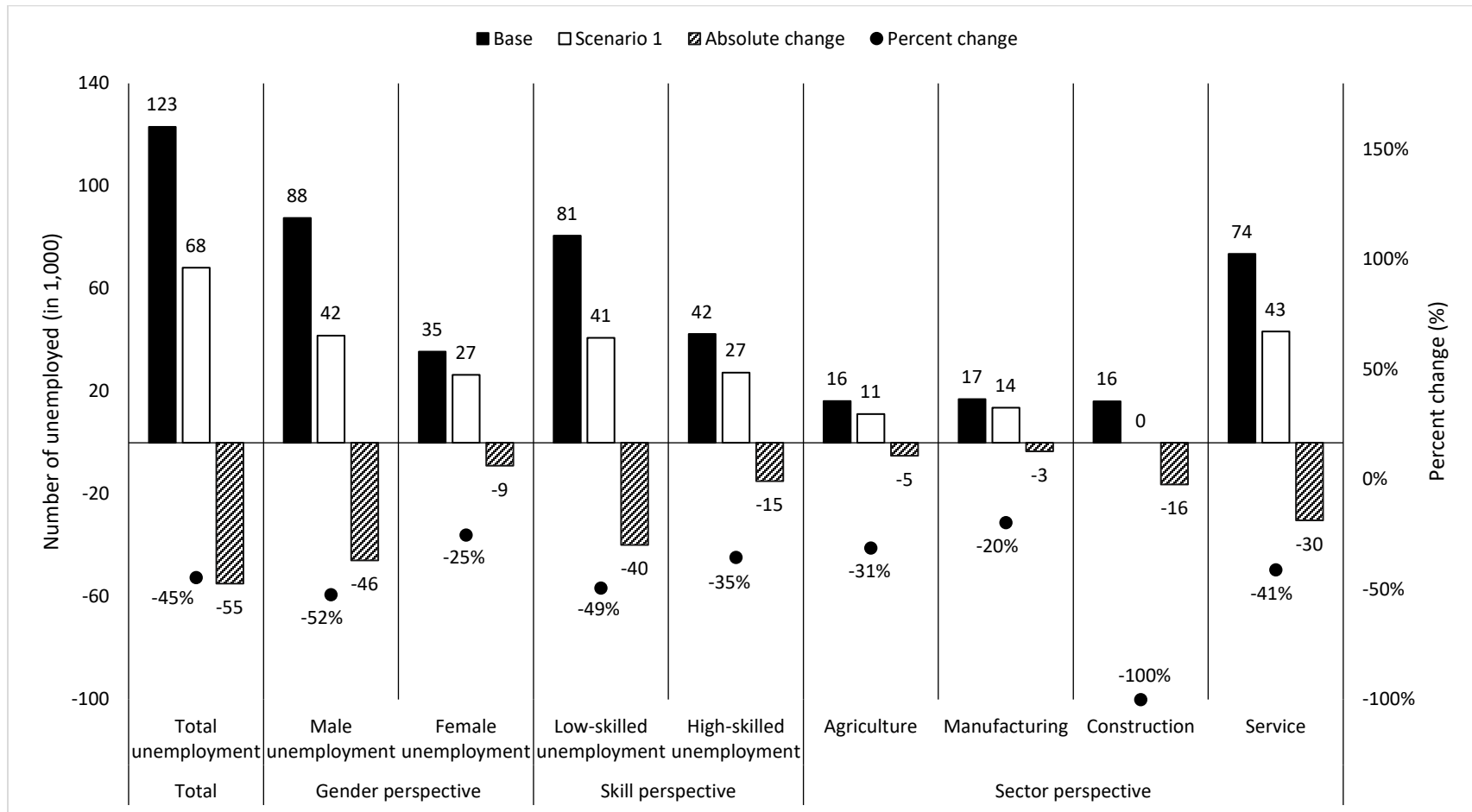
Among the previously unemployed moving into employment, 46% start working in Israel, while 54% start working in the domestic economy (Table 2). Whereas more men moving out of employment join the Israeli market, the vast majority of women moving out of unemployment find a job in the domestic market. This finding stems from a negligible Palestinian female employment in Israel (1% of total female employment) as compared to male employment in Israel (17% of total male employment). Despite this gender-biased pattern of employment in Israel, increasing Israeli demand for Palestinian labor has a substantial effect on female unemployment too (see Figure 2), with many women moving out of unemployment to start working in the domestic economy.

Table 2 also shows that while most low-skilled moving out of unemployment start working in Israel, the opposite holds for the high-skilled with the majority of them moving out of unemployment to start working in the domestic market. This result confirms the finding of Etkes (2012) that the domestic market offers more suitable opportunities for high-skilled workers, while the Israeli market mostly provides low-skilled jobs. The sectoral distribution shows that the share of workers moving out of unemployment to start working in Israel is higher in the manufacturing, construction and agricultural sectors than in services. This finding reflects the concentration of the Palestinian labor in Israel in the manual sectors of construction and agriculture, and in the low-skilled manufacturing sectors rather than in services, while in the domestic market the service sector is preponderant.

Table 2. Changes in employment status among labor categories

|	Moving out of unemployment to employment in Israel	Moving out of unemployment to employment in the domestic market	Total
Aggregate Labor	25,435 (46%)	29,368 (54%)	54,803 (100%)
Gender perspective			
Male population	25,009 (55%)	20,830 (45%)	45,839 (100%)
Female population	426 (5%)	8,537 (95%)	8,963 (100%)
Skill perspective			
Low-skilled	23,229 (58%)	16,575 (42%)	39,804 (100%)
High skilled	2,206 (15%)	12,793 (85%)	14,999 (100%)
Sector of employment			
Agriculture	2,250 (44%)	2,813 (56%)	5,064 (100%)
Manufacturing	2,955 (89%)	384 (11%)	3,338 (100%)
Construction	13,971 (86%)	2,224 (14%)	16,195 (100%)
Services	6,258 (21%)	23,947 (79%)	30,206 (100%)

Figure 3 shows that 97% of Palestinians who start working in Israel move out of unemployment, while 3% were previously employed in the domestic market. This result differs from that of Bulmer (2003) who indicated that more of the additional Palestinian workers moving to Israel come out of the domestic employment. Workers who switch from employment in the domestic market represent 0.2% of the initial number of workers employed in the domestic market. They are mostly males and low-skilled who were previously employed in the construction sector. This finding put into perspective with the previous results (Figure 2 and Table 2) highlights that the extra demand for construction workers in Israel is so high that in addition to absorbing most of the construction workers previously unemployed, workers move out of domestic employment in the construction sector. The construction sector is associated with six market segments for male labor (see Figure 1). In the three market segments of high-skilled male workers and the two segments of low-skilled male workers weakly and highly eligible for work permits in Israel, the stock of unemployed labor is lower than the extra demand for Palestinian workers in Israel. Therefore, in those segments, additional workers are sourced from domestic employment. By contrast, in the market segment of low-skilled male workers ineligible for work permits, the stock of unemployed labor is larger than the extra demand. However, the stock that is left is drawn into domestic employment not only to substitute those who are switching out of domestic employment but also to meet the extra factor demand in the domestic market.

Figure 3. Characteristics of workers who start working in Israel (in 1,000) and change (in %)
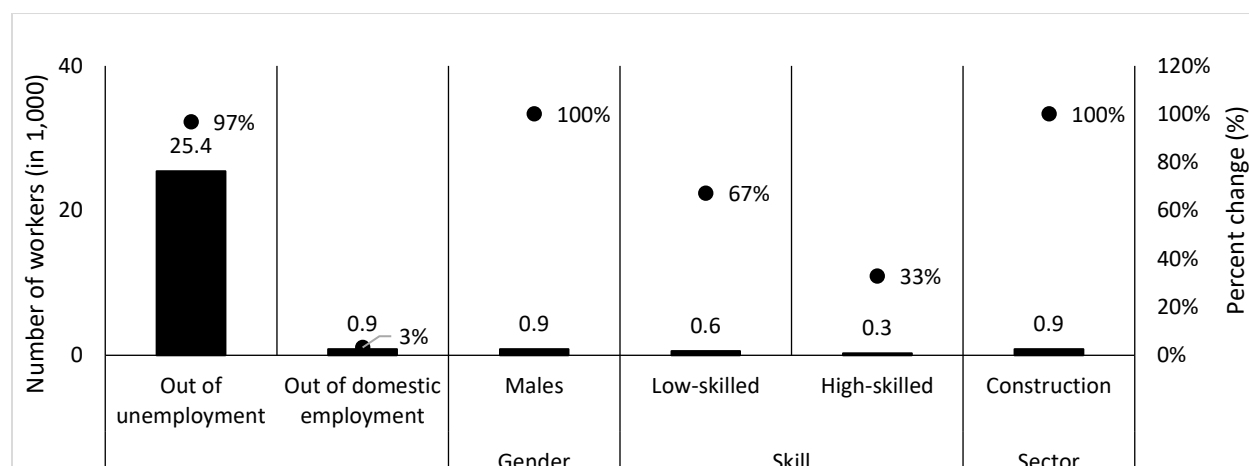
In the domestic market, while some workers switch from domestic employment for employment in Israel, others move out of unemployment to start working in the domestic market. The net effect is an increase in the domestic employment by 5%. This increase is higher for high-skilled workers and for female workers than for males and low-skilled workers (Figure 4). Domestic employment increases in all activity sectors, but substantially more in services. Especially in the construction sector, the inflow of workers moving out of unemployment to start working in the domestic sector surpasses the outflow of workers leaving the domestic market, leading to a net increase in domestic employment in that sector.

Figure 4. Number of domestically employed in the Base & Scenario 1 (in 1,000) as well as change (in 1,000 & %)
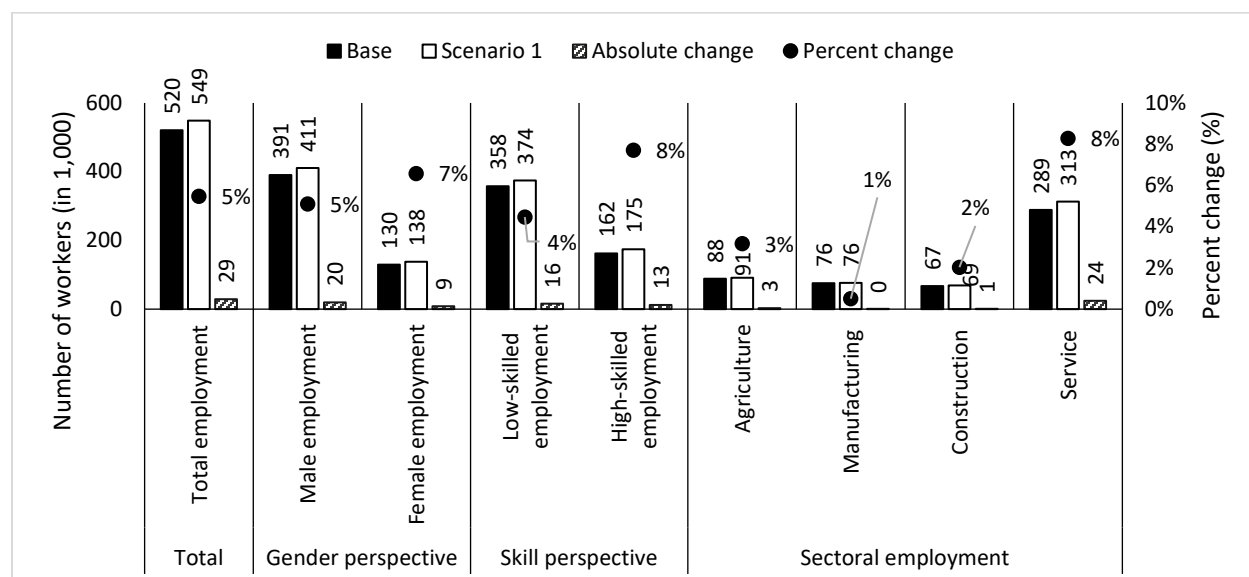
Because the stock of unemployed labor in the market segments related to the construction sector is empty (see Figure 1), the labor supply curve in those markets becomes vertical and any further labor demand is fully transmitted into wage increase. Accordingly, wage in the construction sector rises by 15%, while it remains unchanged in the other sectors. Capital and land rents increase respectively by 8% and 4% in response to increased factor demand by activities as the economy expands.

4.2. Effects on output and consumption

Driven by the increasing factor price, domestic production cost increases on average by 2%. As expected, the construction sector experiences the highest surge in production cost (7% increase) due to the wage increase in that sector. The increase in production cost in the construction sector leads to spillover effects in related sectors such as the non-metal manufacturing sector, which is dominated by building stone and marble industry, where production cost increases by 4%. Despite the overall increase in production cost, the majority of the domestic sectors experience an increase in domestic output (Figure 5). Such increase in domestic output stems from increased household demand, which itself is fueled by the additional income earned by both the workers starting working in Israel and the net positive inflow of workers entering employment in the domestic economy.

The two sectors that do not experience an increase in their domestic output are the non-metal manufacturing and mining sectors. Output reduction in the non-metal manufacturing sector is due to this sector being highly export-oriented. In fact, the non-metal manufacturing sector, dominated

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by the stone and marble industry, is the leading export sector in Palestine (OEC, 2017). In 2010, stone and marble contributed 26% of Palestinian exports, and 5.5% of GDP (Hanieh et al., 2016). However, the supply of additional labor force to Israel negatively affects the Palestinian export industry. It causes a real appreciation of the local currency by 1.5%, due to the large inflow of additional labor income from Israel generating a sort of "Dutch disease". Because of this real appreciation of the local currency, the competitiveness of the export industry is reduced, leading to a net decline in the export supply and in production. The stone and marble industry being the leading export sector is the most affected. Due to spillover effects from the stone and marble industry, the mining sector is also negatively affected. The mining sector is declining as it is dominated by the extraction of stone and marble, which are used as inputs in the non-metal manufacturing sector to produce finished building stones and marble.

Figure 5. Change in domestic output by sector (in %)
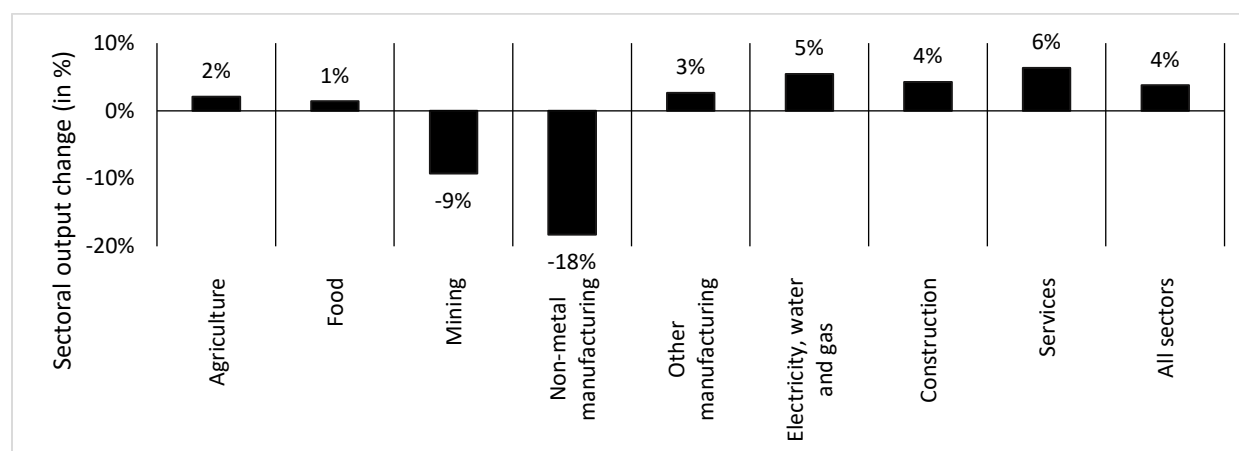
On the demand side, the consumer price increases on average by 2.5% because of both the increase in domestic production cost. The rise in the production cost in the construction sector is reflected in the consumer price for construction service, which increases by 7.4%. Despite the overall increase in consumer prices, total demand in the whole economy increases. Household consumption is increasing on average by 6.7%, while demand for intermediate inputs increases on average by 4.3%. The increase in household consumption, which stems from the additional income earned by new workers in both the domestic and Israeli economies, affects all commodity groups (Figure 6). Household consumption increases more for manufacturing products and services because these categories of commodity have a higher income elasticity of demand. Demand for intermediate inputs increases for almost all commodity groups, with the major exceptions of mining products. Decrease in intermediate input demand of mining products confirms the spillover effects of the shrinking stone and marble industry (non-metal manufacturing sector) mentioned earlier.

*Figure 6. Change in household consumption and demand for intermediate inputs (US$ million)*
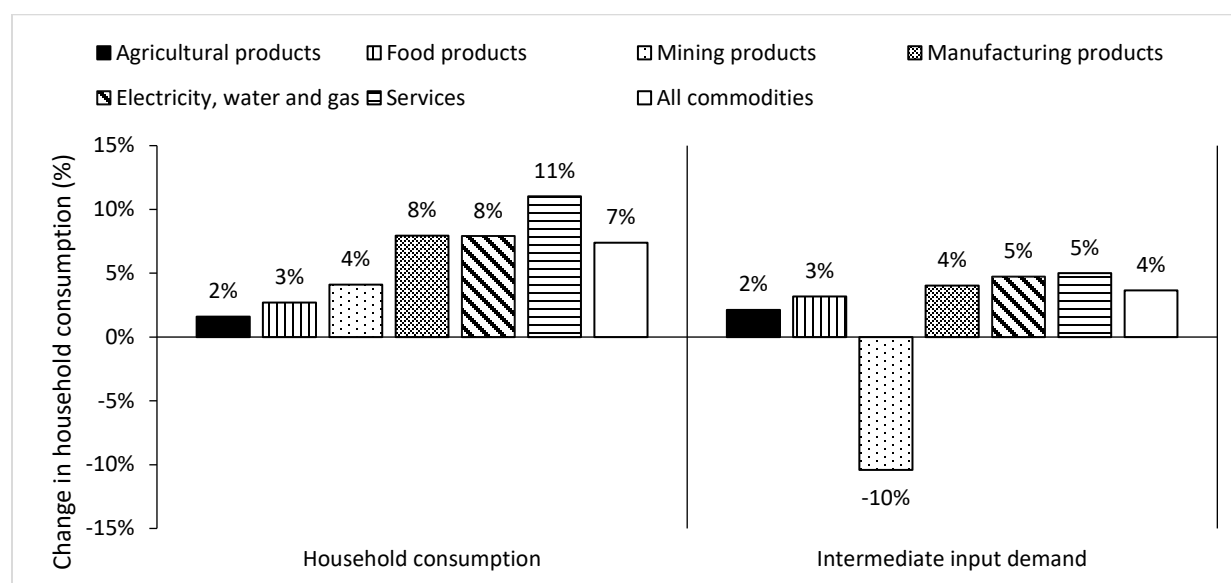
4.3. Welfare and macro-level effects

Household income increases in total by 13% driven by increasing factor income, which stems from three sources as follows: i) increased factor prices, ii) increased employment in the domestic market, and iii) factor income earned by additional Palestinians working in Israel. Similarly, household expenditure increases in total by 10% with the difference between household income and expenditure being saved or transferred. As a measure of household welfare, the Equivalent Variation[2] as a share of household initial expenditure shows that household net welfare improves on average by 7% (Figure 7), which is a combination of the benefits resulting from higher income and the burden of higher consumer prices. Distributional effects at quintile level show that welfare improves more for poor households than for households in the top quintile. This is because poor households derive a higher share of their income from labor and they have a higher share of employment in Israel than richer households.

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[2] The Equivalent Variation is defined as the amount of compensation, that must be added (subtracted) to (from) the household's initial income, to leave him as well off as under the combined price and income changes.

Figure 7. Welfare effects (Equivalent Variation as share of initial household expenditure)
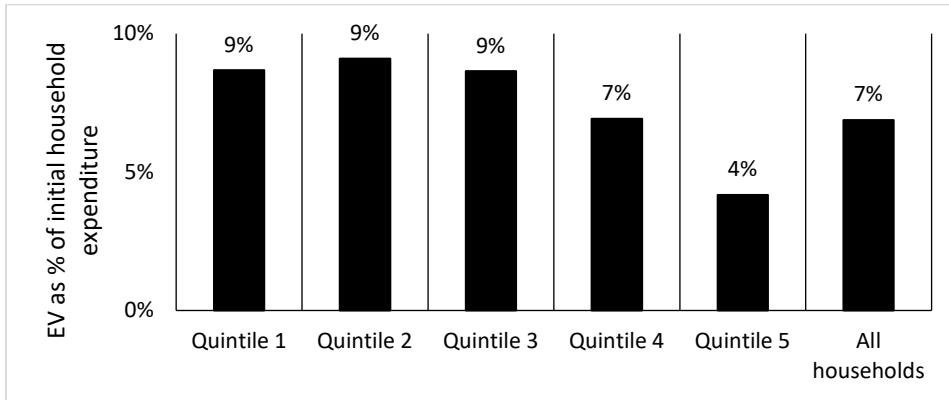
The macroeconomic aggregates show that export supply in real terms decreases by 7.1%, while import demand increases by 5.5%. The decrease in the real value of export supply is due to the increased cost of production in the domestic economy and hence, the decreased competitiveness. Moreover, a higher share of the domestic output is now channeled to the domestic market as the consumer price in the domestic market experiences a higher increase relative to the export price. This finding is in line with Astrup and Dessus (2005) who argued for a trade-off in the Palestinian economy between exporting more labor or more goods. The increase in the real value of import demand stems from the increased household income driving overall demand up.

Decomposing absorption in its different components shows that household and government consumption as well as investment demand all increase. The combined effects of the various changes in the economy are reflected in a GDP increase by 4.6% (Figure 8). This means that increasing labor supply to Israel positively affects the Palestinian economy. This finding differs from the prediction of Etkes (2012) that increasing labor supply to Israel will hamper economic growth in the Palestinian economy. The expectation that increasing wages in the domestic economy and some workers moving out of domestic employment would harm economic growth ignores the effects of new entrants to the labor market from unemployment and the transmission of increasing wages in higher household income. Nevertheless, it needs to be mentioned that the model does not account for the loss of experience caused by those moving out of the domestic market that the new entrants lack. Moreover, it does not account for any opportunity cost associated with the movement out of unemployment. By assuming that the unemployed were not contributing in any way to the domestic economy, the effect of their entrance into employment may have been overestimated.

*Figure 8. Change in real macroeconomic indicators (in %)*
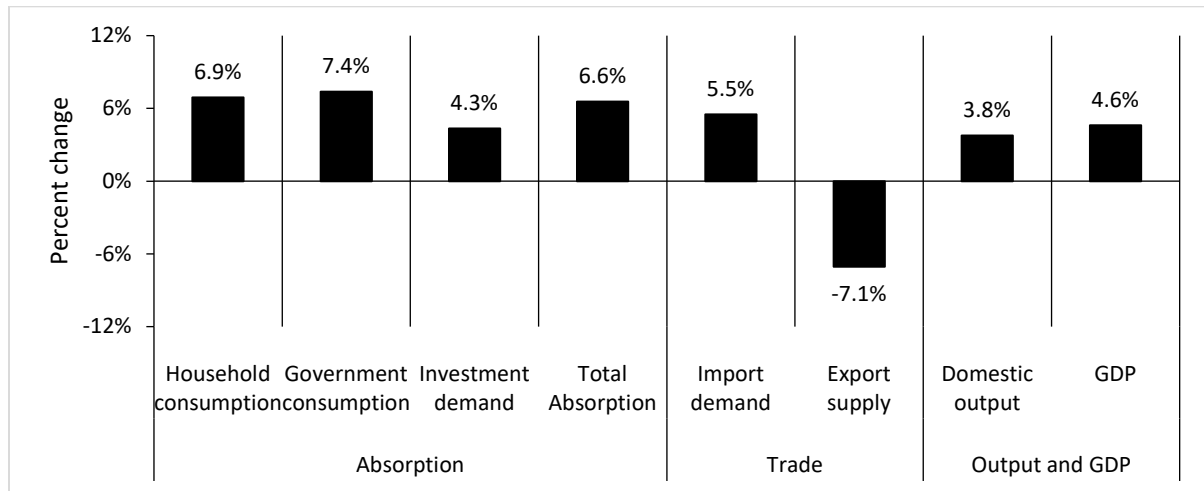
4.3.1. Results with alternative assumptions on labor movement and labor force (Scenarios 2 and 3)

Restricting the movement of the additional labor commuting to Israel among Palestinian men to those who are eligible for a work permit in Israel draws five times more workers out of the domestic employment as compared to scenario 1 (Figure 9). This is the case because in scenario 1, the number of workers who are ineligible for a work permit makes 7,160 workers corresponding to 29% of the labor moving out of unemployment to start working in Israel. As the workers in this category are not allowed to move to Israel in scenario 2, all the extra demand of Palestinian labor in Israel falls on the eligible categories where the stock of unemployed become empty and more workers have to be sourced from domestic employment. Consequently, 5,032 workers have to be taken out of domestic employment in scenario 2, as compared to 852 workers in scenario 1. Because more workers switch from domestic employment to employment in Israel in scenario 2 than in scenario 1, less workers move out of unemployment to employment in Israel (the shock of extra demand for Palestinian labor in Israel is the same in scenarios 1 and 2).

The restriction introduced in scenario 2 has the effect of increasing the number of people moving out of unemployment to start working in the domestic market (Figure 9). While in scenario 1 29,368 workers move out of unemployment to start working in the domestic market, in scenario 2 they make 33,987 workers. As expected, the size of the unemployed labor moving into employment (either in Israel or in the domestic market) is larger in scenario 2 as compared to scenario 1 for categories of eligible Palestinian male workers. Nevertheless, the shock has a strong effect on unemployment also for ineligible Palestinians as many of them move out of unemployment to work exclusively in the domestic market. For the category of female workers, slightly more workers move out of unemployment in scenario 2, although the shock applied on this category in the two scenarios is the same. The net increase in the size of labor moving out of unemployment is slightly higher in scenario2 than in scenario 1.

Figure 9. Comparison of the results on employment in scenario 2 to scenario 1 (1,000 workers)
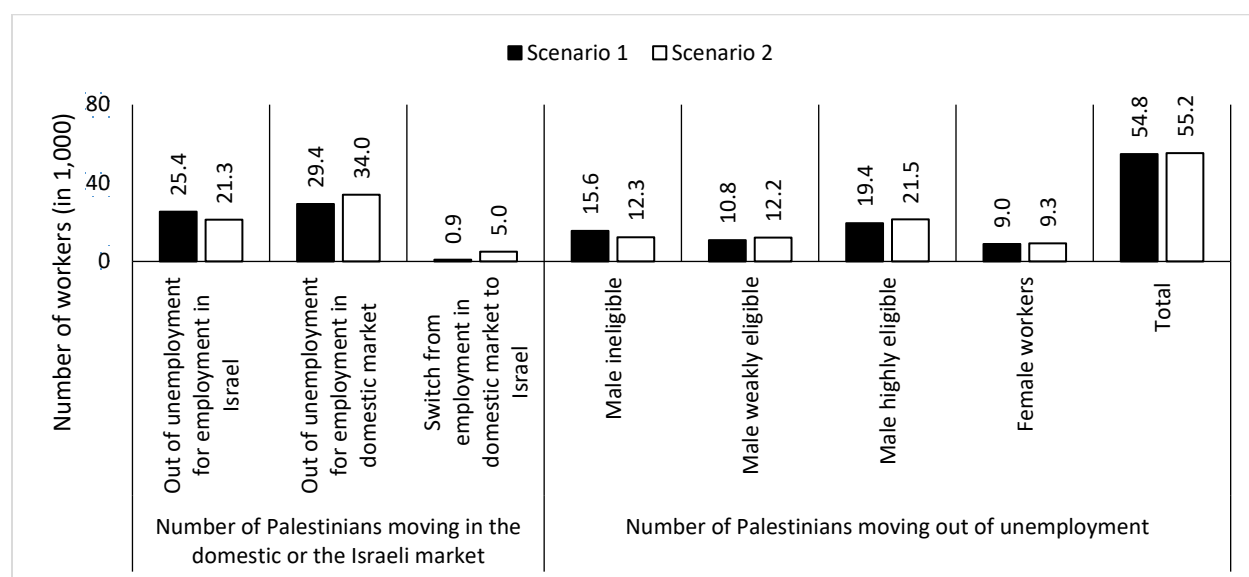
As more workers are leaving the domestic economy, especially in the construction sector, where the loss is not fully compensated by the entrance of the unemployed into the domestic market, labor prices increase more than in scenario 1. Ultimately, production cost increases overall by 2.5% in scenario 2, while it increases by 2.3% in scenario 1. Domestic output fueled by the increased income increases but slightly less in scenario 2 than in scenario 1 (3.7% increase versus 3.8% increase). At the macro level, the economy still expands by 4.5 % but slightly less than in scenario 1 (expansion by 4.6%). This result shows that restricting mobility among Palestinians to those who are eligible to work permits in Israel reduces the positive effects of easing the Palestinian access to the Israeli market.

Considering that improved access to the Israeli market can stimulate a movement into the labor force, and accordingly increasing labor supply by 5% in scenario 3 adds 36,000 people to the labor force. This additional labor force can be considered in a first instance as unemployed, hence increasing the unemployed population by 27%. The results of scenario 3 show that the extra demand for Palestinian labor in Israel is met only with the unemployed labor. Increasing the total supply of labor makes the size of unemployed labor large enough to meet all the extra demand in Israel. Moreover, the increased size of unemployed labor makes the horizontal segment of the labor supply curve longer, meaning that employers can employ more labor without needing to increase wages. Accordingly, the number of workers moving out of unemployment to start working in the domestic market is 10% higher in scenario 3 than in scenario 1 (Figure 10). Because no worker is switching out of domestic employment, while many are entering domestic employment, the net flow in the domestic market is 13% higher in scenario 3 than in scenario 1. The total number of Palestinians moving out of unemployment in scenario 3 is 7% higher than that in scenario 1 (Figure 10).

Figure 10. Changes in employment in scenario 3 as compared to scenario 1 (1,000 workers & %)
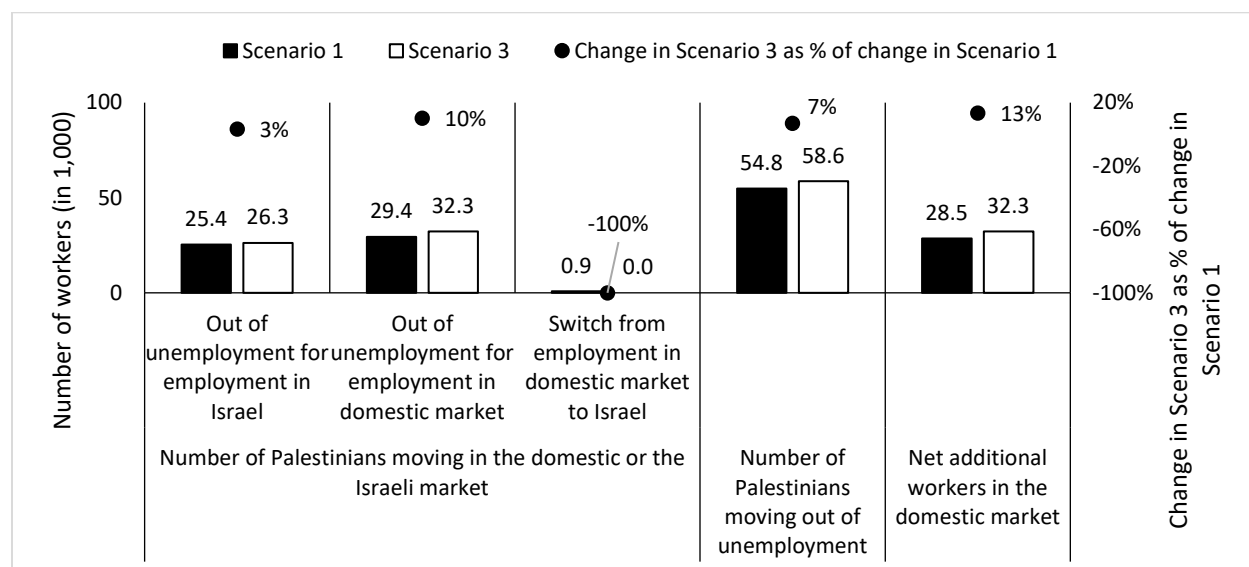
Due to the increased stock of unemployed labor, firms have the opportunity to employ more labor without increasing wages. Subsequently, the average wage per worker in the domestic economy increases only by 0.5% in scenario 3 as compared to 3.8% in scenario 1. Accordingly, production cost increases by 2.1% in scenario 3, while it increases by 2.3% in scenario 1. The entrance of new workers into the domestic economy leads domestic output to increase by 4.0% in scenario 2, compared to an increase by 3.8% in scenario 1. The net increase in employment is ultimately translated into increase in household income and household consumption. At the macro level, real GDP increases by 5.0% compared to 4.6% in scenario 1. This finding indicates that a potential increase in the labor force participation will magnify the effects of easing access of Palestinian labor to Israel.

5. Summary and conclusions

Palestinian employment in Israel has been a distinct feature of the Palestinian labor force for several decades. In recent years, the restrictions on both the number and the characteristics of Palestinians eligible for a work permit in Israel have altered the natural flow of Palestinians commuting to Israel for work with significant negative effects on the Palestinian unemployment and economy. In the perspective of a permanent solution to the conflict, several Palestinian and Israeli experts favor a restored flow of Palestinian workers in the Israeli economy with reduced security restrictions. Accordingly, this study assesses the effects of a return to Palestinian employment in Israel to its *pre-intifada* (1999) level on the West Bank economy. The study employs a CGE model calibrated to a detailed SAM that depicts the special characteristics of the Palestinian labor market and households, while including the essential economic sectors in West Bank that would potentially be affected by a cross-border movement of workers.

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The results show that reducing labor movement restrictions to their *pre-intifada* level has several implications. In scenario 1, the study shows that 97% of workers who start working in Israel come out of unemployment. This finding shows the substantial effect of the extra demand for Palestinian labor in Israel on the unemployment in the West Bank. It also justifies the need to account for unemployment in the model. The finding that 3% of the extra demand is met with workers who switch from domestic employment indicates that the shock negatively affects the domestic production system. This negative effect could be seen as minimal since those who switch out of domestic employment represent only 0.2% of the workers employed in the domestic economy. However, it can be argued that this result is a lower bound estimate of what will happen in the real world, since the modelling approach first allocates the unemployed to meet the extra demand, and only when the stock of unemployed labor is empty that more workers are drawn out of domestic employment. In the real world, it is likely that the movement of workers switching out of domestic employment go in parallel with the movement of workers moving out of unemployment to start working in Israel. In fact, higher wages in Israel are likely to attract more workers who will switch out of domestic employment than in our findings.

To have a sense of the magnitude of the effects if more workers switch out of the domestic market, the same shock as in scenario 1 is run but under full employment assumption. The results show a sharper increase in labor prices, which translate into higher production costs and ultimately a decline in domestic output by 2.4%. Because of additional inflow of labor income from Israel, household consumption increases by 4.2%. Increase in consumption is met primarily with increasing import demand. Export supply falls sharply by 16.6%. Due to the increased income, household experience a welfare gain of 4.4% on average. However, the economy as a whole is negatively affected, with GDP shrinking by 2.0%. These results can be considered as the upper bound effect since under the full employment assumption the extra demand in Israel is met only with workers switching out of domestic employment. In conclusion, the way the cross-border mobility of labor is modelled and which categories of workers move more easily to take the new jobs offered abroad matters. Therefore, an area for future research is about setting different levels of cross-border mobility depending on the labor category. The approach developed by Flaig (2014), which consists in defining pairs of domestic labor market segments between which mobility is allowed and is governed by response elasticities and relative wage changes can be extended to fit the cross-border mobility case.

Another finding of the study is that the extra demand for Palestinian labor in Israel triggers changes in the domestic employment in two ways. First, those who switch out of domestic employment are replaced by workers previously unemployed. Second, the additional inflow of labor income from Israel stimulates household consumption and ultimately domestic production. For the expansion of the domestic production, more unemployed labor is brought into employment. The net effect is an increase in domestic employment by 5%. This finding is arguably an upper bound estimate given that the modelling approach allows firms to employ as much as workers without increasing wages until the stock of unemployed labor is empty. Considering unemployed labor as a spare

capacity that can be brought into employment at no cost may overestimate the effect of the entrance of the unemployed into production. For future research, alternative relations between unemployment and wage need to be explored. The first alternative is the upward-sloping labor supply function (Blanchflower and Oswald, 1995) that considers wage to increase in parallel with increasing employment. A second alternative is the labor leisure trade-off as modelled by Britz et al. (2014). Allowing leisure consumption by households under a time constraint reflects the trade-off facing households between allocating more time for leisure or for employment. Hence, the decision to work instead of consuming leisure, which reflects a state of unemployment or underemployment, is associated with some opportunity cost.

Our results show that in the domestic market, the loss of workers who switch to employment in Israel is overcompensated by the entry of workers moving out of unemployment. The model implicitly assumes the same productivity for the new entrants and those already in employment. Accordingly, the model does not account for experience accumulation and hence the qualitative loss for the domestic production due to the fact that workers switching out of domestic employment carry with them experience they accumulated, which the new entrants do not have. Similarly, for labor mobility between the domestic sectors, and from unemployment to domestic employment, assuming that the new comers are as productive as those who are already in employment may overestimate the effects of labor mobility. Therefore, another area for model improvement is to account for reallocation costs and productivity loss associated with labor mobility. A first approach to implement this is that of Flaig (2014) who defines productivity to be partly worker-specific and partly sector-specific. Hence, different combinations can be modelled for a migrating worker to move with part or all of his/her specific productivity, and pick part or full of the sector-specific productivity he is moving to. A second approach by Lofgren and Cicowiez (2017) is to refer to efficiency wages. In this approach, workers who are already in a sector and accumulated experience are assumed more efficient and earn higher wages than the new comers.

The study findings also show that wage increases by 15% for construction workers, while remaining unchanged for workers in other sectors. This finding needs to be put into perspective with the model setup, where in a labor market segment, wage only changes when the stock of unemployed labor is empty. Hence, as the stock of unemployed labor becomes empty in market segments associated with the construction sector, where the extra demand for Palestinian labor in Israel is the strongest, wages increase only in those segments. As the shock is relatively small, corresponding to an increase in the Palestinian labor demand in Israel by 35%, the effects on the wage change in the construction sector (15% change) are within acceptable bounds. However, in a variant of the shock, where the demand for Palestinian labor in Israel is almost doubled, the wage in the construction sector almost triples. At the same time, wages in the other sectors remain fairly stable. This pinpoints to the rigidity of the model segmentation of the labor market, where the segments are isolated from one another. While such a market segmentation fits well in a short run analysis, in the long run analysis some flexibility needs to be introduced to allow labor mobility between market segments.

Allowing for labor mobility between segments can take the form of a CET specification as introduced by Keeney and Hertel (2005) in GTAP-AGR. A disadvantage of this approach is that wages have to be normalized and the mobility takes place in terms of efficiency units, while the physical quantities of labor cannot be recovered. Another approach used by Flaig (2014) is to introduce a migration function, whereby labor mobility is allowed between pools or pairs of segments. With this approach physical quantities are preserved, and the mobility is controlled by relative changes in wages and some response elasticities. A third approach is that of Lofgren and Cicowiez (2017) who implemented a labor mobility between segments based on a proximity parameter, that captures the distance between sectors. A drawback associated with the two later approaches is the estimation of the response elasticities and the proximity parameter. A challenge common to the three approaches is that they are associated with relative changes in wages, and hence cannot be combined with the neoclassical approach of modelling unemployment, which assumes unemployment to be a spare capacity that can enter production at fixed wages.

The results also indicate that household income increases on average by 13% with net welfare gains for all household groups. These results hold at aggregate household level. However, the model is inadequate to draw deeper insights about distributional effects at individual household level. Following the standard approach of distributing factor income based on the initial shares, the model assumes that the additional labor income from Israel is distributed to households who in the base period have members working in Israel. However, in the real world, it is likely that a substantial share of the new jobs in Israel be taken by workers whose households of origin initially have no worker employed in Israel. Hence, the composition of income at the level of individual household may change compared to the base period. To address this issue in a more sophisticated way, endogenising the factor income distribution should be considered.

The study shows that in the Palestinian context, increasing labor supply to Israel has a strong effect on female employment in the domestic market. Moreover, relatively more high-skilled workers move into employment in the domestic market, which is a good outcome for the domestic production system. At the macroeconomic level, welfare increases by 7% on average for households and GDP increases by 4.6%. Subsequently, increasing the Palestinian labor supply to Israel ultimately has a positive effect on the domestic economy. The study also casts light on the trade-off between exporting more labor to Israel or more goods in the Palestinian economy. In fact, with exporting more labor, the export supply of commodities from the West Bank declines by 7%. The alternative simulations conducted in scenarios 2 and 3 indicate that selective restrictions on the labor movement to some categories reduces the benefits of easing the Palestinian labor access to Israel. Assuming that an improvement in Palestinian labor access to Israel stimulates the labor force participation, which is historically low especially among Palestinian women, amplifies the benefits for the Palestinian economy. Subsequently, in the final status negotiations, the Palestinian authorities should seek the freest possible movement of labor between the Palestinian and the Israeli labor markets.

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