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Note

This study was prepared by the UNCTAD Secretariat. The main authors of this study are Mr. Mahmoud Elkhafif, Senior Economic Affairs Officer and Mr. Rami Alazzeh, Economic Affairs Officer. The study benefited from review and comments by Mr. Mutasim Elagraa, First Economic Affairs Officer, UNCTAD. Special thank is extended to Mr. Seif Aly for his contribution to the data collection and research during his internship with UNCTAD.

In tables, two dots (..) indicate that the data are not available or are not separately reported

Any references to dollars ($) are to United States dollars.

Contents

Figures and Tables

ABBREVIATIONS

CGE	Computable general equilibrium
GDP	Gross domestic product
GNI	Gross national income
I-O	Input-Output approach
ISF	Integrated Simulation Framework
LDV	Lagged dependent variables
MAS	Palestinian Economic Policy Research Institute
NIS	New Israeli shekel
OPT	Occupied Palestinian Territory
PCBS	Palestinian Central Bureau of Statistics
PLO	Palestine Liberation Organization
PNA	Palestinian National Authority
ROW	Rest of the world
SAM	Social accounting matrix
SUR	Seemingly Unrelated Regression
VAT	Value added tax

Executive summary

The economic policy framework of the Palestinian National Authority (PNA), and the narrow range of policy instruments/space it makes available to the Palestinian decision makers, has been shaped by the 1994 Paris Protocol on Economic Relations between the Palestinian Liberation Organization (PLO) and Israel. This protocol, together with a multitude of restrictions and political instability have severely constrained Palestinian public and private sector economic activities and fostered the coercive economic dependence of the Occupied Palestinian Territory (OPT) on Israel.

To capture this reality, UNCTAD developed its first generation of the Integrated Simulation Framework (ISF) in 2006 to model the Palestinian economy post the establishment of the PNA. In 2009 UNCTAD transferred to the Palestinian Central Bureau of Statistics (PCBS) an updated version of the ISF to forecast and conduct policy scenario simulations and to underpin key policy research and publications geared towards planning and assessment of the performance of the Palestinian economy. The economic forecasts and policy scenario analysis conducted by the PCBS are used by the Palestinian Ministry of Finance and Planning in the budget preparation process and other public and private institutions.

After more than a decade, since the ISF was first developed, significant structural changes have taken place, and more data and information have become available. Therefore, UNCTAD deemed it necessary to update and upgrade its macro-econometric model of the Palestinian economy by developing an updated generation of the ISF.

Similar to the first generation, ISF II is a Klein-type demand-side model. It also goes beyond the standard demand-side approach by integrating the supply side of the economy in its structure. It uses more recent economic and demographic data (up to 2018), increases the number of economic sectors (value added and employment) from four to six sectors, and attempts to reflect Palestinian national and international economic relations since the establishment of the PNA in 1994.

The model simulates 139 endogenous variables generated from 46 behavioural equations and 101 identities in 5 blocks. The model performance and its ability to track the historical values of the endogenous variables is assessed through dynamic in-sample simulations for all endogenous variables for the period 1996–2018. It is found that the vast majority of the simulated variables follow their historical trends and values in a satisfactory manner. As well, the model is capable of simulating in-sample and out-of-sample policy scenarios under different assumptions.

ISF II forecast of baseline scenario of the economy of the OPT assumes the continuation of current trade and fiscal policy arrangements with Israel under the 1994 Paris Protocol, no major change in the present political environment, no major movement towards a political settlement, and the persistence of the ongoing Israeli blockade of Gaza since 2007. ISF II baseline scenario forecasts 139 endogenous variables over the period 2019–2025.

Model simulations suggests that the impact of the 2020 COVID-19 pandemic is going to be significant. The Palestinian economy is forecast to shrink by 15.5 per cent in 2020, compared to the baseline scenario. GDP per capita is expected decline by 17.5 per cent and unemployment to hover around 30 per cent. It will take two years for the economy to recover from the pandemic

as GDP is projected to grow by 11 and 6 percent in 2021 and 2022, respectively. Thereafter, the economy is projected to grow by 3.7 per cent annually until the end of the forecast period.

Over the forecast period (2019–2025) GDP is projected to grow at an annual average of 3.4 per cent. This barely keeps pace with population growth, resulting in 0.5 per cent average annual increase in GDP per capita.

Unemployment is expected to hover around 30 per cent through the forecast period. In the long run, with the persistence of the current political and economic environment, the Palestinian economy cannot generate enough jobs to make a dent on the persistently high unemployment rates and is not capable of moving towards balancing its budget and trade deficits.

The baseline forecast suggests that the sustainable socioeconomic recovery in the OPT requires lifting the blockage on Gaza, easing restrictions imposed by occupation in the West bank and increase in donor support. It also requires favourable, enabling framework for effective economic, monetary, fiscal and trade policies capable of responding to the complex and evolving needs of the Palestinian economy.

I. Introduction

A. Background

The Paris Protocol on Economic Relations between Israel and the Palestine Liberation Organization (PLO), signed in1994, shaped, and continues to shape, the Palestinian economic policy framework. It has defined the economic policy space and instruments available to Palestinian decision makers since the establishment of the Palestinian National Authority (PNA). However, the inadequate and one-sided implementation of the 1994 Oslo Accords (the key political reference framework between the PLO and Israel) continues to cast a heavy shadow over the economic side of the agreement - Paris Protocol on Economic Relations between the PLO and Israel. The latter has outlived the five-year transitional phase for which it was designed. In addition, Israel has frequently violated, ignored, limited or selectively interpreted many of the Palestinian rights under the Protocol. This, among other factors, has led to the shrinking of the productive capacities of the Palestinian economy and erosion of its economic base, and gave rise to mutually reinforcing economic distortions, depression-level unemployment rates, fiscal unsustainability, chronic budget and trade deficits and high dependency on international aid to finance a large and persistent budget and trade deficits (UNCTAD, 2019b).

The Palestinian economy has long suffered restrictions and political instability that continue to constrain public and private sector activities. Occupation fosters uncertainty and high transaction costs which undermine investment in the export and import-competing sectors, and thus deepens the dependence of the OPT on imports and transfers, including aid, remittances and income from the employment of Palestinians in Israel and settlements which are illegal under international law (UNCTAD, 2019a).

Since the Oslo Accords, the Palestinian economy passed through three distinct phases. During the first phase, 1994–2000, hope for a final status agreement was high, the PNA was able to balance its budget, Israeli restrictions were less severe, and donor aid was used mainly to finance development, non-recurrent expenditure or humanitarian relief.

This was followed by the post second-*Intifada* phase, which lasted from 2000 to 2007. During this phase, Israel imposed a stringent closure policy in the West Bank and Gaza and accelerated measures to separate East Jerusalem from the rest of the OPT. In addition, much of the Palestinian infrastructure, including PNA institutions, were subject to repeated destruction, and movement of Palestinian labour and goods was severely restricted, with grave consequences on economic growth, employment, poverty and overall development.

The third phase, from 2007 to date, is characterized by further tightening of Israeli restrictions, aid dependency, and the costly separation of the West Bank and Gaza. This split between the two Palestinian regions has fragmented governance and created a dual regulatory framework, and thus has had negative impact on economic activity, public finance and trade. During this phase, Israel imposed a near complete economic blockade on Gaza and tighter closure policy in the West Bank. In addition, Israel expanded the dual-use list which restricts Palestinian access to a wide range of imported factors of production.

Furthermore, the volatility of the permit system for the employment of Palestinian labour in the Israeli economy and Israeli settlements has its negative impact not only on the level of household consumption, but on the whole economy. These factors have been operating and reinforcing each other, which has ultimately led to structural changes in the Palestinian economy.

Occupation has been entrenched further with accelerated expansion of settlements. By the end of 2018, there were 150 settlements and 128 outposts. Settler population reached 671,007, roughly equivalent to one quarter of Palestinian population in the West Bank. Palestinian Central Bureau of Statistics (PCBS) data shows that occupation deprives the Palestinian people of 55 per cent of West Bank land classified as of high or medium agricultural value. Most of the valuable land is in Area (C) - 61 per cent of the area of the West Bank remains under full Israeli occupation and off limits to Palestinian producers (UNCTAD, 2020).

As a result, the OPT experienced weak economic performance, well below its capacity; with GDP growth decelerating from an average of 7 per cent during 2007–2011 to 3.7 per cent during 2012–2018. This has worsened the level and severity of poverty and stifled the economy's ability to create jobs for a growing and rather young population. Furthermore, the decline in donor support from 32 per cent of GDP in 2008 to 3 per cent in 2018 has worsened an already difficult situation.

B. Objectives

In 2006, UNCTAD published the "Integrated Simulation Framework for Palestinian Macroeconomic, Trade and Labour Policy" later referred to as ISF I, which served as a manual for UNCTAD's macro-econometric model of the economy of the OPT. An updated version of the ISF was transferred to the Palestinian Central Bureau of Statistics (PCBS) in 2009 to conduct economic forecast and policy scenario simulations, and produce annual publications covering economic forecasts and assessment of the performance of the Palestinian economy under different assumptions. PCBS economic forecast and policy scenarios are used by the Palestinian Ministry of Finance and Planning in the budget preparation process and by other government agencies and private sector institutions. In addition to the current use, the model has been successfully used for various policy and research studies by UNCTAD and other prominent Palestinian research institutions.

However, after more than a decade since the ISF was first developed, significant structural changes have taken place, and new data and information have become available. The newer generation of the model, ISF II, intends to reflect the recent realities of the economy of the OPT.

The new analytical framework builds on the previous version of the model of the Palestinian economy but attempts to overcome some of its limitations by allowing for more flexibility in assessing current realities. The new generation of the model will attempt to:

- Simulate the economy of the OPT based on current realities and recent structural changes.
- Assess the medium and long-term economic impact of various policy options and assumptions about exogenous variables.

- Evaluate labour policy and employment programs intended to reduce the dependency on the Israeli labour market while creating employment opportunities in the domestic economy.
- Assess trade policy and explore the gradual introduction of a new trade regime to expand Palestinian access to international markets and diversify trading partners.
- Analyse fiscal policy, including the impact of government expenditure, taxation and social transfers and donor aid flows.
- Assess the impact of changes in the Israeli restrictions on the Palestinian economy.

It is hoped that the new model would help Palestinian policy makers in better formulating public policies by assessing the impact of alternative policy packages. For example, in 2017, the PNA articulated an ambitious plan to lay the foundations for a viable, independent Palestinian State, and drafted its National Policy Agenda (NPA) 2017–2022. The NPA features priority targets in diverse sectors such as agricultural and water resources, renewable energy, tourism, quarrying, trade facilitation and public transportation, including railroads and the establishment of an airport in the West Bank and a seaport in Gaza. ISF II could provide some guidance to policy makers by exploring the potential impact of the proposed alternative policies, and for prioritization and integration of the plan with the national budget.

C. Previous models of the Palestinian economy

UNCTAD (2006) surveyed quantitative analyses and econometric models of the Palestinian economy; including World Bank computable general equilibrium model (Astrup and Dessus, 2001a and 2001b); Gideon Fishelson (1989), "The Econometric Model of Gaza Strip; Arnon and Gottlieb (1993), "An Economic Analysis of the Palestinian Economy: The West Bank and Gaza, 1968-1991" and Ron Baums (1989), "The Econometric Model of the West Bank".[1]

In recent years two new models were developed by UN-ESCWA and the World Bank. UN-ESCWA (2015) discussed its analytical framework in a study entitled "*Measuring the Cost of Israeli Restrictions on the Palestinian Economy*". It discussed the impact of Israeli restrictions on the Palestinian economic sectors, using a Computable General Equilibrium model (CGE). The model was developed and simulated based on 2011 social accounting matrix (SAM), it distinguishes 16 types of activities where each produces several types of goods or services.

The World Bank (2017) issued a study entitled "*Prospects for Growth and Jobs in the Palestinian Economy: A General Equilibrium Analysis*". The study also uses a CGE model to assess and quantify the overall prospects for growth and labour market in the OPT. It takes into consideration the economic benefits that could be achieved by easing external and internal constraints imposed on the economy.

[1] For more information please refer to the UNCTAD (2006) study: Integrated Simulation Framework for Palestinian Macroeconomic, Trade and Labour Policy.

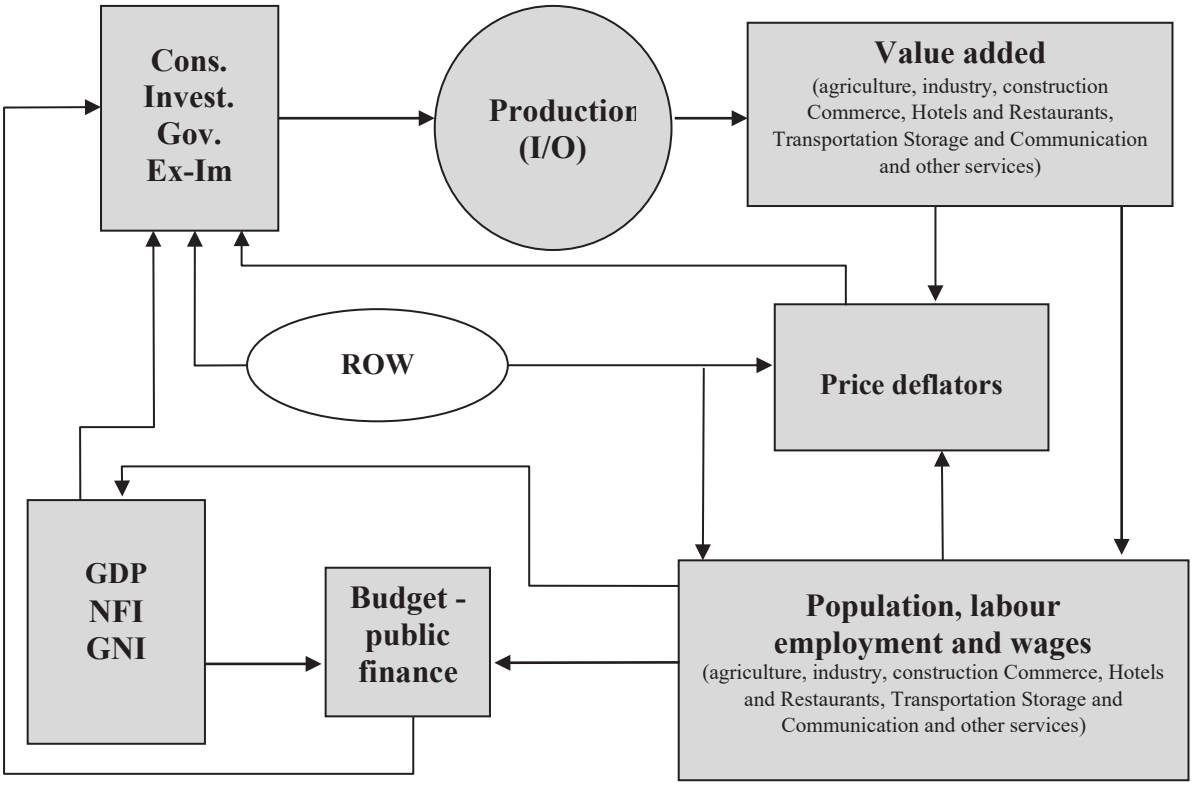
II. Integrated simulation framework for Palestinian macroeconomic, trade and labour policy II

While the second generation of the Integrated Simulation Framework (ISF II) builds on UNCTAD's previous models of the Palestinian economy, it focuses more on Palestinian national and international economic relations subsequent to the establishment of the PNA in 1994. Similar to the first generation, the ISF II is a Klein-type demand-side model, but it goes beyond the standard demand-side approach by integrating the supply side in its structure. Following Elkhafif (1996) and UNCTAD (2006), the ISF II integrates the input-output (I-O) approach to reflect the economy's productive sectors and incorporate both supply and demand factors. Final demand variables operate through value-added equations, which in turn affect sectoral employment. The new model's main developments compared to the 2006 model are the following:

- It uses only the post Oslo data,1994–2018, to avoid the structural shift in the Public sector and the economy before the establishment of the PNA. The previous model subsumed the two periods by using data for the period 1972–2005;
- It changes the base year, for deflating the nominal into real variables, from 2004 to 2015;
- It increases the number of economic sectors for both labour and value added from four (agriculture, manufacturing, construction and services) to six where the services sector is divided into three subsectors (commerce, hotels and restaurants; transportation, storage and communication; and other services) in addition to agriculture, manufacturing, and construction;
- It restructures the government block, where revenue categories have been changed from income tax, value added tax and other revenues to domestic tax revenues, non-tax revenues and clearance revenues (customs and other taxes on imports). The three Public expenditure categories have also been changed from government consumption, transfers and public investment to four categories: central government consumption, local government consumption, public investment and other expenditures - the first two categories constitute the public consumption variable in the national accounts identity;
- It revises the number of closure days in the previous model by using data from UNCTAD (1994–2007) and UNSCO (2008–2018). In addition, statistics on Palestinian casualties obtained from the Israeli Information Center for Human Rights in the Occupied Territories (B'tselm - an Israeli NGO) were introduced as an additional proxy for the intensity of the measures imposed by the occupation.

Figure 1 illustrates the structure of the Palestinian economy according to the ISF II. The simplified chart shows the flow of information among the different blocks in the model. This is basically similar to the structure of ISF I.

Figure 1
A simplified flow chart of the ISF II



Source: UNCTAD (2006)

A. Model structure

The model includes all categories of aggregate demand: private and public consumption and investment, as well as exports and imports of goods and services. Its structure makes it possible to model trade by source and destination, and therefore captures the dependence of the Palestinian economy on Israel for trade and as a destination for Palestinian labour.

The model simulates 139 endogenous variables generated from 46 behavioural equations and 101 identities. These are distributed in five blocks:

i. Labour and demographic block: 16 behavioural equations and 41 identities;
ii. Government block: 6 behavioural equations and 9 identities;
iii. Foreign trade and national accounts block: 10 behavioural equations and 35 identities;
iv. Prices and deflators block: 8 behavioural equations and 4 identities; and
v. Value added block: 6 sectoral behavioural equations and 12 identities.

Annex II provides the variable codes and Annex III lists the structural form of the behavioural equations and identities.

Labour and demographic block

The labour block consists of 16 behavioural equations and 41 identities. The explanatory variables are selected on the basis of a priori demand and supply analysis. This is in line with the Kaleckian and Keynesian approaches whereby output is demand-driven, and the economy can

operate at levels below full employment of available resources. That is, demand for labour is not constrained by labour supply and the wage level does not adjust to ensure full employment. In this case, wages might also be considered as being determined, in part, by factors outside the system.

Given the significant dependence on Israel and settlements for employment, and the higher wages in its markets, Palestinian domestic wage is modelled to capture the relationship with employment and wages in Israel. Domestic employment is thereby dependent, in part, on wage rates and/or relative wage levels offered to Palestinians employed in Israel.

Furthermore, Palestinian employment in Israel is modelled as a function of the wage levels offered to Palestinians employed in Israel, the number of closure days, number of Palestinian casualties, GDP in Israel and its own lag. Meanwhile domestic sectoral employment is taken as a function of value added, wages, employment in Israel and other sectors - in some cases - and lagged levels of employment.

Male and female labour market participation rates are functions of wages, GDP at factor cost and closure days. Wages in the OPT are considered to be driven by the wage level of Palestinians working in Israel, unemployment rate, wages in other sectors, labour supply and lagged wage. In line with the a priori selection process, variables are not necessarily included on the basis of the t-statistics and standard errors. Rather, more emphasis is placed on theoretical consistency. In some limited cases, this involves the inclusion of a variable that is not statistically significant on its own, but it increases the overall explanatory power of the other group of variables in the equation (F statistic).

Government block

The government block consists of 6 behavioural equations and 9 identities to model public finance and its transmission into the national accounts. Total net revenues were divided into three categories: domestic tax revenues, non-tax revenues and clearance revenues instead of income tax, value added tax and other revenues in the 2006 version of the model. Similarly, total government expenditures were divided into central government consumption, other expenditures and public investment instead of government consumption, transfers and public investment. This allows for direct representation of the public finance data and its categories in the national accounts identity. The current model also divides government consumption into local and central government consumption. As was the case in ISF I, government investment is considered to be a policy variable.

Foreign trade and national accounts block

The foreign trade and national accounts block consist of 10 behavioural equations and 35 identities. Palestinian imports from, and exports to, Israel are specified separately from those with the rest of the world to reflect the economy's deep and forced trade dependence on Israel. Total Palestinian imports and exports are also disaggregated into goods and services using their relative shares in total imports and total exports.

Total investment is the sum of public and private, which is divided between construction and non-construction investment by estimating the ratio of the former relative to the latter.

This block also includes private consumption and net factor income.

Prices and deflators block

The narrow monetary policy space implies that the PNA has extremely limited influence on domestic inflation. Inflation, or lack thereof, in the Palestinian economy closely tracks price fluctuations in the Israeli economy. Price deflators are modelled in some detail to account for inflation dynamics in the OPT and to investigate the effects of labour productivity, the exchange rate of the new Israeli shekel (NIS - another policy variable beyond the reach of Palestinian policy makers) and prices in Jordan. The deflators cover the prices of consumption (household and government), investment (construction and non-construction), exports (goods and services), and imports (goods and services). The block of prices and deflators consist of 8 behavioural equations and 4 identities.

Value added block

The model captures the production side of the economy by disaggregating GDP at factor cost (total value added) into six sectors: agriculture, manufacturing, construction, commerce, hotels and restaurants, transportation, storage and communication and finally other services.

The supply of each sector as measured by its value added is regressed on aggregate demand components: private consumption, private investment, public consumption, public investment, exports of goods and services and imports of goods and services. To account for the impact of technology, a time trend is added.

This method of modelling the economy's supply side follows the input-output (I-O) approach to capture production by a Leontief fixed coefficient function (Elkhafif, 1996). Optimally, standard I-O tables should have been used for this purpose. However, at the time of developing this version of the model, final I-O tables have not yet released by the PCBS. The same setup of the I-O approach was therefore estimated econometrically, rather than using the I-O coefficients, to derive the economy's value added from the complete set of aggregate demand components.

B. Empirical results

The model was first estimated equation by equation, then block by block, and finally as a complete system. Many criteria were used in the selection of the independent variables of each equation, including sign plausibility, statistical significance, goodness of fit and the ability to track history. The systems were estimated using Seemingly Unrelated Regression (SUR) to gain the efficiency from cross equation correlations. The system of estimated equations can be expressed in the following matrices form:

$$[Y_t]_{46x1} = [X_t]_{46x239}\,[\beta_{239x1}] + [e_t]_{46x1} \qquad (1)$$

Where Y_t is a vector of 46 dependent variables, X_t is a 46 x 239 matrix, e_t is a vector of 46 error terms. The vector of the 239 regression coefficients takes the following form:

$$\beta = (X' V^{-1} X)^{-1} X' V^{-1} Y \quad (2)$$

Where the inverse covariance is

$$V^{-1} = \Sigma^{-1} \otimes I \quad (3)$$

The equations were mostly in double log form for the added advantage of readily obtaining elasticity. In some cases, lagged dependent variables (LDV) are included to capture partial adjustment, which also allows the estimation of short- and long-term elasticities.

Estimation of the labour and demographic block

Employment

The labour and demographic block consists of 7 behavioural equations to explain employment in the six domestic economic sectors and employment in Israel and settlements all of which are demand functions. Domestic employment in each sector mainly depends on own average daily wage and value added, as well as employment in other sectors, which reflect substitutability of employment among the different sectors. Employment in Israel and settlements is a function of daily wage of Palestinian workers in Israel, Israeli GDP, closure days, and number of Palestinian casualties which capture the impact of changes in access and the security environment.

As presented in Table 1, except for the negative coefficient of employment in agriculture in the equation for employment in industry, all other right-hand-side (RHS) employment variables are positive, which implies complementarity in employment among different sectors - except for substitutability between agriculture and industry.

As for the impact of wages on employment, the estimation suggests that in all sectors employment is wage inelastic. Wages in agriculture have a positive impact on agricultural employment, with a 0.02 per cent elasticity coefficient – this may be explained mainly by the selection of variables in the equation and the presence of subsidies in the agriculture sector. On the other hand, a one per cent increase in the sector's wages is associated with 0.38 and 0.22 per cent employment reduction in industry and construction; respectively. In services, the average daily wage has a statistically significant negative impact in all three services sub-sectors.

The lagged dependent variable is present in agriculture, industry and other services. This implies a long-run wage elasticity of 0.06, 1.76, and 0.16; respectively. In the long run, employment in industry is wage elastic while being inelastic in other services and agriculture.

The restrained capacity of the economy of the OPT to generate jobs, in the face of a growing population, forces large number of Palestinian to seek employment in Israel and its illegal settlements scattered all over the West Bank (UNCTAD, 2019a). Employment in Israel after 2003 has originated from the West Bank only, as workers from Gaza have been banned. An overwhelming 99 per cent of those workers are male, classified as low-skill by educational attainment – less than 13 years of schooling (MAS, 2018). The growing Palestinian labour market dependence on Israel is also encouraged by favourable demand conditions in the Israeli economy, which suffers shortage of manual labour, especially in the agricultural and construction sectors.

Employment in Israel is found to be inelastic with respect to average daily wage for Palestinian labour in Israel and settlements. The estimated elasticity suggests that one per cent increase in wages increases Palestinian employment in Israel by only 0.43 per cent. This implies that employment in Israel is hardly driven by wage levels. Even in the long run Palestinian employment in Israel is wage inelastic, with an estimated coefficient of 0.77. The demand for labour in Israel appears to be of greater impact even if the associated elasticity is less than one.

The annual number of closure days and number of Palestinian casualties both have significant, negative impact on employment in Israel at -0.09 per cent and -0.22 per cent, respectively. In 1999, both closure days and casualties were at their lowest and thus corresponded to the highest number of Palestinian workers in Israel. On the other hand, closure days peaked, and casualties were high in 2003, which corresponded to lowest number of Palestinian workers in Israel as shown in Figures 2 and 3. The negative impact of closure days on employment in Israel was easier to explain up to 2003 as Palestinian labour from both the West Bank and Gaza were allowed to work in Israel. However, since the closure days variable is constructed as a weighted average of Gaza and the West Bank, this negative impact has weakened after 2003, because most of the closure days reflecting or carrying the impact of the Israeli blockade on Gaza where Palestinian workers from Gaza were forbidden form working in Israel. Similarly, the relation between the number of Palestinian casualties and the number of Palestinian workers in Israel was easier to explain prior to 2003. After workers from Gaza were banned from entering Israel, this relation became weaker. This can be seen from the two peaks in Palestinian casualties in 2009 and 2014, which reflect the Israeli military operations on Gaza but do not correspond to lower numbers of Palestinian workers (only from the West Bank) in Israel.

Figure 2
Number of Palestinian workers in Israel and Palestinian casualties, 1994–2018

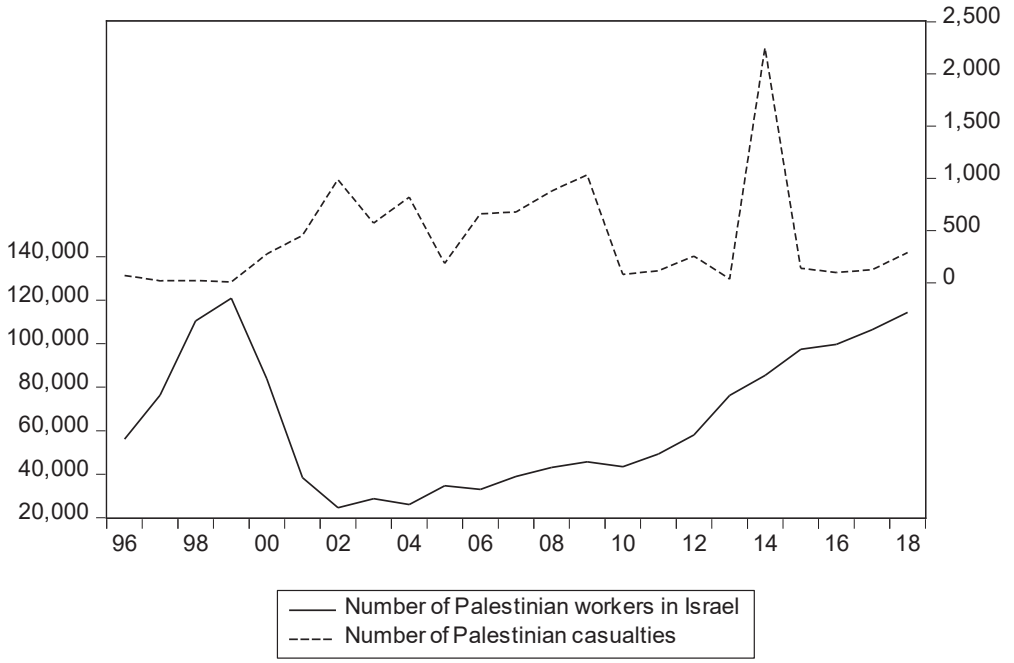


Figure 3
Number of Palestinian workers in Israel and number of closure days, 1994–2018

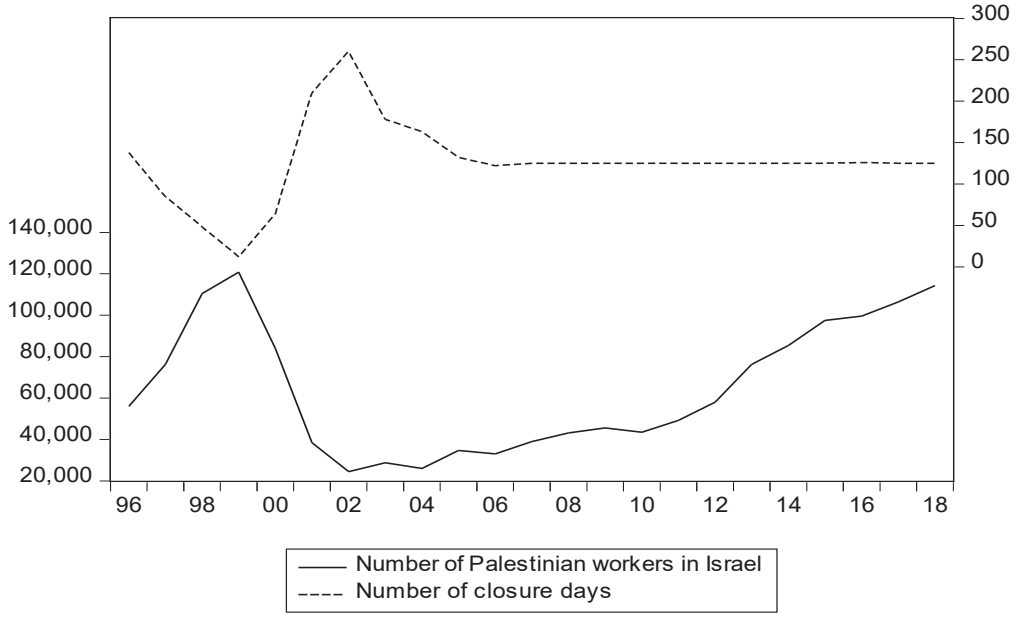


Table 1
Estimation of employment and employment in Israel

Dependent variables	Independent variables	Coefficient	Standard error	t-statistic	Probability.	R^2
Employment in agriculture	Constant	1.941418	0.983517	1.973955	0.0494	0.889152
	Daily wage in agriculture	0.023158	0.009340	2.479369	0.0138	
	Value added in agriculture	-0.151724	0.051857	-2.925842	0.0037	
	Lag construction to non-construction investment ratio	0.076433	0.035489	2.153693	0.0321	
	Employment in Israel	-3.49E-06	5.42E-07	-6.437157	0.0000	
	Employment in services	0.245260	0.060493	4.054332	0.0001	
	Dummy (2001)	-0.474773	0.045179	-10.50877	0.0000	
	LDV	0.622998	0.061825	10.07681	0.0000	
Employment in industry	Constant	0.227991	1.014661	0.224697	0.8224	0.964333
	Value added in industry	0.001469	0.034323	0.042810	0.9659	
	Daily wage in industry	-0.381017	0.125242	-3.042253	0.0026	
	Employment in construction	0.162279	0.024728	6.562650	0.0000	
	Employment in agriculture	0.140188	0.040097	3.496262	0.0005	
	LDV	0.783681	0.044380	17.65825	0.0000	
Employment in construction	Constant	11.41784	1.830059	6.239057	0.0000	0.892888
	Value added in industry	0.156193	0.049820	3.135166	0.0019	
	Daily wage in industry	-0.218797	0.205377	-1.065342	0.2876	
	Employment in Israel	0.300351	0.057697	5.205636	0.0000	
	Employment in agriculture	-0.353914	0.106296	-3.329503	0.0010	
	Dummy (2000, 2001, 2009)	-0.299767	0.039788	-7.534053	0.0000	
Employment in commerce, hotels and restaurants	Constant	3.325797	0.475949	6.987723	0.0000	0.983653
	Value added in commerce, hotels and restaurants	0.182070	0.028295	6.434703	0.0000	
	Daily wage in commerce, hotels and restaurants	-0.189016	0.048897	-3.865586	0.0001	
	Employment in the other services sectors	0.610815	0.039381	15.51048	0.0000	
Employment in transportation storage and communications	Value added in transportation storage and communications	0.206251	0.062226	3.314544	0.0010	0.979800
	Daily wage in transportation storage and communications	-0.327348	0.062123	-5.269340	0.0000	
	Employment in the other services sectors	0.798356	0.039326	20.30081	0.0000	
	AR 1	0.391251	0.120044	3.259232	0.0013	
Employment in other services	Daily wage in other services	-0.007489	0.002654	-2.821463	0.0051	0.983591
	Value added in other services	0.071915	0.053230	1.351032	0.1778	
	LDV	0.957610	0.034749	27.55796	0.0000	
Employment in Israel	Constant	-2.802807	0.874622	-3.204591	0.0015	0.971379
	Daily wage in Israel	0.428219	0.229443	1.866347	0.0630	
	Palestinian casualties	-0.093360	0.011003	-8.484813	0.0000	
	Closure days	-0.222795	0.029837	-7.467067	0.0000	
	GDP Israel	0.738011	0.105493	6.995827	0.0000	
	Dummy (1997-2010)	0.230992	0.036539	6.321718	0.0000	
	Dummy (1998, 2014)	0.412273	0.037203	11.08157	0.0000	
	LDV	0.445823	0.044397	10.04183	0.0000	

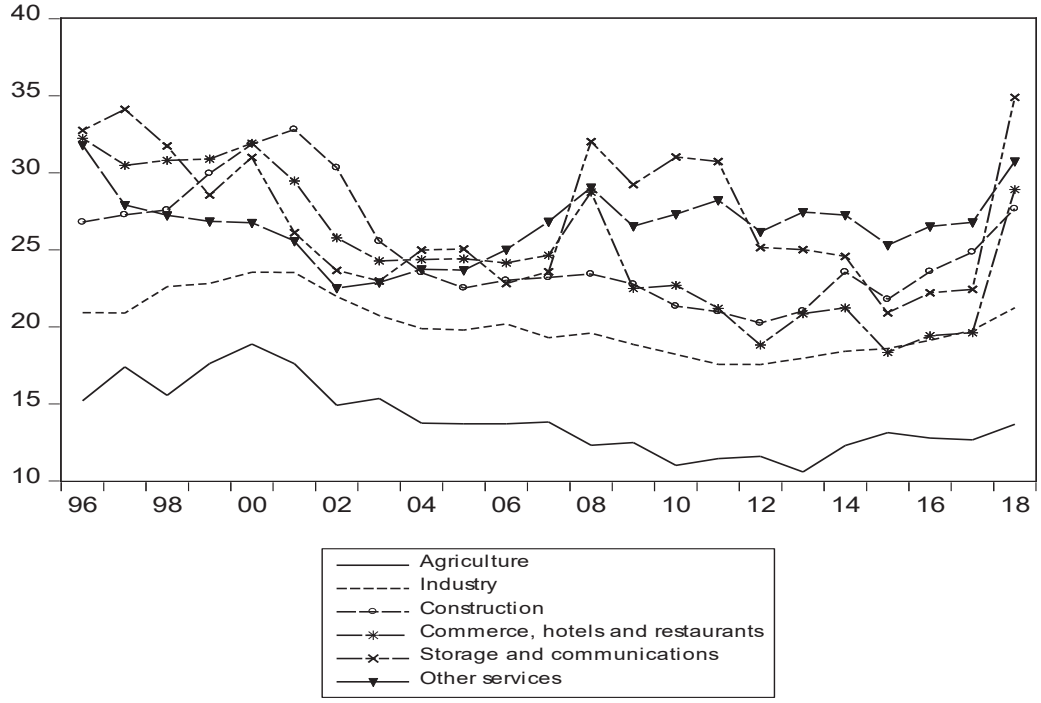
Labour participation rates

As shown in Table 2, the model includes equations capturing the participation rate of both male and female. The most influential variable for male participation rate is the wage rate both in Israel and the domestic wage. Closure days, on the other hand, have a significant negative impact on male participation rate and to a lesser extent on female participation rate. While GDP at factor cost has a significant positive impact on female participation rate, the average daily wage has an equal but negative impact. The female to male employment ratio, from which the shares of male and female in employment is obtained, is negatively affected by the share of industry and agriculture in domestic employment, closure days and casualties.

Table 2
Estimation of labour participation rates and employment shares by gender

Dependent variables	Independent Variables	Coefficient	Standard error	t-statistic	Probability	R^2
Female labour participation rate	Constant	-0.228657	0.078391	-2.916893	0.0038	0.938266
	GDP at factor cost	0.058383	0.007261	8.040494	0.0000	
	Closure days	-2.38E-05	1.57E-05	-1.519350	0.1298	
	Average domestic daily wage	-0.059949	0.015398	-3.893260	0.0001	
	LDV	0.231963	0.081537	2.844890	0.0048	
Male labour participation rate	Constant	0.049328	0.018082	2.728058	0.0068	0.890154
	Average daily domestic wage and daily wage in Israel	0.036856	0.004272	8.627421	0.0000	
	GDP at factor cost	0.011394	0.001559	-7.308371	0.0000	
	Closure days	-0.035894	0.004201	8.544917	0.0000	
	LDV	0.011793	0.004559	-2.586490	0.0102	
Female to male employment ratio	Constant	0.327020	0.082841	3.947544	0.0001	0.776860
	Ratio of daily wage in Israel to daily domestic wage	0.426778	0.020626	20.69100	0.0000	
	Shares of industry and agriculture in domestic employment	-0.053491	0.013124	-4.075966	0.0001	
	Dummy (2000)	-0.430540	0.037078	-11.61171	0.0000	
	Closure days	-0.029157	0.005054	-5.768919	0.0000	
	Palestinian casualties	-0.021113	0.002972	-7.104027	0.0000	

Figure 4
Daily real wage by sector, 1996–2018
(constant 2015 dollars)



Wages

Real wages have declined over the period 1996–2018, or at best stagnated (Figure 4). The wage equations relate sectoral wages to wages in Israel, unemployment rates, labour supply and LDV. Table 3 suggests that the association between wages in Israel and domestic wages is not strong in the construction and industry. As the estimated coefficients show, the wage level in Israel has a positive significant impact on Palestinian wages in the agricultural sector, while it has negative and insignificant impact on wages in both industry and construction. Unemployment, and total labour supply have negative impact on wages. Wages seems to adjust the slowest in construction with a LDV coefficient of 0.85 and the fastest adjustment seems to be in commerce, hotels and restaurants with a coefficient of 0.18.

Table 3
Estimation of daily wage by sector

Dependent variables	Independent variables	Coefficient	Standard error	t-statistic	Probability.	R^2
Daily wage in agriculture	Constant	4.885069	1.183565	4.127421	0.0000	0.833880
	Labour productivity in agriculture	-0.035502	0.044436	-0.798951	0.4250	
	daily wage in Israel	0.523549	0.148333	3.529549	0.0005	
	Total domestic employment	-0.369745	0.091991	-4.019337	0.0001	
	Dummy (2000-2002)	0.126755	0.031498	4.024192	0.0001	
	LDV	0.383886	0.115146	3.333898	0.0010	
Daily wage in industry	Constant	2.310089	0.463369	4.985422	0.0000	0.893935
	Ratio of daily wage in Israel to daily domestic wage	-0.019964	0.047508	-0.420232	0.6746	
	Employment in agriculture	-0.121779	0.023301	-5.226408	0.0000	
	Dummy (2008)	0.008987	0.014801	0.607171	0.5442	
	LDV	0.688280	0.076399	9.008971	0.0000	
Daily wage in construction	Constant	-0.577920	0.294837	-1.960130	0.0510	0.881609
	Employment in Israel	0.098884	0.020517	4.819590	0.0000	
	daily wage in Israel	-0.008890	0.083970	-0.105874	0.9158	
	2008, 1996 Dummies	0.081898	0.031920	2.565764	0.0108	
	LDV	0.852595	0.057750	14.76350	0.0000	
Daily wage in commerce, hotels and restaurants	Constant	7.684137	1.379026	5.572147	0.0000	0.844325
	Unemployment rate	-0.023706	0.045479	-0.521246	0.6026	
	Daily wages in the other two services sectors	0.796746	0.084625	9.415049	0.0000	
	Labour supply	-0.523103	0.082102	-6.371403	0.0000	
	Dummy (2008, 2012)	0.076583	0.026650	2.873664	0.0044	
	LDV	0.175522	0.115843	-1.515162	0.1309	
Daily wage transportation storage and communications	Constant	-5.969122	2.239985	-2.664805	0.0082	0.823792
	Labour supply	0.242067	0.139736	1.732319	0.0843	
	Daily wages in the other two services sectors	1.243419	0.120111	10.35226	0.0000	
	GDP deflator	-0.070174	0.142639	-0.491969	0.6231	
	Dummy (1997, 2001,2004, 2006)	0.083001	0.021661	3.831781	0.0002	
	LDV	0.317738	0.089545	3.548358	0.0005	
Daily wage in other services	Constant	-1.615808	0.334526	-4.830141	0.0000	0.899895
	Average Daily wages in the other two services sectors	0.345137	0.026458	13.04491	0.0000	
	Total domestic employment	0.197448	0.021069	9.371503	0.0000	
	Dummy (2002)	0.345614	0.030128	11.47166	0.0000	
	LDV	0.055660	0.014918	-3.731148	0.0002	

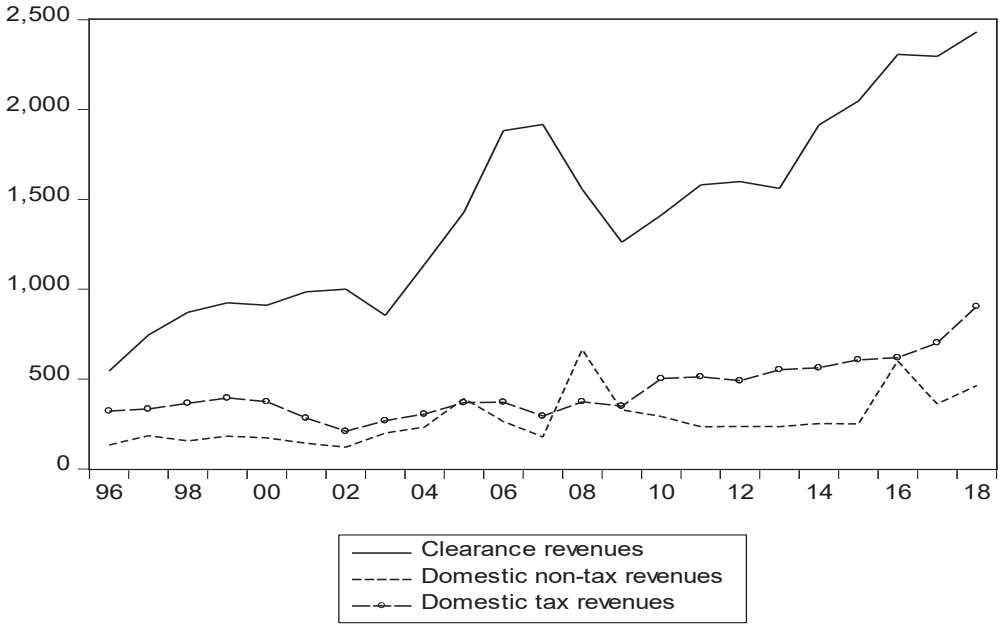
Estimation of the Government block

Since the establishment of the PNA, following the signing of Oslo accords in 1994, the Palestinian economy has been forced into a dependency path on Israeli demand for Palestinian goods and labour, as well as heavy reliance on international aid and remittances of Palestinian workers abroad. In the early years that follow the establishment of the PNA, nearly 60 per cent of Palestinian exports and up to 90 per cent of imports were from and to Israel.

Palestinian public finance underwent three distinct periods: 1994–1999, 2000–2007 and post 2007. The first period witnessed the establishment of the PNA, when public finance and the expenditures were less than a quarter of their recent levels. Donor support was mainly for financing development, not current expenditure, and by 1999 the PNA ran a balanced budget. Then after, the second Intifada erupted in September 2000. This period witnessed a widening deficit driven by greater spending, and long periods of Israeli withholding of Palestinian clearance revenues. Subsequent to the 2006 Palestinian elections, Israel suspended the transfer of clearance revenue to the PNA and donor aid was dramatically reduced. Current expenditure was dominated by the wage bill. The third distinct fiscal period extends from 2007 to the present. Its main characteristics are greater revenue collection efforts, higher spending, and the political and administrative separation of the West Bank and Gaza.

The government block consists of 5 behavioural equations: 2 cover the expenditures side and 3 cover the revenues side. The expenditures side is divided into central government consumption and other expenditures (or the residual). This allows for direct mapping of public finance variables into national accounts identities. The revenue side is divided into domestic tax revenues, non-tax revenues and clearance revenues as shown in figure 5. The selection of the independent variables used in the revenue equations is based on the source and type of revenue. For example, the clearance revenues mainly constitute of customs and VAT taxes collected on imports from Israel and the rest of the world (ROW), therefore the two import categories are independent variables in the clearance revenue equation.

Figure 5
Public revenue categories, 1994–2018
(Constant 2015 dollars)



The empirical results shown in Table 4 indicate that on the expenditure side, government consumption is positively associated with its net total revenues. The 0.74 coefficient of the LDV suggests that government consumption is somehow rigid, which is not surprising since expenditure is dominated by the wage bill and social transfers, in addition to operational expenditures. On the other hand, the other component of expenditures (total recurrent expenditure residual) is positively associated with revenue collection and net current transfers, but it is negatively associated with lagged central government consumption.

Table 4
Estimation of government block

Dependent variables	Independent variables	Coefficient	Standard error	t-statistic	Probability	R^2
Central government consumption	Constant	0.219122	0.265659	0.824827	0.4099	0.959880
	Real govt revenues- total net	0.237106	0.066488	3.566127	0.0004	
	LDV	0.740801	0.061505	12.04448	0.0000	
Government clearance revenues	Constant	-2.212116	0.619863	-3.568716	0.0004	0.974866
	Total imports from Israel + Its lagged value	0.401033	0.075520	5.310316	0.0000	
	Total imports from the ROW + Its lagged value	0.679284	0.023509	28.89457	0.0000	
	GDP growth	0.345942	0.095482	3.623117	0.0003	
	Dummies (1999-2000, 2006 2007)	0.353439	0.019944	17.72112	0.0000	
Government expenditure residual	Constant	4.093596	1.426440	2.869799	0.0043	0.601769
	Net revenues and its Lag	1.622429	0.339718	4.775806	0.0000	
	Lagged central government consumption	-2.725270	0.365359	-7.459166	0.0000	
	Net current transfers	0.848658	0.121903	6.961728	0.0000	
	LDV	0.859925	0.089274	9.632449	0.0000	
Government domestic non-tax revenues	Constant	-0.949254	0.933973	-1.016361	0.3100	0.747377
	Palestinian employment in Israel	-0.040113	0.066548	-0.602759	0.5470	
	Population growth	2.757320	1.197036	2.303455	0.0217	
	Total real net govt revenues -DV	0.894254	0.112235	7.967720	0.0000	
	Dummies (2007, 2008)	0.652201	0.087546	7.449823	0.0000	
	LDV	0.021673	0.074946	0.289185	0.7726	
Government domestic tax revenues	Constant	-2.795852	0.568080	-4.921582	0.0000	0.747377
	Private consumption	0.767440	0.135164	5.677858	0.0000	
	Private investment	0.421331	0.046508	9.059314	0.0000	
	LDV	-0.178651	0.092862	-1.923827	0.0550	
	Dummy (2009, 2010)	0.121175	0.036776	3.294928	0.0011	
Net indirect taxes and subsidies	Constant	0.571561	0.456830	1.251147	0.2115	0.947670
	Clearance revenues	0.912317	0.063813	14.29665	0.0000	
	Dummy (1994)	-2.625799	0.101555	-25.85597	0.0000	
	Dummies (2002, 2009)	0.441925	0.066137	6.681983	0.0000	

On the revenue side, clearance revenue is the largest component, accounting for over two thirds of total net revenues as shown in Figure 5. Clearance revenues are collected by Israel and transferred on monthly basis to the PNA. According to Paris protocol, the clearance mechanism is based on invoices submitted by the PNA. The greatest chunk of revenue is collected from trade with third countries, other than Israel, whereby the PNA levies custom duties, purchase tax and the VAT on imports from these countries. The PNA levies only the VAT on imports originating in Israel as per the stipulations of the customs union enshrined in the Paris Protocol.

The empirical results reveal that 1 per cent increase in trade with the rest of the world is associated with a 0.68 per cent increase in clearance revenues. Meanwhile 1 per cent increase in imports from Israel is associated with only 0.4 per cent increase in clearance revenues.

Domestic tax revenues consist of income tax, value added tax, customs duties on cars as well as property tax collected within Area A and B of the West Bank, where the PNA has jurisdiction

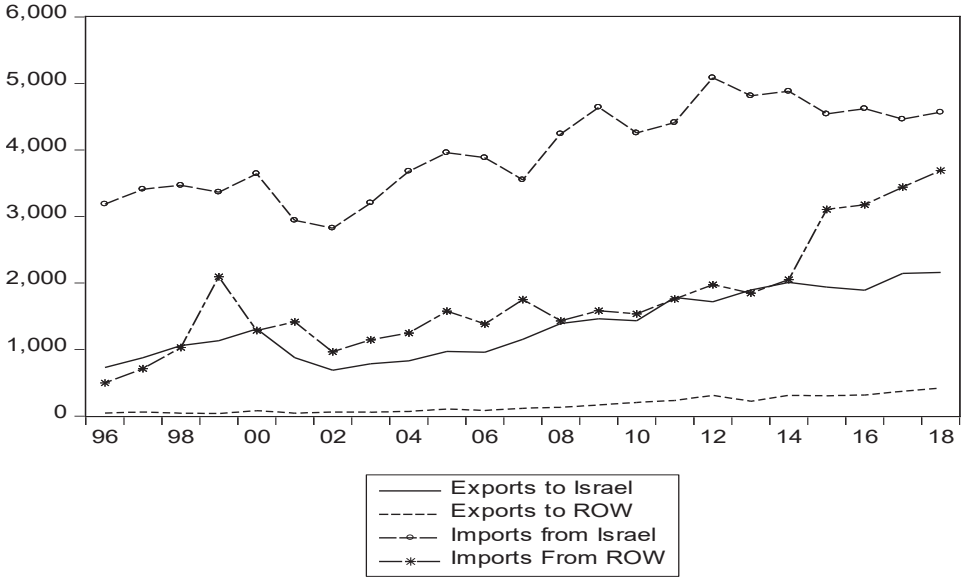
and administrative control. The empirical result suggest that such tax revenue is positively impacted by private consumption but negatively impacted by investment. This may be explained by the fact that investment regulations frequently feature tax advantages and holidays intended to promote greater investment.

Non-tax revenues are mainly fees and charges, licenses and exit fees at borders, which are mostly influenced by the population growth. It is estimated that 1 per cent increase in population is associated with 2.8 per cent increase in non-tax revenues.

Estimation of the external sector block

The external sector consists of 7 behavioural equations. Total imports and exports are divided into two categories: trade with Israel (as the major trading partner) and trade with the rest of the world (ROW). Import equations are estimated as demand functions for the Palestinian side while the exports equations are estimated as demand functions for Israel and ROW. Using the estimated share of goods relative to services equations, total imports and total exports are divided into goods and services. The results of the external sector equations are presented in Table 5. The coefficients of all explanatory variables have the expected sign. The share of goods relative to services in both imports and exports is also estimated using the ratio of prices of goods relative to services. Finally, the net factor income is mainly explained by employment in Israel and Jordan's GDP as the main component in net factor income is remittances.

Figure 6
Imports and exports of goods and services by destination, 1994–2018
(Constant 2015 dollars)



The restrictions on Palestinian trade constitute significant non-tariff barriers and divert Palestinian trade from competitive world markets to the less favourable Israeli markets at considerable cost to Palestinian producers and consumers. OPT's imports from Israel are dominated by goods that Israel does not have comparative advantage in exporting, as they can be procured from other markets at more advantageous cost and quality. Moreover, even when trading with third countries, Palestinians are often forced to access foreign markets through

Israeli intermediaries at cost; an arrangement that drains away Palestinian economic and other resources. The degree of trade diversion is highlighted by the fact that between 1994 and 2017 Israel absorbed 91 per cent of total Palestinian exports and accounted for 73 per cent of its imports. Trade concentration with Israel, as depicted in Figure 6, is a mirror image of the isolation of the OPT from global markets (UNCTAD, 2018).

Net factor income (mainly workers' income) drops by 0.02 per cent with each additional day of closure per year. Exports to Israel and the ROW decline with increased conflict intensity, which is proxied by Palestinian casualties, but imports from Israel are positively associated with Palestinian casualties (and have negative impact on GDP). Additionally, closure days have negative impact on both imports and exports except for exports to the ROW but is insignificant. Imports from Israel are driven by GDP, and as expected are negatively associated with import prices and imports from ROW, which are also driven by the Palestinian GDP and LDV. The share of goods in total imports is mainly driven by the price of the imported goods relative to the price of services imports.

Exports to Israel and the ROW are estimated as demand functions. Hence, exports to Israel are mainly driven by Israeli GDP and LDV, while exports to ROW are positively associated with imports of goods, Jordan's GDP (as a proxy for the ROW income) and are negatively impacted by the Palestinian casualties and the ratio of export prices to domestic prices. As in the case of imports, the share of goods exports is mainly driven by the price of goods exports relative to the price of services.

Table 5
Estimation of the external sector block

Dependent variables	Independent variables	Coefficient	Standard error	t-statistic	Probability.	R^2
Total exports to Israel	Constant	-8.137378	0.835589	-9.738497	0.0000	0.965414
	Israel GDP	0.727871	0.116860	6.228564	0.0000	
	Difference in export price deflator/prices in Israel	-0.311146	0.155275	-2.003837	0.0457	
	Palestinian casualties	-0.009417	0.008889	-1.059330	0.2900	
	Imports from Israel	0.556583	0.111790	4.978815	0.0000	
	Closure days	-0.092318	0.023986	-3.848859	0.0001	
	LDV	0.354675	0.045148	7.855909	0.0000	
Total exports to ROW	Constant	-15.77068	0.921710	-17.11025	0.0000	0.963144
	Export price deflator/GDP deflator	-0.642772	0.223317	-2.878291	0.0042	
	Jordan GDP	1.197475	0.182978	6.544364	0.0000	
	Imports of goods	1.195605	0.190449	6.277823	0.0000	
	Palestinian casualties	-0.053135	0.013635	-3.897066	0.0001	
	Closure days	0.018680	0.056925	0.328147	0.7430	
	Dummies (1998, 1999)	-0.703975	0.077328	-9.103744	0.0000	
Share of Goods in Total Exports	Constant	0.323050	0.038726	8.341971	0.0000	0.823984
	Export of goods price deflator/ export services price deflator	-0.107406	0.015463	-6.946004	0.0000	
	00+ 05 Dummies	-0.085673	0.006989	-12.25758	0.0000	
	LDV	0.636911	0.045430	14.01975	0.0000	
Total Imports from Israel	Constant	-0.479672	0.407835	-1.176144	0.2402	0.971937
	GDP at market prices	1.198438	0.052395	22.87309	0.0000	
	Imports price deflator	-0.532778	0.062429	-8.534111	0.0000	
	Total imports from the ROW	-0.308594	0.017533	-17.60043	0.0000	
	Palestinian casualties	0.015289	0.003167	4.828087	0.0000	
	Closure days	-0.033991	0.009503	-3.576987	0.0004	
Total Imports from ROW	Constant	-1.325597	0.743540	-1.782820	0.0753	0.920980
	Gross national disposable income	0.475891	0.094709	5.024793	0.0000	
	Closure days	-0.087758	0.023438	-3.744344	0.0002	
	Dummies (1999, 2000)	0.373333	0.033473	11.15313	0.0000	
	LDV	0.635511	0.046830	13.57056	0.0000	
Share of Goods in Total Imports	Constant	0.739072	0.022939	32.21883	0.0000	0.921402
	Relative price deflators of goods imports to services imports	-0.116920	0.004109	-28.45446	0.0000	
	Dummies (2001, 2002)	-0.054024	0.002868	-18.83968	0.0000	
	Dummies (2000, 2004, 2016)	-0.018264	0.001845	-9.898500	0.0000	
	LDV	0.175252	0.026007	6.738732	0.0000	
Net Factor Income	Constant	-4.180367	0.473206	-8.834132	0.0000	0.943668
	Palestinian employment in Israel	0.693137	0.024470	28.32547	0.0000	
	Jordan GDP	0.383120	0.042553	9.003331	0.0000	
	Closure days	-0.023276	0.018672	-1.246594	0.2132	
	Dummies (2008, 2010, 2018)	0.232608	0.017421	13.35242	0.0000	

Estimation of the final demand block

The final demand block consists of 3 behavioural equations: private consumption, private investment ratio of construction to Non-construction investment. The equation of the ratio of

investment in construction to non-construction is estimated to divide total investment into construction and non-construction. The estimated private consumption and private investment, along with the estimated government consumption and balance of trade, and the assumed values for government investment (policy variable) are fed directly in the national accounts identities to estimate the GDP on the expenditure side.

As Table 6 shows, the marginal propensity to consume is 0.6. As for the Private investment equation, the variable that explains most of its variation is the change in Israel's (NIS) lending rate, where a 1 per cent decrease in NIS lending rate increases private investment by 1.6 per cent.

The ratio of investment in construction to non-construction is explained mainly by their relative price, and government investment. The estimation suggests that both the relative prices and government investment have negative impact on the ratio of investment in construction to non-construction.

Table 6
Estimation of the final demand block

Dependent variables	Independent Variables	Coefficient	Standard error	t-statistic	Probability	R^2
Private consumption	Constant	0.723166	0.243761	2.966701	0.0032	0.989185
	Gross national disposable income	0.597404	0.051487	11.60301	0.0000	
	Prices of exports	0.086273	0.043077	2.002757	0.0458	
	Dummy (2004, 2008, 2018)	0.108598	0.009873	10.99937	0.0000	
	Difference in closure days	-0.000598	7.54E-05	-7.934684	0.0000	
	Difference in casualties	-9.36E-06	3.59E-06	-2.608371	0.0094	
	LDV	0.307076	0.055398	5.543130	0.0000	
Private Investment	Constant	5.404698	0.593551	9.105705	0.0000	0.956916
	Total consumption +govt. investment	0.214297	0.055645	3.851143	0.0001	
	Difference in NIS lending rate	-1.558070	0.535950	-2.907118	0.0038	
	closure Days	-0.129590	0.020713	-6.256547	0.0000	
	Casualties	-0.066617	0.008350	-7.978047	0.0000	
	Dummy (2007)	-0.525897	0.044066	-11.93423	0.0000	
	Dummies (2012–2018)	0.366009	0.023605	15.50567	0.0000	
	LDV	0.122880	0.038171	3.219213	0.0014	
Ratio of construction to Non-construction investment	Constant	4.279839	1.055900	4.053262	0.0001	0.819207
	Construction Investment price deflator/ investment non-construction price deflator	-1.834856	0.392148	-4.678986	0.0000	
	Govt. Investment	-0.356191	0.131333	-2.712130	0.0069	
	LDV	0.762514	0.055851	13.65266	0.0000	
	Dummies (2004, 06, 07, 10, 11, 14)	0.606727	0.068263	8.888058	0.0000	

Estimation of the prices/deflators block

This block intends to estimate the price dynamics and how prices react to each other and economic conditions. It consists of 8 behavioural equations. The deflators covered are the price indices/deflators of private consumption, government consumption, construction investment, non-construction investment, export of goods, export of services, import of goods and import of services.

Estimation results of the price-deflator equations, in Table 7, suggest that the main influence on private consumption prices is import prices and prices in Israel, with coefficients of 0.64 and 0.10 respectively. Therefore, most of the inflation in the OPT is transmitted from Israel and the ROW. Evidently, the import deflators for both goods and services depend on the average prices in Jordan and Israel. The impact is higher on the imports of services compared to imports of goods.

Table 7
Estimation of the prices block

Dependent variables	Independent variables	Coefficient	Standard error	t-statistic	Probability	R^2
Private consumption price deflator	Constant	-0.013394	0.012249	-1.093439	0.2748	0.974386
	Imports price deflator	0.648761	0.040392	16.06168	0.0000	
	Israeli CPI	0.094612	0.026001	3.638702	0.0003	
	LDV	0.377373	0.035978	10.48896	0.0000	
Government. consumption price deflator	Constant	0.073402	0.061343	1.196584	0.2321	0.974048
	Israeli (NIS) exchange rate	-0.037778	0.046313	-0.815715	0.4151	
	GDP deflator	0.750812	0.069062	10.87153	0.0000	
	LDV	0.197115	0.071851	2.743400	0.0063	
Construction investment price deflator	Constant	-0.654191	0.229527	-2.850165	0.0046	0.934395
	Import price deflator	0.566988	0.083621	6.780477	0.0000	
	Avg. daily wage in construction	0.203387	0.072806	2.793524	0.0054	
	Israeli (NIS) exchange rate	-0.211313	0.035376	-5.973373	0.0000	
	2008 Dummy	-0.362073	0.041225	-8.782917	0.0000	
	LDV	0.457301	0.067187	6.806398	0.0000	
Non-construction investment price deflator	Constant	0.001549	0.024046	0.064413	0.9487	0.952293
	Services import price deflator	0.232772	0.021003	11.08300	0.0000	
	Lending rate in NIS	0.174253	0.181040	0.962512	0.3363	
	Dummy (2007)	0.513391	0.023988	21.40161	0.0000	
	LDV	0.666230	0.042950	15.51167	0.0000	
Services export price deflator	Constant	-0.003518	0.013297	-0.264569	0.7915	0.965823
	Imports price deflator	0.650084	0.036698	17.71464	0.0000	
	Dummy (2007–2010)	0.232689	0.008543	27.23731	0.0000	
	LDV	0.431927	0.024896	17.34897	0.0000	
Goods export price deflator	Constant	1.143947	0.260257	4.395459	0.0000	0.954077
	Productivity in manufacturing	-0.116803	0.023362	-4.999628	0.0000	
	Israeli (NIS) Exchange Rate	-0.051820	0.045003	-1.151490	0.2501	
	LDV	0.720694	0.027866	25.86247	0.0000	
Services imports price deflator	Constant	-0.421161	0.073775	-5.708687	0.0000	0.966090
	Average CPI of Israel and Jordan	1.243831	0.204285	6.088706	0.0000	
	2006 Dummy	-0.729941	0.019233	-37.95347	0.0000	
	LDV	0.188005	0.030545	6.154985	0.0000	
	AR (1)	0.769414	0.039203	19.62633	0.0000	
Goods imports price deflator	Constant	0.737153	0.154113	4.783202	0.0000	0.947695
	Average CPI of Israel and Jordan	0.203792	0.053879	3.782376	0.0002	
	Share of good in total imports	-0.867182	0.173764	-4.990571	0.0000	
	Dummy (1995–2002)	0.133762	0.017085	7.829321	0.0000	
	Dummy (2012)	-0.091497	0.015290	-5.984200	0.0000	
	LDV	0.840155	0.051643	16.26842	0.0000	

Estimation of the value-added block

This block follows the Input-Output (I-O) approach to estimate sectoral value-added. However, instead of using the I-O fixed coefficients, Econometric estimation is used to model the relationships between the sectoral values added as dependent variables, and the GDP

components, from the expenditure side, as independent variables. As mentioned, the economy is disaggregated into six sectors: agriculture, manufacturing, construction, commerce, hotels and restaurants ,transportation storage and communication, and finally, other services.

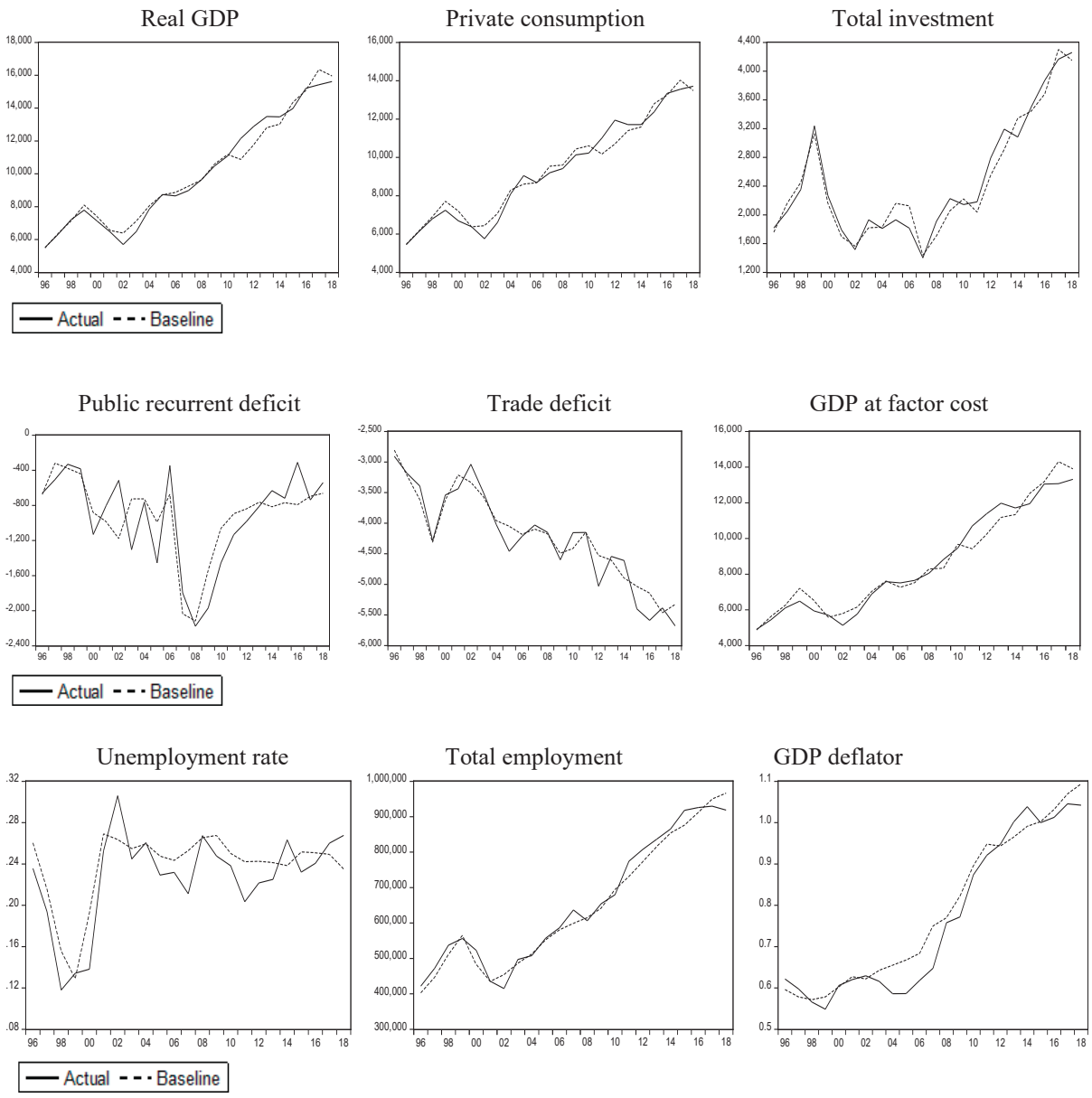
Table 8
Estimation results of value-Added block

Dependent variables	Independent variables	Coefficient	Standard error	t-statistic	Probability.	R^2
Value-added in agriculture	Total consumption	1.446056	0.365566	3.955660	0.0001	0.823556
	Total investment	0.064255	0.125315	0.512744	0.6092	
	Negative trade balance*	-0.813223	0.427704	-1.901369	0.0599	
	Time trend	-0.013341	0.007791	-1.712475	0.0897	
	02 Dummy (2002)	-0.311964	0.109311	-2.853922	0.0052	
Value-added in industry	Constant	3.867686	0.857824	4.508718	0.0000	0.924098
	Total consumption	0.725793	0.164258	4.418617	0.0000	
	Total investment	0.432852	0.081410	5.316966	0.0000	
	Negative trade balance*	-0.928649	0.279195	-3.326165	0.0012	
	Time trend	0.02	-	-	-	
	Dummy (2005, 2007)	0.202363	0.050234	4.028370	0.0001	
Value-added in construction	Total consumption	2.844586	0.439946	6.465755	0.0000	0.929206
	Total investment	0.598904	0.174962	3.423055	0.0009	
	Negative trade balance of services *	-0.478368	0.125242	-3.819553	0.0002	
	Negative trade balance of goods *	-2.685136	0.505953	-5.307087	0.0000	
	Time trend	-1.48E-06	2.26E-06	-0.654879	0.5140	
	Dummy (1999, 2002, 2008)	-0.732063	0.081386	-8.994908	0.0000	
Value-added in commerce, hotels and restaurants	Total consumption	0.152043	0.124207	1.224102	0.2236	0.956616
	Total investment	0.612125	0.097215	6.296633	0.0000	
	Negative trade balance of services *	-0.002495	0.079587	-0.031345	0.9751	
	Time trend	0.041711	0.004900	8.512004	0.0000	
	Dummy (2008, 2011, 2018)	-0.156869	0.053903	-2.910203	0.0044	
Value-added in transportation storage and communications	Constant	-2.518865	1.106889	-2.275624	0.0249	0.945862
	Total consumption	0.736891	0.355469	2.073007	0.0406	
	Total investment	0.309275	0.139005	2.224914	0.0282	
	Total exports	0.452173	0.136051	3.323555	0.0012	
	Total imports	-0.282282	0.533133	-0.529478	0.5976	
	Time trend including Dummy (1996, 2018)	-0.260808	0.056445	-4.620566	0.0000	
Value-added in other services	Private consumption	1.714954	0.207120	8.280007	0.0000	0.927536
	Government investment	0.152116	0.033245	4.575600	0.0000	
	Total imports	-1.077781	0.226360	-4.761351	0.0000	
	Dummy (2008, 2010)	0.235545	0.040458	5.821939	0.0000	
	Time trend	0.20	-	-	-	

* Negative trade balance is imports minus exports. As trade balance is negative reversing the sign of trade balance is needed for the log.

The results are presented in Table 8. As expected, consumption, investments and exports have positive coefficients in all six sectors, while imports or trade deficit have negative coefficients in all six sectors. Time trend coefficients in industry and other services was restricted in the estimation to a small positive value, which have improved the overall fit of the equations.

Figure 7
Simulated and actual series - selected variables



C. Model performance

To assess the performance of the model and its ability to track the historical values of the endogenous variables, a dynamic in-sample simulation was performed to produce simulated values for all endogenous variables during the period 1996–2018. Figure 7 shows that the simulated values closely track the historical values of some of the main variables, including GDP at market prices, private consumption, total investment, government budget deficit, trade deficit, domestic employment, GDP at factor cost (aggregation of all six sectoral value-added), unemployment and GDP deflator. Most of the simulated variables follow the trend and values in a satisfactory manner. This suggests that the variables that comprise these aggregates also satisfactorily track their historical actual values.

III. Baseline forecast: Prospects of the Palestinian economy

The objective of this chapter is to simulate the ISF II to forecast the development prospects of the economy of the OPT over the period 2019–2025. Given the high degree of economic and political uncertainty, it is difficult to make assumptions about the economic and political conditions that are likely to prevail in the future. Therefore, the exogenous variables of the baseline simulation assume that the existing economic and political environment will continue during forecast period. Consequently, the baseline simulation could forecast and assess the performance of the economy within the existing policy framework and the limited policy tools presently available to the Palestinian decision maker.

The baseline forecast scenario could also be used to assess the impact of alternative policy frameworks by comparing its forecasts with the outcome of other simulations that assumes an end to restrictive measures imposed by the occupation and alternative policy frameworks with a wider policy space available to policymakers in sovereign states.

A. Baseline assumptions

In early 2020, the COVID-19 pandemic struck at a time of rapidly deteriorating conditions in the OPT, with the first case of COVID-19 reported in early March. The PNA responded by closing institutions and limiting the movement of people within the OPT and completely locked down some localities. The general slowdown of the economy, cessation of operations and decline in sales hit the private sector hard. One month after the outbreak, private sector representatives announced plans to cut wages by 50 per cent. Meanwhile, the loss of income of the 140,000 Palestinians who work in Israel and settlements will seriously undermine household consumption and feed into the whole economy via aggregate demand shock. These workers earn, on average, 2.5 more than their counterparts employed in the domestic economy and their households account for one-third of private consumption, a key driver of GDP growth in recent years (UNCTAD, 2020).

Various institutions attempted to forecast the impact of the pandemic. Estimates of the economic loss vary with assumptions made regarding the severity and duration of the crisis and the nature of policy response. One of these attempts is MAS (2020), which uses a computable general equilibrium model to estimate the losses under different assumptions about relevant variables. MAS estimates that the West Bank's real GDP would shrink by 21 per cent in 2020 and public revenue would fall by 24 per cent in the optimistic scenario and in a more pessimistic scenario, real GDP would fall by 35 per cent and revenue would collapse by 33 per cent. The PCBS also simulates the economy under different assumptions pertaining to crisis duration, severity and scope. Assuming three-month duration before the gradual return to normalcy, the PCBS projects the contraction of GDP by 14 per cent compared to a baseline scenario. Meanwhile, the World Bank projects the cost of the pandemic to be in the range of 2.5 to 7 per cent of GDP (UNCTAD, 2020).

The historical record suggest that the cost of the pandemic will be significant. Following the outbreak of the Second Intifada in September 2000, the occupying power imposed a stringent policy of border and internal closures that resulted in widespread disruption of economic activity

in the OPT. The restriction reversed a cycle of double-digit growth in previous year as real GDP contracted by 9, 9 and 13 per cent in 2000, 2001 and 2002, respectively. The consecutive three-year contraction translated into the decline of real GDP per capita by 11 per cent in 2000, 12 per cent in 2001 and 15 per cent in 2002 (UNCTAD, 2020).

The assumptions of the exogenous variables in the baseline scenario start in 2019 and continue to 2025; taking into account the impact of the COVID-19 pandemic in 2020. For the overall political environment, the baseline forecast assumes that there will be no movement towards political settlement and the persistence of the separation between Gaza and West Bank. In other words, the restrictions are assumed to continue at the same level.

For 2020, the closure days are assumed to be 200 days to capture the lockdown imposed by Israel and the PNA to contain the pandemic. Net current transfers are assumed to decline by 20 per cent due to the decline in the income of Palestinians who work in Israel and settlements. Government investment is assumed to decline by 15 per cent due to the fiscal pressure that ensued with the pandemic. Finally, GDP in Jordan and Israel (main trading partners) are assumed to shrink by 1 and 2 per cent, respectively. In 2021, the economy is assumed to recovery from the COVID-19 pandemic, closure days are to revert to their pre-pandemic levels, and net factor income is assumed to grow by 6.5 per cent. Government investment is assumed to grow by 40 per cent. Finally, the economies of Jordan and Israel are also assumed to recover with GDP growth of 2 and 4 per cent, respectively.

For the remaining years of the baseline scenario, it is assumed that the number of closure days is assumed to continue at the same rate of 125 days per year; this is based on the assumption that the blockade on Gaza will continue, and the level of mobility restrictions imposed on the West Bank in the last few years will not change. Annual number of Palestinian casualties in the forecasting period is assumed to equal to the average number of casualties in the last ten years (390 casualties per year); meaning that the impact of the three military operations on Gaza during the period 2007 to 2018 continues in the forecast period. Finally, the forecast assumes the continuation of the current trade and fiscal arrangements with Israel which are formalized under the terms of the 1994 Paris Protocol. This qualitative description is translated into quantitative assumptions as summarized in Tables 9 and 10.

For public finance, the baseline scenario assumes that the growth rate of government investment will show a steady growth after 2021 at 8 per cent. Local government consumption and consumption abroad also exhibits steady growth after 2021 at 6 and 4 per cent, respectively, to the end of the forecast period.

Table 9
Baseline forecast assumptions: National exogenous variable, including policy *

	1996-1999	2000-2007	2008-2011	2012-2018	2019	2020 (COVID)	2021 (recovery)	2022-2025
Public investment	0.19	0.02	-0.02	0.02	0.09	-0.15	0.40	0.08
Local government consumption	0.02	0.02	0.45	0.38	0.06	0.00	0.00	0.06
Government consumption abroad[2]	0.22	-0.06	-0.05	0.03	0.05	0.04	0.04	0.04
Population growth rate	0.06	0.03	0.026	0.024	0.025	0.025	0.05	0.025

*1994–2018 - Actual data; 2019–2025 - forecast assumptions

Table 10
Baseline forecast assumptions: External exogenous variables*

	1996-1999	2000-2007	2008-2011	2012-2018	2019	2020 (COVID)	2021 (recovery)	2022-2025
Net Current transfers growth rate	-0.04	0.29	-0.18	0.066	0.23	-0.20	0.065	0.04
Closure days/year	71	157	125	125	125	200	125	125
Palestinian casualties / year	29	580	527	456	131	390	390	390
Lending rate in NIS - percentage change	-0.07	-0.023	-0.02	-0.03	-0.035	-0.056	0.00	0.00
Exchange rate NIS/USD	3.7	4.4	3.7	3.7	3.6	3.6	3.6	3.6
Percentage change of wages in Palestinian labour in Israel	0	-0.01	0.014	0.055	0.04	0.045	0.038	0.035
Israeli GDP growth rate	0.01	0.035	0.044	0.034	0.035	-0.02	0.04	0.03
Jordan GDP growth rate	0.028	0.063	0.042	0.024	0.02	-0.01	0.03	0.03
Israeli CPI percentage change	0.10	0.027	0.035	0.01	0.01	0.01	0.02	0.02
Jordan CPI percentage change	0.04	0.03	0.06	0.026	0.01	0.01	0.015	0.025

*1994 –2018 - Actual data; 2019–2025 – forecast assumptions.

The assumption about net current transfers from abroad (mainly donor support) reflects the trend of the past 5 years; with decline in the level starting from 15 per cent in 2018, 8 per cent in 2019 and then 4 per cent from 2022 onwards. This pattern suggests that donor contributions, and their share in GDP will continue to decline over time.

Following the same trend over the last 10 years, population growth rate in the OPT is assumed to remain at 3.5 per cent annually during the forecast period. In addition, the ratio of male to female population and their respective share in manpower is assumed to stay constant during the forecast period.

[2] Government consumption abroad is mainly the PNA's expenditures on Palestinian institutions and offices abroad such as embassies, representation offices, as well as social support for refugees.

Table 10 displays the forecast assumptions for the variables exogenous to the Palestinian economy. These are economic growth in Israel and Jordan, the main Palestinian trading partners, the exchange rate of USD to NIS, the NIS lending rates, inflation rates in Israel and Jordan, and the real wage of Palestinians working in Israel and settlements. The annual economic growth rate in Jordan and Israel is assumed to be three per cent, in line with the historical trend in the past decade. The exchange rate is assumed to remain stable through the forecasting period at 3.6 NIS/USD. Finally, the baseline scenario assumes that the real wage of Palestinians working in Israel and settlements will grow approximately as fast as Israeli real GDP given that in the sample period the average growth rates were similar.

B. Baseline forecast

Based on these assumptions, the ISF II is simulated for the period 2019-2025 to produce projections of the model's 139 endogenous variables. Figure 8 presents the projections of the main economic indicators.

The baseline scenario suggests a GDP growth rate of 0.8 per cent in 2019 resulting in further decline in GDP per capita. The impact of the COVID-19 pandemic in 2020 is significant. The Palestinian economy in 2020 is forecast to shrink by 15.5 per cent. GDP per capita is expected to decline by 17.5 per cent in 2020 and unemployment to be around 30 per cent. It will take two years for the economy to recover from the impact of the pandemic as GDP is projected to grow by 11 and 6 percent in 2021 and 2022; respectively. Then after the economy is projected to grow by 3.7 per cent annually until the end of the forecast period, barely keeping pace with population growth, resulting in 1.2 per cent annual increase in GDP per capita. The poverty implication of this growth pattern correlate with the unemployment trajectory in figure 8. The latter is forecasted to hover around 31 per cent throughout the forecast period. In the long term, with the persistence of the current political and economic environment, the Palestinian economy will not be able to create enough jobs to make a dent on its depression-level unemployment rates.

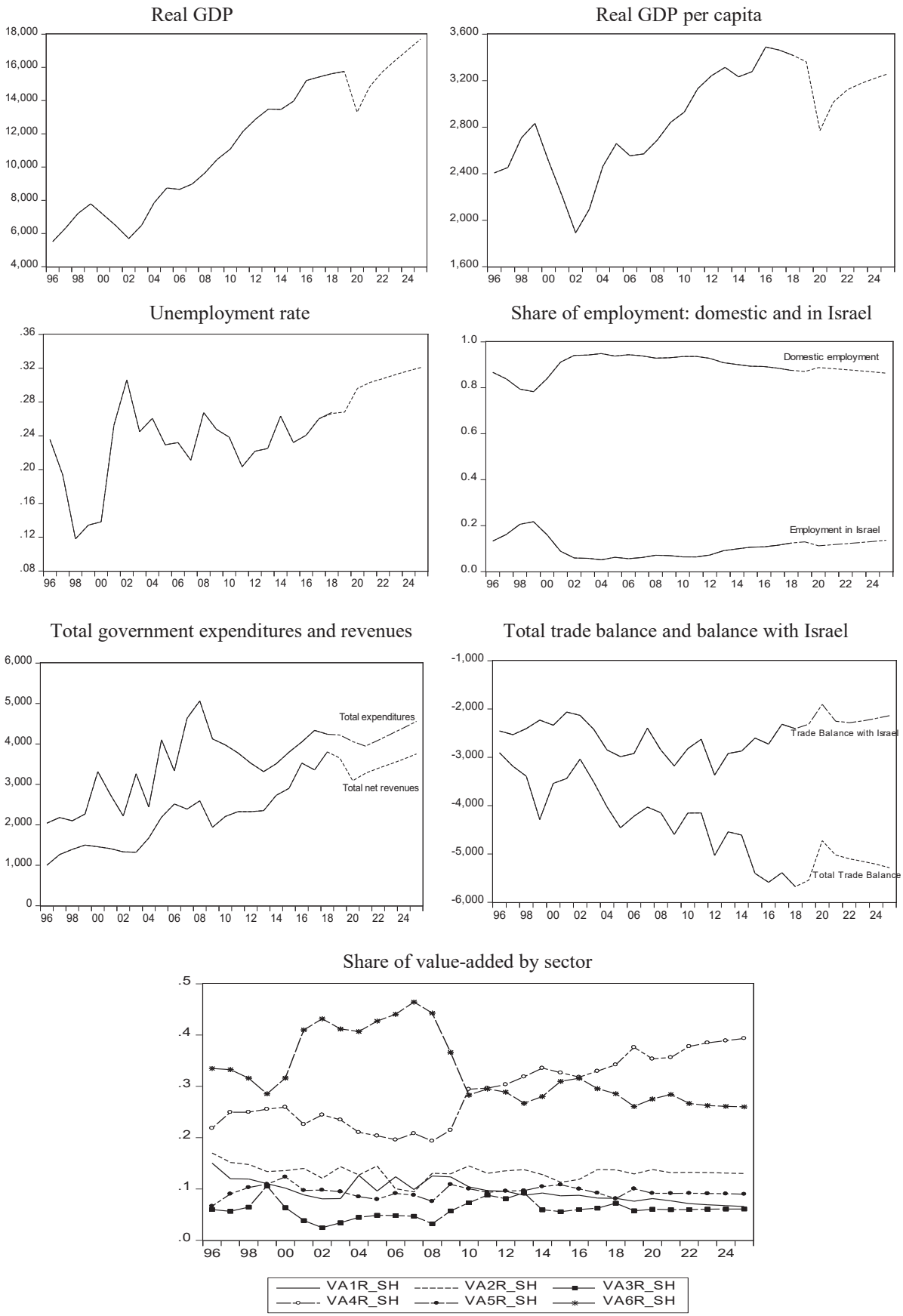
With this growth trajectory, the distorted structure of the economy is expected to remain the same. Agriculture's share in GDP is projected to decline from 8.2 per cent in 2018 to 6.6 percent in 2025; share of the services sector remains around 75 per cent; share of manufacturing remains around 12-13 per cent; while the share of construction will remain around 6 per cent. As Figure 8 shows, the ratio of the trade deficit to GDP is expected to decline slightly from 35 per cent in 2018 to 30 per cent of GDP in 2025.

Domestic employment is projected to increase steadily from 834,000 jobs in 2019 to 919,250 jobs by the end of the forecast. Driven by the higher demand in Israel, employment in Israel is projected to increase from 115,000 jobs in 2018 to 145,000 jobs by 2025. However, neither domestic employment nor employment in Israel is sufficient to drive the unemployment rate below 30 per cent.

The government budget deficit is expected to grow as expenditure growth will exceed that of revenues during the forecasting period. The administrative separation of Gaza from the West Bank is a source of additional fiscal pressure. Furthermore, the forecast indicates a decline in imports from Israel and those from the ROW as percentage of GDP. This decline in imports has

direct impact on Palestinian total revenues. This grim forecast makes it abundantly clear that sustainable economic recovery and poverty reduction prerequisite an alternative policy framework featuring an end to the restrictive measures imposed by the occupation, the availability of more policy space for the Palestinian policy makers including a sovereign fiscal, monetary and trade policy instruments available to Palestinian decision makers.

Figure 8
Baseline forecast for 1996–2025: Key economic indicators



IV. Concluding remarks

The ISF II is developed to model the economy of the OPT within a historical perspective to serve as an analytical tool for economic forecasting, scenario analysis and policy assessment. It is capable of simulating the Palestinian economy under alternative policy scenarios. For example, UNCTAD (2019b) uses the ISF II to assess the impact of the leakage of Palestinian fiscal resources to Israel and to quantify the associated cost to the Palestinian economy in terms of output and employment through the period 2000–2017.

Among the key findings of the simulation, discussed in this paper, is that employment is wage-inelastic except for the industrial sector. Employment in Israel is also wage-inelastic with respect to Israeli average daily wage. Demand for Palestinian labour in Israel, associated with Israel's GDP, appears to be the strongest causal factor. Both the number of closure days per year and Palestinian casualties have significant, negative impact on employment in Israel. Exports to Israel and to the ROW decline with greater intensity of Israeli military operations, proxied by Palestinian casualties. On the other hand, imports from Israel and the rest of the World (ROW) are positively associated with Israeli military operations, while closure days have negative impact on imports from the ROW.

One of the most important findings pertain to the quantification of the impact of imports from Israel on revenues compared to the impact of those from the ROW. The highest revenues are collected from trade with third countries, not Israel, as the PNA collects custom duties, purchase tax and VAT on these imports, while it only collects VAT on imports originating in Israel; with which it shares a customs union. The empirical results suggest that a 1 per cent increase in trade with the ROW is associated with 0.72 per cent increase in clearance revenues, while a 1 per cent increase in imports from Israel translates to 0.4 per cent increase in clearance revenues.

Forecasts of the model up to 2025 raise major concerns. The baseline forecast captures the economy's response to the political environment; featuring occupation restrictions and the continuation of the Paris Protocol as the policy framework that governs Palestinian economic, trade, monetary and fiscal relations with Israel and the rest of the world. The persistence of such unfavourable conditions implies slow, below potential GDP growth, that barely keeps pace with population growth and consequently a stagnation in per capita GDP. Such feeble economic growth cannot reduce poverty or resolve the unemployment problem in a meaningful and sustainable way.

Genuine, sustainable socioeconomic recovery in the OPT therefore requires greater donor support, lifting the blockage on Gaza, easing and ending occupation restrictions in the West bank, and replacing the outdated Paris protocol with a favourable, enabling framework for effective economic, monetary, fiscal and trade policies capable of responding to the complex and evolving needs of the Palestinian economy.

Annex I
Economic and demographic data

The Palestinian Central Bureau of Statistics (PCBS) is the main source of all data pertaining to national accounts, prices, demographics and labour and trade. The source of public finance data is the Palestinian Ministry of Finance and Planning.

Other time series data, 1994–2017, were developed by the UNCTAD secretariat by combining data sets from different sources. All data used by the model is in 2015 US dollars unless otherwise is indicated.

National accounts data

The national accounts data are expressed in real 2015 US$, in line with the most recent data published by PCBS. different deflators are used for each of the national account variables.

Sectoral reconciliation

The PCBS national accounts divide GDP into 9 sectoral value added: 1. Agriculture, forestry and fishing; 2. Mining, manufacturing, electricity and water; 3. Construction; 4. Wholesale and retail trade, repair of motor vehicles and motorcycles; 5. Transportation and storage; 6. Financial and insurance activities; 7. Information and communication; 8. Services which is further divided into: Accommodation and food service activities, real estate activities, professional, scientific and technical activities, administrative and support service activities, education, human health and social work activities, arts, entertainment and recreation and other service activities; and 9. Public administration and defence.

In the model sectoral GDP is consolidated/aggregated into six sectors: agriculture, industry, construction, commerce, Hotels and restaurants, transportation, storage and communication and finally other services. Table 11 describes how six GDP value added sectors are constructed for the model.

Table 11
Reconciling sectoral value added

GDP by sector	Composition
Agriculture	Includes agriculture, forestry and fishing.
Industry	Includes mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply, waste management and remediation activities.
Construction	Includes only construction activities.
Commerce, hotels and restaurants	Includes accommodation and food services, wholesale and retail trade, repair of motor vehicles and motorcycles.
Transportation, storage and communication	Transportation, storage, information and communication.
Other services	Financial and insurance activities, public administration and defence, and home services.

Trade data

Aggregate trade data are presented by the value of exports and imports of goods and services as reflected in the national accounts. The data also disaggregate total exports and imports by two destination: Israel and the ROW. All trade data are presented in constant 2015 US dollars as well as shares in GDP. The source of trade data is the PCBS' most recent data.

Labour and demographic data

The labour data includes sectoral domestic employment, average daily wage in constant 2015 US dollars; in line with the most recent data published by PCBS. Sectoral domestic employment is consistent with the six sectors in Table 11 and does not include employment in Israel and settlements which is treated as a separate category.

The set of demographic variables follows PCBS demographic data scheme. All the data, including population, manpower, male and female manpower are obtained from PCBS labour survey reports from 1996–2017.

Public Finance Variables

The public finance variables were obtained from the Palestinian Monetary Authority (PMA). All variables are presented on cash basis, in constant 2015 US dollars. The variables were deflated by the government consumption price deflator; with 2015 as the base year. The only exception is clearance revenues for 2002–2003 the period during which Israel withheld clearance revenues for two years (in the aftermath of the second intifada) - the annual sums withheld are added for both years.

Occupation proxies

Occupation proxy variables seek to capture the Israeli restrictions, actions and policies that negatively impact the Palestinian economy. It is extremely difficult to find one or several measurable variables that can be adequately used as proxies for the controls imposed by occupation. The model uses two variables to proxy the impact of occupation: restrictions and measures against the Palestinian people are proxied by closure days, while the number of casualties is used to proxy the intensity of Israeli military operations.

The variable, closure days, was constructed using UNCTAD 1993–2002 data and afterwards was established using UNSCO data separately for Gaza and the West Bank. Using the regional share in GDP as weights for each region, a weighted average is constructed. After 2007, the West Bank closure days are represented by the number Jewish holidays and number of Saturdays stated in UNSCO data. The Palestinian casualties to occupation and settlers was obtained from B'tselem data base on casualties.

Annex II
Variable definitions

Code	Variable	Measurement
CPR	Private consumption	2015 US$ million
CPR_SH	Private Consumption- GDP ratio	per cent
CTR	Total consumption	2015 US$ million
CTR_SH	Total Consumption- GDP ratio	Per cent
D_EM_N	Female to male employment	Ratio
D_EMF	Employment female	Worker
D_EMM	Employment male	Worker
D_UEM	Unemployment rate	Per cent
D_UEMF	Unemployment rate among females	Per cent
D_UEMM	Unemployment rate among males	Per cent
DDEM	Labour demand	Worker
DEM1	Domestic employment in agriculture	Worker
DEM1_SHD	Share of agriculture in domestic employment	Per cent
DEM2	Domestic employment in industry	Worker
DEM2_SHD	Share of industry in domestic employment	Per cent
DEM3	Domestic employment in construction	Worker
DEM3_SHD	Share of construction in domestic employment	Per cent
DEM4	Domestic employment in commerce, hotels and restaurants	Worker
DEM4_SHD	Share of commerce, hotels and restaurants in domestic employment	Per cent
DEM5	Domestic employment in transportation storage and communications	Worker
DEM5_SHD	Share of transportation storage and communications in domestic employment	Per cent
DEM6	Domestic employment in other services	Worker
DEM6_SHD	Share of services and other branches in domestic employment	Per cent
DEMDT	Total domestic employment	Worker
DEMDT_SHT	Share of total domestic employment from total labour demand	Per cent
DEMIS	Palestinian employment in Israel	Worker
DEMIS_SHT	Share of Palestinian employment in Israel from total labour demand	Per cent
DLP	Labour productivity	$/worker
DLP1	Labour productivity in agriculture	$/worker
DLP2	Labour productivity in industry	$/worker
DLP3	Labour productivity in construction	$/worker
DLP4	Labour productivity in commerce, hotels and restaurants	$/worker
DLP5	Labour productivity in transportation storage and communications	$/worker
DLP6	Labour productivity in other services	$/worker
DLS	Labour supply/ Labour force	Worker
DLSF	Female labour supply/ Labour force	Worker
DLSM	Male labour supply/ Labour force	Worker
DMPW	Total manpower	Worker

Code	Variable	Measurement
DMPWF	Female manpower	Worker
DMPWM	Male manpower	Worker
DPARF	Female participation rate	Per cent
DPARM	Male participation rate	Per cent
DPOP	Total population	Person
DPOPF	Female population	Person
DPOPM	Male population	Person
EXCHX	Israeli exchange rate (average of the year)	NIS/US$
DUNEM	Unemployment	Person
FBTR	Balance of trade: goods and services	2015 US$ million
FBTR_SH	Balance of trade - GDP ratio	Per cent
FCAR	Current account	2015 US$ million
FEXGDR	Export of goods	2015 US$ million
FEXGDR_SH	Share of goods in total exports	Per cent
FEXISR	Exports of goods and services to Israel	2015 US$ million
FEXISR_SH	Exports to Israel - GDP ratio	Per cent
FEXOR	Exports to rest of the world	2015 US$ million
FEXSER	Export of services	2015 US$ million
FEXSER_SH	Share of services in total exports	Per cent
FEXTR	Total exports	2015 US$ million
FEXTR_SH	Total exports- GDP ratio	Per cent
FIMGDR	Imports of goods	2015 US$ million
FIMGDR_SH	Share of goods in total imports	Per cent
FIMISR	Imports from Israel	2015 US$ million
FIMISR_SH	Imports from Israel- GDP ratio	Per cent
FIMOR	Imports from the rest of the world	2015 US$ million
FIMSER	Imports of services	2015 US$ million
FIMSER_SH	Share of services in total imports	Per cent
FIMTR	Total imports	2015 US$ million
FIMTR_SH	Total imports - GDP ratio	Per cent
FNFIR	Net factor income	2015 US$ million
GBUDCR	Government recurrent deficit	2015 US$ million
GBUDCR_SH	Government recurrent deficit - GDP ratio	Per cent
GBUDR	Government total deficit	2015 US$ million
GBUDR_SH	Government total deficit - GDP ratio	Per cent
GCR	Government consumption	2015 US$ million
GCR_SH	Government consumption share in GDP	Per cent
GDPFCR	Real GDP at factor cost	2015 US$ million
GDPR	Real GDP at market prices	2015 US$ million
GDPR_POP	GDP per capita	2015 US$ million
GECATR	Government central consumption abroad	2015 US$ million
GECCTR	Government central consumption	2015 US$ million
GECTR	Government total current expenditures	2015 US$ million
GECLTR	Government local consumption	2015 US$ million
GEDR	Government development expenditure	2015 US$ million
GERITR	Residual of government current expenditure	2015 US$ million

Code	Variable	Measurement
GETR	Total government expenditures	2015 US$ million
GINR	Public investment	2015 US$ million
GINR_SH	Public investment- GDP ratio	Per cent
GEDRTR	Government development expenditure residual	2015 US$ million
GNDIR	Gross national disposable income	2015 US$ million
GNDIR_POP	Gross national disposable income per capita	2015 US$ million
GNIR	Gross national income	2015 US$ million
GNITXSR	Net indirect taxes and subsidies	2015 US$ million
GRCTR	Government clearance revenues	2015 US$ million
GRNTAR	Government non-tax revenues	2015 US$ million
GRNTR	Government net total revenues	2015 US$ million
GRTAR	Government tax revenues	2015 US$ million
GDPIRX	Israel real GDP	2015 US$ million
GDPJRDRX	Jordan real GDP	2015 US$ million
INCNSTR	Investment in construction	2015 US$ million
INCNSTR_SH	Share of construction investment in total investment	Per cent
INNCNSTR	Investment in non-construction	2015 US$ million
INNCNSTR_SH	Share of non-construction investment in total investment	Per cent
INPR	Private investment	2015 US$ million
INPR_SH	Private investment - GDP ratio	Per cent
INSHCNST_N	Construction to non-construction investment ratio	Ratio
INTR	Total investment	2015 US$ million
INTR_SH	Total investment- GDP ratio	Per cent
NSVR	National savings	2015 US$ million
PCD	Private consumption price deflator	2015 = 1.00
PEX	Export price deflator	2015 = 1.00
PEXGD	Export of goods price deflator	2015 = 1.00
PEXS	Export of services price deflator	2015 = 1.00
PGDP	GDP deflator	2015 = 1.00
PGOV	Government consumption price deflator	2015 = 1.00
PIM	Imports price deflator	2015 = 1.00
PIMGD	Imports of goods price deflator	2015 = 1.00
PIMS	Imports of services price deflator	2015 = 1.00
PIN	Investment price deflator	2015 = 1.00
PINCNST	Investment- construction price deflator	2015 = 1.00
PINNCNST	Investment- non-construction price deflator	2015 = 1.00
PISX	Israel CPI	2015 = 1.00
PJRDX	Jordan CPI	2015 = 1.00
RLX	Lending rate on NIS	Per cent
OCDX	Closure days	Days
OPC	Palestinian Casualties by Israeli occupation	Persons
VA1R	Value added in agriculture	2015 US$ million
VA1R_SH	Share of agriculture in GDP (factor cost)	Per cent
VA2R	Value added in industry	2015 US$ million
VA2R_SH	Share of industry in GDP (factor cost)	Per cent
VA3R	Value added in construction	2015 US$ million

Code	Variable	Measurement
VA3R_SH	Share of construction in GDP (factor cost)	Per cent
VA4R	Value added in commerce, hotels and restaurants	2015 US$ million
VA4R_SH	Share of commerce, hotels and restaurants in GDP (factor cost)	Per cent
VA5R	Value added in transportation storage and communications	2015 US$ million
VA5R_SH	Value added in storage and communications in GDP (factor cost)	Per cent
VA6R	Value added in other services	2015 US$ million
VA6R_SH	Share of services and other branches in GDP (factor cost)	Per cent
W1R	Daily wage in agriculture	2015 US$ million
W2R	Daily wage in industry	2015 US$ million
W3R	Daily wage in construction	2015 US$ million
W4R	Daily wage in commerce, hotels and restaurants	2015 US$ million
W5R	Daily wage in storage and communications	2015 US$ million
W6R	Daily wage in other services	2015 US$ million
WAR	Average daily domestic wage	2015 US$ million
WISR	Average daily wage of Palestinian employment in Israel	2015 US$ million
T	Time trend	1995 = 1
WGB	National wage bill	2015 US$ million

Annex III
Model structure

Note that an equation number is followed by "b" means a behavioural equation, and when the number is followed by "i" means an identity.

Labour and demographic block

(1b)	log(dem1)	= c(10) + c(011)*(w1r) + c(12)*log(va1r) + c(13)*log(inshcnst_n(-1)) + c(14)*(demis) + c(15)*log(dem4+dem5+dem6) + c(16)*dum01 + c(17)*log(dem1(-1))
(2b)	log(dem2)	= c(20) + c(21)*log(va2r) + c(22)*log(w2r) + c(23)*log(dem3) + c(24)*log(dem1) + c(25)*log(dem2(-1))
(3b)	log(dem3)	= c(30) + c(031)*log(va3r) + c(32)*log(w3r) + c(33)*log(demis) + c(34)*log(dem1) + c(35)*(dum01+dum00+dum09)
(4b)	log(dem4)	= c(40) + c(41)*log(va4r) + c(42)*log(w4r) + c(43)*log(dem5+dem6)
(5b)	log(dem5)	= c(51)*log(va5r) + c(52)*log(w5r) + c(53)*log(dem4+dem6) + [ar(1)=c(054)]
(6b)	log(dem6)	= c(61)*d(w6r) + c(62)*log(va6r) + c(63)*log(dem6(-1))
(7b)	log(demis)	= c(501) + c(502)*log(wisr) + c(503)*log(opc) + c(504)*log(ocdx) +c(505)*log(gdpirx)+c(506)*(dum97-dum10)+c(507)*(dum98+dum14)+c(508) *log (demis(-1))
(8b)	dparf	= c(70) + c(71)*log(gdpfcr) + c(72)*d(ocdx) + c(73)*log(war) + c(74)*dparf(-1)
(9b)	dparm	= c(81)*log((war+wisr)/2) + c(82)*log(gdpfcr) + c(83)*log(ocdx) + c(84)*dum96 + c(85)*dum18+c(86)*dparm(-1)
(10b)	d_em_n	= c(551) + c(552)*log(wisr/war) + c(553)*(dem2_shd+dem3_shd) + c(554)*dum00+c(555)*log(ocdx)+c(556)*log(opc)
(11b)	log(w1r)	= c(90) + c(91)*log(dlp1) + c(92)*log(wisr) + c(93)*log(ddem) + c(94)*(dum00-dum02) + c(95)*log(w1r(-1))
(12b)	log(w2r)	= c(100) + c(101)*log(wisr/war) + c(102)*log(dem1) + c(103)*dum08 + c(104)*log(w2r(-1))
(13b)	log(w3r)	= c(110) + c(111)*log(demis) + c(112)*log(wisr) + c(113)*dum01+ c(114)*log(w3r(-1))
(14b)	log(w4r)	= c(120) + c(121)*log(d_uem) + c(122)*log(w5r+w6r) + c(123)*log(dls) + c(124)*(dum08-dum12) + c(125)*log(w4r(-1))
(15b)	log(w5r)	= c(130) + c(131)*log(dls) + c(132)*log(w4r+w6r) + c(133)*log(pgdp) + c(134)*(dum97+dum04-dum01-dum06) + c(135)*log(w5r(-1))
(16b)	log(w6r)	= c(140) + c(141)*log((w4r+w5r)/2) + c(142)*log(ddem) + c(143)*log(w6r(-1)) + c(144)*dum02

Labour block identities

(1i)	d_emf	= (d_em_n / (1 + d_em_n)) * ddem
(2i)	d_emm	= ddem - d_emf
(3i)	d_uemm	= 1 - (d_emm / dlsm)
(4i)	d_uemf	= 1 - (d_emf / dlsf)
(5i)	dpop	= dpop (-1) * (1 + dpopgrwx)
(6i)	dpopm	= dpop * dpop_shmx
(7i)	dpopf	= dpop * dpop_shfx
(8i)	dmpwm	= dpopm * dpop_mpmx
(9i)	dmpwf	= dpopf * dpop_mpfx
(10i)	dmpw	= dmpwm + dmpwf
(11i)	dlsm	= dmpwm * dparm
(12i)	dlsf	= dmpwf * dparf
(13i)	dls	= dlsm + dlsf
(14i)	demdt	= dem1 + dem2 + dem3 + dem4 + dem5 + dem6
(15i)	ddem	= demdt + demis
(16i)	dem1_shd	= dem1 / demdt
(17i)	dem2_shd	= dem2 / demdt
(18i)	dem3_shd	= dem3 / demdt
(19i)	dem4_shd	= dem4 / demdt
(20i)	dem5_shd	= dem5 / demdt
(21i)	dem6_shd	= dem6 / demdt
(22i)	demdt_sht	= demdt / ddem
(23i)	demis_sht	= demis / ddem
(24i)	d_uem	= 1 - (ddem / dls)
(25i)	dunem	= (dls - ddem)
(26i)	war	= (dem1_shd * w1r) + (dem2_shd * w2r) + (dem3_shd * w3r) + (dem4_shd * w4r) + (dem5_shd * w5r) + (dem6_shd * w6r)

(27i) wgb = war * 12 * 22 * demdt / 1000000
(28i) dlp = (gdpfcr * 1000000) / demdt
(29i) dlp1 = (va1r * 1000000) / dem1
(30i) dlp2 = (va2r * 1000000) / dem2
(31i) dlp3 = (va3r * 1000000) / dem3
(32i) dlp4 = (va4r * 1000000) / dem4
(33i) dlp5 = (va5r * 1000000) / dem5
(34i) dlp6 = (va6r * 1000000) / dem6

Government block

(17b) log(gecctr) = c(150) + c(151)*log(grntr)+c(152)*log(gecctr(-1))
(18b) log(grctr) = c(160) + c(161)*log(fimisr+ fimisr(-1)) + c(162)*log(fimor+fimor(-1)) + c(163)*(gdpr/gdpr(-1)) + c(164)*(dum06+dum07-(dum00+dum99))
(19b) log(geritr) = c(170) + c(171)*log(grntr(-1)) +c(172)*log(gectr(-1))+ c(173)*log(fnctr)+ c(175)*log(geritr(-1))
(20b) log(grntar) = c(180) + c(181)*log(demis) + c(182)*log(dpop/dpop(-1)) + c(183)*log(grntr-grntar) + c(184)*(dum08-dum07) + c(185)*log(grntar(-1))
(21b) log(gnitxsr) = c(601)+c(602)*log(grctr)+c(603)*dum94+c(604)*(dum09-dum02)
(22b) log(grtar) = c(190) + c(191)*log(cpr) + c(192)*log(inpr) + c(193)*log(grntr(-1)) + c(194)*(dum10-dum09)

Government block identities

(35i) gbudcr = grntr - gectr
(36i) gbudcr_sh = gbudcr / gdpr
(37i) gbudr = grntr - getr
(38i) gbudr_sh = gbudr / gdpr
(39i) grntr = grtar + grntar + grctr
(40i) gectr = gecctr + geritr
(41i) getr = gectr + gedr
(42i) gcr = gecctr + gecltr + gecatr
(43i) gedr = ginr - gedrtr

Trade and national accounts block

(23b) log(fimisr) = c(220) + c(221)*log(gdpr) + c(222)*log(pim) + c(223)*log(fimor) + c(224)*log(opc)+ c(225)*log(ocdx)
(24b) log(fimor) = c(230) + c(231)*log(gndir) + c(232)*log(ocdx)+c(233)*(dum99-dum00)+ c(234)*log(fimor(-1))
(25b) (fimgdr_sh) = c(240) + c(241)*log(pimgd/pims) + c(242)*(dum01+dum02) + c(243)*(dum00-dum04-dum16) + c(244)*(fimgdr_sh(-1))
(26b) log(fexisr) = c(250) + c(251)*log(gdpirx) + c(252)*d(pex/pisx) + c(253)*log(opc) + c(254)*log(fimisr) + c(255)*log(ocdx)+ c(256)*log(fexisr(-1))
(27b) log(fexor) = c(260)+c(261)*(pex/pgdp) +c(262)*log(gdpjrdrx)+c(263)*log(fimgdr)+c(264)*log(opc)+c(265)*log(ocdx)+c(266)*(dum99+dum98)
(28b) (fexgdr_sh) = c(270) + c(271)*log(pexgd/pexs) + c(272)*(dum00+dum05)+ c(273)*(fexgdr_sh(-1))
(29b) log(fnfir) = c(280) + c(281)*log(demis) + c(282)*log(gdpjrdrx) + c(283)*log(ocdx)+ c(284)*(dum08+dum18-dum10)
(30b) log(cpr) = c(290) + c(291)*log(gndir) +c(292)*log(pex)+c(293)*(dum04-dum08-dum18/2)+c(294)* d(ocdx)+c(295)*d(opc)+c(297)*log(cpr(-1))
(31b) log(inpr) =c(301)+c(302)*log(ctr+ginr)+c(303)*d(rlx)+c(304)*log(ocdx)+c(305)*log(opc)+c(307)*dum07+c(308)*(dum12+dum13+2*dum14+1.5*dum15+1.5*dum16+2*dum17+2*dum18)+c(309)*log(inpr(-1))
(32b) inshcnst_n = c(310) + c(311)*(pincnst/pinncnst) + c(312)*log(ginr) + c(314)*(inshcnst_n(-1))+c(315)*(dum04+dum07+dum11-dum06-dum10-dum14)

Trade and national accounts block identities

(44i) fimtr = fimisr + fimor
(45i) fimgdr = fimgdr_sh * fimtr
(46i) fimser_sh = 1 - fimgdr_sh
(47i) fimser = fimtr * fimser_sh
(48i) fextr = fexisr + fexor
(49i) fexgdr = fexgdr_sh * fextr
(50i) fexser_sh = 1 - fexgdr_sh
(51i) fexser = fextr * fexser_sh

(52i) fbtr = fextr - fimtr
(53i) fcar = fbtr + fnfir + fnctr
(54i) fextr_sh = fextr / gdpr
(55i) fexisr_sh = fexisr / gdpr
(56i) fimtr_sh = fimtr / gdpr
(57i) fimisr_sh = fimisr / gdpr
(58i) fbtr_sh = fbtr / gdpr
(59i) gdpr = ctr + intr + fbtr
(60i) ctr = cpr + gcr
(61i) intr = ginr + inpr
(62i) gnir = gdpr + fnfir
(63i) gndir = gnir + fnctr
(64i) gdpr_pop = gdpr * 1000000 / dpop
(65i) gndir_pop = gndir * 1000000 / dpop
(66i) nsvr = gndir - ctr
(67i) incnstr_sh = inshcnst_n / (1 + inshcnst_n)
(68i) inncnstr_sh = 1 - incnstr_sh
(69i) incnstr = incnstr_sh * intr
(70i) inncnstr = inncnstr_sh * intr
(71i) ctr_sh = ctr / gdpr
(72i) cpr_sh = cpr / gdpr
(73i) gcr_sh = gcr / gdpr
(74i) inpr_sh = inpr / gdpr
(75i) ginr_sh = ginr / gdpr
(76i) intr_sh = intr / gdpr
(77i) gdpfcr = gdpr - gnitxsr

Prices/ deflators block

(33b) log(pcd) = c(320) + c(321)*log(pim) + c(322)*log(pisx) + c(323)*log(pcd(-1))
(34b) log(pgov) = c(330) + c(331)*log(exchx) + c(332)*log(pgdp) +c(334)*log(pgov(-1))
(35b) log(pincnst) = c(340) + c(341)*log(pimgd) + c(342)*log(w3r) + c(343)*d(exchx) + c(344)*dum08 + c(345)*log(pincnst(-1))
(36b) log(pinncnst) = c(350) + c(351)*log(pims) + c(352)*(rlx) + c(353)*dum07 + c(354)*log(pinncnst(-1))
(37b) log(pexs) = c(360) + c(361)*log(pim) + c(362)*(dum10-dum07-dum08-dum09) + c(363)*log(pexs(-1))
(38b) log(pexgd) = c(370) + c(371)*log(dlp2) + c(372)*log(exchx) + c(373)*log(pim)
(39b) log(pims) = c(380) + c(381)*log((pisx+pjrdx)/2) + c(382)*dum06 + c(383)*log(pims(-1))+ [ar(1)=c(384)]
(40b) log(pimgd) = c(390) + c(391)*log((pjrdx+pisx)/2) + c(392)*(fimgdr_sh) +c(393)*(dum95-dum02)+c(394)*(dum12)+c(395)*log(pimgd(-1))

Prices/ deflators block identities

(78i) pin = (pincnst * incnstr_sh + pinncnst * inncnstr_sh)
(79i) pim = (pims * fimser_sh) + (pimgd * fimgdr_sh)
(80i) pex = (pexs * fexser_sh) + (pexgd * fexgdr_sh)
(81i) pgdp = pcd * (cpr / gdpr) + pgov * (gcr / gdpr) + pin * (intr / gdpr) + pex * (fextr / gdpr) - pim * (fimtr / gdpr)

Value added block

(41b) log(va1r0) = c(401)*log(ctr) + c(402)*log(intr) + c(403)*log(fimtr-fextr) + c(404)*t+ c(405)*(dum02)
(42b) log(va2r0) = c(410) + c(411)*log(ctr) + c(412)*log(intr) + c(413)*log(fimtr-fextr) +0.02*(t)+c(415)*(dum05-dum07)
(43b) log(va3r0) = c(421)*log(ctr) + c(422)*log(intr) + c(423)*log(fimser-fexser)+ c(424)*log(fimgdr-fexgdr) + c(425)*(t*t*t)+ c(426)*(dum02+dum08-dum99)
(44b) log(va4r0) = c(431)*log(ctr) + c(432)*log(intr)+ c(433)*log(fimser-fexser)+ c(434)*(t)+ c(435)*(dum08+dum18-dum11)
(45b) log(va5r0) = c(440) + c(441)*log(ctr) + c(444)*log(intr) + c(445)*log(fextr) + c(446)*log(fimtr) + c(447)*log(t)+c(447)*(dum96+dum18)
(46b) log(va6r0) = c(451)*log(cpr) + c(453)*log(ginr)+ c(457)*log(fimtr)+ 0.2*log(t)+c(459)*(dum08-dum10)

Value added block Identities

(82i) va1r_sh = va1r0 / (va1r0 + va2r0 + va3r0 + va4r0 + va5r0 + va6r0)
(83i) va2r_sh = va2r0 / (va1r0 + va2r0 + va3r0 + va4r0 + va5r0 + va6r0)

(84i) va3r_sh = va3r0 / (va1r0 + va2r0 + va3r0 + va4r0 + va5r0 + va6r0)
(85i) va4r_sh = va4r0 / (va1r0 + va2r0 + va3r0 + va4r0 + va5r0 + va6r0)
(86i) va5r_sh = va5r0 / (va1r0 + va2r0 + va3r0 + va4r0 + va5r0 + va6r0)
(87i) va6r_sh = va6r0 / (va1r0 + va2r0 + va3r0 + va4r0 + va5r0 + va6r0)
(88i) va1r = va1r_sh * gdpfcr
(89i) va2r = va2r_sh * gdpfcr
(90i) va3r = va3r_sh * gdpfcr
(91i) va4r = va4r_sh * gdpfcr
(92i) va5r = va5r_sh * gdpfcr
(93i) va6r = va6r_sh * gdpfcr

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