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The World Bank (WB) Computational General Equilibrium model (CGE) by Claus Astrup and Sebastian Dessus (2001) is a cornerstone study on Palestine. It adopts a strictly neoclassical perspective, in which price-driven adjustments and the Armington/Constant-Elasticity-of-Transformation (CET) apparatus describe the functioning of the Palestinian economy and its foreign trade relations. This paper argues that certain empirical and factual inconsistencies prevent such a "pure" neoclassical approach from representing the Palestinian reality. We firstly argue that quantity-driven adjustments better describe economic adjustments within the Palestinian economy than price-driven adjustments do. Secondly, we stress the prevailing inter-industry nature of Palestinian foreign trade and the relevance of real income variables to explain expenditure allocation between domestic and imported goods. These aspects are hardly caught by the Armington/CET apparatus and require an alternative formalizing strategy. The final section of the paper describes a heterodox/structuralist perspective on Palestine.

Keywords: Palestine, Foreign trade, Structuralist CGE models

JEL classification: F14, C68, B50

Introduction

Trade policy is a hotly debated issue in Palestine. It matters on a twofold level. First, trade policy issues are strictly tied to political issues. At the beginning of the nineties, the Palestinian-Israeli negotiations on the Paris Protocol were mainly driven by political considerations and Palestinian support for a Free Trade Area agreement with Israel basically aimed at establishing precise territorial borders between Israel and the future Palestinian State[1]. Second, trade policy may deeply impact on the development process of Palestine. Three issues inhere to such policy: first, the effects of alternative trade policy agreements on Palestinian overdependence on Israel as a market for Palestinian exports and as the main provider of Palestinian imports; second, the need to diversify

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Palestinian export pattern; third, the need to replace a labour-exporting development with a goods-exporting development paradigm[2].

The World Bank (WB) Computation General Equilibrium model (CGE) by Claus Astrup and Sebastean Dessus (henceforth the "AD model") is a fundamental contribution to the description of Palestinian trade and of the effects of different trade arrangements on Palestinian development. Astrup and Dessus propose a standard neoclassical real-side CGE model. Economic decisions, both on the supply and on the demand side of the economy, are the results of maximising behaviours from representative agents. Relative prices adjust so as to ensure general equilibrium. Full employment is assumed and savings determine investments. The well-known Armington/Constant-Elasticity-of-Transformation (CET) assumptions describe foreign trade, so that intra-industry trade emerges as a feature of trade relations.

In this paper, we provide an extensive reappraisal of the WB model in its application to Palestine, and we argue that a strictly neoclassical model may not be the most appropriate one to describe the Palestinian economy in general and its trade relations in particular. We stress that discrepancies seem to exist between the building blocks of the AD model and certain stylised facts on Palestine, and accordingly we advance two observations. Firstly, quite a substantial body of literature propose that quantity-driven adjustments are far more relevant than price-driven adjustments in the functioning of the Palestinian economy. Palestine suffers protracted economic stagnation due to a lack of *effective* demand for Palestinian goods; Palestinian capital formation is frustrated due to a lack of profitable investment opportunities rather than to saving restrictions. These facts collectively seem to be at odds with the supply-side full-employment approach at the base of the AD model. Secondly, Palestinian intra-industry trade does not emerge as a main feature of the Palestinian trade pattern; inter-industry trade prevails at both macro-aggregated and industry level. Palestinian trade seems to respond slightly to relative price changes, whilst income fluctuations and economic dynamics appear to be fundamental to explain both import and export flows and of the relations of these flows to domestic absorption and production decisions. The Armington/CET model does not capture these features efficiently, so that a different theoretical approach may be required.

On the basis of this evidence, this paper considers some theoretical alternatives to a strictly neoclassical approach to describe the Palestinian economy and its trade pattern. Our attention focuses on the post-Keynesian structuralist approach. Following Taylor (1983), structuralist CGE models are eclectic in character and assume multiple adjustment mechanisms. Quantity-driven adjustments are taken into account alongside price-driven adjustments. Quantity-driven adjustments may prove to be useful to describe the functioning of the Palestinian economy, at least that of the tradable goods sector. Several structuralist models depart from a pure Armington/CET scheme

(Naastepad 1999). The abandoning of the concept of "composite goods" and of the associated technicalities has several implications. First, it allows structuralist models to include income dynamics as a direct explaining factor for expenditure allocation between domestic and foreign products. Second, it accounts for differences in income elasticity between home-produced and imported goods. Finally, the departure from the price-driven Armington/CET apparatus may facilitate explanation of the prevailing inter-industry nature of Palestinian trade without enforcing unrealistic economic scenarios or extreme parametrical settings.

After this introduction, this paper is organised into 4 sections. Sections 2 and 3 describe some stylised facts on Palestine. We highlight some macroeconomic features of the Palestinian economy and their discrepancies with the building blocks of the WB CGE model. We then define the main economic variables explaining Palestinian trade flows, and we compute the Grubell-Loyd index of intra-industry trade. Section 4 presents some possible core lines of a structuralist model on Palestine. Section 5 concludes.

The WB model on Palestine and the functioning of the Palestinian economy: quantity-driven vs price-driven adjustments

The World Bank model on Palestine is a rigorous, real-side neoclassical model, which describes a simple price-driven economy. Prices are assumed to move freely and quantities to respond to relative price changes in order to reach full-employment equilibrium. A saving-to-investment macroeconomic causality exists. The Armington/CET apparatus is adopted to describe Palestinian trade. In Figure 1, we provides a sketchy representation of such a neoclassical perspective on Palestine. Of course, we do not get all the complex relations of the WB CGE model on Palestine. Nevertheless, we highlight some core mechanisms composing it and its trade block in particular.

(Figure 1 here)

Let us assume a simple one-sector Palestinian economy and call domestic output *X*. On the left-hand side of Figure 1, we portray the demand side. It is formalised according to the so-called Armington assumption (Armington 1969). From a technical point of view, the Armington apparatus is a simple two-stage maximisation process. Consumption demand is derived by maximising consumers' utility. The neoclassical representative consumer first maximises a top-level aggregate utility function, for example an LES utility function, to allocate disposable income between savings (*Sav*) and the "Armington" good XA^3. The "Armington" good is a composite of home-produced and imported varieties of a specific product. At the bottom level of the optimisation problem, all rational

economic agents, domestic consumers, firms and domestic government, decide how to allocate expenditures between domestic goods *XD* and imported goods *XM*. Domestic consumers and government establish how to split domestic public and private consumptions between home-produced and imported varieties. Once disposable savings (*Sav*) have determined total investments XA_i, firms decide how many capital goods to import or buy domestically. Consumers, government and firms define optimal consumption and investment demands by minimising the cost of acquiring a unit of the "Armington" good *XA*[4]. The "Armington" function $XA = z(XD, XM)$, a CES function in general, describes how home-produced and imported varieties are combined to produce the "Armington" good. Imperfect substitution between *XD* and *XM* is assumed through finite and positive values of the elasticity of substitution σ $(=1/(1+\rho))$ in the Armington function.

On the right-hand side of Figure 1, the Constant-Elasticity-of-Transformation (CET) apparatus models the supply side of the economy. According to it, domestic firms firstly derive optimal labour and capital demands through standard production cost minimisation[5]. Free matching between labour (capital) demand and supply (L^D and L^S; K^D and K^S) on labour (capital) market determines labour (capital) equilibrium price *PL* (*PK*) and ensures full employment. Once the production process is over, domestic firms may either sell their output on the domestic market or export it so as to maximise revenues. Since both consumer tastes and/or international regulatory regimes may differ, switching from domestic sales to export is costly, and the two options are imperfect substitutes. Domestic producers deal with a smooth transformation frontier, the "Constant Elasticity of Transformation" (CET) function: they will define domestic supply and exports according to relative prices prevailing on domestic and foreign markets. Parameter θ $(=1/(1+\phi))$ is the elasticity of transformation between exports and domestic sales. Positive and finite values of θ avoid corner solutions (i.e. production totally exported or sold domestically) to take place.

In this neoclassical representation of Palestine, all prices adjust freely to clear markets. This is shown in the bottom part of Figure 1. *PD* is the equilibrium price of Palestinian good on domestic market; *PM* is the price of imports and *PE* is exports' price[6]. The simultaneous equations of the model give rise to myriad of relations. Dotted lines in Figure 1 represent these relations and show how prices influence each other and affect economic decisions by modifying *relative* prices.

Stylised facts on Palestine: Some Keynesian features of today Palestinian economy

The economic implications of the sixty-year-old Israeli-Palestinian conflict explain much of nowaday conditions and structural features of Palestinian economy. From 1967 on, Palestine has been forced into a de-facto Customs Union with Israel. Trade relations, however, have been treated asymmetrically. Whilst Israeli goods have benefited from free access to the Palestinian market, Palestinian exports have been subjected to strict regulations and restrictions (Kanafani 2001).

Moreover, the development of productive capacity in Palestine has been largely hindered by the military administration of occupied territories. Palestinian firms had to apply for licences from the military authorities to start up. Permits were usually not conceded so as to discourage and prohibit Palestinian firms from competing with Israeli producers (Arnon and Weinblatt 2001). As a consequence, the Palestinian economy now shows "all the hallmarks of an underdeveloped economy" (WB 2007) and appears to be a small, underdeveloped "province" of Israel (Arnon et al. 1997). From a structural point of view, whilst the industrial sector is largely underdeveloped, agriculture is still a significant source of employment (UNCTAD 2006). In 2007, according to PCBS (2009a), the manufacturing sector collapsed even further, and accounted for a mere 10% of domestic GDP and 12% of total employment. Agriculture and services, in contrast, respectively generate a 16% and more than 50% of total employment.

Further, Palestine depends massively on imports to satisfy its consumption and production needs. In 2007, imports of goods represented 67% of domestic GDP, whilst exports only amounted to 11%. From 1996 to 2007, Palestine's economy was characterised by a profound and structural trade imbalance, with a trade deficit equivalent to 56,25% of domestic GDP in 2007 (see Table 1 and Figure 2).

(Table 1 here)

(Figure 2 here)

Most Palestinian imports and exports come from, and are directed to, Israel. On average, from 1996 to 2007, imports from Israel amounted to 74,56% of total Palestinian imports. The share of export flows towards Israel amounted to 92% of total Palestinian exports (see Table 2). Palestine is not a significant source of imports or destination of exports for the Israeli economy. In 2007, imports from Palestine amounted to 0,68% of total Israeli imports. Exports to Palestine were 4,27% of total Israeli exports (see Table 2).

(Table 2 here)

In this context, from the mid-1990s onwards, Palestinian economic dynamics have been highly volatile, and dramatic mass unemployment has persisted. In 2007, the unemployment rate was 21,6% and in 2002 it reached 31,3%, the highest value since 1967. Mass unemployment is reflected in the huge output gap between effective GDP and potential GDP represented in Figure 3.

(Figure 3 here)

Palestinian labour productivity, here computed as the ratio between real GDP and the employed labour force, fluctuated substantially throughout the period here considered, and registered a general downward trend from 1996 to 2007. Of course, this can hardly be explained in terms of technological changes, but rather of economic cycles and the considerable disguised unemployment that emerges in periods of economic downturn (PCBS 2009b). Let us assume the 1999 level of labour productivity, i.e. the highest level recorded between 1996 and 2007, as the benchmark value for labour productivity in Palestine. Moreover, let us fix the Palestinian natural rate of unemployment at 8%, i.e. the UNCTAD estimates on Palestinian unemployment in 2007 under the assumption of an improved macro framework (UNCTAD 2009). According to these assumptions, effective GDP between 1996 and 2007 remained constantly below potential GDP. This gap widened even further after the Second Intifada, and therefore created opportunities for ample adjustments on the real side of the economy.

Neither a Harris-Todaro argument nor the over-regulation of the Palestinian labour market can plausibly explain these figures. As to the first hypothesis, the Palestinian labour market is largely separated from the Israeli one, so that mass Palestinian unemployment can only partially be considered as the outcome of voluntary job searching in Israel. As to the second point, "Palestinian labour markets are highly flexible (Astrup and Dessus 2005)", so that the mismatch between domestic labour demand and labour supply is not the result of institutional restrictions.

More generally, according to some recent analyses, "the Palestinian dependence on Israel pervades almost every aspect of economic life, including prices and other major monetary variables" (Peres Centre for Peace and Paltrade 2006, 12). "Prices in Palestine follow closely those prevailing in Israel" (Femise Network 2006, 77). Such descriptions do not apply to all sectors, and specifically not to non-tradable goods and services. However, due to the lack of domestic substitutes for imported goods and to a pretty high degree of trade openness, foreign goods "control" Palestinian markets and the "small country assumption" suits the tradable-good sector well. Most intermediate inputs used in domestic production processes are imported from abroad, so that foreign prices heavily influence domestic price formation. As a consequence, several prices in Palestine appear sticky and the Palestinian price system only partially responds to macroeconomic imbalances; neoclassical-type relative price adjustments seem to be largely useless to restore full employment.

Even further, it has been argued that the current state of the Palestinian economy, in both the labour and the goods market, "reflects the fact that demand for Palestinian goods is insufficient for the economy to function at full employment (WB 2004)". On the one hand, consumption and investment needs are mostly satisfied by importing from abroad. On the other hand, demand injections are low. Investment projects do not take off due to entrepreneurs' reluctance to invest in

the unstable and unfavourable Palestinian context. Exports are highly jeopardised by Israeli restrictions, which deny Palestinian goods free and stable access to foreign markets. Public expenditure and investments are dampened by a lack of finance[7]. High demand leakages and poor demand injections jointly curtail *effective* demand for Palestinian goods, induce Palestinian firms' economic activity to barely reach 50% of installed capacity and give rise to widespread unemployment.

On the basis of these considerations, it can be reasonably argued that the Palestinian economy shows some typical *Keynesian* features and that the portrait of post-1967 Palestine by Arnon et al. (1997), althought reffered to the pre-Second Intafada period, may still be relevant to describe how the Palestinian economy currently works: "since the [Palestinian] price system was mostly determined by the Israeli economy, it was irresponsive to domestic trends, while the only component of the system to be partly determined at home related to non-tradable goods. Thus, the adjustment mechanism and convergence to equilibrium was realised through quantity (real) changes, not through price changes (Arnon et al. 1997, 42)".

In terms of modelling strategies, these facts seem to imply that a pure neoclassical model is inappropriate to model Palestine and it might be modified to incorporate some Keynesian flavours. In particular, we think about a more general and eclectic framework, in which quantity-driven adjustments are introduced alongside price-led adjustments and in which, due to the large availability of unused productive inputs, responses to absorb economic shocks also take place on the quantity-side of the economy through changes in domestic production and factor utilisation rather than in prices. In section 5, we present a heterodox/structuralist model which may prove to be a better fit for Palestine's singular scenario than a strictly neoclassical approach.

The Palestinian trade pattern: discrepancies with the Armington/CET apparatus

The inter-industry nature of Palestinian trade

As far as trade relations are concerned, two properties of the Armington/CET apparatus are worth stressing.

1) The Armington/CET apparatus assumes imperfect substitution among domestic and imported varieties (domestic sales and exports) of a specific kind of product. Accordingly, smooth consumption, production and allocation decisions characterise economic behaviours in each sector of the economy. Moreover and above all, *intra-industry* trade emerges as a relevant aspect of trade relations[8].

2) The two-stage maximisation process of the Armington/CET apparatus requires linearly homogeneous second-stage Armington/CET functions (Lloyd and Zhang 2006). Expenditures (sales) on home-produced and imported varieties of a given product category (on domestic markets or foreign markets) depend exclusively on relative prices. In the case of the Armington part of the story, changes in real income have no direct effects on expenditure allocation, so that home-produced and imported goods implicitly have equal income elasticities. In the CET scheme, changes in production levels will be equally distributed among domestic and foreign sales unless relative price variations will take place.

Regarding the first point, data in Table 1 and the trade dynamics in Figure 2 show that, between 1996 and 2007, Palestinian imports were six times higher than Palestinian exports. Due both to the underdevelopment of the Palestinian productive system and to its incapacity to satisfy domestic needs, Palestinian imports largely consisted in *non-competitive* imports, for both consumption and investment purposes. Palestinian exports, on the contrary, were much more concentrated in poorly-processed low-skilled labour-intensive goods, such as clothes, footwear and natural resource products. In the given period, exports of construction materials (non-metallic products in the SITC Rev.3 classification) accounted for 25% of total Palestinian exports. On the basis of these figures, the World Bank itself states that evidence exists as to "the lack of participation in intra-industry or intra-product trade of the Palestinian economy (WB 2007)".

In this paper, we calculate the well-known Grubel-Lloyd (GL) index for the Palestinian economy in the 1996 to 2007 period, in order to compute the relevance of intra-industry trade in Palestinian trade relations. We calculate it both at the industry and at the economy-wide levels:

$$GLij = 1 - \left(\frac{\left| E_{ij} - M_{ij} \right|}{(E_{ij} + M_{ij})} \right)$$ Industry-Level Grubel-Lloyd Index

$$GL_j = \sum_{i=1}^{n} \phi_{ij} \left(1 - \frac{\left| E_{ij} - M_{ij} \right|}{(E_{ij} + M_{ij})} \right) \quad \text{with} \quad \phi_{ij} = \frac{(E_{ij} + M_{ij})}{\sum_{i=1}^{n} (E_{ij} + M_{ij})}$$ Economy-wide Grubel-Lloyd Index

E_{ij} and M_{ij} are respectively export and import flows of good (industry) i and country j to and from the rest of the world. GL index values close to one mean that intra-industry trade plays a significant role in explaining trade relationships. In contrast, GL index values close to zero indicate the prevailing inter-industry nature of trade relations.

The results obtained are reported in Table 3.

(Table 3 here)

According to our findings, macro-aggregated analysis reveals intra-industry trade generally accounting for less than one-fourth of Palestinian trade, and its incidence as declining between 1996 and 2007. At industry level, the lack of intra-industry trade often appears to be even more evident. It is practically non-existent for machinery and equipment (SITC code 7), as well as for primary commodities (SITC 0+1+2+3+4+68), food items (0+1+22+4) and fuels (SITC 3).

On the basis of these data, it is reasonable to question whether the Armington/CET framework is a useful and appropriate theoretical apparatus to model Palestinian trade. Actually, although conceived to describe intra-industry trade, it ends up formalising prevalently inter-industry flows when applied to the Palestinian scenario. Its internal technicalities are such that the Armigton/CET model may explain the inter-industry nature of Palestinian trade only if one posits specific but perhaps unrealistic economic and/or parametrical scenarios. Three such scenarios come to mind. First, one-way trade may emerge as a result of extreme relative price ratios between home-produced and foreign products which tend towards zero or infinity. Second, we may assume extreme values for the elasticities of substitution between domestic and imported goods. In this case, however, we completely lose the in-depth meaning of the Armington/CET model, which relies on the assumption of imperfect substitutability between domestic and foreign products, i.e. positive but finite values for the elasticity of substitution(transformation) in the Armington(CET) function. Finally, one-way trade may depend on extreme values, approaching zero or one, for the Armington/CET "share" parameters.

The determinants of spending(sale) ratios in the Armington/CET model: The relative importance of price and income factors

As to the second point above, linear homogeneity of the Armington function, let assume a CES function, implies that the Palestinian expenditure ratio between home-produced and imported goods can be modelled as follows:

$$Er = \left(\frac{\alpha}{1-\alpha}\right)^{\sigma}\left(\frac{PD}{PM}\right)^{1-\sigma} \qquad (1)$$

In equation (1), $Er = ((PD*XD)/(PM*XM))$ is the Palestinian expenditure ratio between home-produced goods and imported goods, PD is the price of the Palestinian good in the domestic market, PM the price of the imported variety. XD stands for the quantity of Palestinian goods sold

domestically and *XM* are real imports. Finally, Parameters α and σ are the share parameter and the elasticity of substitution in the CES Armington function.

On the basis of equation (1), expenditure allocation between domestic and imported goods depends directly on relative prices alone, the positive or negative sign of such a relationship depending on the value of the elasticity of substitution σ. Values of σ higher than 1 will induce the expenditure ratio *Er* to react negatively to increases in the price ratio (*PD/PM*). Elasticity of substitution values lower than 1, on the contrary, will define a positive relationship between *Er* and (*PD/PM*). In this regard, Astrup and Dessus (2001, 2005) assume parameter σ to be far above 1, so that a negative relationship should connect *Er* to (*PD/PM*). Other way around, Armington technicalities imply that "the within group budget shares are independent of group expenditures, i.e. the income elasticities of all goods within a group are equal (Winters 1984)". Unless income affects relative prices, income changes will not have any effect on expenditure allocation between domestic and imported goods. According to Winters (1984), "this is very restrictive, especially in the context of international trade (Winters 1984)".

A first look at empirical data seems to confirm that Winters' criticism has some validity when referred to the Palestinian case, and it casts doubt on the ability of equation (1) to explain expenditure ratios in Palestine. In Figures 4 and 5, we portray the dynamics of the Palestinian expenditure ratio between domestic and imported goods, and relate them to both relative prices and income dynamics. In Figure 4, we adopt a macro-aggregated perspective, whilst Figures 5 focuses on manufacturing. We use the wholesale price index for domestic and imported goods provided by PCBS (1999 – 2008) to compute the price ratio (*PD/PM*). Data on real Palestinian GDP are used to capture the role of domestic income variables in determining expenditure allocation ratios.

At a macro-aggregated level (Figure 4), the relative price ratio remains reasonably stable throughout the period considered. However, the Palestinian expenditure ratio shows huge fluctuations, and hence appears to be largely delinked from relative prices. When real income dynamics enter the picture, expenditure choices between domestic and foreign goods appear to be much more dependent on income dynamics than on price changes. Figure 4 seems to support the idea of strong negative relationships between income dynamics and expenditure choices. Regardless of movements in relative prices, increases in real GDP in phases of economic recovery seem to provoke large increases in expenditures on foreign goods, much larger than expenditures on domestic products. In contrast, abrupt reductions in real GDP may induce sharp switches from imported goods to home-produced products.

(Figure 4 here)

Broadly similar numbers emerge in Figure 5, in which we focus on manufacturing. The price ratio (*PDm/PMm*) now shows a slight downward trend between 1997 and 2007. In contrast, expenditure allocation ratio between domestic manufactured and foreign goods show substantial fluctuations. These dynamics are somewhat puzzling from the standpoint of the AD model. According to equation (1) and the connected parametrical assumptions, we would expect the expenditure ratio *Erm* to increase constantly when the price ratio decreases. Figure 5 clearly shows that this does not happen during most of the period considered[9].

(Figure 5 here)

Again, the discrepancy between empirical evidence and theoretical implications of the AD model may be solved by the consideration of additional factors, other than relative prices, as explanations for Palestinian expenditure ratios. Real GDP is the best candidate for the additional factor role. When real GDP is included in our picture, a strong negative relationship seems to connect real GDP dynamics to the Palestinian expenditure ratio on manufactured goods. Such a relationship seems to be confirmed and supported by the Peres Centre for Peace: "The Level of Israeli exports to the PA is determined by: (1) the overall level of economic activity in the PA at large; and (2) the overall level of household incomes and their purchasing power. A decline in Palestinian economic activity is immediately reflected in a decreased level of imports of inputs and equipment and a decline in incomes and purchasing power is translated into a decrease in import of non-basic food and other consumption products (Peres Centre for Peace 2006)".

As to the supply side, equation (2) below determines the CET allocation ratio of domestic output between domestic and foreign markets:

$$Sr = \left(\frac{1-\mu}{\mu}\right)^{\theta}\left(\frac{PD}{PE}\right)^{1-\theta} \qquad (2)$$

In equation (2), Sr = ((*PE***XE*)/(*PD***XD*)) is the sale allocation ratio established by Palestinian firms, *PE* stands for the foreign price of Palestinian exported output and *XE* are Palestinian exports. Parameters θ and μ are the elasticity of transformation and the "share" parameter in the CET function. Astrup and Dessus (2001) assume the elasticity of transformation θ to be equal to five. Accordingly, rising values for the relative price (*PE/PD*) should induce Palestinian firms to sell more abroad and less at home: the CET allocation ratio *Sr* should increase.

In Figure 6, we plot the dynamics both of the relative price ratio (*PE/PD*) and of the ratio of Palestinian exports to domestic sales between 1997 and 2007. The data exclusively regard the

manufacturing sector. As Israel is by far the most important market for Palestinian exports, we assume the wholesale price index of the Israeli manufacturing sector to be a proxy for the export price *PE*. In line with the assumption of the AD model, we assume *PE* to be exogenous.

(Figure 6 here)

Empirical evidence from Figure 6 shows that reality produced the reverse of what we expected. Between 1997 and 2007, the relative price ratio (*PE/PD*) constantly increased so that *Sr* would have been expected to increase as well. Almost the opposite occurred: the Palestinian export ratio decreased slightly, or remained constant, over most of the period considered.

Neither Israeli real GDP nor Palestinian GDP help to explain this evolution. Between 1997 and 2007, for instance, Israeli real GDP generally increased, so an additional positive factor might have been expected to induce Palestinian manufacturing exports and the corresponding allocation ratio to rise.

This dilemma may be resolved if we consider that Palestinian exports are largely affected by extra-economic factors. According to Akkaya et al. (2008), increasing Israeli security and closure measures have reduced the ability of Palestinian exporters to honour foreign contracts. The rising uncertainty associated with Palestinian exports has shifted foreign preferences towards non-Palestinian products. Further, the reduction of Israeli trade tariffs has also favoured the substitution of Palestinian goods with competing third-country products. Finally, Palestinian exports have been curtailed by overwhelming Israeli quality requirements, which act as non-tariff protectionist measures (World Bank 2007). In this context, Palestinian exports are mostly determined exogenously and their ratio on domestic sales is de-linked from, and not responding to, relative price changes. The same holds for income dynamics.

In Table 4 we present the results of a simple econometric evaluation of the points considered above. Of course, lack of data strongly jeopardises the relevance and the robustness of most econometric analyses on Palestinian trade issues. The results shown in Table 4 must therefore be treated with extreme caution; they are presented and intended only as a rough and intuitive assessment of the degree to which the Armington/CET assumptions are coherent with Palestinian reality. We analyse Palestinian expenditure and sale allocation ratios between 1997 and 2007 by means of a standard OLS linear model, and we test the significance of income and price variables as explanations to Palestinian allocation decisions. All variables considered are expressed in log terms. We use data on Palestinian and Israeli real GDP, indexed to their 1996 value, as a proxy for income variables. Wholesale price indexes for home-produced and imported goods from PCBS (1999 – 2008) and ICBS (2009) are used to compute relative prices. Obviously, the outbreak of the Second

Intifada and Hamas' 2006 electoral win may have influenced Palestinian allocation decisions through both direct and indirect effects on Palestinian economic activity. We use an ad-hoc dummy variable d_1 to get such effects[10].

(Table 4 here)

In Table 4, regression (1) tests the basic Armington assumption, and assumes Armington relative prices to be the unique explanatory variable for expenditure ratios. Regression (2), in contrast, assumes Palestinian real GDP to be the unique explanatory variable. Regression (3) introduces a dummy variable d_1 to consider direct and indirect consequences of the Israeli-Palestinian conflict and of Palestinian political elections. Regression (4) is a fully extended regression that includes price, income and dummy variables. Regression (5) restricts analysis to manufacturing. Finally, regression (6) tests the CET assumption on sale allocation.

More in details, the fully-extended explicative models we assume to describe Armington (CET) allocation ratios can be described as follows:

$$Er = \alpha_1 + \alpha_2 d_1 + \alpha_3 (RPGDP) + \alpha_4 (d_1 * RPGDP) + \alpha_5 (PD / PM)$$

$$Sr = \beta_1 + \beta_2 d_1 + \beta_3 (RPGDP) + \beta_4 (d_1 * RPGDP) + \beta_5 (PE / PD) + \beta_6 (RIGDP)$$

The results reported in Table 4 largely conform to expectations. In regression (1), Armington relative prices (*PD/PM*) appear not to be significant as explanations for Palestinian expenditure ratio at the 5 percent significant level. The explicative power of regression (2) is much higher. From regression (2) to regression (4), the "Palestinian real GDP" variable (*RPGDP*) shows the expected negative sign, and it invariably provides significant explanation for Palestinian expenditure allocation. In contrast, relative prices do not appear significant in regression (4). Regression (5) shows both domestic GDP and relative prices to be significant explanatory variables for expenditure allocation on manufactured goods with the expected negative signs. Regression (6), in turn, shows relative CET prices (*PE/PD*), Palestinian GDP (*RPGDP*) and Israeli GDP (*RIGDP*) to be unanimously insignificant as explanations for the allocation of Palestinian output between domestic markets and exports. The negative and significant intercept coefficient in regression (6) may prove that Palestinian exports (compared to domestic sales) are largely influenced by the long-lasting extra-economic conditions (i.e. Israeli-imposed administrative and physical restrictions) imposed on the economic and political environment by the Israeli-Palestinian conflict. Finally, the outbreak of Intifada Al-Aqsa and 2006 Hamas electoral win seem not to have any statistically significant direct

or indirect effect on expenditure and sale allocation ratios. Actually, political and environment factors influencing these variables date back to the beginning of the 1990s, when the Oslo agreement was signed, or even before. Intifada Al-Aqsa and 2006 Hamas electoral, although important events, thus seem not to carry out any structural consequence on much older, well-established and deeply rooted trends and economic mechanisms emerging from the sixty-year old Israeli-Palestinian conflict.

In summary, our findings suggest it is reasonable to argue that income variables, here captured by Palestinian real GDP, appear to exert a non-negligible influence on Palestinian expenditure allocation between imported and home-produced goods. In contrast, relative prices often play a minor role. A standard Armington model totally overlooks this point, and accordingly needs amendments to make it resemble the Palestinian context more closely. Additionally, Palestine's political and economic environment imposes substantial extra-economic constraints on Palestinian firms' decisions to export or sell on domestic markets; these decisions are therefore largely insensitive to fluctuations in CET-type relative prices or income variables. This point should obviously be borne in mind in future attempts to elaborate a quantitative theoretical model whose aim is to resemble the Palestinian economy as close as possible. Specifically, an ad-hoc export function might enable future models to better capture the peculiarities of the Palestinian context. At the very least, the CET approach should be modified so that it accounts for the exogenous factors that influence sale allocation decisions by Palestinian firms and that reduce such decisions' responsiveness to changes in relative prices.

Income and relative price linkages in the WB CGE model on Palestine.

In the neoclassical model described in Figure 1, changes in real income and production level do not *directly* affect expenditure(sale) allocation between domestic and foreign goods(domestic and foreign markets). Nevertheless, it might be argued, they might play an *indirect* role and influence expenditure(sale) ratios by modifying relative prices. Let us try to capture this point through a simple theoretical exercise.

Take the one-sector model assumed above and its foreign trade block as described by the Armington/CET apparatus. We have:

$$P = \left\{ \left[\eta^{\beta} PL^{(1-\beta)} + (1-\eta)^{\beta} PK^{(1-\beta)} \right]^{1/(1-\beta)} \right\} / A \tag{3}$$

$$P = \left[\mu^{\theta} PD^{(1-\theta)} + (1-\mu)^{\theta} PE^{(1-\theta)} \right]^{1/(1-\theta)} \tag{4}$$

$$\frac{XD}{XM} = \left(\frac{\alpha}{1-\alpha} \frac{PM}{PD} \right)^{\sigma} \tag{5}$$

$$\frac{XD}{XE} = \left(\frac{\mu}{1-\mu} \frac{PD}{PE} \right)^{\theta} \tag{6}$$

Equation (3) describes the price "*P*" of the domestic good as obtained by production cost minimisation, η being the share parameter of labour and β the elasticity of substitution between labour and capital in the domestic CES production function. Parameter *A* stands for the Total Factor Productivity of domestic inputs. Equation (4) is the dual price function from the CET-constrained allocation of domestic output between domestic and foreign sales. Finally, equations (5) and (6) establish real expenditure(sale) ratios according to the Armington/CET argument.

Because of its neoclassical framework, this model assumes real income to be set according to the full-employment condition of available inputs. Hence, changes in real income come from variations in the disposal of productive inputs or technological progress. Let us consider this last possibility and assume Total Factor Productivity *A* to increase[11]. By totally differentiating equations (3), (4), (5) and (6), and expressing variations in percentage terms, we get:

$$\hat{P} = -\hat{A} \tag{3.A}$$

$$\hat{PD} = \nu \hat{P} \quad \text{with } \nu = \frac{\left[\mu^{\theta} PD^{(1-\theta)} + (1-\mu)^{\theta} PE^{(1-\theta)} \right]}{\mu^{\theta} PD^{(1-\theta)}} > 1 \tag{4.A}$$

$$(\hat{XD / XM}) = -\sigma \hat{PD} \tag{5.A}$$

$$\left(\hat{XD / XE}\right) = \theta \hat{PD} \tag{6.A}$$

Following Taylor and Von Armin (2007), if nominal wages and profits do not fully absorb variations in input efficiency, technology-led increases in domestic output are immediately reflected in the domestic price *P*. For the sake of simplicity, let us assume *PL* and *PK* do not move, so that in equation (3.A) increases in *A* are fully passed through reductions in the domestic price *P*. From equation (4.A), given *PE*, *PD* necessarily decreases. In equations (5.A) and (6.A), (*XD/XM*) will increase whilst (*XD/XE*) will decrease. Should the elasticity of substitution and transformation be those assumed in the AD model, increases in domestic output, by affecting relative prices, will

increase the Palestinian expenditure ratio on home-produced goods and raise Palestinian export ratio over domestic sales. Actually, these changes go in the opposite direction with respect to the empirical data recorded above.

Similar conclusions may arise if we consider variations in the disposal of productive inputs. Following Astrup and Dessus (2005), let us assume Israeli closures increase the domestic availability of labour by impeding Palestinian workers from commuting to Israel in search of better remunerated jobs[12]. The ensuing consequence is an increase in domestic output, a reduction in the price of labour *PL* and in the price *P* of Palestinian output, and a rise in real profits. From equation (5), *PD* decreases lead both the expenditure ratio *Er* and the export-to-domestic sale ratio *Sr* to increase. Whilst these changes perfectly agree with the results emphasised by Astrup and Dessus (2005), they simply run counterfactual to data on the Palestinian economy.

Finally, let us try to consider the destructive effects of political turmoil and military conflicts on the available capital stock. Following Astrup and Dessus (2005), a lower supply of capital will reduce production and increase the real profit rate. If the tradable-good sector is relatively capital-intensive (see Astrup and Dessus 2005), increases in *P* and *PD* likely follow from equations (3) and (4). Accordingly, (*XD/XM*) will decrease in equation (5) and (*XD/XE*) increase in equation (6). Despite their theoretical adherence with its own neoclassical framework, these changes in expenditure(sale) ratio are not supported by the empirical evidence cited above[13].

A heterodox perspective on Palestine

Heterodox economics is a huge body of variegate and heterogeneous theories. Accordingly, heterodox models, and CGE models in particular, do not present a unique and well-defined framework. However, certain common aspects distinguish them from standard neoclassical models. Following Taylor (1991), we can envisage a brief list of departures from mainstream models that would take at least three main points into account. First, prices are often set according to a mark-up rule on variable costs rather than to dual cost functions derived from minimising procedures; moreover, quantity-driven adjustments are introduced alongside price-driven adjustments. Second, the saving-investment nexus is reversed, so that investments now determine savings. Third, the macro-economic equilibrium is demand-constrained rather than supply-constrained: full-employment is an occasional feature rather than a well-established rule of macroeconomic equilibria.

On the basis of these points, Figure 7 provides a sketchy description of the Palestinian economy as conceived by a hypothetic heterodox/structuralist CGE model[14].

(Figure 7 here)

We persist in assuming a simple, one-sector economy. On the right-hand side of Figure 7, we portray the supply side of the economy by assuming a Kaleckian cost-plus price determination function. Diverging from usual practice and according to the "small country assumption" adopted above, here we assume the domestic price $\overline{P}$ to be set exogenously on foreign markets. Given the price of labour *PL* in the short run, which is determined by institutional factors and/or is due to a Lewis-type argument, the mark-up rate τ (and the profit share π) adjust endogenously to determine profits (Botta and Vaggi 2010)[15].

On the left-hand side of Figure 7, we describe the demand side of the economy. Domestic households derive consumption demands and aggregate savings by maximising the corresponding utility function. Public expenditure "*G*" constitutes an exogenous policy variable. Finally, domestic firms determine investments through an autonomous investment function "*I*". Several ways exist to model investment demand from domestic firms. Here we adopt what is a pretty standard scheme in structuralist literature, and we assume *I* to depend positively on the level of capacity utilisation "*u*" (Taylor 2004). Ceteris Paribus, the higher the degree of utilisation of installed capital stock, the higher firms' demand for new capital goods. Moreover, for any given value of the profit share π, the higher *u*, the higher the profit rate *r* and entrepreneurs' willingness to invest.

As far as foreign trade is concerned, structuralist CGE models have an eclectic perspective and do not share a standard modelling strategy. Foreign trade blocks frequently change according to the economic reality under observation. Taylor (1991), for instance, assumes import (export) flows to be positive (negative) functions of the ratio between domestic and foreign prices, price elasticities being the results of econometric analyses. Jorn Rattso and Ragnar Torvik (1998), Gibson and Van Seventer (2000) adopt more complex frameworks when modelling the economies of Zimbabwe and South Africa, respectively. As to expenditure allocation between domestic and imported goods, both models introduce the distinction between competitive and non-competitive imports. In the first case, a standard Armington apparatus is assumed, so that only relative prices matter to establish intra-group expenditures between competing varieties of the same kind of product. In the case of non-competitive imports, import flows depend on consumption and investment demands, and therefore on income and production levels. Obviously, income and production variables prove to play a direct role in the determination of overall imports flows: the larger the share of non-competitive imports in total imports, the greater the relevance of income and production variables in explaining foreign trade. As to the supply side of the tale, authors model export flows according to sectoral peculiarities. In the case of perfectly competitive industries in international markets, exports are the difference between domestic supply and domestic demand, the domestic price being

equal to the foreign one. As to oligopolistic sectors, which are mainly industrial sectors, exports depend both on the real exchange rate and on sectoral production capacity.

Finally, a third formalisation strategy is provided by Naastepad (1999) in a structuralist CGE model on India. Naastepad provides an extended version of the Taylor model in which import (export) flows respond positively to relative prices and to domestic real (foreign) income according to properly estimated price and income elasticities.

Because each of these strategies may address some drawbacks of the standard Armington/CET apparatus, we here adopt a mixture of them in order to reproduce the existing Palestinian trade pattern as close as possible. In Figure 7, we abandon the two-stage maximisation process implicit in the Armington/CET scheme and the associated theoretical properties. More in depth, as far as import flows are concerned, we follow Naastepad (1999). Given prices, overall domestic imports are a positive function of domestic real income *X* through the income elasticity γ_1. This is formally stated in equation (7) below:

$$XM = \gamma_0 X^{\gamma_1} \tag{7}$$

As to export flows, here we model them in equation (8) as a constant share (ξ) out of domestic production:

$$XE = \xi X \tag{8}$$

In equation (8), parameter ξ stands for the share of domestic output exported abroad. We take it as exogenous and linked to the peculiar conditions and restrictions Palestinian firms experience in marketing their products. Of course, this is a rough and overly simple representation of Palestinian trade. It may be modified in several ways to account for relative prices. Further, it aims at representing the current status of Palestinian trade and it may be subjected to in-depth revisions should conditions on the ground modify, and the factors affecting trade flows change. However, equations (7) and (8) may help models to capture the missing factors stated above and overcome some shortcomings in the WB model. In section 4.1 below we will show how equations (7) and (8) may allow us to explicitly account for income and extra-economic factors, i.e. the political factors deriving from the Israeli-Palestinian conflict, as relevant explicative variables of expenditure(sale) ratios between domestic and imported goods(between domestic sale and exports).

In the bottom part of Figure 7, we set the equation for the macroeconomic equilibrium of our simple one-sector Palestinian economy. Macroeconomic equilibrium is achieved when aggregate demand is equal to aggregate supply. In accordance with the structuralist theory, we describe a

demand-driven Palestinian economy. Given the installed capital stock *K*, aggregate output *X* and capacity utilisation *u* adjust endogenously to satisfy effective demand and to ensure market equilibrium. Once *X* and *u* are determined, and given the labour coefficient "*b*" in the short run, labour demand and the employment level follow automatically. Nothing ensures that full employment will occur. In contrast, aggregate demand may be well below the full-employment level and full employment appears as an episode rather than the distinguishing feature of the macroeconomic equilibrium.

Even though such adjustment mechanisms are typical features of the heterodox/structuralist approach, multi-sector heterodox/structuralist CGE models may provide more complex scenarios. One the one hand, price-driven adjustments may equilibrate flexi-price competitive sectors. On the other hand, quantity-driven adjustments hold true on fixed-price oligopolistic sectors (Kraev 2003). The emerging picture is complicated even further if intermediate inputs are considered, so that price changes may spread throughout the economy and affect quantity-adjusting sectors through the mark-up price setting rule.

Advantages of a Structuralist perspective on Palestine

What advantages does the structuralist perspective on Palestine here described offer? In our opinion, at least two.

With regard to the first, this paper provides evidence on the Keynesian nature of certain phenomena characterising the Palestinian economy. Persistent mass unemployment and output gaps seem to depend on the lack of *effective* demand for Palestinian goods (WB 2004). The underdevelopment of the local productive system and overdependence on foreign imports for both consumption and production needs link domestic prices tightly to foreign ones, and render them largely insensitive to macroeconomic imbalances. As a consequence, quantity-driven adjustments seem far more important than price-driven adjustments within the Palestinian economy; production levels and capacity utilisation emerge as endogenous economic variables that determine macroeconomic equilibrium. Of course, a pure neoclassical framework is unlikely to capture this point. A structuralist model may be of help by considering a wide range of adjustment mechanisms and by providing a more comprehensive description of Palestine. The combination of fixed-price and flex-price markets into multi-sector structuralist models may respond to the rising demand among CGE modellers for various adjustment mechanisms and hybrid macro closures (Kraev 2003).

Regarding trade issues, our departure from the Armington/CET apparatus has deep implications on the description of expenditure (sale) allocation ratios. As to the demand side of the story, once

import and export functions (7) and (8) are considered, the expenditure ratio between home-produced and imported goods reads a sfollows:

$$\frac{\overline{P} * XD}{\overline{P} * XM} = \frac{(X - XE)}{XM} = \frac{(1-\xi)}{\gamma_0} X^{(1-\gamma_1)} \tag{9}$$

In equation (9) relative prices prove to be irrelevant to determine the Palestinian expenditure ratio. In contrast, real income, and therefore its fluctuations, now play a *direct* and significant role. In particular, should the imports' income elasticity γ_1 be larger than 1, a negative relationship links the expenditure ratio $(\overline{P}XD / \overline{P}XM)$ to real GDP *X*. We think equation (9) and the assumption of a high income elasticity of Palestinian imports enable us to capture some important aspects of the Palestinian trade pattern and of Palestinian expenditure allocations. On the one hand, these assumption seem to fit well with the data reported above and to agree with recent literature on Palestine (FEMISE 2006). On the other hand, it makes sense to assume Palestinian imports' income elasticity γ_1 to be larger than 1. Import income elasticity, we know, relies on the degree of development of the domestic productive system, the availability of domestic substitutes for imported goods and dependence on non-competitive imports (Cimoli 1994). In backward economies whose domestic needs are largely satisfied by imported goods, import flows can be reasonably expected to be highly sensitive to changes in domestic income. This seems to be the case of the Palestinian economy. A brief evaluation of Palestinian import income elasticity through a simple OLS model, see Table 5 below, shows that Palestinian import income elasticity is significant and approximately equal to 1,98, (at 95 percent confident level), whilst relative prices appear to be irrelevant (see regression (2) in Table 5)[16].

(Table 5 here)

For the distribution of Palestinian firms' sales between domestic and foreign markets, equation (10) below determines the corresponding sale ratio :

$$\frac{\overline{P} * XD}{\overline{P} * XE} = \frac{X - XE}{XE} = \frac{X - \xi X}{X} = \frac{(1-\xi)}{\xi} \tag{10}$$

According to our assumptions on export flows, the ratio of domestic sales to foreign sales proves to be constant and exogenous. It is completely determined by parameter ξ, which represents the overwhelming exogenous factors that influence Palestinian firms' access to domestic and foreign

markets. In this regard, we emphatically recognise that such a description of Palestinian firms' sale allocation cannot be considered to be universally true, and may well be inappropriate for the modelling of country scenarios that differ from current Palestine. What matters here, however, is the degree to which the model fits Palestine's circumstances. Palestine export ratio (on domestic sales) now seems largely to behave independently from both price and income factors and to reflect political and extra-economic factors. Should these factors endure and continue to shape the behaviour of Palestinian firms, our description of Palestinian export flows, although rough, may perhaps capture some aspects of the Palestinian economy.

The structuralist one-sector model we present provides an extremely simplified picture of Palestine. Inevitably, it cannot grasp complexity in full. Our simple cost-plus-cum-exogenous-price function, for instance, is a rough way to describe price formation. However, it may highlight some possibly important aspects of the Palestinian scenario. The assumption of an exogenous price level $\overline{P}$ and of relatively high transport costs, together with the introduction of an independent investment demand function, can easily explain the lack of productive investments in Palestine. Poor domestic investments prove not to be saving-constrained (WB 2007), but to depend on the lack of profit opportunities and comparatively low profit rates in comparison with those prevailing in foreign countries, which in turn induce domestic operators to invest their capital abroad (WB 2007; Missaglia and Valensisi 2010). Unlike a pure neoclassical model, our alternative model at least partially captures the emerging Keynesian nature of the Palestinian economy.

Conclusions

The World Bank CGE model on Palestine by Claus Astrup and Sebastian Dessus (the AD model in this paper) is a standard real-side neoclassical CG model. It describes a price-driven economy in which relative prices freely adjust to ensure macroeconomic equilibrium, productive factors are fully utilised, and savings determine investments. The well-known Armington/CET apparatus is adopted to model the foreign trade block, so that intra-industry trade appears as a substantial component of the Palestinian trade pattern.

However, some theoretical implications of such a standard neoclassical approach seem to be at odds with data and with empirical evidence on Palestine. First, the Palestinian price system seems to be sticky, and to react slowly to macroeconomic imbalances. Quantity-driven adjustments seem to prevail over price-driven adjustments in the determination of macroeconomic equilibrium. Further, the full-employment condition of available inputs is far from being reached, and massive Palestinian unemployment persists. A lack of *effective* demand is a plausible explanation for this problem (WB 2004). Last but not least, Palestine's trade pattern does not follow the stylised facts

implied by the technicalities of the Armington/CET apparatus. Intra-industry trade is generally irrelevant, whilst inter-industry trade represents more than 75% of trade flows. Relative prices barely influence expenditure and sale allocation ratios. As to the Armington part of the story, income fluctuations appear far more explicative of changes in expenditure allocation ratios than are price variations. As to sale allocation decisions by Palestinian firms, overwhelming politically derived factors, i.e. the economic consequences of the Palestinian-Israeli conflicts, exert enormous influence and make such decisions independent of economic variables. Overall, the picture that emerges is one of a Palestinian economy that shows some *Keynesian* features. This may well require a theoretical model that incorporates some heterodox stances.

We describe some basic aspects of a hypothetical structuralist model on Palestine. On the one hand, we stress the proximity between the Keynesian spirit of structuralist CGE models and certain phenomena that characterise Palestine. The introduction of fix-price markets and quantity-driven adjustments in place of, or in addition to, price-driven adjustments enables structuralist models to capture some adjustment processes at work within the Palestinian economy. On the other hand, the departure from the technicalities of the Armington/CET apparatus helps to solve the inconsistencies raised above. In this sense, the introduction of simple import and export functions allows us to reconcile theoretical insights with empirical data and to depict the role of real variables, income variables in particular, as main explicative factors for imports flows and expenditure allocation decisions. On these bases, we believe that a structuralist CGE model may be a more appropriate tool with which describe the Palestinian economy than a strictly neoclassical model.

Notes

1. According to Arnon and Weinblatt (2001), Israeli support for a Customs Union arrangement aimed at delaying as many political decisions as possible and at avoiding the clear demarcation of Palestinian and Israeli territories.

2. From the Six-day War on, the Israeli administration of occupied territories strongly hindered the development of the local productive system. Permit restrictions and protectionist policies in favour of Israeli producers kept the Palestinian economy in a status of general backwardness. The need for poverty alleviation was mainly addressed by allowing Palestinian people to commute to Israel in search of work. A labour-exporting economy emerged, with domestic expenditures being financed by foreign remittances. After the Oslo Treaty, due to repeated closures by the Israeli authorities, such a development pattern came to an end, and the need for a new development paradigm became evident. A goods-export paradigm instead of a labour-exporting one now appears as the main way to promote Palestinian development.

3. In complex multi-sector CGE models, top-level consumer' utility functions incorporate several "Armington" goods on which representative consumer has to allocate consumption expenditures. In this paper, for the sake of simplicity, we present a simple macro-aggregated model assuming a single "Armington" good *XA*.

4. Such a simplified model assumes the Armington good *XA* to be both consumed or used for investment purposes.

5. For the sake of simplicity, we neglect intermediate inputs and we assume labour and capital as unique productive inputs.

6. According to Astrup and Dessus (2001), we adopt the "small-country" assumption to describe Palestine, so that both *PM* and *PE* are taken as exogenous.

7. The Palestinian public budget is strongly determined by the availability of foreign financial support, and in the aftermath of the Second Intifada, highly volatile and shrinking fiscal revenues have been often used to cover urgent current expenditures.

8. It is worth mentioning that the Armington assumption was originally elaborated by Paul Armington (1969) in order to reconcile theory with empirical evidence and to model the importance of intra-industry trade in statistical data.

9. The counter-intuitive relationship between expenditure ratios and relative prices that often emerges from data might possibly be explained by an Armington elasticity of substitution value lower than 1. Such a value, however, implies in-depth consequences on the effects of trade liberalisation policies on domestic welfare. According to Taylor and Von Armin (2007), low Armington elasticity of substitution values strongly reduce the improvements in social welfare that derive from trade liberalisation measures, and possibly reverse them when domestic taxes have to increase in order to offset reductions in import tariffs and to ensure public budget equilibrium.

10. Political and military turmoils may have both direct and indirect effects on Palestinian expenditure (sale) allocation ratios. The outbreak of the Second Intifada and the ensuing restrictive security measures by Israel, for instance, could impede Palestinian people to freely import foreign goods and therefore *directly* force them to substitute imports with home-made products (impede Palestinian firms to sell goods abroad and confine them to domestic markets). Political instability also influences Palestinian economic activity and therefore, perhaps *indirectly*, Palestinian expenditure decision by affecting income variables. In our model, dummy variable d_1 aims at capturing these effects. It assumes values equal to 1 in years 2000-2002 and in 2006 in order to get the consequences both of Intifada Al-Aqsa and 2006 Hamas electoral win. Direct effects of these events are assumed to change the intercepts of regression functions (through parameters α_2 and β_2). Indirect effects, in turn, act on the relationship between expenditure (sale) allocation ratios and Palestinian real GDP (through parameters α_4 and β_4).

11. The effects of different trade policies on technological change is a main issue in WB models. In the theoretical exercise above, we try to assess how technological change, perhaps trade liberalisation-led technological change, may affect relative price and expenditure allocation by increasing real income. Our final goal, of course, is to verify the consistency of the allocation consequences of changes in real income with the empirical evidence on Palestine within the framework of the AD model.

12. See also Missaglia and De Bour (2004) for an extended version of the AD model including the Harris-Todaro assumption and allowing for Palestinian unemployment.

13. Actually, this is only a potential outcome of the AD model. In the neoclassical approach, relative prices matter, so that nominal variables may move in several different directions. The result sketched in the main text, however, is perfectly plausible, and stresses the gap that may divide the AD description of Palestine from the concrete functioning of its economy.

14. See Botta and Vaggi (2010) for a theoretical post-Keynesian model on short-run and long-run economic dynamics in the Palestinian economy.

15. In a more complex model, our simple cost-plus function could be extended to account for high transportation costs in Palestine. Interestingly, the combination of exogenous prices and high transportation costs, by inducing low mark-up rates, may explain the low profitability and the ensuing lack of investment opportunities in Palestine.

16. All economic variables in regressions (1) and (2) in Table 5 are indexed to the corresponding 1996 value and expressed in log-terms. Dummy variable d_1 is used, as usual, to get the effects on regression intercept and income variable coefficient of the outbreak of the Second Intifada and of the political turbulences resulting from the 2006 Palestinian political elections.

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Figures

Figure 1. A prototype neoclassical Armington/CET model on Palestine.

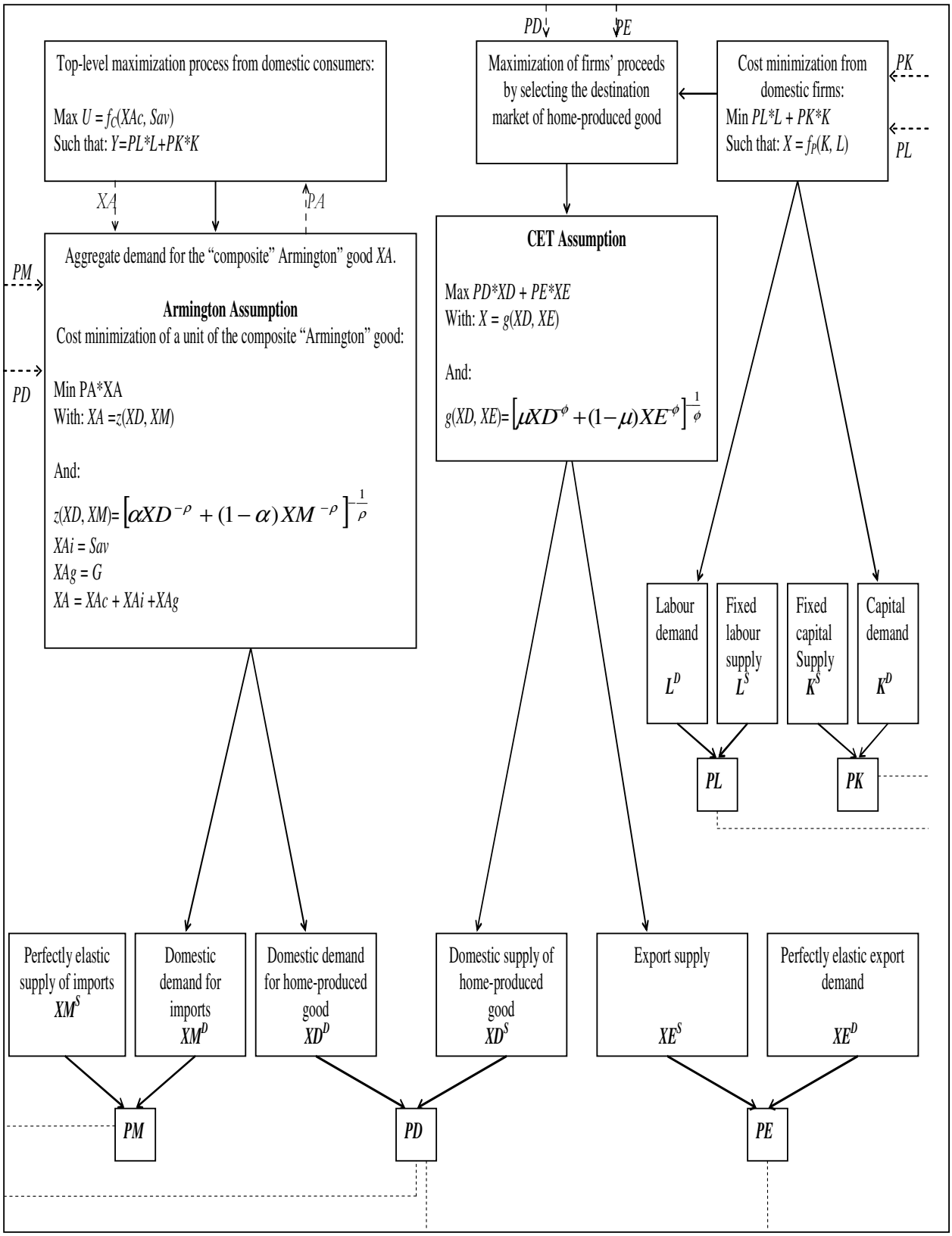
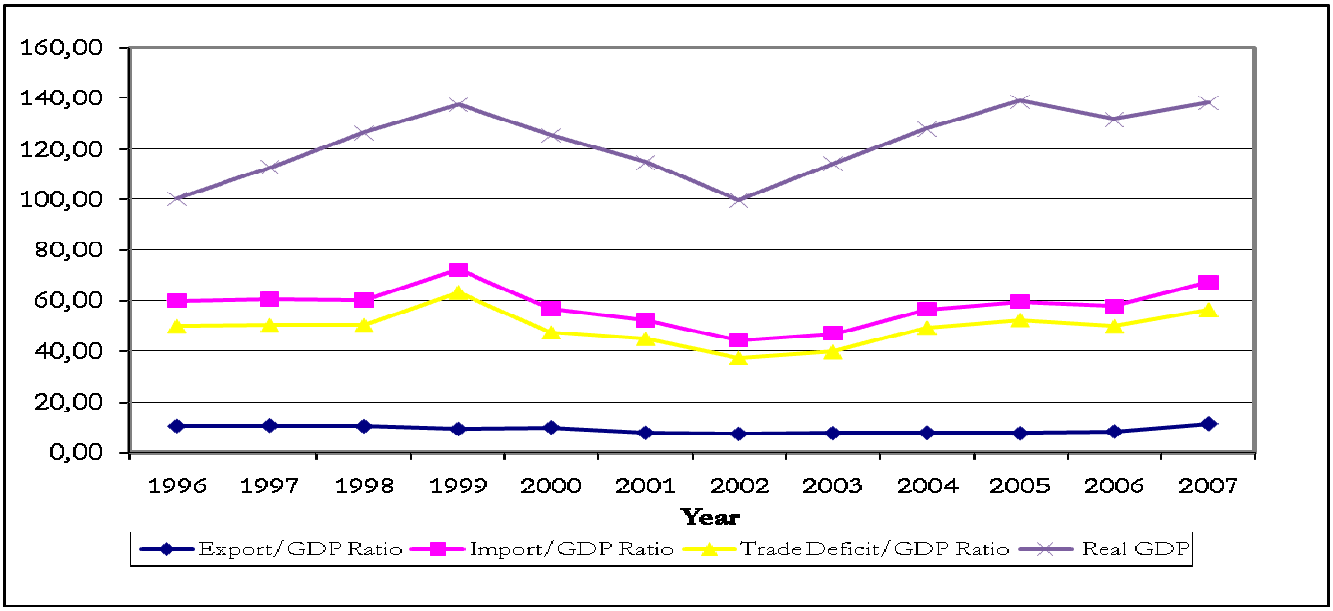
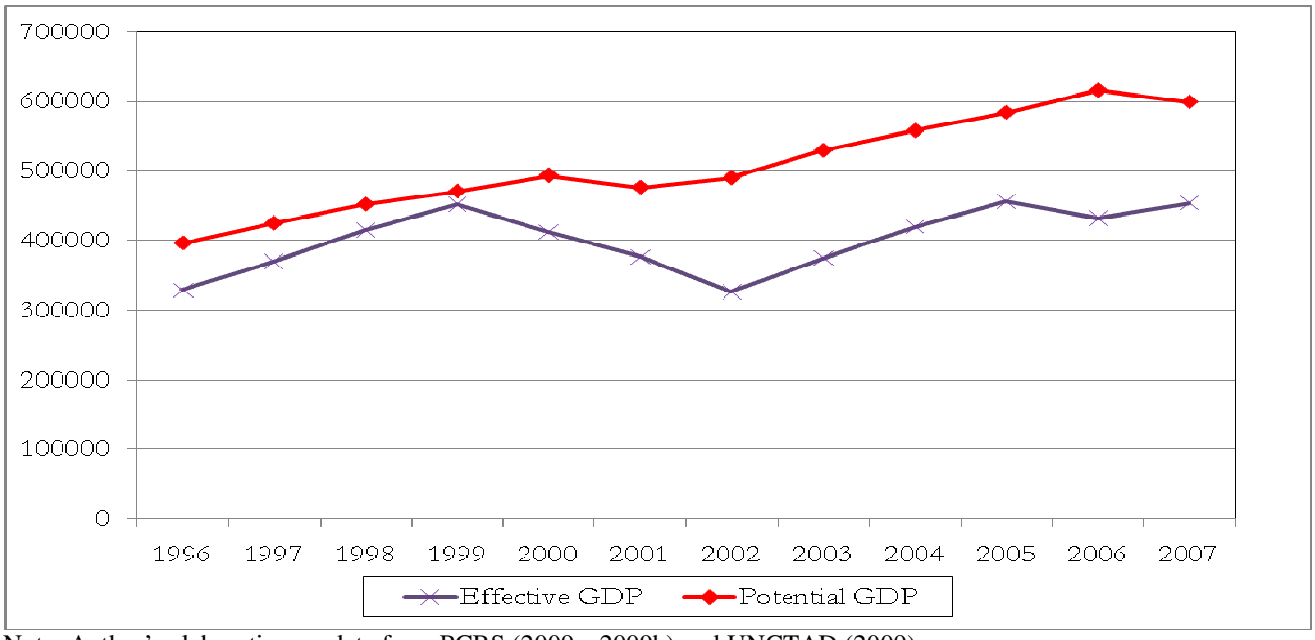


Figure 2. The Palestinian trade pattern, 1996 – 2007.



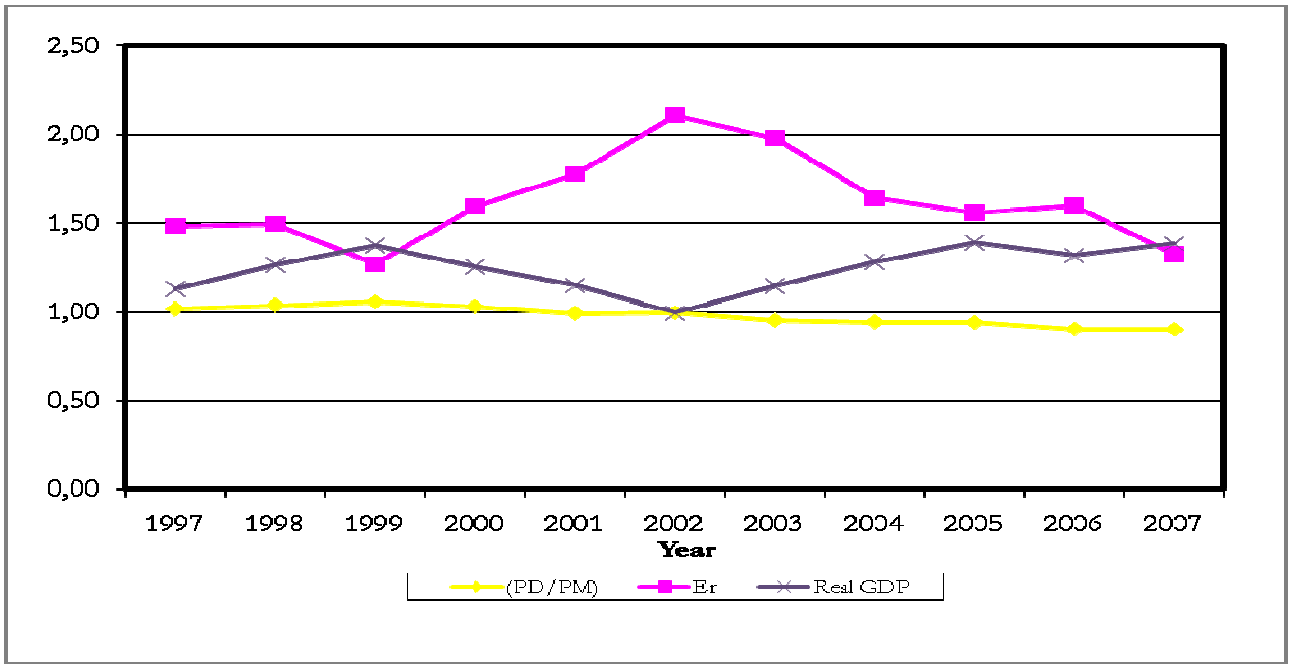
Note: Author's elaboration on data from PCBS (2009a).

Figure 3. Palestinian potential and effective GDP, 1996 – 2007.



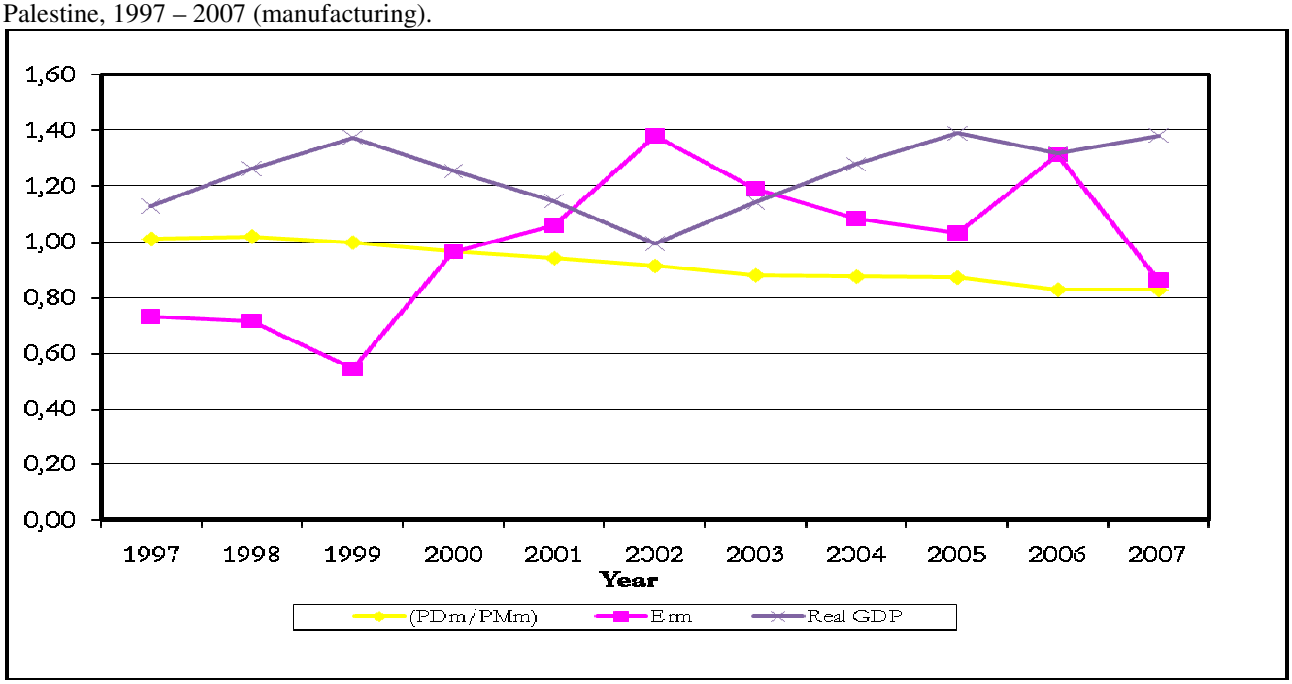
Note: Author's elaboration on data from PCBS (2009a, 2009b) and UNCTAD (2009).

Figure 4. Expenditure allocation ratio, home-produced and imported goods price ratio and real GDP. Dynamics in Palestine, 1997 – 2007 (overall economy).



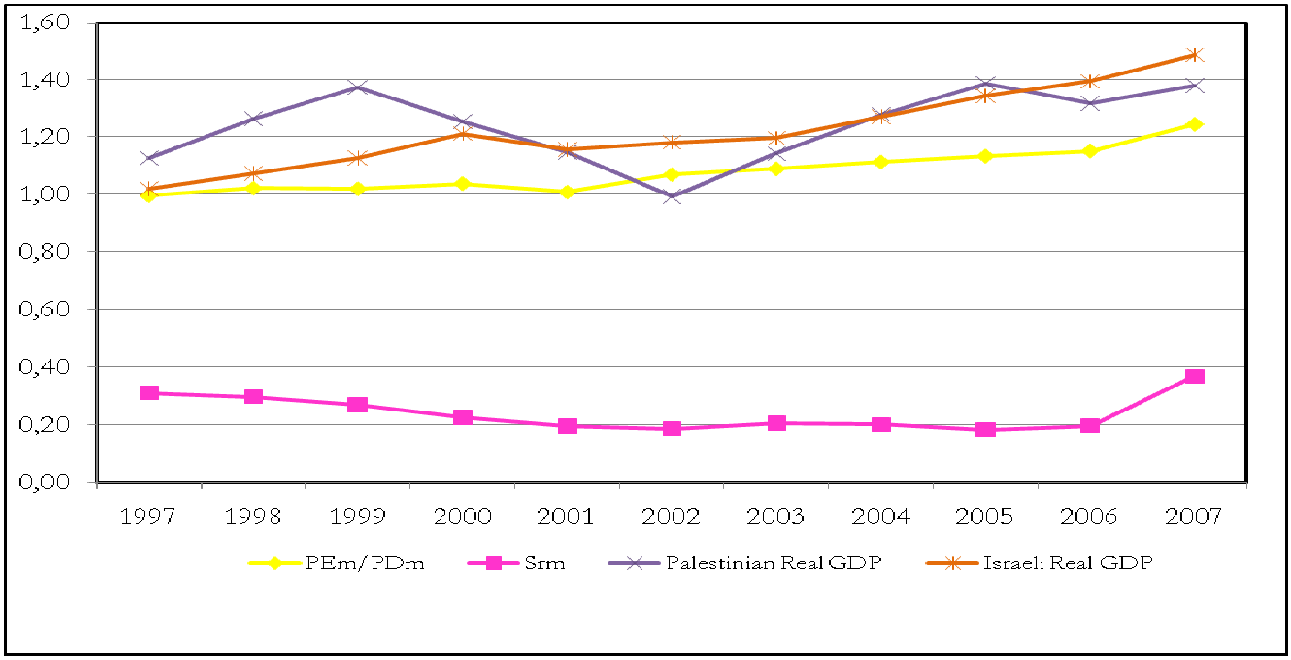
Note: Author's elaboration on data from PCBS (1999 – 2008a, 1999 – 2008b).

Figure 5. Expenditure allocation ratio, home-produced and imported goods price ratio and real GDP. Dynamics in Palestine, 1997 – 2007 (manufacturing).



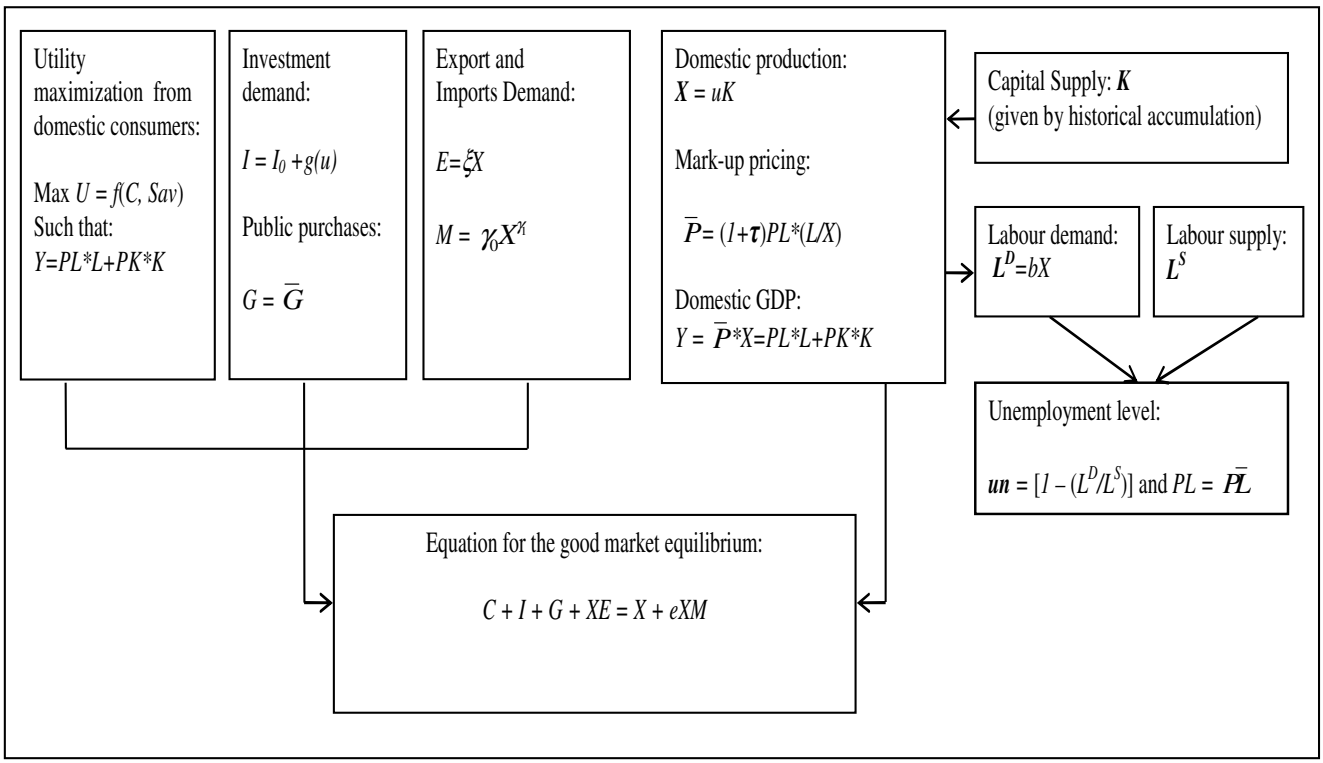
Note: Author's elaboration on data from PCBS (1999 – 2008a, 1999 – 2008b).

Figure 6. Sale allocation ratio between domestic sales and exports in Palestine (manufacturing), 1997 – 2007.



Note: Author's elaboration on data from PCBS (1999 – 2008a, 2009a) and ICBS (2009).

Figure 7. A heterodox/structuralist perspective on Palestine.



Tables

Table 1. Palestinian imports, exports and trade balance (in percentage of GDP), 1996 – 2007.

Year	Exp/GDP ratio	Imp/GDP ratio	Exp/Imp Share	Trade deficit/GDP ratio
1996	10,09	59,91	16,84	49,82
1997	10,28	60,48	16,99	50,20
1998	10,01	60,22	16,62	50,21
1999	8,91	71,97	12,38	63,06
2000	9,56	56,80	16,82	47,24
2001	7,45	52,18	14,28	44,73
2002	7,02	44,15	15,89	37,14
2003	7,28	46,87	15,54	39,59
2004	7,45	56,53	13,18	49,08
2005	7,24	59,53	12,16	52,29
2006	7,94	57,73	13,75	49,79
2007	10,98	67,23	16,33	56,25

Source: Author's calculations on data from PCBS (1999 – 2008a)

Table 2. Relative importance of Palestine and Israel as trade partners, 1996 – 2007.

Year	Palestine		Israel	
	Exports to Israel (Share)	**Imports from Israel (Share)**	**Exports to Palestine (Share)**	**Imports from Palestine (share)**
1996	94,04	86,46	8,57	1,07
1997	94,20	80,56	7,98	1,24
1998	96,62	77,18	7,83	1,39
1999	96,85	61,64	7,19	1,16
2000	92,22	73,00	5,45	1,00
2001	94,02	66,46	4,65	0,82
2002	89,81	73,71	3,79	0,65
2003	91,53	72,75	4,19	0,75
2004	89,91	73,65	4,54	0,68
2005	86,62	70,23	4,41	0,65
2006	89,05	72,58	4,31	0,68
2007	88,74	86,55	4,27	0,80
1996-2007	**91,97**	**74,56**	**5,60**	**0,91**

Note: Author's calculations on data from PCBS (1999 – 2008a) and ICBS (2010).

Table 3. G-L index for the Palestinian trade pattern, 1996 – 2007.

SITC Div. Code	Division	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
0+1+2+3+4+68	**Primary commodities**	0,19	0,19	0,20	0,16	0,17	0,14	0,15	0,14	0,12	0,13	0,11	0,13
0+1+22+4	All food items	0,23	0,21	0,28	0,22	0,30	0,18	0,20	0,20	0,19	0,19	0,18	0,22
2-22-27-28	Agricultural raw material	0,39	0,28	0,33	0,24	0,41	0,50	0,74	0,58	0,53	0,52	0,42	0,50
27+28+68	Ores and metals	0,51	0,38	0,39	0,34	0,38	0,32	0,36	0,32	0,23	0,26	0,60	0,69
3	Fuels	0,04	0,03	0,03	0,02	0,01	0,02	0,01	0,02	0,03	0,03	0,01	0,01
68	Non ferreous metals	0,27	0,28	0,23	0,26	0,27	0,14	0,25	0,17	0,18	0,31	0,44	0,51
5+6+7+8-68	**Manufactured Goods**	0,38	0,37	0,35	0,25	0,36	0,34	0,41	0,39	0,36	0,32	0,41	0,48
5	Chemicals	0,26	0,24	0,23	0,24	0,24	0,29	0,25	0,28	0,25	0,23	0,30	0,36
7	Machinery and equipments	0,15	0,15	0,10	0,07	0,10	0,13	0,12	0,13	0,10	0,08	0,13	0,15
6+8-68	Other Manufactured goods	0,49	0,47	0,49	0,36	0,53	0,42	0,55	0,53	0,49	0,47	0,57	0,66
67	Iron and Steel	0,24	0,32	0,29	0,19	0,19	0,09	0,09	0,16	0,16	0,11	0,31	0,37
26+65+84	Textile	0,23	0,20	0,19	0,18	0,37	0,29	0,32	0,33	0,28	0,33	0,39	0,46
from 0 to 9	**Economy-wide level**	0,28	0,29	0,29	0,22	0,25	0,25	0,25	0,25	0,22	0,21	0,22	0,26

Note: Author's calculations on data from PCBS (1999 – 2008a).

Table 4. OLS estimation of the Armington/CET assumptions.

Dependent Variable: Expenditure ratio (sale ratio)	**1**	**2**	**3**	**4**	**5**	**6**
Intercept: α_1 (β_1)	0,464* (0,000)	0,889* (0,000)	1,048* (0,0007)	1,032* (0,0008)	0,131 (0,54)	-1,814* (0,0015)
d_1 (intercept): α_2 (β_2)			-0,229 (0,28)	-0,195 (0,30)	0,014 (0,96)	0,379 (0,45)
RPGDP: α_3 (β_3)		-1,333* (0,0005)	-1,789* (0,0084)	-1,808* (0,0068)	-1,580* (0,048)	2,217 (0,162)
d_1 (*RPGDP*): α_4 (β_4)			0,736 (0,26)	0,617 (0,29)	0,517 (0,562)	-0,232 (0,851)
Armington prices (*PD/PM*): α_5	-0,279 (0,78)			-0,717 (0,15)	-2,852* (0,023)	
CET prices (*PE/PD*): (β_5)						9,926 (0,103)
RIGDP: (β_6)						-7,03 (0,093)
R Square	0,01	0,793	0,836	0,896	0,878	0,608
R Square-adjusted	-0,099	0,767	0,753	0,812	0,796	0,215
F Statistic	0,092 (0,768)	30,677* (0,0005)	10,161* (0,0091)	10,736* (0,0113)	10,769* (0,0066)	1,548 (0,322)

Note: Author's calculations on data from PCBS (1999 – 2008a, 1999 – 2008b, 2009a) and ICBS (2009). Statistically significant variables (at 5% level) signed by (*); p-values reported in brackets.

Table 5. OLS estimation of Palestinian imports' income elasticity.

Depedent Variable: Palestinian imports	(1)	(2)
Intercetta	0,68* (0,001)	-0,26* (0,041)
RPGDP	2,35* (0,001)	1,98* (0,003)
d1 (intercept)	0,07 (0,64)	-0,01 (0,93)
d1 (*PRGDP*)	-0,38 (0,59)	0,058 (0,92)
Relative Prices (*PD/PM*)		0,25 (0,65)
R Square	0,89	0,91
Adjusted R Square	0,84	0,85
F Statistic	18,228* (0,001)	14,723* (0,029)

Note: Author's calculations on data from PCBS (1999 – 2008a, 1999 – 2008b, 2009a). Statistically significant variables (at 5% level) signed by (*); p- values reported in brackets.