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INTRODUCTION

The Palestinian economy is characterized by unstable economic and political conditions, and it is full of distortions and abnormalities, its best described as a malformed economy. Despite of several development attempts, this small open economy has been forced to grow dependent on Israeli demand for goods and labor, international aid and remittances of Palestinian workers abroad. The absence of a national currency has deepened Palestinian dependence on others. Three different currencies circulate inside the Palestinian economy: the New Israeli Shekel, US Dollar, and Jordanian Dinar, leaving it subject to the monetary policies of issuing countries.

There has been little work on monetary policy and efficiency of banking system in Palestine[1], mainly because of the absence of a national currency and other monetary tools. The essays shed light on the role and performance of central banks in the presence of different currencies other than the national currency, and the consequence of absence of the national currency. In addition, they put under spotlight the monetary transmission mechanisms through which external monetary policies might affect the domestic real economy and inflation. Moreover, the essays have addressed the impact of monetary and fiscal policies on the performance of the banking system, by predicting cost and technical efficiency of banks operating in Palestine over the period of 2000 – 2009. In addition, the essays have analyzed the cost structure and attempt to identify the determinants of efficiency in the Palestinian banking system. A stochastic cost frontier function has been utilized in order to measure the cost and technical efficiency of banking system in Palestine. Furthermore, the essays have had addressed the historical development, role, and performance of the "Microcredit sector" in Palestine, and investigate the main conditions and circumstances that are potentially affect supply and demand of small loans.

The importance of the thesis stems from the vital need of both policy makers and bankers to track improvements and understand mechanisms through which the Palestinian

economy is affected by monetary policies, and through which banking efficiency is achieved. Moreover, it sheds light on the development of the micro credit sector, since political instability and military confrontations make Palestine a very good case in point to analyze the issue of micro credit in conflict areas.

Different techniques have been utilized to achieve the main goals of the thesis. The first chapter used vector error correction approach (VECM) and Ordinary Least Square (OLS) simple regression to investigate the influence of external, as well as, internal monetary policy on the Palestinian economy and prices during the period Q1 1996 – Q2 2009. Chapter two employed a parametric test (mainly it employed a translog stochastic cost frontier function) to measure the efficiency of banking industry in Palestine and to investigate whether domestic banks are more efficient than foreign banks or vice a versa. Third chapter analyzes micro credit industry through analyzing the performance of a representative micro-credit institution with an empirical and quantitative approach.

The first chapter has analyzed the transmission mechanism of monetary policy in the absence of a national currency, where the case of Palestine has been addressed. This chapter investigates and identifies the channels through which external and/or internal monetary policy shocks can affect the real economy and inflation in Palestine. Two approaches are used: The vector error correction model (VECM) and ordinary least square (OLS) simple regression. In estimating the performance of these models, actual quarterly data is used between Q1 2002 and Q2 2009. For the period of Q1 1996 to Q2 2009, a mix of actual and predicted data is used.

The second chapter estimates the cost (technical) efficiency of the banking system in Palestine, using a panel of 18 banks during the period 2000 – 2009. Estimates have been obtained using the stochastic frontier approach. The analyses were extended to cover bank ownership (foreign and local) and type (Islamic and commercial). Results indicate that the overall cost (technical) efficiency of banks in Palestine is declining during the

period of research. The mean of cost and technical efficiency was found to deteriorate through the years. Cost efficiency declined from 0.730 in 2000 to 0.666 in 2009, while technical efficiency declined from 0.733 to 0.713 during the same period. Moreover, the lower allocative efficiency (incorrect input-mix rather than utilization or wasting resources) is the main cause of the decline in cost efficiency over the period of analysis. In addition, large banks have lower cost efficiency, which indicates the presence of diseconomies of scale for Palestinian banks.

The third chapter analyses the development and functioning of the micro credit industry in Palestine in the period 1995 - 2008. The chapter shows how despite the increase of potential demand for micro credit due to the deterioration of the economic environment, the growth of the sector has been below expectations. One of the most important causes of this phenomenon has been the reluctance to lend caused by the growing risk of late or no repayment of loans. Using original data from one micro credit institution (*Arab Centre for Agricultural Development*) and a quantitative approach, the chapter investigates the causes of this problem. Results show that the risk of late payment was negatively correlated to the level of interest rate, to macroeconomic conditions, and to the age of the borrower while it was positively associated to the share of investment in the Gaza Strip, and to the size of loans.

The thesis is organized as follows: chapter one analyses the transmission mechanisms of monetary policy in the absence of a national currency. Chapter two measures the cost and technical efficiency and identifies the potential determinants of banking efficiency in Palestine. Third chapter analyses the development and functioning of the micro credit industry in Palestine.

CHAPTER ONE

ANALYZING THE TRANSMISSION MECHANISMS OF MONETARY POLICY IN THE ABSENCE OF A NATIONAL CURRENCY: THE PALESTINIAN CASE

ABSTRACT

This chapter investigates and identifies the channels through which external or internal monetary policy shocks can affect the real economy and inflation in Palestine. Two approaches are used: The vector error correction model (VECM) and ordinary least square (OLS) simple regression[2]. In estimating the performance of these models, actual quarterly data is used between Q1 2002 and Q2 2009; for the period of Q1 1996 to Q2 2009, a mix of actual and predicted data is used. Empirical results in general indicate that monetary policy shocks have limited influence on economic activities and inflation in Palestine. However, results show that pass-through from domestic lending interest rates of USD (or JD) is higher than for NIS. They reveal a presence of significant but relatively low pass-through for policy rates onto domestic lending interest rates, and therefore, on real economic activities. Israeli monetary policy has a significant impact on Palestinian real economic activities, mainly net exports and on the inflation rate. Furthermore, the exchange rate channel influences GDP by affecting wealth and net exports. Finally, political conditions have had a significant and important impact on the behavior of the Palestinian people by affecting consumption levels.

Keywords: Palestine, external monetary policy, internal monetary policy, domestic lending interest rate, domestic market.

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I. INTRODUCTION

Large debate exists among economists and politicians about how monetary policy transmission mechanisms affect the economy. The operation of monetary transmission channels varies systematically across countries due to differences in: the extent of financial intermediation; the size, concentration and health of the banking system; the development of capital markets and structural economic conditions (Checetti 1999). The macroeconomic environment as well as structural features[3] of the economy, in turn determine the link between financial conditions and spending/investment decisions (Créel and Levasseur, 2005). Coricelli et al. (2005) indicate that, although the interest rate channel is the most important transmission channel in industrial countries with developed financial markets, the exchange rate channel is generally the dominant channel of monetary policy transmission in transition economies. Juks (2004) indicated that, interest rate, credit, balance sheet and asset price channels remain largely ineffective in the face of underdeveloped financial intermediation.

There has been little work on monetary policy in Palestine, mainly because of the absence of a national currency and other monetary tools. Naqib (1999) has written about the choice of exchange rate regime when a Palestinian currency is issued. He suggested a currency union with Jordan due to common features in both economies and societies. Cobham (2004) suggested issuing a national currency and pegging it with the Euro. Other literature has looked at issuing a national currency in Palestine or currency union with different scenarios and assumptions. None, however, have had investigated the channels of the transmission mechanism in Palestine.

The purpose of this chapter is to explore the natural relationship between monetary shocks in Israel, USA and Jordan, and Palestinian real economy and prices. This chapter provides a preliminary evaluation of the effect of monetary policy actions and exogenous shocks onto aggregate demand and inflation in Palestine. First, it analyzes the effect of monetary policy actions in Israel, Jordan and the USA on Palestine's real economy. This

includes analyzing the transmission from policy interest rates to domestic interest rates and real economic activities[4]. Second, it evaluates the effect of fluctuations of the exchange rate of USD against NIS[5] on aggregate demand and inflation in Palestine. Third, the chapter investigates the impact of a change in domestic interest rates on total credit facilities, real economy and inflation.

The extraordinary conditions and absence of monetary tools in Palestine make it difficult to use standard techniques for investigating the transmission mechanism of monetary policy. Two other, more appropriate techniques are therefore deployed. The standard technique vector error correction approach (VECM) is used to investigate the influence of external and internal monetary policy on the Palestinian economy during the period Q1 1996 – Q2 2009 and employs both actual and constructed data. OLS simple regression is used to investigate the effect of exogenous shocks onto the Palestinian economy. OLS simple regression is applied for the period Q1 2002 – Q2 2009 and used entirely real, actual data. Since constructing data and making predictions affect results, caution is needed and more weight will be given to findings from the OLS regression.

The chapter is organized as follows: Section II presents an overview of the Palestinian economy. Section III reviews the monetary policy transmission mechanism in Palestine. Section IV shows data sources and methodology. Section V presents model specifications and the empirical results. Section VI draws conclusions and policy implications.

II. Overview Of The Palestinian Economy

The Palestinian economy is characterized by abnormal economic and political conditions that mainly result from Israeli measures and occupation since 1967. In addition, there is no national currency, but three, with differing importance depending on their usage: NIS is most frequently used in daily transactions; USD is mainly used for trade, savings and investment; and JD is principally for investment and saving. Moreover, VAT revenues and custom clearances are collected by the Israeli government on the behalf of the PA.

Consequently, the Palestinian economy is deeply affected and shaped by the Israeli policies. Although some positive developments from the 1993 Peace agreement have come to bear[6], the Palestinian economy is still vulnerable and fragile.

Palestinian Central Bureau of Statistics (PCBS) indicates that real GDP grew at an average rate of around 5.9% during the years of 2004 - 2009, to increase to $5.24 billion for 2009. Total consumption was roughly 125.6% of GDP during the same period. The high consumption rates show the enormous role of foreign grants and international aid play to finance the daily needs of the Palestinian people. Moreover, data indicates that during 2004 - 2009, investment contributed about 25.2% of GDP. Hence, saving/investment balance represents a deficit of about 50.8% of GDP during the same period. There are two main sources to finance this deficit; current transfers including foreign grants and transfers to private sector, and workers' remittances mainly of Palestinian workers in Israel (Figure 1).

The Palestinian government relies heavily on international aid and foreign grants, where it accounted for an average of 44% of total government revenues during the period 2004 - 2009, (with higher levels of assistance during times of political turmoil). Budget deficit without grants and aid stood at around 25.3% of real GDP during 2004 – 2009, but with aid and international grants included, declines to about 1.6%. This reflects the fragility of the Palestinian government, given the potential risks arising from an unstable political situation, and its weakness to buffer negative impact of new monetary policies in other countries[7]. Moreover, aid was in both forms mostly budget support (an average of 81.6% of total aid for the period 2004 - 2009) and target projects. Deficit is financed through aid, loans from domestic banks and arrears. Hence, this will increase the risk factor especially for banking system, if the government defaults.

Inflation rates on annual bases increased from about 2.8% in 2000, to 9.9% in 2008 and 2.8% in 2009. Prices in 2008 were clearly affected by the global prices of fuel and food,

reflecting the relatedness of the Palestinian economy to the outside world and the impact of external shocks. Figure (2) clearly demonstrates the relationship between the rate of inflation in Palestine and Israel therefore price in Palestine is highly affected by the Israeli prices. Inflation, mainly, rising because most of imports (74%) originates or passes through Israel (roughly speaking at most 50% of consumption is imported), in addition aid and worker remittances increases the domestic absorption which creates inflationary pressure. Therefore, inflation in Palestine is partially a function of international prices mainly Israeli one (40% to 50% of inflation is imported). Hence, inflation targeting in Israel mitigate the volatility of inflation in Palestine. This will helps Palestinian to target a smaller set of prices to be influence in particular in the absence of monetary policy and can somehow control the services sector prices.

On the other hand, PCBS data shows that the vast majority of trade is from and to Israel - 74.4% of total imports and 91.8% of total exports during the period 1996 – 2009. Large volumes of trade with Israel reflect a direct link and subordination of the Palestinian economy to its Israeli counterpart and that a relatively large proportion of inflation in Palestine is transferred from Israel. In addition, most trade transactions are in NIS, indicating that the exchange rate must have a relatively low influence on the volume of trade in Palestine. Moreover, current account (CA) is affected by three main factors: trade balance, net current transfers, and net income from abroad. Figure 3, indicate that trade deficit would raise the CA deficit, while on the contrary, current transfers and income from abroad reduces that deficit. Data indicate that CA achieved a surplus of about 213.6% in 2008, where it increased from a deficit of $467 million in 2007 to surplus of about $530 million in 2008 (PMA, 2009). Among the sources of CA, net current transfers[8] were a major contributing factor to the surplus in CA by about 230.7% points, while net income from abroad had a contributing influence with 22.1% points. On the other hand, trade deficit had 39.2% points' contribution to the decrease of CA surplus, and it indicates that increment in imports is much greater than that of exports[9].

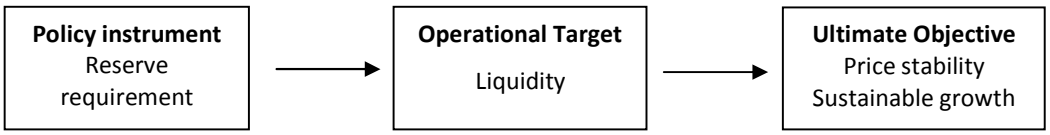
The Palestinian banking sector has improved during recent years, mainly due to the establishment of the Palestine Monetary Authority (PMA), which serves as an emerging central bank, and the enforcement of new laws and regulations. The number of banks has increased from 7 banks with 33 branches in 1994, to 20 banks with 209 branches as of December 31 2009. Despite improvements in the banking sector, the Palestinian credit market still lags behind developed markets because of an absence of monetary tools such as: a national currency, bonds, treasury securities, commercial paper, and other interbank debt. The major services provided by the Palestinian credit market are loans, deposits and the securities exchange. Domestic loans are offered and deposits accepted in the three currencies: NIS, USD, and JD. Shares of deposits and loans vary among currencies, where USD has the largest share in both deposits and loans, while NIS is the smallest share in deposits. This various shares of currencies are justified by the fact that, historically, people trust the USD (and JD) more than NIS and other currencies. Although, in the recent years the share of deposits of USD is declining in favor of the NIS, as a result of the relapses of the USD after the world financial crisis in late 2007. Moreover, the shares of deposits is also influenced by the sources of income, were most of aid and current transfer payments are dollar denominated.

Domestic lending interest rates of USD, JD and NIS were, on average for the period 2004 – 2009, 7.3%, 8.7% and 12.7% respectively, while domestic deposit rates were 1.8%, 2.3% and 1.8% respectively. These rates are high compared to deposit lending rates in USA, Jordan and Israel[10]. This high margin is justified by the fact that there is no national currency thus PMA cannot affect and do not intervene in determining the interest rate; banks claim to be facing high risks therefore they increase the interest rate on loans and offer a low rate on deposits; weak competition between banks (oligopoly). Moreover, banks usually use LIBOR plus a premium, since there is no policy rate in Palestine. Thus many factors influence the effective rate such as political risks and instability, exchange rate, lack of competition, and premium.

III. TRANSMISSION MECHANISMS OF MONETARY POLICY IN PALESTINE

A monetary transmission mechanism is generally defined as the process through which monetary policy actions and decisions are transmitted into changes in output and other economic activities (Taylor, 1995). Mishkin is a main pioneer of analysing monetary transmission mechanisms. He summarises the channels through which monetary policy can theoretically affect the real economy (See Mishkin (2004), the economics of money banking and financial markets).

The PMA cannot conduct its own monetary policy because of the absence of a national currency. Its responsibilities are therefore limited. Controlling reserve requirement is the only possible monetary policy through which the PMA could achieve its ultimate objective of price stability and growth sustainability[11]. A framework for monetary policy in Palestine is given by the following representation:



According to Article IV of the Paris Protocol[12], the PMA is the authority with the power to grant and announce liquidity requirements on all deposits in banks operating in Palestine. Liquidity requirements on the various kinds of NIS deposits (or deposit linked to the NIS) in banks operating in Palestine must be between 4 - 8%, according to deposit type. Changes in the liquidity requirements on NIS deposits (or deposits linked to the NIS) in Israel over 1% call for corresponding changes in the above rates (i.e. 4 – 8%). The supervision and inspection of the implementation of all liquidity requirements will be carried out by the PMA.

The PMA does not print its own currency, rather it uses NIS and JD as the main national currency, as stipulated by the Paris Protocol. This makes the PMA unable to control the supply of money and losing its last resort policy. In addition, banks in Palestine do not regularly lend or borrow from the central banks of Israel (BoI), USA (FED) and Jordan

(CBJ). This means they are not directly affected by changes in policy interest rates and therefore, it is unlikely that the standard mechanisms linking policy interest rates operate. However, since banks in Palestine typically keep excess liquidity in the three currencies, they must regularly place funds (of each currency) into banks from those countries or into financial markets that are closely linked with those countries[13].

Monetary shocks are expected to stem from two main sources: first, exogenous monetary shocks affecting interest rates and generated by monetary policy in USA, Israel, and Jordan. These are expected to affect domestic interest rates and bank lending in Palestine. Second, monetary shocks generated by fluctuations in the exchange rate, which affects individuals' purchasing power and the volume of trade between Palestine and the rest of the world. Other influencing factors include political conditions, which influence the quantity of money and inflation rate in the domestic market. NIS price fluctuations, as well as high Israeli interest rate, reduce the volume of domestic NIS bank lending and encourage banks in Palestine to charge high interest rates on NIS loans. Furthermore, fluctuations in NIS currency affect Palestinian's purchasing power, since NIS are mainly used for daily transactions[14].

Figures (2, 4, and 8) demonstrate a presence of direct impact of monetary policy in Israel, Jordan, and USA onto the Palestinian real economy and inflation. Figure 2 demonstrates a direct impact of Israeli monetary policy onto the inflation rate in Palestine therefore the real Palestinian economy. Figure 4 represents a highly significant influence of the exchange rate of USD (or JD) onto the stock market, therefore the wealth of Palestinian society and its companies and individuals. While figure 8, shows a positive relationship between policy rates of used currencies (USD, NIS, and JD) compared to the predicted policy rate in Palestine. Monetary policy shocks are likely to affect the Palestinian economy by impacting upon the following:

1. **State treasury:** The PA relies heavily on foreign aids and grants to finance budget deficit. Aids to finance budget deficit amounts to about $1.36bn, which is roughly 22.4% of nominal GDP in 2009[15], compared to 1.3% in 2000 (i.e. before the second Intifada). This indicates the enormous impact of foreign aids and political unrest on the Palestinian economy. Aids tend to increase at times of political conflict, and its often paid in USD or Euro. Since the government pays salaries and wages in NIS, a weak exchange rate from USD leads to heavy losses in the PA's budget, which negatively impacts government expenditure and adversely affects production in Palestine.

2. **Lending channel:** The high cost of domestic lending is another consequence of fluctuations in the currencies used in Palestine. For example, the instability of the NIS during the previous periods has led to high interest rates on domestic NIS loans. For the period of Q1 2004 to Q2 2009, they averaged 12.9% in Palestine, compared to a 5.3% average prime lending rate in Israel. However, an increase in the cost of loans decreases the ability of individuals to borrow, mainly affecting people who depend on loans to finance projects and maintain basic levels of consumption.

3. **Bank deposits:** A depreciation of USD (or JD) leads to bank deposits of Palestinian citizens devaluing. Palestinians mainly use USD and JD for deposits; 81.5% of total bank deposits in 2004 and 71% in 2009. Thus, a decline in the value of USD leads to lower their wealth, and it is expected to directly affect patterns of consumption and investment in Palestine, thereby affecting total production.

4. **Financial markets:** A decline in the value of USD (or JD) affects the stock value of companies listed on the Palestinian Securities Exchange (PSE). A devaluation of USD (or JD) lowers the value of savings and retirement funds as well as the medium and long-term contracts of the two currencies used at the PSE (JD and USD). PSE data shows that a 13.3% devaluation of USD (or JD) against NIS is associated with a 14.2% decrease in the Palestinian market capitalization during 2008 (Figure 4).

5. **Foreign trade:** The strength of the NIS against USD (or JD) affects the volume of Palestinian net exports, which leads to a decline in the competitiveness of Palestinian products and consequently affects Palestinian output negatively. PCBS data shows that for the years 1996 - 2009, most foreign trade was with Israel (91.8% of total exports and 74.4% of total imports), whereas Palestinian depositors held the majority of their money and wealth in USD and JD. Due to a large trade deficit with Israel, exchange rate volatility adds additional risk to Palestinians, particularly if the NIS appreciates against USD (or JD).

6. **Expectations:** Monetary policies may impact the economy by affecting the confidence and expectations of economic agents. Country risks, political instability, and fluctuations in exchange rates all prevent individuals and/or companies from adopting and developing a specific strategy, negatively affecting economic activities in Palestine.

Due to data limitations and the extraordinary environment in Palestine, some transmission channels cannot be investigated, such as equity price channel, household balance sheet effects, and balance sheet channel. Diagram (A) summarises the channels through which monetary policies in the USA, Israel and Jordan are expected to affect the Palestinian economy. The Palestinian banking sector and the exchange rate are expected to be the main transmitters of monetary policy shocks in the Palestinian economy. Inflation in Israel is also expected to have a direct influence on the Palestinian inflation rate.

IV. DATA AND VARIABLES

Data availability and consistency is a main challenge for research in Palestine. This is because of the main data source PCBS is relatively new, established in 1993. Moreover, the absence of a national currency and lack of long time series data makes it very difficult to collect a consistent time series data for monetary indicators. Appendix 2 shows the process of data construction for a number of variables on a quarterly basis. There is no actual data for these quarters so to construct some; the relation of these series to others

where quarterly data does exist is used. Due to their very nature, such estimates must be treated with caution.

Data was collected on a quarterly basis for the period Q1 1996 – Q2 2009. The PCBS is the main source of data on annual national accounts: gross domestic product[16], final and private consumption, gross capital formation, exports and imports. In addition, other data is collected by the PCBS on a quarterly base, including consumer price index, exchange rate of USD against NIS and labour force data. The PMA is the source of data on credit facilities, deposits and domestic lending/deposit rates; while International Financial Statistics (IFS) and central banks provide raw data on lending, deposit, and policy interest rates in the USA, Israel and Jordan.

Construction of quarterly data in order to fill the gaps necessary for econometric testing is presented in Appendix 2. To create the necessary data, we have looked for similarities between sets of quarterly data series. This relationship will be examined and then adjusted for another pairing of data series, where one is missing some quarterly data.

V. Model Specification and Empirical Results

Vector Auto-Regression (VAR) and OLS models were employed to examine the relationships between monetary policy variables and both output and prices in Palestine. However, the extraordinary economic and political environment that leads, in part, to an inconsistency of available and accurate data, complicates the analysis of monetary shocks and may affect the expected results. To focus on macroeconomic dynamics in the post-establishment of Palestinian Authority, two different samples of quarterly data have been used: constructed and actual data is used for the period Q1 1996– Q2 2009 and entirely actual data for Q1 2002 - Q2 2009. Data availability and the absence of monetary tools limited the ability to use the standard approach (VECM) to investigate the impact of monetary policy shocks, therefore both VECM and OLS simple regression has been utilised.

V.1 Vector Error Correction Model

A Vector Error Correction Model (VECM) estimates both a long run equilibrium and short run dynamic equations. The chapter used it to examine the effect of external/internal monetary policy[17] shocks onto real economic activities (i.e. Gross domestic product (GDP), Final consumption (FC)[18], gross capital formation (GCF), inflation (π), and unemployment rate (U)). Given that the Palestinian economy is a small and open economy, it is unlikely to have an impact on the global economy. Therefore, variables from USA, Israel, and Jordan are treated as exogenous, since they influence Palestinian economic indicators without any feedback effects. The Johansen (1988) methodology is used to estimate the long run cointegrating vector from a VECM of the form:

$$\Delta Y_t = \Gamma(L) \times \Delta Y_t + D \times Z_t + \alpha\beta'[Y_{t-1}] \quad (1)$$

Where Y_t is a (n × 1) vector of I(1) endogenous variables, Γ(L) is (n × n) matrix of the estimated parameters, Z_t is a (m × 1) vector of stationary exogenous variables including dummies, and D is (n × m) matrix of parameters associated with the exogenous variables. The α parameters measure the speed of adjustment in which the variables in the system adjust to restore a long run equilibrium[19], and the β vectors are estimates of the long run cointegrating relationship between the variables in the model (Hendry 1999). All variables in the VECM are in Log form in order to capture the nonlinear element (exponential growth).

Channels of monetary transmission mechanism to be investigated by VECM are Bank lending (credit) channel and domestic lending rate channels of USD, NIS, and JD. Other channels such as asset price channel and balance sheet channel are not considered here due to data limitations. The baseline model (Table (2)) seeks to explain the effect of external/internal monetary policy shocks on the endogenous variables and is formulated as:

$$\begin{bmatrix} \Delta GDP_t \\ \Delta \pi_t \\ \Delta FC_t \\ \Delta GCF_t \\ \Delta U_t \end{bmatrix} = A_1 \begin{bmatrix} \Delta GDP_{t-1} \\ \Delta \pi_{t-1} \\ \Delta FC_{t-1} \\ \Delta GCF_{t-1} \\ \Delta U_{t-1} \end{bmatrix} + \ldots + A_p \begin{bmatrix} \Delta GDP_{t-p} \\ \Delta \pi_{t-p} \\ \Delta FC_{t-p} \\ \Delta GCF_{t-p} \\ \Delta U_{t-p} \end{bmatrix} + \alpha\beta' \begin{bmatrix} GDP_{t-1} \\ \pi_{t-1} \\ FC_{t-1} \\ GCF_{t-1} \\ U_{t-1} \end{bmatrix} + DZ_t + \begin{bmatrix} u_{1t} \\ u_{2t} \\ u_{3t} \\ u_{4t} \\ u_{5t} \end{bmatrix} \quad (2)$$

To test the significance of a given channel, variables of interest are appended to the baseline model in order to determine its effect on real economy in Palestine. Model (1) traces the domestic lending rate of USD (DLR_USD) channel; model (2) traces the domestic lending rate of NIS (DLR_NIS) channel; model (3) gives the domestic lending rate of JD (DLR_JD) channel; and model (4) traces the credit channel. Augmented Dickey Fuller (ADF) and Philips Peron (PP) tests are applied to test for data stationary. Johnson's (1988) procedure is applied to determine the number of cointegrating equations of the system[20].

V.1.1 Cointegration analysis

The ADF test suggests that the null hypothesis that the variables are integrated of order one [I(1)] cannot be rejected, and it indicates that the first difference series are stationary. The cointegrating equation[21] is estimated to test for a long run relationship between variables, (where domestic lending rate of NIS and USD are endogenous and policy rates in Israel and USA are exogenous variables[22]). Since residuals are estimated and not observed, adjusted ADF critical values are used instead of standard values (Mackinnon, 1991). Figures (5.1 and 5.2) depict an expected long run relationship between policy rate in Israel (USA) and the NIS (USD) domestic lending rates, as well as deposit rates. It shows that both series move in the same direction, indicating that they share a certain type of behaviour in terms of their long-term fluctuations.

V.1.2 Lag length selection

Proceeding to estimate the VECM, a lag length of order one (p=1) is selected as the optimal VAR length in all models (Otero and Smith, 1999). Greater numbers of lag orders are preferred when dynamic forecasts for long periods ahead are conducted.

V.1.3 Granger causality

Results show that domestic lending rates of NIS and USD significantly granger-causes GDP and FC, not the other way round. Furthermore, prime lending rate of Israel, granger-causes the domestic lending rate of NIS (at 5%), JD, and USD (at 10%). Since the JD is pegged to the USD, the impact of fluctuating interest rates in the USA directly reflects

onto Jordanian rates, whilst the reverse is not true. However, results emphasise that the policy rate in the USA affects both domestic lending rates of USD and JD. This is mainly because banks in Palestine use LIBOR as a reference in determining the domestic lending rate of USD and JD. Also since the JD is pegged to the USD, it can be expected that the domestic lending rate of USD affects the JD, but not the reverse, and this is demonstrated by our empirical results. In addition, the Palestinian consumer price index granger-causes NIS domestic lending rate, significantly. This is because the NIS currency is used in daily transactions, and therefore price fluctuations directly influence the domestic interest rate of NIS. Moreover, results show that FC significantly granger-causes TCF, and not the other way round. This is because FC in Palestine primarily depends on international aid and foreign transfers. Therefore, it can be expected that TCF will not affect FC, while increasing FC will increase demand for money, thereby increasing demand for loans. Finally, results indicate that domestic lending rates significantly granger causes TCF.

Having concluded that variables in the VAR model appear to be cointegrated, estimates of the short-run behaviour and adjustments of the long-run models can be made. The following specifications and assumptions are used in the calculations. It is likely that there are data trends, so criteria that assume a linear trend in both data and the cointegrating equation is used. One lag order is assumed to be the optimal lag order, and exogenous variables are added to the model in order to capture the effect of structural breaks.

V.1.4 Results from VECM

In general, the VECM produces a poor in-sample forecast for all models that are estimated, which may be due to insufficient numbers of observations.

Domestic lending rate channels

Model (1) reveals an inverse short-run relationship between USD domestic lending rate and FC[23]. Results presented in table (3) showed that coefficients are statistically significant. The error correction term revealed that about 13.4% of the deviation of FC

from its long run equilibrium will be adjusted each quarter (i.e. it takes FC about two years to get back to its long run equilibrium). Results also indicate that USA policy interest rate has a positive and significant effect on USD domestic lending rate. This indicates a presence of the pass-through effect from policy rate in the USA to real economic activities in Palestine.

Model (2) traces the NIS domestic lending rate channel, where prime lending rate in Israel was appended to the model as an exogenous variable. Results (shown in Table 3) reveal a significant negative short-run effect of NIS domestic lending rate onto real GDP. Results show a relatively low speed of adjustment towards the equilibrium; around 7.2% of the disequilibrium is corrected each quarter (i.e. it takes GDP about 3.5 years to get back to long run equilibrium). Furthermore, policy rate of Israel (i.e. headline rate) has a positive and significant impact on domestic lending rate of NIS and therefore negatively influences economic activities.

Finally, Model (3) establishes the JD domestic lending rate channel, where discount rate in Jordan was appended to the model as an exogenous variable. Results are presented in table (3) and highlight a significant and negative short-run influence from JD domestic lending rates onto real economy. The error correction term is significant and has a negative sign, with a value of about (-0.216). This implies that around 21.6% of the disequilibrium is corrected each quarter. In addition, results show that discount rate (i.e. policy rate in Jordan) positively and significantly affecting the JD domestic lending rate

These results show that the influences of USD and JD domestic lending rates on the Palestinian economy are much greater than that from the NIS domestic lending rate. This is because of the high share of USD and JD loans and deposits (77.5% of total loans and 77.2% of deposits during the Q1 2004 – Q2 2009), which influences the final consumption and liquidity which in turn affects the real economy (see diagram A). Also, this is because most of investments are denominated in USD (or JD). In sum, real economic activities take

roughly 2, or 1 1/4 years to return to a long-run equilibrium due to changes in the domestic lending rates of USD and JD, respectively; while with changes in NIS domestic lending rates, it takes about 3.5 years.

Bank lending or credit channel

Model (4)[24] traces the bank lending channel, where two lags and one cointegrating equation are used, (see Table (3)). Results show a weak effect of bank lending on real economic activities, depicting a positively but insignificant short-run influence on GDP. This odd result can be largely attributed to high reliance of GDP on foreign aids and political conditions, as well as, it is attributed to the same data problems that have been referred to previously. Moreover, the error correction term (ECT) is statistically significant, however, at a rejection level of 10%, indicating a weak long-run causality link from total credit facility to economic activities.

Impulse response function (IRF)

A standard Choleski decomposition is utilized here in order to identify the short-run effects of monetary policy shocks on the endogenous variables levels in the VECMs applied here (Cecchetti (1999), and Garratt et al. (2003)). Impulse responses are depicted in figures (6.1 – 6.4). Figure (6.1) illustrates a policy rate shock in the USA, revealing a positive effect on the domestic lending rate of USD, (the effect begins to dissipate after four to five quarters). Both FC and GDP are seen to be negatively influenced, since both decreases for the first four quarters after the shock, (they begin adjusting to original levels after about 8 quarters).

Figure (6.2) depicts how the real economic activities react to a shock in the exchange rate of USD against NIS. CPI, FC, and GDP react positively to the shock for the first four to five quarters, but the effect fades away in the long run resulting in a negative influence. In addition to this, TCF, FC, GDP and GCF all have negatively responses to a shock in USD or NIS domestic lending rates (as detailed in Figures 6.3 and 6.4). Figure (6.3) shows that the

effect dies in the long run and real economic activities go back to its previous levels. Finally, CPI, on the one hand responds positively to a USD domestic lending rate shock for 10 quarters and thereafter is negative until the shock dies out; whilst on the other hand, prices immediately responds negatively to a shock in NIS domestic lending rate, (and remains so until the shock dies out). This is because the majority of consumption and overdraft loans are in NIS, so increasing the NIS domestic interest rate directly affects individuals, thereby lowering demand, which lowers prices. As for USD loans, they are typically used for investment and foreign trade; therefore a high domestic USD interest rate increases investors' costs, driving prices up for a time. After a certain period consumers' demand falls and prices fall to earlier levels.

V.2 Results of OLS simple regressions

OLS simple regression is used to investigate the effect of external monetary policy onto real economic activities in Palestine for the period Q1 2002 – Q2 2009. This section will investigate the short run relationship by running OLS regression over the differenced series in order to eliminate the trends or the long run movement in the variables.

V.2.1 Effect of monetary shocks on domestic lending interest rates

Results show some degree of the pass-through effect from external monetary shocks onto domestic interest rates, even if it is relatively low. This is because of the high-risk premium and/or the distinction of recognition of interest rates[25]. Other exogenous variables also affect interest rates in Palestine, such as political circumstances, country risks and foreign aid. The expected risk premium is high because of country risks and political instability, which both reduce any pass-through effect from policy rates to domestic interest rates.

Table (4) shows that the pass-through effect from policy rate in USA and Israel (i.e. Federal fund rate, and Headline rate) on USD and NIS domestic lending rates, respectively, is positive but relatively low. This emphasis the fact that the risk premium in Palestine is

relatively high also it highlights the immense effects of external factors, particularly political issues and the absence of a national currency, onto the Palestinian economy. Jordanian discount rate has a relatively high effect on JD domestic lending rate compared to its effect on lending rate in Jordan. This might be explained by the PMA's adoption of a free market policy and the high proportion of Jordanian banks in Palestine[26]. Also, the JD is pegged to the USD so there are more limitation than just demand and supply forces determining Jordanian interest rate.

Despite the low effect of policy rates onto domestic interest rates, the above results demonstrate a presence of the pass-through effect from policy rates in their countries to the lending/deposit interest rates in Palestine. This implies that the external monetary shocks affecting the Palestinian economy are indirect, impacting through domestic interest rates.

V.2.2 Effect of monetary shocks on The Palestinian real economy

Consumption

The consumption function is estimated as a function of GDP as a proxy for gross disposable income (GDI), domestic lending rate of both USD and NIS loans[27] (R and R^* respectively), nominal exchange rate of USD against NIS (E), Palestine securities exchange market index (Al-Quds index) - used as an indicator of the net wealth of Palestinians (IND), foreign aid (AID), and dummy variables (D06, and D07)[28] - used to capture the effect of political issues on FC in Palestine.

$$\Delta lFC_t = b_0 + b_1 \Delta lGDP_t + b_2 \Delta lR_t + b_3 \Delta lR_t^* + b_4 \Delta lE_t + b_5 \Delta lIND_t + b_6 D06 \times lAID_t + b_7 D06 + b_8 D07$$

The estimated results presented in Table (5) indicate that GDP, Al-Quds index, foreign aid and political conflict significantly affects FC in Palestine. Results show that domestic lending rate of USD is predicted to negatively influence FC[29]. Despite the sizeable proportion of private sector employees[30] receiving their salaries in USD (or JD), results

indicate that the exchange rate of USD against the NIS has a positive but insignificant impact on FC. However, there is still an argument that exchange rate does have some degree of influence on FC, at least for people paid in USD (or JD). This could be the case where a USD (or JD) appreciation increases individual wealth, thus making a household more likely to spend and less likely to save at each level of disposable income. In addition, fluctuations in the exchange rate affect the stock market in Palestine, in which USD and JD are used. An appreciation of the exchange rate will revive the stock market, as well as, raise the dollar price of imported goods and services, and thus discourage FC. This implies that exchange rate has an ambiguous effect on FC. Further important determinants of FC in Palestine include international aid, political conflict[31] and expectations. Results show that FC falls during a period of intense conflict.

To summarise, FC is greatly influenced by international aid and political and social issues. Contrarily, monetary shocks and policies seem to have a low and insignificant impact on FC. This highlights the significant impact of international aid and political conditions on GDP as well as the insignificance of monetary policy for GDP. These results are consistent with Walsh (2003), who argued that in the long-run, the correlation between money growth or inflation and real output growth is probably close to zero.

Investment

Investment function is estimated as a function of the lagged dependent variable; exports are a proxy for external demand; domestic lending/deposit interest rates are of USD and NIS (R, R*, DR); the Al-Quds index is a proxy of the stock market; and dummy variables D06 and D07 capture the effect of a political condition on an investment decision in Palestine.

$$\Delta lGCF_t = b_0 + b_1 \Delta lGCF_t(-1) + b_2 \Delta lEX_t + b_3 \Delta lR_t + b_4 \Delta lR_t^* + b_5 \Delta lDR_t + b_6 \Delta lIND_t + b_7 D06 + b_8 D07$$

b's in the above equation, represent: elasticity of exports, domestic lending rate of USD and NIS, domestic deposit rate of USD and the Al-Quds index of the investment. Results shown in Table (5) indicate on the one hand, that domestic lending rates of USD and NIS are inversely related to investment but have insignificant coefficients. On the other hand, the results show that increasing the domestic USD deposit rate discourages investments. Both of these results are due to political and economic instability, which almost always exists, creating an unhealthy environment for investment and propelling individuals and entrepreneurs to search for alternative safe and profitable ways to invest (such as deposits). Furthermore, as expected the stock market has a positive and significant impact on investment. Since USD and JD are the currencies of the Palestinian stock market, it is expected that USD (or JD) fluctuations will affect investment levels by affecting the stock market, where a depreciation of USD (or JD) will plunge the Palestinian stock market and discourage investment.

To summarise, by insulating political conditions, investment in Palestine is determined by level of USD domestic deposit rate, exports, and the stock market (and exchange rate), which then affects Palestinian GDP.

Net Exports

This study has examined the impact of real wage, domestic and foreign interest rates, inflation rate in Palestine and Israel, also GDP in Israel (as a proxy for foreign demand), and the political conditions represented by a dummy variable (D06) on exports. This study excludes the effect of exchange rate on exports, since most (on average about 90% of total exports) of Palestinian exports are to Israel and paid in NIS, which mitigates the exchange rate influence.

As expected, exports are negatively related to the Palestinian price level and positively related to the price level in Israel. An increase in domestic price level renders Palestinian exports more expensive (i.e. less competitive) and decreases the demand for these goods

and services; while increasing prices in Israel increases the demand on Palestinian goods and services, and therefore increases export. This implies that Israeli monetary policy has a significant effect on Palestinian exports through the Israeli price level. In other words, increasing the supply of Israeli money increases the Israeli price level, which tends to increase the volume of exports to Israel and subsequently encourages greater Palestinian output[32]. Finally, results indicate that political conditions significantly impact on exports, which fall when there are political turmoils, (illustrated in Table 5).

Aggregate import demand in Palestine is estimated through the following model (Tang (1983) and Kotan and Saygili (1999)):

$$\Delta lM_t = b_0 + b_1 \Delta lGCF_t(-1) + b_2 \Delta lFC_t + b_3 \Delta lE_t(-1) + b_4 \Delta lFR + b_5 \Delta l\Pi_t + b_6 \Delta l\Pi_t^* + b_7 D06$$

Results in Table (5) show that through foreign exchange reserves (FR), monetary policy can affect Palestinian imports, as foreign exchange reserves have a positive and significant influence on imports. Results also demonstrate that Israeli monetary policy has a significant influence on Palestinian imports through the Israeli price level and exchange rate[33]. USD (or JD) appreciation increases the purchasing power of Palestinian merchants, who usually keep their wealth in all three currencies (NIS, USD, and JD). It can be assumed that their wealth (as well as the wealth from other segments of society[34]) will increase with USD (or JD) appreciation, and they are able to import more with the same amount of USD (or JD). Exchange rate is expected to have a relatively low influence on imports as most imported goods (75%) are from Israel and are paid for in NIS. However, high Israeli prices increase Palestinian imports. This is quite surprising and may be due to the following:

- Palestinian imports are inelastic to the Israeli price level because most imported goods are essential goods with no substitutes, (energy resources, oil, food ingredients etc.). Therefore, increasing the Israeli price level increases the value of imports and not the volume.

- An absence of regulations and laws to supervise and monitor the Palestinian market[35] allows merchants to increase prices and profits, and encourages them to import more.

In summary, results indicate that monetary policy shocks in Israel influence Palestinian exports and imports by affecting Israeli demand for Palestinian goods and services and through the price channel. Exchange rate and interest rate have an insignificant effect on Palestinian exports, while exchange rate has a significant impact on imported goods and services. Results show that exchange rate directly affects imports by affecting levels of wealth, and indirectly affects them through impacting foreign exchange reserves.

Inflation Rate

The Palestinian economy suffers from continuously increasing inflation. It is mainly due to levels of supply, demand and other external factors such as fluctuations in the exchange rate of NIS against other currencies, and the Israeli price level. For this reason, price stability is a main focus of the PMA and investigating the effect of monetary shocks onto the Palestinian inflation rate is such an important issue. When tackling this subject, it is important to keep in mind that NIS is a common dominator in estimating the consumer price indices (CPI) in both Palestinian and Israeli economies.

Many empirical studies on pass-through have estimated the impact of nominal exchange rate, and index of foreign prices onto the domestic price level, such as, Campa and Goldberg (2002). The unique features of the Palestinian economy override the impact of the exchange rate on inflation, as most commercial exchanges are in NIS. Despite this, some indirect effect of the exchange rate is still expected because most Palestinian traders use more than one currency for trading[36]. The equation below uses Israel's inflation rate (Π^*) to capture the effect of global changes on the Palestinian inflation rate. The interest rate channel is also investigated, using USD domestic lending rate and NIS (R, R^* respectively), together with USD domestic deposit rate (DR). The Al-Quds index (IND) is used as an indicator of wealth, where increasing the index will increase the wealth of shareholders, thereby increasing their ability to buy more. This means increasing

purchasing power and demand, which positively influences price level. Finally, a dummy variable (D) is added to the equation to capture the effect of the presidential election in 2005, which would likely be a positive influence on inflation, since people expected favorable changes to the economic and political situation which would increase spending and demand.[37]

$$l\Pi_t = \beta_0 + \beta_1 l\Pi_{t-1} + \beta_2 l\Pi_t^* + \beta_3 \Delta lR_t^* + \beta_4 \Delta lR_t + \beta_5 \Delta lDR_t + \beta_6 \Delta lIND_t + \beta_7 D + u_t$$

Results in table (5) indicate a presence of significant pass through from Israel's inflation rate onto the Palestinian inflation rate. Also, this study's results coincide with Tillmann (2008), as he shows that higher interest rates translate into higher marginal costs of production and, eventually, into higher inflation. Results of this study show that domestic lending rate of USD positively and significantly influences inflation rate in Palestine. This is because an increase in domestic lending rate increases the cost of borrowing, (which should increase the price level). Moreover, as expected, domestic deposit rate is negatively and significantly influences inflation rate in Palestine. The Al-Quds index has a positive and significant impact on the inflation rate in Palestine. Another conclusion is that nominal exchange rate of USD against NIS affects inflation rate indirectly, by affecting the Al-Quds index, which positively influences inflation rate. Another reason to expect a nominal exchange rate to have an important influence on inflation rate and aggregate demand in Palestine is the cash-based payments system and high share of cash in household asset portfolios, despite developments in the Palestinian banking system.

To summarize, USA monetary shocks affect price levels in Palestine, through affecting the domestic lending and deposit interest rates. Results also indicate that Israeli monetary shocks have a direct and significant impact on price level in Palestine. Where, adjustments of money supply in Israel has a long run influence on price level in Palestine, while the Israeli prices of goods and services (mainly fuel and oil) has a short run and direct influence on price level in Palestine.

VI. CONCLUSION

This chapter uses two different approaches to investigate the sensitivity of the real Palestinian economy to internal monetary shocks as well as monetary shock in Israel, USA, and Jordan. To compensate for insufficient data and to facilitate econometric testing of the transmission mechanism of monetary policy, econometric models are used to fill in some the gaps. Monetary policy effectiveness in Palestine is weak, mainly because of the high dependence of the economy on foreign aid, and the absence of a national currency and therefore, a subsequent absence of monetary tools. Notwithstanding, there is still a space through which monetary policy can affects the real economy, namely through domestic interest rates and bank lending channels.

The final results of this chapter indicate that changes to monetary policy in Israel, USA, and Jordan will affect, to a certain degree, the real economy in Palestine. Results show a significant but low pass through effect from policy rates in Israel, USA, and Jordan onto the domestic interest rates. Hence, high risk premium and different method of averaging interest rates, lowers the significance of pass-through effects. Furthermore, results of the VECM reveal that adjustments toward the equilibrium are relatively slow, where it takes one to more than three years to get the indicators back to their long rum equilibrium. Furthermore, Results show that the nominal exchange rate of the USD against NIS, directly affects the real Palestinian economy through imports and indirectly through affecting individuals' wealth. Finally, the results indicate that the FC is influenced by international aid and political conditions; therefore it is expect that the political conditions will have a significant influence on the real economic activities.

Domestic lending and deposit rates significantly influence FC, GCF through affecting the inflation rate. Furthermore, policy rates in Israel, USA, and Jordan have a positive influence on the domestic lending rates therefore we expect a negative pass-through from them onto the real economic activities. Moreover, it is anticipated that the USD (or JD) domestic lending rates have a higher effect on real activities than that of NIS. This is

because both investments and most of the credit facilities are denominated in USD and JD. In addition, results show a high level of discrepancy between interest rates in Palestine and its relatives in Israel, USA, and Jordan due to the presence of high country risk, weak legal environment, political instability, and lack of supervision and control[38].

Furthermore, a fixed exchange rate system would be the appropriate exchange rate regime, initially, if Palestinian monetary authorities decided to introduce a new currency (Beidas and Kandil, 2005). However, the best nominal anchor is the New Israeli Shekel due to some economic and political reasons. As for the economic reasons; most of Palestinian trade is done with Israel (90% of export goes to Israel and about 75% of Palestinian imports are from Israel). As for the political reasons; it's known that Israel controls at land borders, sea and air thus prices in Palestine are highly affected by the Israeli measurements.

With regards to recommendation, results demonstrate that it is imperative that the PMA imposes greater restrictions and supervision on banks. Also it is vital that the PMA monitor domestic interest rates (i.e. margin between lending and deposits), and redirect them to serving the Palestinian economy or towards achieving price stability (the PMS's greatest objective). In addition, the PMA ought to track the exchange rates of the aforementioned currencies, and implement policies that enhance the trust in the Palestinian markets. This would prevent currency speculations, and hinder the black market. However, PMA can issue a Certificate of Deposits (CDs), through which it can control the liquidity and enhance interbank market.

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ACRONYMS

BoI	Bank of Israel
CA	Current account
CBJ	Central Bank of Jordan
CPI	Consumer Price Index
DISR_J	Discount Rate (policy rate in Jordan)
DLR_JD	Domestic Lending Interest Rate of JD
DLR_NIS	Domestic Lending Interest Rate of NIS
DLR_USD	Domestic Lending Interest Rate of USD
E	Exchange rate of one USD against NIS
FC	Final Consumption
FED	Federal Central Banking System of the United States
FF_US	Federal Fund Rate (policy rate in USA)
GCF	Gross Capital Formation
GDP	Gross Domestic Product
GS	Gaza Strip
HR_IS	Headline rate (policy rate in Israel)
IFS	International Financial Statistics
JD	Jordanian Dinar
NIS	New Israeli Shekel
OLS	Ordinary Least Square
PA	Palestinian Authority
PCBS	Palestinian Central Bureau of Statistics
PMA	Palestine Monetary Authority
TCF	Total Credit Facility
TD	Total Deposits
U	Unemployment rate
USD	US dollar
VAT	Value Added Tax
VECM	Vector Error Correction Model
WB	West Bank

APPENDIX 1

Diagram A: Channels of external monetary policies, which are likely to affect the Palestinian economy

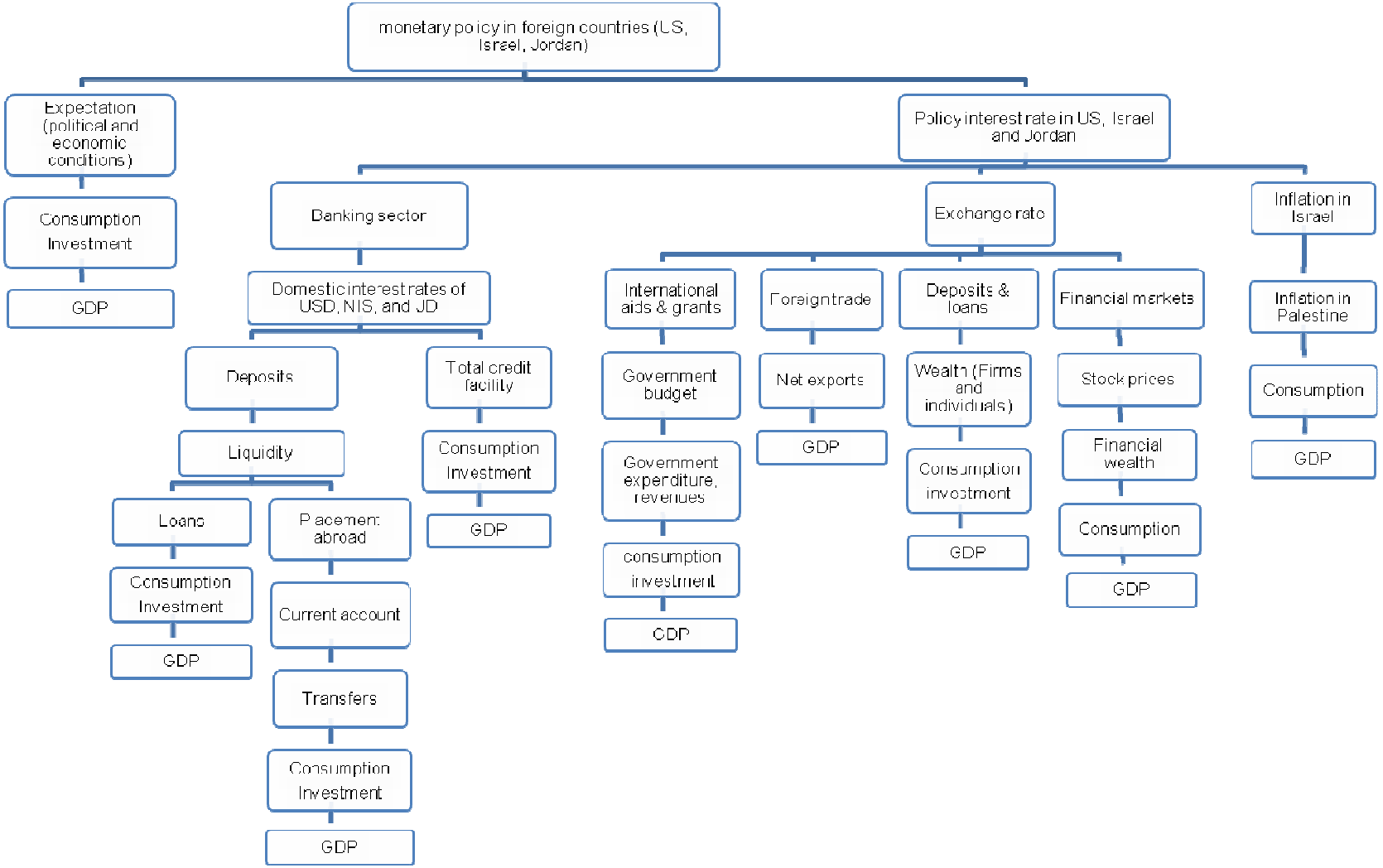


Figure 1: S/I balance and sources of finance

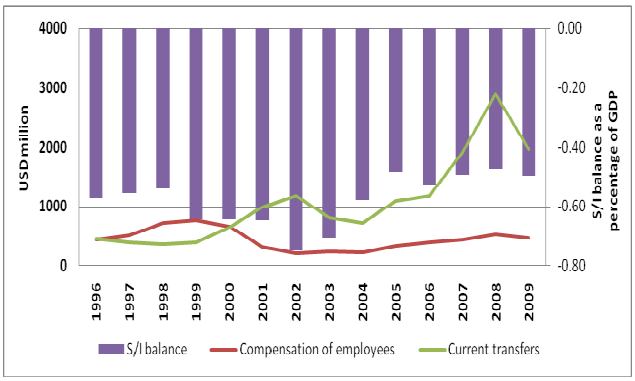


Figure 2: Inflation rate in Palestine vs. Israel

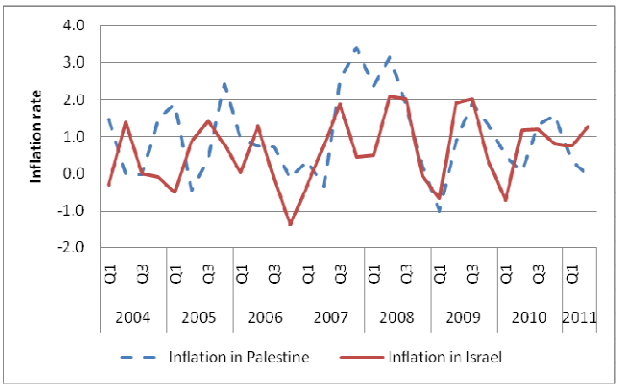


Figure 3: Current account deficit and sources of finance

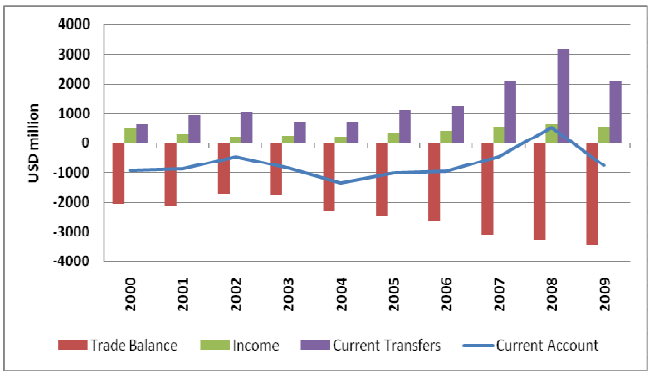


Figure 4: Palestinian market capitalisation vs. exchange rate of USD against NIS

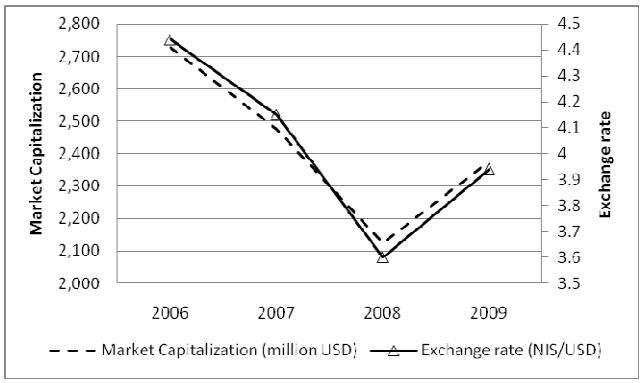


Figure 5.1: Federal fund rate vs. domestic lending (deposit) rate of USD

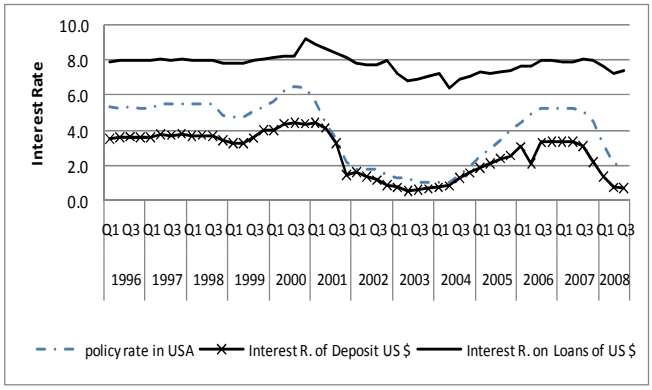


Figure 5.2: Israeli policy rate vs. domestic lending (deposit) rate of NIS

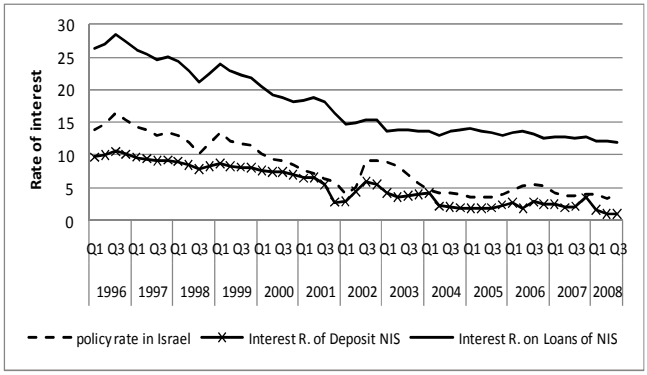


Figure 6.1: Impulse response to federal fund fate (FFR)

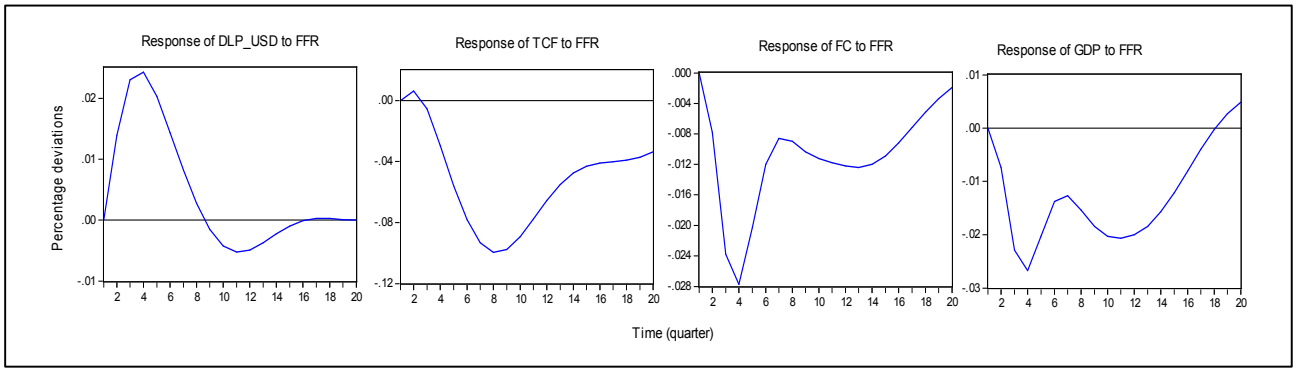


Figure 6.2: Impulse response to exchange rate of NIS/USD (E)

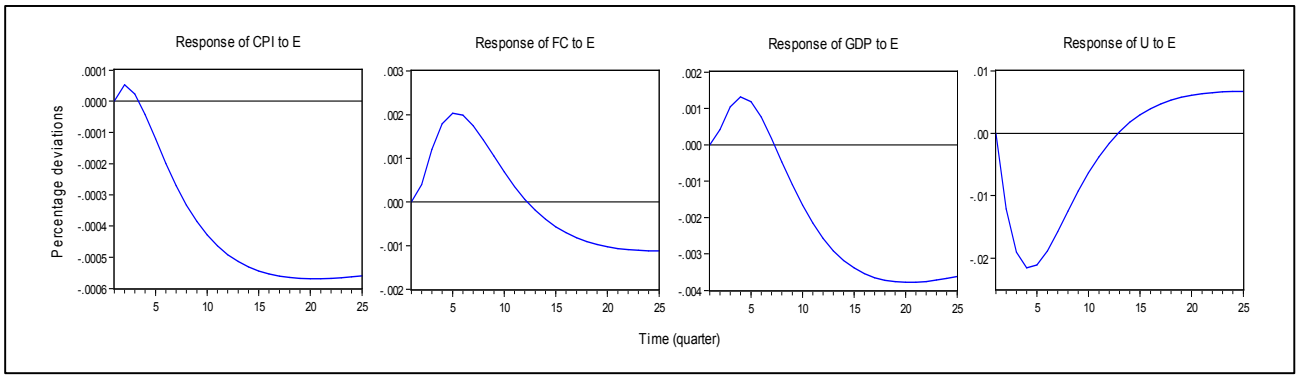


Figure 6.3: Impulse response to domestic lending rate of USD (DLR_USD)

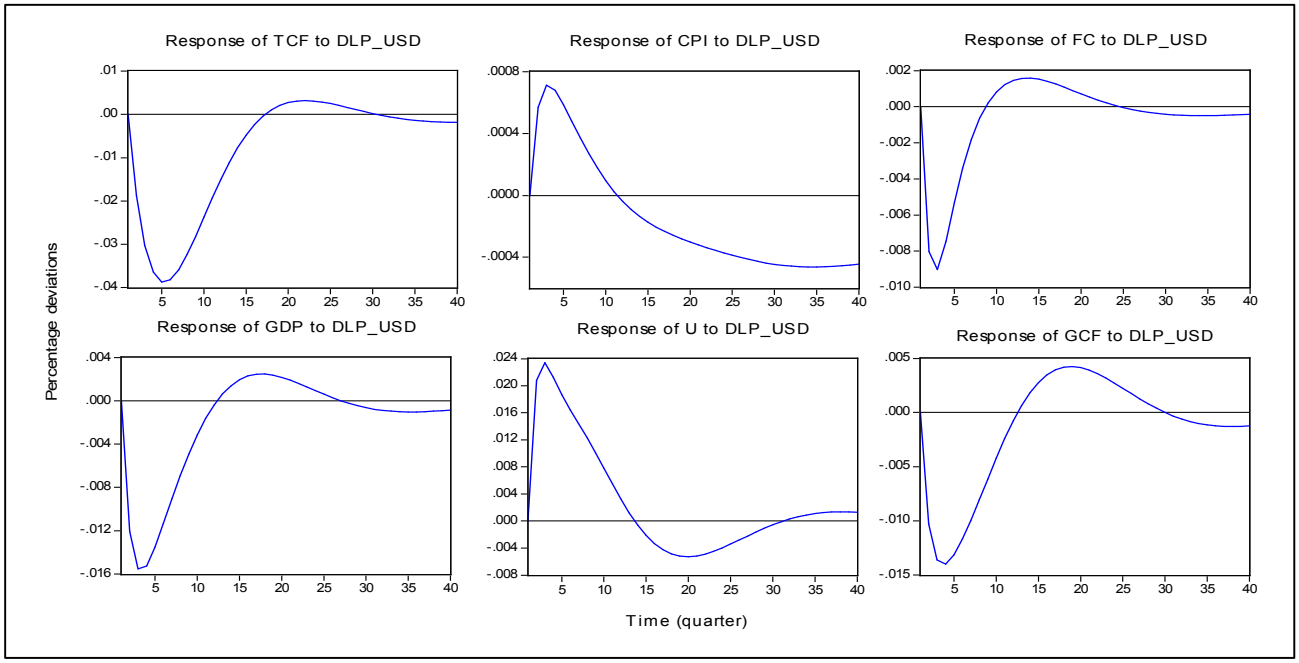


Figure 6.4: Impulse response to domestic lending rate of NIS (DLR_NIS)

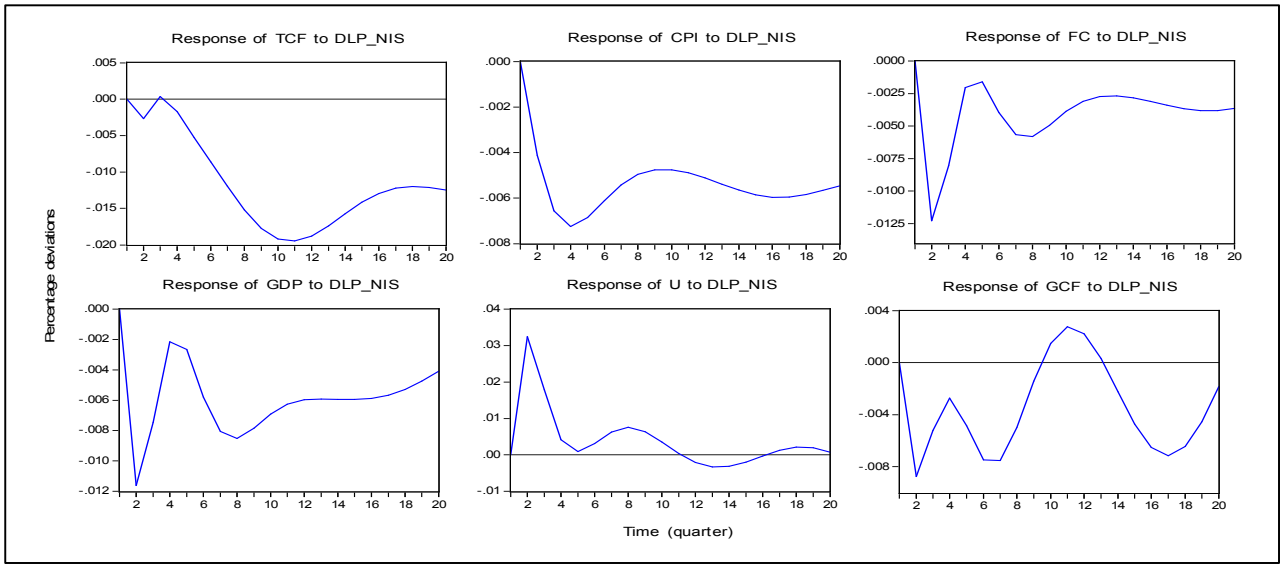


Figure 7.1: Actual vs. predicted domestic lending rate of USD

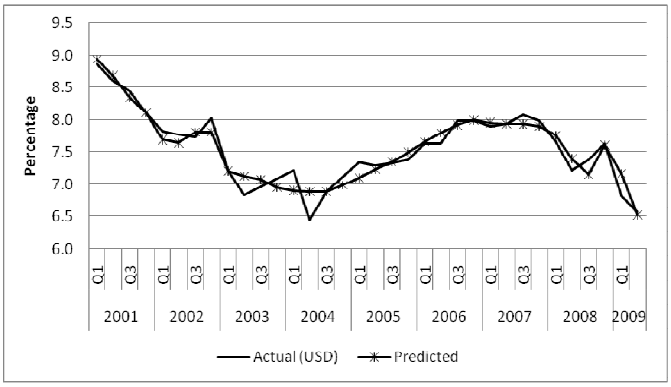


Figure 8: Average policy and lending rate in Palestine vs. policy rates of US, NIS and JD

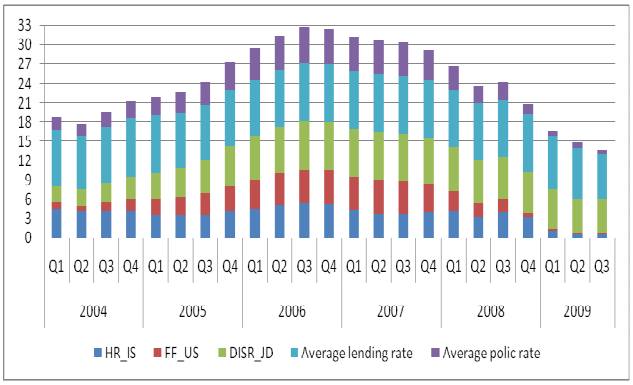


Figure 7.2: Actual vs. predicted domestic lending rate of NIS

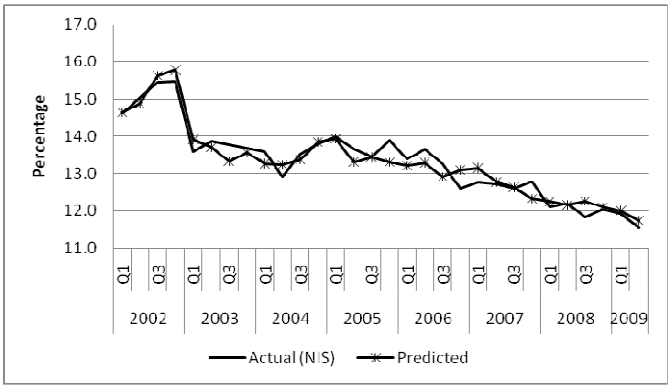


Table 1: A simple linear regression to predict domestic lending rates

Variables	Domestic lending rate of USD	Domestic lending rate of NIS
Constant	6.46 [0.089]	10.73 [0.360]
Federal Fund rate (USA)	0.25 [0.017]	
Headline rate (Israel)	0.043 [0.016]	
Prime Lending rate in Israel		0.21 [0.030]
Liquidity ratio of NIS in banking in Palestine		1.97 [0.491]
D1	0.53 [0.068]	1.61 [0.175]
D2		0.74 [0.166]
D3		-0.51 [0.142]
Adj-R^2	90.6%	92.1%
DW	2.2	1.9
Sample size	34	30

Numbers in parenthesis are standard errors

D1 equals 1 for the period of conflicts (Second Intifada: Q1 2001 – Q4 2002, Gaza War: Q4 2008 - Q1 2009) and zero otherwise.

D2 is a dummy capturing the optimistic period (2005:1 – 2005:4), where President Mahmud Abbas has been elected.

D3 is a dummy capturing the effect of the financial crisis on the Palestinian banking system; equals 1 during Q4 2007 – Q4 2008.

Table 2: Baseline estimate of VECM

Co-integrating equation				Coefficients
LOG(FC(-1))				1.000
LOG(GDP(-1))				2.317 [-0.396]
LOG(GCF(-1))				-2.531 [-0.220]
LOG(U(-1))				-0.621 [-0.140]
@TREND(96:1)				-0.020 [-0.003]
C				-6.182
	Coefficient			
Error Correction	D(LOG(FC))	D(LOG(GDP))	D(LOG(GCF))	D(LOG(U))
CointEq1	**-0.073 [-0.041]**	**-0.065 [-0.041]**	**0.037 [-0.047]**	**0.317 [-0.115]**
D(LOG(FC(-1)))	-1.353 [-0.760]	-2.273 [-0.764]	-1.981 [-0.875]	5.248 [-2.127]
D(LOG(GDP(-1)))	1.539 [-0.865]	2.447 [-0.868]	1.150 [-0.994]	-5.211 [-2.418]
D(LOG(GCF(-1)))	-0.282 [-0.207]	-0.297 [-0.208]	0.730 [-0.238]	0.311 [-0.578]
D(LOG(U(-1)))	-0.075 [-0.057]	-0.078 [-0.057]	-0.049 [-0.066]	-0.016 [-0.160]
C	0.008 [-0.009]	0.008 [-0.009]	0.008 [-0.010]	-0.003 [-0.025]

Note: Sample adjusted: Q4 1996 – Q2 2009, included observations: 50 after adjustments. [Std. error].

Table 3: VECM results of domestic lending rates and credit channels

	Model 1	Model 2	Model 3	Model 4
L(GDP(-1))	0.000	1.000	1.000	1.000
L(FC(-1))	1.000	-1.314 [-0.662]	0.000	-0.038 [-0.226]
L(GCF(-1))	0.317 [-0.269]	-2.006 [-0.346]	-0.707 [-0.062]	-1.169 [-0.123]
L(U(-1))	0.300 [-0.193]	-1.429 [-0.200]	-0.180 [-0.044]	-0.418 [-0.069]
L(DLR_USD(-1))	3.502 [-0.541]			
L(DLR_NIS(-1))		4.607 [-0.848]		
L(DLR_JD(-1))			0.931 [-0.241]	
L(TCF(-1))				-0.055 [-0.064]
@TREND(96:1)		0.025 [-0.007]	-0.003 [-0.001]	-0.003 [-0.003]
C	-17.118	5.431	-4.290	1.836
	Coefficients			
Error Correction	D(L(DLR_USD))	D(L(DLR_NIS))	D(L(LRP_JD))	D(LOG(TCF))
CointEq1	**-0.134 [-0.035]**	**-0.072 [-0.029]**	**-0.216 [-0.125]**	**-0.281 [-0.177]**
D(L(GDP(-1)))	-0.885 [-0.568]	-2.298 [-1.050]	0.713 [-0.466]	0.653 [-1.933]
D(L(GDP(-2)))		2.619 [-1.116]		1.653 [-2.317]
D(L(FC(-1)))	0.986 [-0.521]	1.637 [-0.897]	-0.590 [-0.407]	-0.911 [-1.635]
D(L(FC(-2)))		-1.977 [-0.974]		-1.416 [-1.899]
D(L(GCF(-1)))	0.053 [-0.116]	0.556 [-0.206]	-0.159 [-0.104]	-0.007 [-0.459]
D(L(GCF(-2)))		-0.913 [-0.279]		-0.548 [-0.697]
D(L(U(-1)))	0.050 [-0.029]	-0.008 [-0.039]	-0.013 [-0.025]	-0.146 [-0.070]
D(L(U(-2)))		-0.074 [-0.036]		-0.153 [-0.067]
D(L(DLR_USD(-1)))	0.100 [-0.139]			
D(L(DLR_JD(-1)))			0.218 [-0.218]	
D(L(DLR_NIS(-1)))		0.055 [-0.170]		
D(L(DLR_NIS(-2)))		-0.207 [-0.155]		
D(L(TCF(-1)))				0.064 [-0.165]
D(L(TCF(-2)))				0.258 [-0.167]
C	-0.037 [-0.008]	-0.085 [-0.036]	-0.120 [-0.054]	0.307 [-0.151]
L(FF_US)	0.029 [-0.006]			
L(PR_IS)		0.037 [-0.018]		
L(DISR_J)			0.065 [-0.030]	
L(EXCH)				-0.198 [-0.104]

Sample adjusted: Q4 1996 – Q2 2009, included observations: 51 after adjustments. [std. error]

Table 4: OLS regression of lending (deposit) rate in PT on policy rates

Country	Policy rate	Δ domestic lending rate on Δ policy rate	Δ domestic deposit rate on Δ policy rate	Δ domestic lending rate on Δ domestic deposit rate
Sample Q1 1996 – Q2 2009				
Israel	Headline rate	0.202 [0.064] 14.6	0.324 [0.094] 17.4	0.281 [0.086] 15.8
USA	Federal Fund rate	0.184 [0.069] 10.4	0.563 [0.091] 41.8	0.215 [0.081] 10.4
Jordan	Discount rate	0.155 [0.067] 7.8	0.182 [0.132] 1.7	0.168 [0.069] 8.6
Sample Q1 2001 – Q2 2009				
Israel	Headline rate	0.108 [0.077] 2.8	0.302 [0.145] 9.2	0.206 [0.083] 13.4
USA	Federal Fund rate	0.191 [0.088] 10.0	0.565 [0.121] 38.9	0.211 [0.100] 9.5
Jordan	Discount rate	0.261 [0.084] 20.9	0.236 [0.192] 1.5	0.146 [0.082] 6.1

Reported numbers are regression coefficients, followed by standard errors between brackets, then adjusted R squared.

Table 5: OLS estimates during Q1 2002 – Q2 2009

Independent Variables	Final Consumption	Gross Capital Formation	Exports	Imports	Inflation rate
Constant	-0.01 [0.004]	-0.03 [0.010]***	0.08 [0.030]**	-0.04 [0.009]***	0.6 [0.203]***
Lagged dependent variable		0.42 [0.073]***			0.11 [0.152]
Gross Domestic Product	0.91 [0.041]***				
USD domestic deposit interest rate		-0.09 [0.024]***			-0.67 [0.263]**
lagged domestic lending rate of USD loans	-0.08 [0.046]*	-0.12 [0.157]			3.33 [1.590]**
NIS domestic lending rate	0.06 [0.059]	-0.02 [0.195]	0.4 [0.244]		-1.35 [1.958]
Exchange rate of USD against NIS	0.06 [0.051]	-0.04 [0.151]		0.15 [0.078]*	
Exports		1.07 [0.111]***			
Final consumption				0.99 [0.065]***	
Lagged gross capital formation				0.16 [0.037]***	
Inflation rate			-0.07 [0.025]**	0.01 [0.009]	
Inflation rate in Israel			0.04 [0.020]*	0.02 [0.007]**	0.4 [0.131]***
Al-Quds index	-0.023 [0.009]**	0.07 [0.027]**			1.02 [0.334]***
GDP in Israel			0.52 [0.233]**		
Real wage			-0.18 [0.153]		
Foreign exchange reserves				0.09 [0.031]**	
Interactive dummy variable (D06*foreign aids)	0.02 [0.010]**				
Dummy variable (D06)	-0.10 [0.050]**	0.03 [0.014]*	-0.05 [0.02]**	0.03 [0.008]***	-0.35 [0.214]
Dummy Variable (D07)	0.01 [0.005]**	-0.01 [0.015]			
Adjusted R-squared	97.1	87.3	37	93	40.6
Durbin Watson	1.46	1.95	1.65	1.5	1.78
Sample size	30	30	30	30	30

***, **, * represents 1%, 5%, and 10% level of significant respectively. Numbers in parenthesis are standard errors. All equations are estimated in first difference form, except for inflation, where level is used.

APPENDIX 2

Data manipulation

Some data prediction and manipulation is needed as there are gaps of the data. Quarterly domestic rates and national account data is created to fill necessary gaps.

Domestic lending rates predictions

Domestic lending rates of the three main currencies used in Palestine are available on quarterly basis during Q1 2001 – Q2 2009[39]. A simple linear regression is used to predict the domestic lending rates during the period Q1 1996 – Q4 2000. Table (1) shows that USD domestic lending rate depends on the Federal Fund Rate, Headline rate, and a dummy variable to capture political and structural changes. NIS domestic lending rate depends on the prime lending rate in Israel, the liquidity ratio of NIS in Palestine, and a dummy variable. The OLS regressions align well with the data. Figures (7.1) and (7.2) demonstrate how predicted and actual domestic interest rates of USD and NIS behave during the period this thesis covers (Q1 2001 – Q2 2009).

Data for domestic interest rate for JD loans is available during the period Q1 2001 – Q2 2009, and it's predicted for Q1 1996 – Q4 2000, based on information about the domestic lending rate of USD. As the JD is pegged to the USD, it is expected that fluctuations are very similar. The difference between JD and USD interest rates is almost fixed; it's averaged to 1.54 during Q1 2000 – Q2 2009. It is assumed that the difference during the period of Q1 1996 – Q4 2000 is the same as in the subsequent period.

Predictions of quarterly national accounts

Bloem et. al (2001) used Benchmarking Technique to construct quarterly national account data- "The Proportional Denton Method". The Proportional Denton technique is used to construct the quarterly national accounts data in this thesis, since it resolves the step problem by smoothing the benchmarking indicators. The technique keeps the benchmarked series (predicted series) as proportional to the indicator as possible, by minimizing (in a least-squares sense) the difference in relative adjustment to neighbouring quarters subject to the constraint

provided by the annual benchmarks. Mathematically, the proportional Denton technique is formalized as follows:

$$\min_{(X_1,\ldots,X_{4y},\ldots,X_Q)} \sum_{q=2}^{Q}\left[\frac{X_q}{I_q}-\frac{X_{q-1}}{I_{q-1}}\right]^2$$
$$q \in \{1,\ldots,(4y),\ldots,Q\}$$

Subject to the constraint that the sum of the quarters should be equal to the annual data for each benchmark year:

$$\sum_{q=4y-3}^{4y} X_q = A_y \qquad y \in (1,\ldots,Y)$$

Where, q is time, q=4y-3 is the first quarter of year y and q=4y is the fourth quarter of year y. X_q is the derived quarterly national account estimate for quarter q. I_q is the level of the indicator for quarter q. A_y is the annual national account estimate for year y. Y is the last year for which an annual benchmark is available. Q is the last quarter for which quarterly source data are available.

The benchmark series (quarterly GDP) during Q1 1996 – Q4 1999 is predicted depending on the indicator (quarterly total credit facilities). Quarterly data for consumption, investment, and net export (benchmarks) during Q1 1996 – Q2 2009 are predicted from the quarterly GDP (indicator).

Policy rate predictions

An average policy (lending) rate in Palestine is estimated using weighted average policy interest rates (domestic lending rates) based on the weights of the three currencies lending. Policy interest rate in Palestine is predicted based on the USA federal fund rate (FF_US), headline rate in Israel (HR_IS) and discount rate in Jordan (DISR_J) as in the following equation (Cobham, 2010):

$$\text{Policy rate in Palestine} = \frac{\text{TCF in USD} \times \text{FF\_US} + \text{TCF in JD} \times \text{DISR\_J} + \text{TCF in NIS} \times \text{HR\_IS}}{\text{Total credit facility (TCF)}}$$

Whereas average lending rate was estimated as follows[40]:

$$\text{Lending rate in Palestine} = \frac{\text{TCF in USD} \times \text{DLR\_USD} + \text{TCF in JD} \times \text{DLR\_JD} + \text{TCF in NIS} \times \text{DLR\_NIS}}{\text{Total credit facility (TCF)}}$$

Predicted policy rate in Palestine is more likely to be elastic to policy rate fluctuations, while lending rate is less elastic to them. As a consequence of policy rate fluctuations, predicted policy rate in Palestine decreased from about 10% in 1996 to 2.2% in 2004, then increased to 5.3% in 2006 and decreased again to about 2.8% in 2008. In contrast, average lending rate was less elastic, since it decreased from about 12.2% in 1996 to 8.7% in 2004, then it increased to 8.9% in 2006 and later decreased to 8.8% in 2008 (Figure 8).

OLS results from using average predicted policy rate (lending/deposit rate), instead of domestic interest rates of each currency, are consistent with the previous ones presented in section V.2. Lagged policy rate has a negative impact on FC, with a significant (at 10%) coefficient. Average deposit rate has a negative influence on GCF, with a significant (at 5%) coefficient. Foreign trade (exports and imports) is not affected by interest rates. Results also indicate that inflation rate is affected positively by average lending rate, since the coefficient was significant, at 10%, while average deposit rate has a negative but insignificant coefficient.

CHAPTER TWO

THE EFFICIENCY OF THE BANKING SYSTEM IN PALESTINE 2000 – 2009

ABSTRACT

This chapter estimates the cost (technical) efficiency of the banking system in Palestine, using a panel of 18 banks during the period 2000 – 2009. Estimates have been obtained using the stochastic frontier approach. The analyses were extended to cover bank ownership (foreign and local) and type (Islamic and commercial). Results indicate that the overall cost (technical) efficiency of banks in Palestine is declining during the period of research. The mean of cost and technical efficiency was found to deteriorate through the years. Cost efficiency declined from 0.730 in 2000 to 0.666 in 2009, while technical efficiency declined from 0.733 to 0.713 during the same period. Moreover, the lower allocative efficiency (incorrect input mix rather than utilization or wasting resources) is the main cause of the decline in cost efficiency over the period of analysis. In addition, large banks have lower cost efficiency, which indicates the presence of diseconomies of scale for Palestinian banks.

Keywords: Palestine, cost efficiency, technical and allocative efficiency, stochastic frontier approach, data envelopment approach, translog cost function.

I. INTRODUCTION

Banks in Palestine are exposed to various financial, political and economic risks due to the abnormal political and economic conditions in which the Palestinian economy is operating. One example is the presence of three different foreign currencies instead of a national one. This absence of a national currency, as stipulated by the Paris Protocol, prohibits the Palestine Monetary Authority (PMA) from conducting monetary policy. It has, however, been playing many of the functions of a central bank, and most importantly, reinforcing domestic and international confidence in the Palestinian monetary and financial system. The overall purpose of the PMA is to regulate and supervise banks in Palestine, and to implement and operate modern and efficient payment systems. In doing so, the PMA is assisting in maintaining the stability of the Palestinian financial system and promoting sustained economic growth.

Despite the extraordinary conditions under which the Palestinian economy operates, the PMA has adopted a set of laws and legislations that enhance banking supervision and efficiency. The PMA has lately been engaged in a policy to reduce the number of banks operating under its jurisdiction by encouraging mergers and strategic partnerships. The motivation for this action is to raise bank capital, thus reducing insolvency risk. This, however, has other ramifications to equity holders in the form of lowering Return on Equity (ROE). Another byproduct of the merger is that it affects returns to scale, thus altering banking efficiency in an ambiguous way[41]. Moreover, the PMA forced banks to reduce placements abroad to 55% of total deposits[42] from 65%. In so doing, the PMA enhances the role of banking system in developing the Palestinian economy through providing funds for both private and public sectors (PMA, financial stability report, 2009).

The literature on banking efficiency in Palestine is scant; Odeh (2005) used the translog function to examine and analyze the main characteristics of the production operation of the banking sector in Palestine during the period 1996 – 2005. Al-khalil (2004) analyzed credit risks of the Palestinian banking system in a master thesis, which estimated the influence of credit policies

on private investment. In addition, Makhool (2006) measured the individual's satisfaction of banking services provided. Therefore, this study is one of the first to specifically address the efficiency of the banking system in Palestine.

This chapter will analyze the efficiency, cost structure and determinants of efficiency in the Palestinian banking during the period 2000 – 2009. The importance of this chapter stems from the vital need of both bankers and policy makers to track improvements and understand mechanisms through which banking efficiency is achieved. Advancing efficiency will improve financial services and lead to a higher volume of funds available in the market. This in turn opens more doors for the banking system to contribute to economic development. Moreover, as efficiency is an important indicator of good performance of individual banks and the productivity of the industry as a whole, measuring efficiency enables banks management, supervisory institutions and policy makers to spot weaknesses in the banking system and identify banks that might face future problems, giving way for precautious measures. This is particularly crucial in light of recent PMA attempts to enhance the Palestinian banking performance and efficiency, as this study will help policy makers and regulators evaluate policy repercussions and provide suggestions to remedies if necessary.

In addition to shedding light on the efficiency of banking industry in Palestine, this chapter attempts to identify the determinants of banking efficiency. For example, being a small economy with many foreign banks, no national currency and in a volatile regional environment implies that the banking system in Palestine is highly responsive to the external shocks which hamper baking performance[43]. An example of such shocks is exchange rate fluctuations, which are expected to affect the depositor and bank behavior. Studying these determinants will give insights on how the banking system adapts to political and economic shocks[44].

It should be noted that analyzing banking efficiency takes on an added significance in the case of Palestinian banks as they face increasing competition from their foreign counterparts (mainly Jordanian banks) and other financial institutions offering financial services. Finally, measuring

banking efficiency can provide some policy implications for issues such as mergers and efficient number of branches.

There haven't been any studies on the Palestinian banking efficiency; this study aims to measure banking efficiency in Palestine and to investigate the efficiency of foreign banks compared to the domestic counterparts. A number of Parametric and non-parametric tests has been employed to measure the efficiency of banking industry in Palestine and to investigate whether domestic banks are more efficient than foreign banks or vice a versa. Another goal of this chapter is to identify the determinants of banking efficiency in Palestine; in this regard, the effect of some factors will be examined on efficiency. First we want to investigate how bank size affects efficiency[45]. Another set of variables are included to capture the influence of different institutional aspects, such as a dummy variable to capture the impact of ownership and public listing on the Palestine Exchange. Furthermore, another set of variables used, such as capitalization, overhead costs per employee, asset quality measured by provision loans/loans, and asset growth.

I.1 BANKING DEVELOPMENTS

Palestinian-Israeli peace negotiations, and the subsequent Oslo Accords in 1993, resulted in the establishment in an interim authority in the West Bank[46] and Gaza Strip. This has had a great impact on the development of different economic and social sectors. The banking industry was one of those sectors that flourished after the peace agreement. An emerging central bank - PMA- was established in 1995. New Palestinian banks were licensed to operate and to open new branches under the supervision of PMA. As a result, the number of licensed banks has come to 20 banks with 209 branches by the end of 2009, including 10 foreign banks with 105 branches, and three Islamic banks[47]. Despite this flourishing period, the Palestinian economy, and banking sector in particular, are working under extraordinary economic and political conditions[48], which affect their capability and efficiency. Several factors and exogenous variables distorted market competition, efficiency and the development of banking services; the PMA has no monetary policy tools to control the market, there are no inter-banking tools to

regulate the inter-relationships between banks and there are three different currencies circulating in the Palestinian economy.

I.2 BANKING STRUCTURE AND REGULATION

The banking system in Palestine (as of end of 2009) consists of the PMA, twenty licensed banks (foreign and domestic), moneychangers, and micro-credit facility institutions. The PMA acts as a regulator and banking supervisor with its stated objective to become an independent central bank for an independent Palestinian state. Its overall purpose is to assist in the maintenance, stability, and effectiveness of the Palestinian financial system. Furthermore, it aims to promote sustained economic and financial growth of the Palestinian economy through effective and transparent regulation and supervision of banks and overseeing the implementation and operation of modern and efficient payment systems[49]. Its mission is to ensure the continuing achievement of domestic and international confidence in the Palestinian monetary and financial system, as well as enhancing banking efficiency in Palestine. To achieve its goals, the PMA developed action plans, measured responses, and prepared some scenarios to deal with the extraordinary environment. The PMA adopted a set of laws and legislations to enhance banking supervision such as, the anti-money laundering (AML) law, to prevent money smuggling, and protect the banking system.

The distribution of the 20 operating banks in Palestine is as follows: 10 foreign banks (eight Jordanian, one Egyptian, and HSBC British bank) and 10 domestic banks. The equity of banks amounted to $959 million by end of 2009, of which 76.2% was paid up capital. The index of population to total number of operating banks in Palestine was higher than 18 thousand citizens per branch at the end of 2009, which is considered a high ratio when compared to other neighboring countries. For example, the ratio in Lebanon was 6 thousand citizens and in Jordan each branch served about 10 thousand citizens by the end of 2009 (PMA, annual report 2009). The PMA is seeking to decrease the number of citizens for each branch to ten thousand citizens by

encouraging banks to open new branches in rural areas. This is expected to decrease the average cost by increasing scale production (Allen and Liu, 2005).

Total credit facility (TCF) -amounted $2234.3 million at the end of 2009- distributed between the West Bank and Gaza Strip, of which 92.1% was in the West Bank. Despite political and country risk, TCF increased by 22.2% compared to 2008, which is an indicator of the significant role of banking system in developing the Palestinian economy. On the other hand, deposits rose by 7.7%, on annual bases, to about $6.3 billion at the end of 2009.

Total credit facility amounted to 35.5% of deposits in 2009 compared to 31.3% in 2008, which might indicate some inefficiency in the banking industry in Palestine (PMA, annual report, 2009). Although the ratio has been improved between 2008 and 2009, in comparison with other countries, this is still low. The ratio in Jordan was about 65.6% in 2009 and 72.1% in 2008 (CBJ, 2009), and in Israel it was 84.4% in 2009 and 87.0% in 2008 (BoI, 2009). Banks in Palestine adopted a conservative policy of lending (due to high political risk) therefore the ratio of TCF to total deposits is relatively low.

II. LITERATURE REVIEW

During the last decades there have been many studies conducted to investigate and analyse the efficiency of banking sector. The majority of these studies covered developed countries (Berger and Humphrey (1997); Goddard et al. (2001)). Research about emerging markets is lagging far behind. Most studies agree on the nature of functions performed by banks and adopt the intermediation approach (Kraft and Tirtiroglu (1998); Rezanvian and Mehdian (2002); Isik and Hassan (2002)). Hence, Kumbahkar and Lovelli (2000) define “technical efficiency” as the ability of a firm to minimize input use in the production of a given output vector, or it is the ability to maximize output from a given input vector. They define “cost efficiency” as the minimum expenditure on variable inputs required to produce the output vector.

Berger and Humphrey (1992) found that during the 1980s banks in the US with higher total costs experienced higher rates of failure than banks with lower total costs due to increasing efficiency. Hasan and Marton (2000) indicated that bank size has a negative effect on allocative efficiency; the large size might have a positive impact on efficiency, because of having a higher chance of attracting talented management. On the other hand, large banks might be perceived as "too big to fail", which could lead to moral hazard behavior. Sathye (2001) argued that more professional management might require higher remuneration and, thus, highly significant positive correlation with all measures of efficiency is natural. Thus, increasing overhead costs leads to inefficient banking system.

Berger and Humphrey (1997) reviewed and surveyed 130 studies on the measurement and analysis of the efficiency of the financial sector. They concluded that the efficiency estimates from non-parametric approach (Data Envelopment Analysis - DEA) are similar to those from parametric approach models (Stochastic frontier approach - SFA). However, the non-parametric approach generally gives lower mean efficiency-estimates and greater dispersion than the results of parametric approaches.

Ahmad (2000) examined the efficiency of the banking system in Jordan during the period 1990 – 1996. He used econometric and mathematical programming to estimate the cost efficiency frontier, as well as a non-standard profit function to analyze the profit efficiency of Jordanian banks during the same period. He argued that average inefficiency is estimated to be 20-25% when using the parametric approach, while average inefficiency ranged from less than 10% to over 50% when using the non-parametric approach. The reason behind this contrast is the assumptions used, where the non-parametric approach assumes no random errors; any deviation from the frontier is due to inefficiency, while the parametric approach assumes that the error can be decomposed into two components (i.e. inefficiency and random error).

Abdel-Baki (2010) employed a non-parametric two-stage DEA model to measure the efficiency of Egyptian banks from 2004 to 2009, during which the Central Bank of Egypt implemented the

Entire Bank Reform Plan. She points out a consistent improvement in profit, operational and intermediation efficiency for all categories of Egyptian banks. Moreover, her results showed that the performance of state-owned and foreign banks lags behind their domestic counterparts in terms of profitability and production efficiency.

Camanho and Dyson (2005) used the DEA model to identify both input and output inefficiencies from a cost minimization perspective. Production and value-added approaches are deployed jointly to give an assessment of bank branch efficiency. In their paper, Camanho and Dyson highlighted that the major source of branch inefficiency is related to the balance of banking products sold. Furthermore, they argued that adopting different output mixes could reduce branch total costs significantly.

Kablan (2010) estimated a stochastic frontier analysis to measure efficiency of banking system in Sub-Saharan Africa (SSA), and used a generalized method of moment's system to explain financial developments. Furthermore, she assessed the determinants of banking system efficiency in SSA. In her study, Kablan found that banks in SSA are generally efficient but capitalization and non-performing loans have a negative impact on efficiency. She suggests that improvements in the regulatory and credit environment will improve the efficiency of banks in Sub-Saharan Africa.

Berger and Humphrey (1997) argued that in developed markets (such as in the US and to some extent Europe) foreign banks exhibit lower efficiency in comparison with domestic banks. However, Isik and Hassan (2002) and Hasan and Marton (2000) found that in emerging markets foreign banks succeed to exploit their comparative advantages and show higher efficiency than domestic banks.

Olena (2005) used DEA to investigate the efficiency of banking system in Poland during the period 1998 – 2000. She employed univariate and multivariate regression analysis in order to detect the determinants of banking efficiency in Poland. Her results showed that average

efficiency was 44.62% and 69.70% for domestic and foreign banks, respectively. Furthermore, results indicate that the size of a bank, overhead cost, number of employees, fast assets growth and poor quality of loan portfolio have a negative effect on allocative efficiency. Whereas publicly traded banks, and better capitalized ones have significant positive impacts on banking efficiency in Poland.

Battese et al (2000) deployed a translog stochastic frontier labour-use model to investigate the labour use in Swedish banks over the period 1984 – 1995. Results indicated that there are significant technical inefficiency effects from labour use in the Swedish banks. In addition, the different type of banks, number of branches, total inventories and year of observation significantly affect the level of the inefficiencies of labour use.

Fitzpatrick and McQuinn (2008) have simultaneously used a stochastic profit function and inefficiency model to measure bank profit efficiency in Ireland, UK, Canada and Australia. Results indicated that "bad management" and "bad luck" factors appear to have some influence on inefficiency levels of these banks. Moreover, they found that there are significant cross-country differences in levels of profit inefficiency.

Stavárek (2003) employed the DEA to estimate commercial banks efficiency in the Visegrad region (V4 group) during the period 1999 – 2002. Overall results indicated that there has been, with the exception of Hungary, no improvement in efficiency, and its actual level reaches preferably moderate levels. Furthermore, results indicated that there is evidence of statistically significant factors influencing banks efficiency in the whole V4 group such as profitability, foreign ownership and bank size. Another important result one may conclude is that country specific factors are still -in spite of globalization, integration, harmonization and other similar developments and processes- important determinants in explaining differences in banking efficiency levels in the V4 countries.

Mamatzakis et al (2010) employed the stochastic frontier methodology to estimate alternative profit efficiency in the banking industry of four new European Union Member States over the period 1999-2003. They investigated the impact of financial reforms on banking efficiency in four Central European countries. Results showed that structural reforms in the banking industry improve performance in terms of higher efficiency, whereas institutional development of the non-bank financial sector hinders banks' profit efficiency. In addition, they found a negative relationship between profit inefficiency and both the level of economic development, as measured by GDP per capita, and the inflation rate.

III. SAMPLE AND VARIABLES SELECTION

The sample data include an unbalanced panel of 18 banks during the period of 2000 – 2009 representing 174 observations, which account for more than 95% of banking assets in the time period under consideration. Hence, 17 banks were included each year for 2000 – 2005, while 18 banks were included each year for 2006 - 2009[50]. Panel data is preferable in order to be able to observe each bank more than once over a period of time, which is a critical issue in a changing business environment[51] (Isik, and Hassan, 2002). Moreover, Panel data provide larger sample size, and therefore, more degrees of freedom, accounting for time variations in efficiency (managerial, regulatory or environmental factors), or generating a more satisfactory solution to biases produced by heterogeneity within the dataset (Irsova, 2010).

The sample includes both commercial and Islamic banks. Data was obtained from various issues of the Association of Banks in Palestine and the PMA. Hence, it's worth mentioning that, before 2006, each bank was using its own balance sheet. Therefore, we may find some data discrepancy. Starting with 2006, the PMA unified the items of banks balance sheet, as well as many other reforms which has been taken by the PMA such as decreasing the number of commotions and fees from about 180 fees to about 60.

Table (1) shows notable variations between banks in Palestine over the sample period 2000 – 2009. Minimum total cost ($0.50 million), for example, is too far from the maximum of $101.87 million. Minimum total assets ($13.67 million) are very small compared with a maximum of $2560.43 million. In addition, some banks are running with zero non-performing loans, while others have over $34.16 million. This suggests a variation in the effectiveness of banks working in Palestine over time.

Table 1: Descriptive statistics of output and input variables (2000 – 2009)

Variable*	Definition	Mean	Std. Dev.	Min	Max
TC	Total cost	11.34	16.33	0.50	101.87
AC**	Average cost (TC/total outputs)	0.055	0.021	0.024	0.125
TA	Total assets	303.77	496.03	13.67	2560.43
NPL	Non-performing loans	1.27	3.24	0.00	34.16
Outputs					
TCF	Total credit facility	84.14	125.27	1.20	736.50
INV	Total Investment	168.97	302.68	5.63	1495.53
Inputs					
LAB	Number of employees	198.50	217.62	11	874
TD	Total deposits	267.40	456.73	8.56	2313.59
CAP	Total fixed assets	7.09	9.69	0.05	51.85
Prices of inputs					
PC	Price of capital (operating costs net of personnel expenses / total assets)	0.01	0.01	0.003	0.04
PL	Price of labor (employees expenditure/total number of employees)	0.02	0.01	0.01	0.05
PD	Price of deposits (interest expenses / total deposits)	0.02	0.02	0.00	0.09

*All variables are measured in $ Million, except labor which represent number of employees

** Average cost (AC) measured in dollars per unit of output (AC = TC/(TCF+INV); Number of banks 18; Number of observation: 174

Figure (1) depicts the change in total cost compared to the change in outputs (i.e. investment plus total credit facility) of banks in Palestine. It shows that both have the same trend as both have increased during the period of 2001 – 2005, and when output decreased during 2006 and 2008-2009, total cost also decreased. This might imply that banks in Palestine lack long term plans and strategies to control costs or, at least, do not consider efficiency when setting them possibly due to the instability of the political environment[52].

Figure 1: Change in total cost and outputs of banks in Palestine

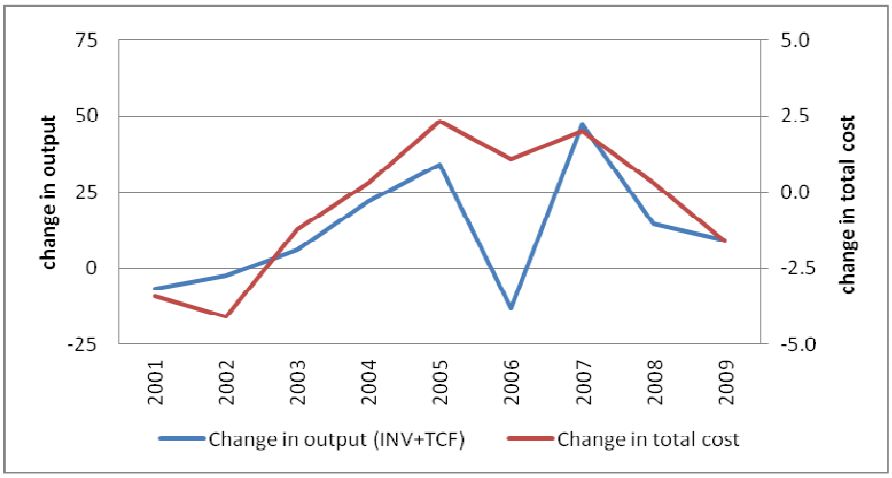


Figure (2) is more representative, where it shows the price of inputs and total cost for domestic and foreign banks over the period of study. The figure shows that the price of deposits has a major role in determining the behavior of total cost of banks in Palestine. This implies that banks do use the price of deposits to control their costs, i.e. total cost declined when the price of deposits is reduced and vise a versa. This emphasizes the fact that banks do not have long term strategies. It also indicates that banks reduce their costs at the expense of the depositors by cutting interest expenses. Finally, it implies that banks in Palestine are affected by global markets through the price of deposits, as banks use LIBOR as a benchmark for interest rates on deposits in Palestine due to the absence of a national currency.

Figure 2: Total cost vs. price of inputs of foreign and domestic banks

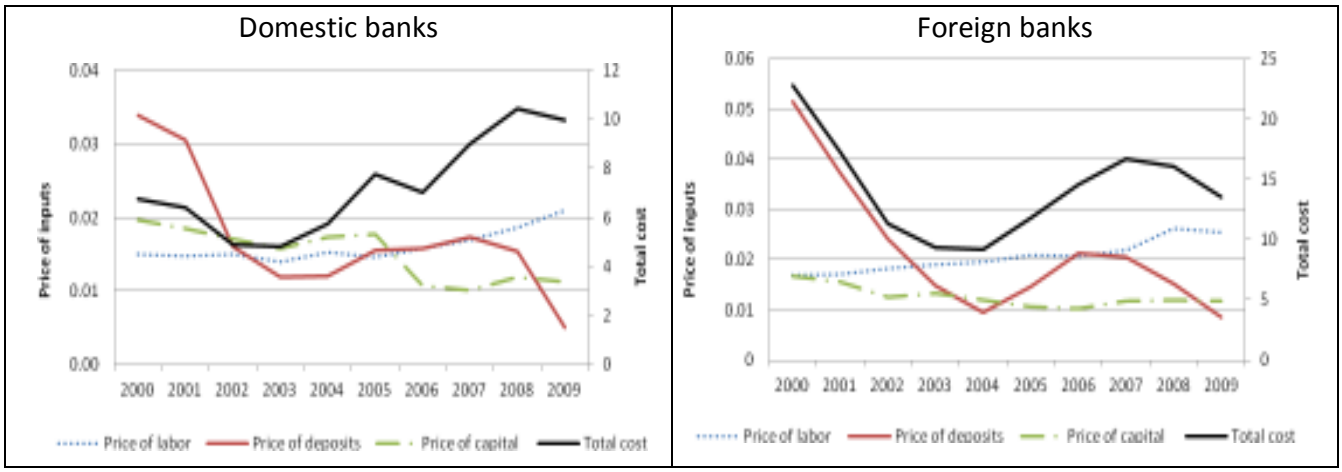


Table (2), below, reports the ***average*** of total cost, inputs and outputs indicators according to: (1) some selected years; (2) bank ownership; (3) bank size[53]. It indicates that average cost (AC) has a decreasing trend over the study period, where it declined from about $0.084 in 2000 to $0.047 per unit of output in 2009. This is mostly due to banking reforms that occurred during the study period, especially 2006 – 2009, when a new structural plan (STP) was introduced by the PMA in the aims of increasing transparency, further regulating the banking sector and tightly supervising banks.

Table 2: Mean of bank indicators*

Item	TC	PC	PL	PD	IE	W	AC**	INPUTS			OUTPUTS		Banks' No.
								TD	LAB	CAP	TCF	INV	
YEAR													
2000	16.19	0.648	0.016	0.044	10.36	2.84	0.083	225.9	183	6.04	71.3	141.2	17
2004	7.79	0.438	0.018	0.011	1.87	3.29	0.048	242.9	171	8.14	76.6	155.1	17
2007	13.28	1.276	0.020	0.019	5.36	4.48	0.051	311.9	223	6.14	91.3	208.9	18
2009	11.98	1.858	0.023	0.007	1.88	5.75	0.047	365.3	244	7.68	122.6	201.3	18
ONWERSHIP													
Foreign	14.28	1.221	0.021	0.022	5.94	4.54	0.054	350.5	216	7.07	99.5	227.7	100
Domestic	7.38	0.455	0.016	0.017	2.28	2.83	0.057	155.0	174	7.11	63.3	89.6	74
BANK SIZE													
Small	2.82	1.383	0.019	0.020	0.93	0.97	0.060	43.6	53	1.70	20.4	26.3	79
Medium	7.35	0.484	0.017	0.022	2.82	2.49	0.056	137.7	147	4.85	57.3	81.1	40
Large	26.49	0.495	0.019	0.018	10.48	8.86	0.049	638.2	444	16.45	195.2	437.7	55

This table shows the average outputs, inputs, and cost structure for 2000 – 2009; all variables are measured in million dollars, except for labor (LAB) which is measured in numbers of employees. Total cost (TC); Price of capital (PC); Price of labor (PL); Price of deposits (PD); Interest expenses (IE); Personal expenses wages and salaries (W); Average cost (AC); Total deposits (TD); Number of banking employees (LAB); Physical capital (CAP); Total credit facility or total loans (TCF); and Total investments (INV).

* Means of variables are computed for all banks in some selected years (YEAR); means are computed for all banks over the period of study (2000 – 2009) according to ownership (OWNERSHIP) and bank size (BANK SIZE).

** AC represents the mean value of average cost for all banks for each year; AC by ownership was calculated for each bank over time and then the mean for all banks is reported above and likewise by bank size.

TC fluctuations for all banks over the period of study (2000 – 2009) are mainly a result of interest expense fluctuations, as these expense accounts, on average, for about 37% of TC over the study period. Table (2) also shows an increase in average input and output variables and prices of capital and labor and a decrease in the price of deposits over time. As expected, the rise in prices of capital is due to the increase of depreciation and amortization of fixed assets over time. While prices of deposits decreased as a result of banks attempting to control their expenses as well as the decline in global interest rates (i.e. LIBOR).

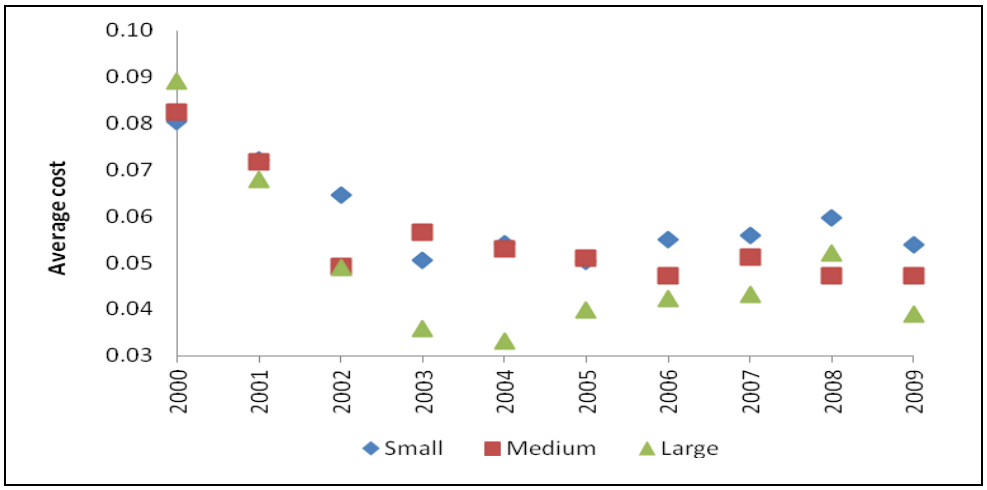
As for banks' ownership, table (2) shows variations between foreign and domestic banks. AC per unit of output of foreign banks is $0.003 lower than that of domestic banks[54]. Therefore, we might expect foreign banks to be more efficient. In general, more than 60% of inputs and outputs are hired and exploited by foreign banks. The investigation of labor price across groups shows that foreign banks pay higher wages and benefits than domestic ones. Over the period of study (2000 – 2009), foreign banks paid their employees an average of $21000 per year, while domestic banks paid an average of $16500.

The analysis of the price of capital, measured as the ratio between non-personal expenses over total assets, also reveals that foreign banks pay much higher prices (each foreign bank paying an average of $1.22 million) than do domestic banks (each domestic bank paying an average of $0.46 million). Hence, foreign banks might be paying more rent for offices and equipment, and they are paying more interest expenses and other financing charges than domestic banks.

Domestic banks, however, paid a lower price for funds; each bank paid an average of $17100 compared to $21800 for each foreign bank as interest expenses over the period of study 2000 – 2009. This can be attributed to the fact that foreign banks acquire most of the Palestinian deposits[55] therefore foreign banks paying higher amount of interest, $5.94 million, compared to 2.28 million paid by domestic banks during the same period (2000 – 2009). In other words, domestic banks need to pay higher interest rate on deposits to attract more clients which increases their price of funds.

As for size, large banks pay a lower price of funds compared to medium and small size banks, as the latter pay higher prices to attract more deposits and source of funds. Large banks also have a relatively low average cost compared to medium and small size banks (figure 3). In addition, figure (3) shows the variation of average cost of banks before 2006 were higher than they were post 2006.

Figure 3: Average cost of all banks according to bank size during 2000 - 2009.



IV. THE MODEL

This chapter uses the SFA, as developed by Aigner et al. (1977), to estimate cost and technical efficiency. The choice of SFA (parametric approach) over DEA (non-parametric approach) is justified on the grounds that even though DEA imposes less structure on the efficiency frontier than SFA, they have the drawback of not allowing for random errors, data problems or other measurement errors. Christos et. al. (2008) argued that applying DEA in transition economies is a significant disadvantage because uncertainty and measurement problems loom large. On the contrary, SFA allows for measurement error, and the generation of firm-specific efficiency estimates, which are important for bank managers in order to improve their operational efficiency.

The fundamental element of the stochastic frontier approach is that each bank potentially produces less than it might because of a degree of inefficiency; specifically:

$$q_{it} = f(x_{it}, \beta)*\xi_{it} \qquad (1)$$

Where q_{it} is output, the x_{it} are input quantities, β is a vector of technology parameters to be estimated, and ξ_{it} is the level of technical efficiency for bank i at time t; ξ_{it} must be between 0 and 1. If $\xi_{it} = 1$, the bank is achieving the optimal output with the technology embodied in the

production function $f(x_{it}, \beta)$. When $\xi_{it} < 1$, the bank is not making the most of the inputs (x_{it}) given the technology embodied in the production function $f(x_{it}, \beta)$. The degree of technical efficiency is assumed to be strictly positive since the output is assumed to be strictly positive (i.e. $q_{it} > 0$).

Furthermore, output is also assumed to be subject to random shocks, implying that

$$q_{it} = f(x_{it}, \beta)*\xi_{it}*\exp(v_{it}) \quad (2)$$

Taking the natural log of both sides yields:

$$Lnq_{it} = lnf(x_{it}, \beta) + ln\xi_{it} + v_{it} \quad (3)$$

Assuming that there are k inputs and the production function is linear in logs, defining $u_{it} = -ln\xi_{it}$ yields:

$$Ln\, q_{it} = \beta_0 + \sum_{j=1}^{k} \beta_j Ln\, x_{jit} + v_{it} - u_{it} \quad (4)$$

The chapter uses cost function approach instead of the profit function approach for mainly two reasons: The profit function requires price data for outputs, and this is difficult to construct in case of Palestinian banking system. The profit function specifies both inputs and outputs, which implies that the number of parameters is significantly higher than that for a cost function. Thus, degrees of freedom become a more severe constraint (Kraft and Tirtiroglu, 1998).

Kumbhakar and Lovell (2000) provided a detailed cost version, and they show that performing an analogous derivation in the dual cost function problem allows us to specify the problem as:

$$Ln(C_{it}) = \beta_0 + \beta_q \ln(q_{it}) + \sum_{j=1}^{k} \beta_j Ln(P_{jit}) + v_{it} - au_{it} \quad (5)$$

where C_{it} is cost and P_{jit} are input prices, and

$$a = \begin{cases} 1, & \text{For production function} \\ -1, & \text{For cost function} \end{cases}$$

Intuitively, the inefficiency effect is required to lower output or raise expenditure, depending on the specification.

A likelihood ratio test (LR) was conducted to determine the frontier functional form; the purpose of the test is to determine whether this functional form is the Cobb-Douglas form against the Translog functional form. The test indicated that the translog functional form is more representative. Thus, a translog function with composite error is used to measure the efficiency of banks in Palestine. The parameters of stochastic frontier model are estimated by the maximum likelihood (ML) method. The stochastic cost function is defined as (Kraft and Tirtiroglu, 1998)[56]:

$$Ln\,C_{it} = a_0 + \sum_{i-1}^{2} a_i Ln\,Q_{it} + \sum_{m=1}^{3} b_m LnP_{mt} + \frac{1}{2}\sum_{n=1}^{3}\sum_{m=1}^{3} \alpha_{nm} LnP_{mt} LnP_{nt} + \frac{1}{2}\sum_{i=1}^{2}\sum_{j=1}^{2} \beta_{ij} LnQ_{it} LnQ_{jt} + \sum_{i=1}^{2}\sum_{m=1}^{3} \delta_{im} LnQ_{it} LnP_{mt} + \sum_{i} \varphi_i LnZ_i + v_{it} + u_{it} \quad (6)$$

Where subscript *i* denotes the cross-sectional dimension (banks), *t* stands for the time dimension, *Ln*C_{it} = the natural logarithm of total costs for a panel of N banks and time T; *Ln*Q_{it} is the natural logarithm of bank outputs (total loans and total investments); *Ln*P_m is the natural logarithm of the *m*th input price (i.e. labor, physical capital, and loan-able fund); a_i, b_m, α_{nm}, β_{ij}, and δ_{im} are coefficients to be estimated. To ensure homogeneity of degree +1 of the cost frontier in input prices, it's assumed that $\sum_m b_m = 1$ and $\sum\alpha_{nm} = \sum\beta_{ij} = \sum\delta_{im} = 0$. Moreover, theoretical considerations suggest imposing symmetry on the cross-price and quantity effects (i.e. $\alpha_{nm} = \alpha_{mn}$, $\beta_{ij} = \beta_{ji}$ and $\delta_{im} = \delta_{mi}$). However, this chapter ensures homogeneity through normalizing cost and input prices by the price of capital before taking logarithms to impose linear input price homogeneity (Yildirim and Philippatos (2001). Z_i stands for a set of control variables; asset quality which is defined as non-performing loans / total loans; bank size (large, medium and small); equity, and dummy variables.

The stochastic components v_{it} and u_{it} represent random errors and inefficiency errors, respectively. The random errors v_{it} are assumed to be uncorrelated across time and panel, and normally distributed with mean zero and variance $\sigma_v^2 > 0$. The components u_{it} are assumed to have a strictly non-negative distribution (it's often referred to as the *inefficiency term*) and it is

provided by a truncated-normal distribution with mean μ^+ and variance $\sigma_u^2 > 0$[57] (Berger and DeYoung, 1997).

The sum ($v_{it} + u_{it,}$) reflects technical and economic inefficiencies, as well as pure random shocks in the production process that might be due to careless handling and defective or damaged output. It also reflects unfavorable external events such as bad luck, climate, and machine performance (Aigner et. al. 1977).

The technical inefficiency term (u_{ht}) is defined as follows:

$$u_{ht} = \{\exp[-\eta(t - T)]\}u_h \quad (7)$$

Where technical inefficiency (u_{ht}) decreases, increases, or constant over time depending upon whether $\eta > 0$, $\eta < 0$, or $\eta = 0$, respectively.

Similar to many other studies, the intermediation approach is applied in order to measure efficiency, which assumes that the main function performed by a bank is to channel funds between depositors and borrowers at the lowest possible cost (Gilbert and Wilson (1998); Kraft and Tirtiroglu (1998); Rezvanian and Mehdian (2002); Isik and Hassan (2002)). According to the intermediation approach, banks are producing two outputs (Loans, and other investments), and employing three inputs (capital, labour, and deposits). All variables except labour are measured in millions of US dollar. Labour is measured in number of employees.

The input vector includes: Labor [LAB], the number of full-time employees[58]; Capital [CAP], the book value of premises and net fixed assets[59]; and total deposits [TD], it includes time, saving and current deposits. Hence, total costs include both interest expenses and operating costs (personnel expenses and salaries, maintenance and leasing of buildings, car leasing and equipment, non-banking fees and commissions, insurance expenses, depreciation and amortization, and insurance on deposits).

Prices of inputs were computed in order to calculate cost (technical) efficiency; Price of labour is derived by taking total expenditures on wages, salaries, and employee benefits divided by the number of employees. Price of deposits is calculated by dividing interest expenses by total deposits. As for price of capital, there were several ways to calculate it. Olena (2005) calculated price of capital as the depreciation of fixed assets divided by fixed assets. D.G. McKillop (1996) calculated it as a ratio of (real yen) non-personnel expenses to the (real yen) value of movable and immovable capital. While Carvallo and Kasman (2005) consider the price of capital as the operating costs net of personnel expenses over fixed assets. Laura Cavallo and Stefania Rossi (2001) adjusted this definition to account for distortions by taking it as net of depreciation. Moreover, Semih Yildirim and George C. Philippatos (2001) measured the price of physical capital as the ratio of other operating expense to fixed assets. Fitzpatrick and McQuinn (2008), on the other hand, measure the price of physical capital as a ratio of noninterest expenses – personnel expenses over the corrected fixed assets. This chapter defines the price of physical capital as the ratio of non-personnel expenses over total assets. This is due to the unavailability of data on the yearly depreciation. As a result, we cannot employ the ratio of non-personnel expenses to net fixed assets as unit price for capital.

The output vector includes: Total Credit Facility [TCF][60] and Total Investments [INV] which includes deposits of banks inside Palestine, deposits of banks outside Palestine, subsidiaries, affiliates, minority interests, subordinated loans, securities available for sale, securities held to maturity, and reserves for investments.

Moreover, there are some covariates (factors), which are likely to affect banking efficiency in Palestine; such as: non-performing loans (NPL), bank size (large, medium, and small), bank ownership (foreign vs. domestic), and equity.

Bank size may be an important factor in explaining banking efficiency as some banking literature indicates (Roberta, et. al, 2010). Therefore, we test whether bank size can help explain efficiency. To construct this explanatory variable “bank size” we employ the

classification provided by Roberta and others (2010), which is the classification of the Central Bank of Brazil. All banks that add up to 75% of total banking assets are classified as large. Medium sized banks are the banks that add up from 75% to 90% of total assets. Finally, small banks are the banks that add up from 90% to 100% of total bank assets.

Asset quality (non-performing loans/total loans) is positively related to banking inefficiency. Hence, it is expected that it has a positive influence on total cost. In addition, an inverse relationship exists between cost efficiency and equity because less equity implies higher risk taken at greater leverage.

IV.1 HYPOTHESIS TO BE TESTED

The main objective of this chapter is to investigate the incidence, magnitude and determinants of banking efficiency in Palestine during 2000 – 2009. To achieve this goal, the chapter will focus on the following questions:

a) Does the banking system in Palestine, as a whole, show any evidence of efficiency? A t-test will be conducted to test the null hypothesis that the banking system in Palestine is fully efficient against the alternative hypothesis that the efficiency of banking system is less than fully efficient.
b) Did efficiency estimates improve during the period of interest (2000 – 2009)?
c) Do commercial and Islamic banks in Palestine have the same level of efficiency?
d) Do differences in bank size, publicly-traded shares, bank ownership (foreign vs. domestic), capitalization, overhead costs, number of employed workers, assets growth, and quality of loan portfolio have any impact on banking efficiency in Palestine?

V. EMPIRICAL RESULTS

Stochastic cost frontier approach is used to generate estimates of cost (technical) efficiencies for each bank over the years 2000-2009. The maximum likelihood function is used to estimate the cost (technical) efficiency of all banks in Palestine using the translog function (stochastic

frontier cost function). Estimating the model using the maximum likelihood method, enables us to use both z-test as well as the LR tests (Coelli et al. 2005). Robustness tests were applied before running the translog model; LR and t-test are used to test for the presence of cost (technical) efficiency. In addition AIC and LR-test were used to choose among various specifications, the selected model (based on AIC) specifies the price of capital as the non-personal expenses divided by total assets.

The LR statistic is used to test whether technical inefficiency effects are not present in the model (i.e. banks in Palestine are fully efficient). The LR statistic is 106.27 and with 19 degrees of freedom, the calculated $\chi^2_{0.95}(19)$ is 30.14 therefore the null hypothesis is rejected and it is concluded that the inefficiency component is present in the total cost. Moreover, a t-test is used to test whether cost (technical) inefficiency effects are not present in the model, which is expressed by the null hypothesis H_0: $\hat{\lambda} = 0$, where the parameter $\hat{\lambda}$ is defined by $\hat{\lambda} = \sigma_u^2 / (\sigma_v^2 + \sigma_u^2)$. The parameter $\hat{\lambda}$ is between zero and one, where $\hat{\lambda}$ is zero implying a full technical efficiency. Hence, the null hypothesis (H_0: $\hat{\lambda} = 0$) states that banking system is fully technically efficient and the alternative hypothesis (H_1: $\hat{\lambda} > 0$) states that part of the error term is due to the inefficiency in banking system.

$$t^* = \frac{\hat{\lambda}}{se\,(\hat{\lambda})}$$

where $\hat{\lambda}$ is the ML estimator of λ and *se(* $\hat{\lambda}$ *)* is the estimator for its standard error. However, $t^* = 11.3$ for the cost function, which is greater than tabulated t-statistics ($t_{0.95}$) = 1.96, thus the null hypothesis that there is no cost (technical) inefficiency effects is rejected. In other words, results indicate a presence of cost (technical) inefficiency in Palestinian banking system. Moreover, $\hat{\lambda} = 0.842$ implying that much of the variation in the composite error term (84.2%) can be attributed to the inefficiency component (table 3).

LR test is used to test the null hypotheses that the technical inefficiency effects are time invariant (H_0: $\eta = 0$) and have a half normal distribution (H_0: $\mu = 0$). If parameter η is positive, the technical efficiency term increases over time and vice versa. However, if η is zero, then banking efficiency will be constant over time. Similarly, if parameter μ is zero, then banking efficiency would have a half normal distribution instead of a truncated normal distribution (Goyal and Suhag, 2003).

The LR test indicates that the null hypothesis that bank efficiency has a half normal distribution cannot be rejected at 5% level of significance[61]. LR = –2*[105.29 – 106.27] = 1.96, which is less than the 5% critical value $\chi^2_{0.95}(1)$ = 3.842. Thus, the null hypothesis that bank efficiency have a half normal distribution cannot be rejected. This implies that the inefficiency terms are independently and identically distributed i.e. $u_i \sim iidN^+(\mu, \sigma^2_u)$.

The time invariance of banking efficiency is rejected at the 5% level, the computed LR is 3.64 while the critical value is 2.71, so we can reject the null hypothesis that the technical efficiency of the banks in Palestine is constant over time. Hence $\eta < 0$, which indicates that technical efficiency of banks in Palestine, is decreasing over time (table 3).

Table (3) presents the estimation of the cost frontier function. Overall, results show a good fit and the signs of estimated coefficients are in line with the theory. The coefficients of the price of labor and funds have a positive and significant influence on total cost at 1% level of significance. With respect to the elasticity of total cost to the two outputs (loans and investments), the estimated coefficients are both positive and statistically significant at the 1% level of significance. The coefficient on the cross-output term is negative and statistically significant at 1% level of significance, and the same applies to the cross-price term. Moreover, the coefficients of asset quality (non-performing loan / total loans) and equity are negative, though not statistically significant. On the other hand, results indicate that the global financial crisis (in late 2007) had a positive influence on total cost of banks in Palestine, though the

coefficient is statistically insignificant. Furthermore, when all independent variables are set to zero, total cost will be 5.7 million US dollar.

Table (3): The cost frontier function parameter estimates[62]

Variable	Coefficient	Std. Err.	t-statistic
Ln(PL)	0.713***	0.039	18.420
Ln(PD)	0.287***	0.039	7.410
0.5*Ln(PL2)	-0.105***	0.023	-4.500
Ln(PL)*Ln(PD)	-0.098***	0.024	-4.180
0.5*Ln(PD2)	0.203***	0.017	11.940
Ln(L)	0.663***	0.064	10.380
Ln(I)	0.293***	0.078	3.740
0.5*Ln(L2)	0.292***	0.024	12.120
Ln(L)*Ln(I)	-0.325***	0.026	-12.510
0.5*Ln(I2)	0.353***	0.035	10.140
Ln(PL)*Ln(L)	0.015	0.026	0.560
Ln(PL)*Ln(I)	-0.086***	0.026	-3.360
Ln(PD)*Ln(L)	0.025	0.019	1.350
Ln(PD)*Ln(I)	-0.006	0.018	-0.320
Ln(NPL/Loans)	-0.116	0.571	-0.200
Ln(Equity)	-0.003	0.027	-0.130
Dummy (d06)	-0.021	0.033	-0.640
Dummy (d08)	0.034	0.032	1.070
Constant	1.740***	0.163	10.690
Mu	0.400***	0.156	2.560
Eta	-0.032*	0.017	-1.890
Gamma	0.842	0.075	
sigma_u2	0.063	0.034	
sigma_v2	0.012	0.001	
Number of observations		172	
Log likelihood function		106.3	

***, **, and * indicate 1%, 5% and 10% significance levels, respectively.

Results, presented in Tables (5) and (6), indicate that the average cost (technical) efficiency of banks in Palestine is in line with efficiency of those banks in the MENA region and some Arab countries. The overall average cost and technical efficiency of banks in Palestine during the period 2000 – 2009 is about 69.8% and 72.3% respectively. Ahmad (2000) found that the average overall cost efficiency of banks in Jordan during the period 1990 -1996 was about

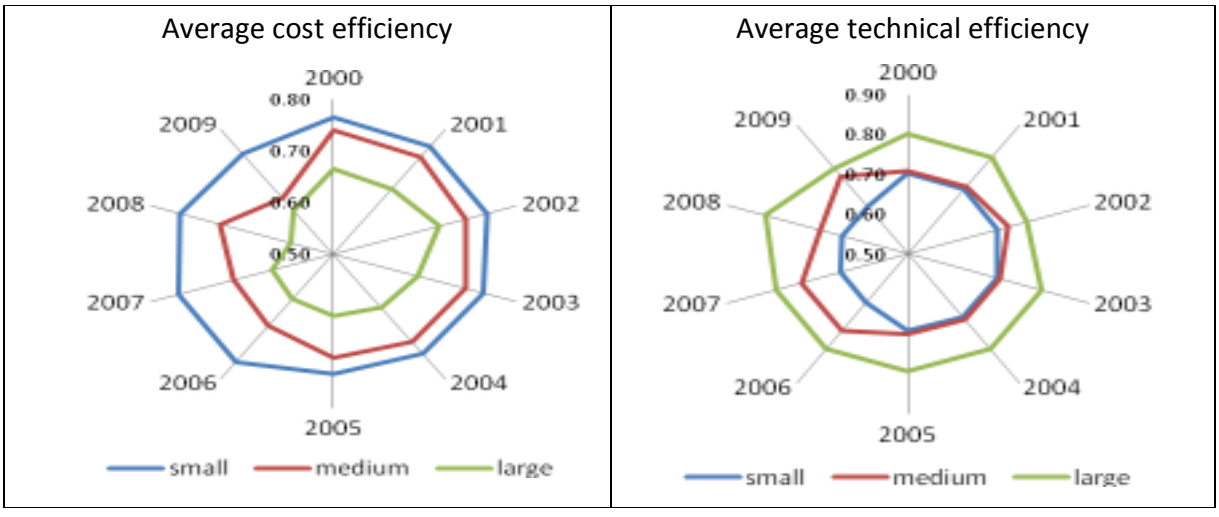
77.5% or 73.5% based on the econometric frontier approach and the mathematical programming approach respectively. In addition, Poshakwale and Qian (2009) found that the average scores of cost efficiency of banks in Egypt are generally around 74.8% during the period of 1992 – 2007. Kablan (2010) predicted the average cost efficiency to be around 76.5% in Sub-Saharan Africa, 74% in Eastern Africa, and 76.6% in Southern Africa. Bouchaddakh and Salah (2005) predicted the average cost efficiency of the Tunisian banking system to be about 86% over the period 1997 – 2003. Empirical results for developing countries yield close levels of cost efficiency. For example, cost efficiency in Turkey was 68.5% in 1996 (Isik and Hassan (2002)), in Pakistan the pre-reform period efficiency was 48.5% and climbed to 72.8% in the post-reform period (Hardy and Bonaccorsi di Patti (2001)). Grigorian and Manole (2002) report efficiency in the range of 23.7% in Belarus and 79.9% in the Czech Republic. Berger and Mester (1997) found that cost efficiency of banks in US was about 72%. Moreover, Yildirim and Philippatos (2002) estimate the cost efficiency of banks in European transition economies during the period 1993 – 2000 to be ranged between 70% and 80.4%

The overall cost (technical) efficiency of banks in Palestine appears to have a downward trend; results in Table (5 and 6) show that cost (technical) efficiency was 73.0% (73.3%) in 2000, 70.1% (72.6%) in 2004, and 66.6% (71.3%) in 2009. This fall might be attributed to different factors; Palestine experienced fundamental and chronic economic and political abnormalities since the establishment of the Palestinian Authority in 1993, this has been exacerbated since the outbreak of the second intifada in late 2000, which adds more costs on banks. An increase of employee compensations, which constitute more than 33% of the total cost, lowers cost efficiency of banks in Palestine. These compensations have also doubled during the 2000 – 2009 period to about $103.6 million. Moreover, increasing competitiveness among banks encouraged more branching, and thus, reducing cost (technical) efficiency. In addition, cost efficiency fell over this period partly due to PMA procedures and regulations in monitoring and supervision. These regulations enforced Basel II requirements, which induce relatively new and high costs[63].Banks, for example, were obliged to install ATM machine for each new branch, to update and modify the accounting systems in line with modern standards; they were also

obliged to commit to using effective banking supervision and standards of Basel II. Furthermore, banks were required to introduce new sections and careers, such as "Monitor compliance", which all entail new costs on banks[64]. In addition, banks were obliged to increase their capital from about $35 million by end of 2009 to $50 million by end of 2010. Finally, banks lack long term strategies. All these factors have contributed to raising overall banking costs and lowering cost efficiency.

As for cost (technical) efficiency according to bank size, results in Tables (5 and 6) show that small size cost efficiency (75.0%) is higher than that of medium (69.6%) and large size (62.4%). On the contrary, technical efficiency was lower in small banks (67.9%) than that of medium (71.7%) and large (79.2%) size banks over the period of interest, (Figure 4). This result coincides with Isik and Hassan (2002), which suggests a negative relationship between banks size and cost efficiency. This can be explained by the competition between small and large banks, where small banks compete with large ones primarily in populated urbanized (metropolitan) markets, and not in rural and remote markets. Therefore, small banks show more market discipline, which leads to higher cost efficiency. In addition, Hasan and Marton (2000) found a negative relationship between a bank's size and allocative efficiency as large banks might be perceived as too big to fail, which could lead to moral hazard behavior.

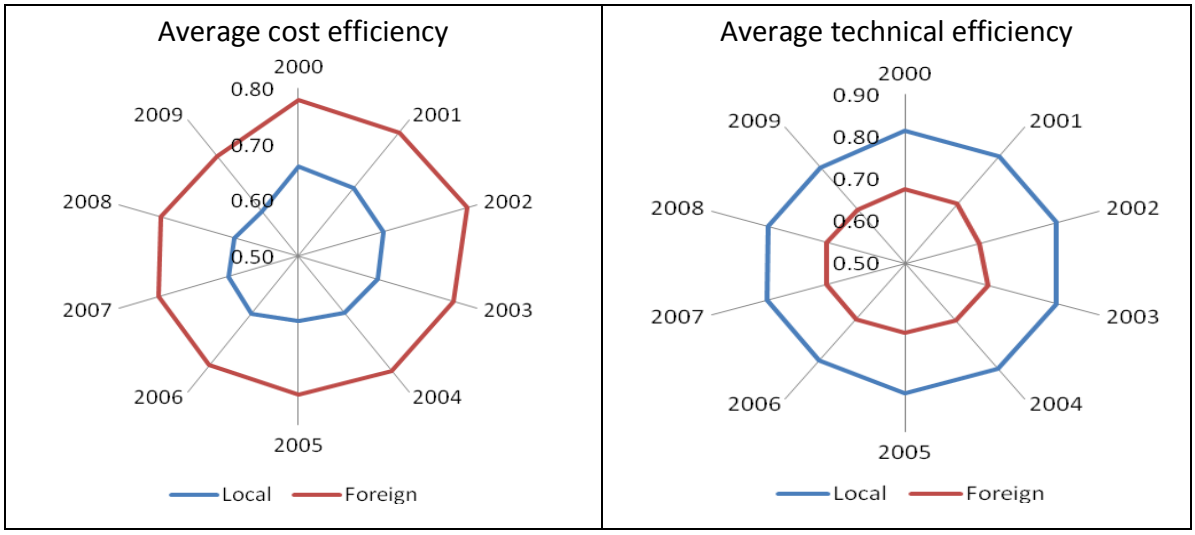
Figure 4: Average cost and technical efficiency according to banks size (2000 – 2009)



As for bank nationality, results in Table (5 and 6) show that foreign banks have higher cost efficiency (75.2%) compared with (62.7%) of local banks. On the contrary, local banks show higher technical efficiency (80.0%) than their foreign counterparts (66.5%) during 2000 – 2009, (Figure 5). A higher cost efficiency in foreign banks may be attributed to the high labor productivity ($1350 per worker), which is almost double that of local banks ($790 per worker). Also, foreign banks have the advantage of having more experience than domestic banks, which provides some opportunities for foreign banks to utilize this comparative advantage.

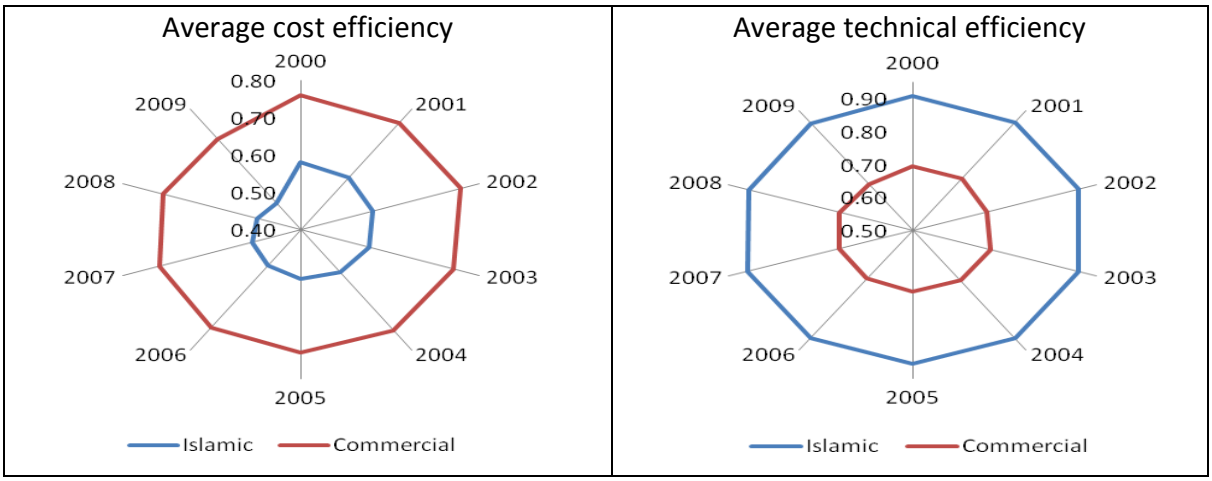
In addition, domestic banks might be slower to adopt new technologies and make investments in automation. This is contrary to the finding of Isik and Hassan (2002), who found that for local banks, technical inefficiency is smaller than allocative inefficiency; which suggest that the dominant source of their cost inefficiency is allocative (regulatory) rather than technical (managerial).

Figure 5: Average cost and technical efficiency by banks' ownership (2000 – 2009)



Finally, commercial banks show higher cost efficiency (73.3%) than Islamic banks (53.5%), mean while technical efficiency (68.5%) is found to be lower than of Islamic banks (90.5%) during the period of interest (Figure 6).

Figure 6: Average cost and technical efficiency by bank type (2000 – 2009)



The low cost efficiency of Islamic banks is possibly to the political conditions and adoption of anti-terrorism law by various countries around the world mainly USA and Israel[65]. This compelled Islamic banks to implement its banking transactions through a third party (i.e. through a third bank) which induces higher costs.

Moreover, Islamic banks provide its banking services according to the Islamic law (Al-Shariah), and it adopts the principle of Musharakah (partnership in profit and loss), this imposes more risks on these banks due to the high uncertainty in Palestine. Furthermore, the weak legal environment, the little attention given to Islamic banks by official institutions in Palestine, as well as the modernity and lack of experience of these banks weakens their performance[66]. This suggests that the dominant source of cost inefficiency in Islamic banks is allocative (regulatory) rather than technical (managerial). To the contrary, technical inefficiency is the dominant source of cost inefficiency in commercial banks in Palestine. However, the higher allocative inefficiency relative to technical inefficiency implies that managers of Islamic, large and local banks in Palestine performed relatively well at utilizing all factor inputs, but they were not so well at choosing the proper input mix given the prices.

Hence, overall banking inefficiency in Palestine may be attributed to choosing the incorrect input mix rather than mal-utilizing or wasting resources. The reason for the high allocative

inefficiency overtime might be the considerable volatility in factor prices due to exposure to external factors and shocks, such as exchange rate and interest rate fluctuations, and vulnerability of domestic prices, particularly in Israel (imported inflation). High uncertainty about input prices increases the likelihood of bank managers to make inefficient decisions. Political instability, movement and access restrictions, and the absence of a national currency[67], lead to deterioration in the performance of the Palestinian economy in general and both banking and financial sectors in particular.

VI. POTENTIAL DETERMINANTS OF EFFICIENCY

Having estimated the cost efficiency scores of banks in Palestine during 2000 – 2009, the next step is to determine whether efficiency levels can be explained by specific factors. For this purpose, we provide an explanatory analysis by regressing cost efficiency (dependent) against a number of financial and structural variables (exogenous). GLS model was used to estimate correlation between cost efficiency and other determinants[68].

Table (4) reports the results of the estimation of GLS regression. Overall, most coefficients are significant and in line with our expectations. The coefficient of the size variable is negative and statistically significant at the 1% level, indicating a presence of diseconomies of scale. This result coincides with Odeh (2007), in which he argued that most Palestinian banks are either near or at the optimal size, which means that with more branching and expansion of banks in Palestine since 2007, many banks may have moved across the scale to less inefficient production. Banks with higher ratio of non-performing loans to loans (LNPLR) are found to be less cost efficient. Hence, the coefficient of LNPLR is negative, but insignificant. The GDP growth rate variable has a positive coefficient indicating that favorable economic conditions would improve banking efficiency. However, GDP growth rate as well as total asset growth rate have a very low (almost zero) influence on cost efficiency. This coincides with reality since many other factors affects cost efficiency of banks in Palestine, such political conditions and the relatively high uncertainty. Among market structure variables, the degree of competition, measured by

Herfindahl-Hirschman index (HHI), has a positive influence on cost efficiency. These results suggest that banks operating in more competitive markets are under more pressure to control their costs by exercising their potential market power. Furthermore, foreign banks operating in Palestine appear to be more cost efficient relative to local banks, though the coefficient is insignificant. The dummy variable representing the political instability and conflict has a positive and significant influence on cost efficiency of banks in Palestine; this is mainly due to the conservative lending and investment policy adopted by banks during such conflict periods.

Table 4: Random effect of generalized least square (GLS) regression

Variable	Coefficient	Std. Error	t-statistic
Bank size (SZ)	-0.005***	0.002	-2.610
Bank nationality (BN)	0.047	0.048	0.970
Bank type (BT)	0.166**	0.074	2.260
Overhead cost per employee (OCE)	0.239***	0.062	3.850
Logarithm of non-performing loans over loans (LNPLR)	-0.006	0.039	-0.150
Total assets growth rate (TAR)	0.000	0.000	0.620
GDP growth rate (GDPR)	0.000***	0.000	-5.810
Herfindahl Hirschman index (HHI)	0.332***	0.076	4.360
Dummy (d06)	-0.008*	0.004	-1.850
Dummy (d01)	0.014***	0.001	10.430
Constant	0.448***	0.077	5.850
Rho	0.991	99.1% of the variance is due to the difference across panels	
Number of observation		154	
Wald chi2(10)		801.3	
Prob > chi2		0.000	
R-squared		0.403	

Dependent variable is cost efficiency. ***, **, and * indicate 1%, 5% and 10% significance levels, respectively.

VII. CONCLUSION

The analysis of the cost and technical efficiency of the banking industry in Palestine during the period of 2000 – 2009 shows significant differences of cost (technical) efficiency between banks by type, nationality and size. Moreover, results show a downward trend of overall efficiency

over the period of study. Despite having a downward trend, the overall average efficiency is in line with that of banks in the MENA and some Arab countries.

Finding large and significant differences in cost efficiency in different groups of banks classified by ownership, type and size indicates that banks in Palestine competed weakly with each other in cutting costs and that competitive input market existed. Hence, small banks compete with large banks primarily in metropolitan markets, and therefore, show more market discipline, which leads to higher cost efficiency. Moreover, foreign banks have had higher labor productivity, in addition to utilizing their comparative advantage of having more experience, adopting new technologies and make investment in automation. In the case of Local banks, allocative inefficiency is a dominant source of cost inefficiency, revealing that these banks suffer from regulatory matters rather than managerial ones. Thus, the higher allocative inefficiency in the case of Islamic, large, and local banks indicate that these banks performed relatively well at utilizing all factor inputs, but not so well at choosing the proper input mix given the prices.

Results also show that the PMA regulations, such as strict banking supervision and monitoring, have a negative influence on banking efficiency. This could be explained by the increase in the cost of upgrading banking technology platforms, enlarging branch networks and managing diverse activities. However, the negative influence is expected to be in the short-term, while it is expected that the positive effect of bank reforms will take place in the medium and long-term.

PMA must use further measures to increase competition, fairness and transparency between existing banks. These focused on reducing information gaps, between banks and customers and on allowing consumers to switch easily and cheaply between banks. Most of these recommendations can be implemented through bank supervision directors of PMA, but some measures would require legislation by the Palestinian Legislation Council.

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APPENDIX

Table (5): Predictions of cost efficiency of banks in Palestine

	Bank size			Bank nationality		Bank type		
Year	Small	Medium	Large	Local	Foreign	Islamic	Commercial	TOTAL
2000	0.765	0.740	0.665	0.660	0.779	0.582	0.761	0.730
2001	0.759	0.733	0.656	0.651	0.773	0.572	0.755	0.723
2002	0.753	0.718	0.674	0.643	0.783	0.562	0.759	0.722
2003	0.747	0.718	0.639	0.634	0.760	0.552	0.742	0.708
2004	0.740	0.711	0.630	0.625	0.754	0.541	0.735	0.701
2005	0.734	0.703	0.620	0.616	0.747	0.531	0.728	0.693
2006	0.759	0.672	0.609	0.626	0.741	0.520	0.724	0.690
2007	0.753	0.664	0.599	0.617	0.734	0.509	0.716	0.682
2008	0.753	0.685	0.570	0.608	0.730	0.498	0.710	0.672
2009	0.740	0.635	0.605	0.598	0.720	0.487	0.702	0.666
TOTAL	**0.750**	**0.696**	**0.624**	**0.627**	**0.752**	**0.535**	**0.733**	**0.698**

Table (6): Predictions of technical efficiency of banks in Palestine

	Bank size			Bank nationality		Bank type		
Year	Small	Medium	Large	Local	Foreign	Islamic	Commercial	TOTAL
2000	0.703	0.710	0.801	0.815	0.676	0.908	0.696	0.733
2001	0.701	0.708	0.800	0.814	0.674	0.907	0.694	0.732
2002	0.699	0.723	0.762	0.813	0.653	0.906	0.681	0.723
2003	0.697	0.704	0.797	0.811	0.670	0.906	0.690	0.728
2004	0.695	0.702	0.796	0.810	0.668	0.905	0.688	0.726
2005	0.694	0.701	0.794	0.809	0.666	0.904	0.686	0.725
2006	0.650	0.739	0.794	0.785	0.664	0.904	0.681	0.718
2007	0.648	0.737	0.793	0.784	0.662	0.903	0.679	0.716
2008	0.647	0.696	0.818	0.783	0.662	0.902	0.679	0.719
2009	0.647	0.742	0.765	0.781	0.658	0.902	0.675	0.713
TOTAL	**0.679**	**0.717**	**0.792**	**0.800**	**0.665**	**0.905**	**0.685**	**0.723**

CHAPTER THREE

MICRO CREDIT IN PALESTINE (1995-2008): A BUSINESS HISTORY PERSPECTIVE*

ABSTRACT

This chapter analyses the development and functioning of the micro credit industry in Palestine in the period between its establishment as a partially-autonomous political entity (1994) and the Israeli invasion of the Gaza Strip (2008). The chapter shows how despite the increase of potential demand for micro credit due to the deterioration of the economic environment, the growth of the sector has been below expectation. One of the most important causes of this phenomenon has been the reluctance to lend caused by the growing risk of late or no repayment of loans. Using original data from one micro credit institution (*Arab Centre for Agricultural Development*) and a quantitative approach the chapter investigates the causes of this problem. Results show that the risk of late payment was negatively correlated to the level of interest rate, to macroeconomic conditions, and to the age of the borrower while it was positively associated to the share of investment in the Gaza Strip, and to the size of loans.

Keywords: Palestine; micro credit; development economics

*This chapter has been co-authored by Paolo Di Martino who is a lecturer in International Business History at the University of Birmingham (UK) and member of the research project 'Creation of a Centre for Advanced Studies and Research in Cooperation and Development at Bethlehem University.

I. INTRODUCTION

In 1993, in a meeting held in Oslo, the Israeli government and the Palestine Liberation Organization signed an agreement which allowed three distinct geographic areas, East Jerusalem, the so-called West Bank, and the Gaza Strip, a limited political and economic autonomy to be administered by the Palestine National Authority. Since then the region, usually referred to as *Palestine Territory*, or *Occupied Palestinian Territory*, or simply *Palestine,* experienced a high degree of political instability, often degenerating in open military conflicts, which attracted the attention of the academic world and of the general public alike. However, while political, military and social aspects have been deeply investigated and discussed, much less attention has been paid to the evolution of the economy and of the business environment.[69]

Among the neglected topics are the one of the development of the credit sector and, in particular, of the dynamics between ordinary banks and non-for-profit organizations, including micro finance and micro credit institutions (MCIs).[70] This lack of attention to the credit market is problematic given that, as a number of recent studies in economics has pointed out, the credit sector has an active role in pushing economic performance and cannot be seen as a passive element that only responds to the stimuli coming from the real economy (among others, King & Levine, 1993).

In mature economies this function is performed mainly by the formal banking system and the stock market, thus research usually focuses on these two elements only. However, this is much less true in developing countries where large sections of the population are too poor or too risky to be served by profit-oriented institutions and where ignorance and cultural norms also make individuals unwilling to approach ordinary banks (Robinson, 2001). Thus in this context the study of the functioning of the credit market cannot be performed without paying substantial attention to the role of non-for-profit institutions, including MCIs.

In the Palestinian case two further considerations motivate the interest in the micro credit sector. Firstly, political instability and military confrontations make Palestine a very good case in point to analyze the issue of micro credit in conflict areas, a trajectory already established in the literature (Manalo, 2003; McNulty & Nagarajan, 2004). Secondly, Palestine is particularly interesting to analyze the extent to which micro credit helps develop more direct participation and stronger responsibility in the economy among less affluent and often cut-off members of society. Such development of stake-holding is important in every developing country, but it is particularly relevant in economies such as Palestine where the availability of a disproportionate amount of external loans and donations risks leading to passive if not parasitic attitudes (Israel/Palestine Centre for Research and Information [IPCRI], 2005). However, despite its undisputable relevance and interest, the topic of the development and functioning of the micro credit industry in Palestine is almost non-existing, especially when compared to the attention directed to the study of this themes in other geographic areas; as a matter of fact, our preliminary survey of the literature has revealed that available studies only amount to an MA dissertation published by the University of Uppsala in 2008 and some descriptive works, largely at micro level (Abuznaid, 2005; Abukarsh, 2005; Fridell 2008).

The aim of this chapter is thus to start filling this gap in the literature. The chapter focuses on the period between the signature of the Oslo agreement and 2008. This is not only because of the limitations in the availability of data, but also because the invasion of Gaza at the end of that year opened new scenarios whose impact on the Palestinian economy in general, and on the micro credit sector more specifically, cannot be fully analyzed yet. This study adopts a firm-based perspective by analyzing with an empirical and quantitative approach the strategies and performance of the *Arab Centre for Agricultural Development* (ACAD), an important player in the market. This case study is framed in the more general analysis of the development of the micro credit sector in Palestine and of the macroeconomic scenario in which these organizations operate.

The chapter is structured as follows; section two explores the development of the credit market in Palestine. Section three analyses the characteristics of this sector while section four focuses more specifically on ACAD. Using original data from ACAD, sections five and six run a quantitative test to analyze the determinants of portfolio risk. More specifically, section five describes data and methodology and provides descriptive statistics, while section six discusses results. Section seven concludes.

II. THE DEVELOPMENT OF THE CREDIT MARKET

Alike the real side of the economy, during the last 15 years the financial sector has been hit by exogenous shocks and has operated under severe uncertainty. On top of these issues common to all sectors of the Palestinian economy, the banking industry also suffered from the specific problem of the absence of a national currency, and US Dollar, New Israeli Shekel, and Jordanian Dinar being used in parallel. This meant that the Palestine monetary authority could not implement any meaningful monetary policy and that inter-banking lending has been difficult if not impossible.

In this context it is not surprising to see that in terms of number of banks no change occurred in the last decade. By the end of 2008 twenty-one different banks operated in Palestine, ten of which foreign (eight Jordanian, one Egyptian, and HSBC bank), exactly the same number as in 2001 (table 1).

Table 1: Number of banks and branches in Palestine

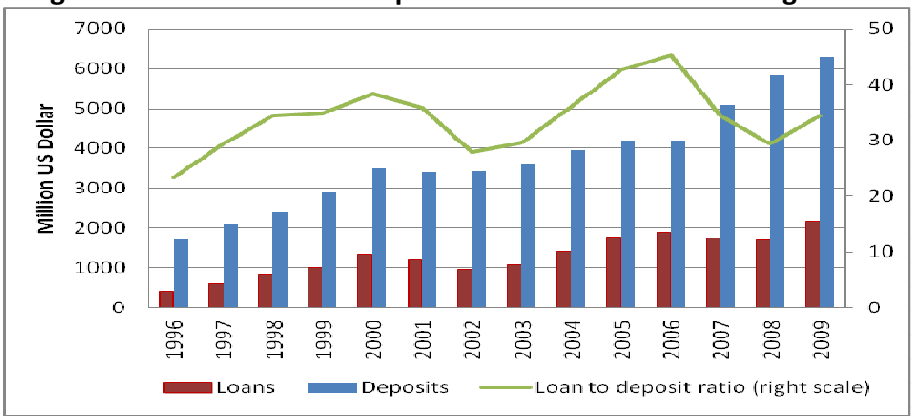
	Number of Banks	Number of bank branches		
		West Bank	*Gaza Strip*	*Total*
2001	21	89	35	124
2002	20	89	36	125
2003	20	94	37	131
2004	20	96	37	133
2005	20	101	38	139
2006	21	111	40	151
2007	21	119	41	160
2008	21	144	46	190

Source: PMA, 2009.

Among these, a non-negligible share of the market (12.8 % in 2008) was in the hands of three banks operating according to Islamic principles (PMA, 2009). Although the number of banks remained constant between 2001 and 2008, the number of branches increased from 124 to 190, 144 located in West Bank and 46 in the Gaza Strip.

This means that although the number of intermediaries did not augment, the existing ones have increased their capacity to penetrate the market. The most evident sign of this pattern is the increase in the volume of deposits which shows a clear positive trend, with phases of rapid growth between 1996-2000, 2003-2005, and 2008-2009 (Figure 1).

Figure 1: Total amount of deposits and loans of the banking sector

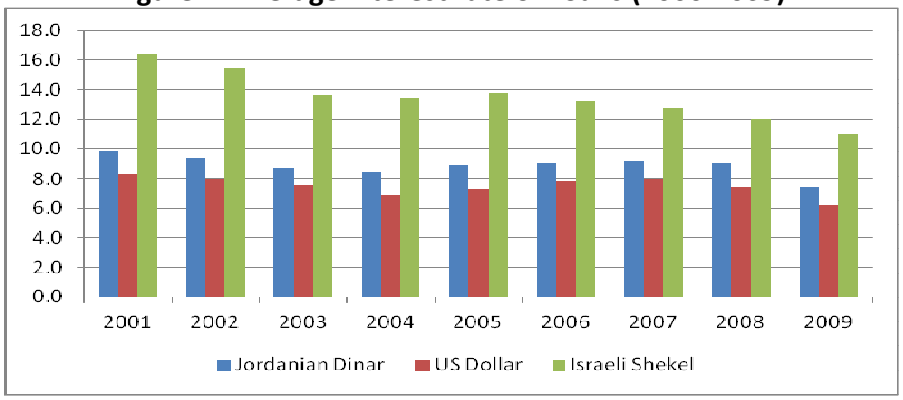


Source: PMA, 2009.

However the increase in the level of deposit was not mirrored by a similar trend in the amount of loans provided and these, similarly to the pattern of some of the macroeconomic variables analysed in the previous section, increased up to 2000, declined during the years of the *Second Intifada*, grew again during the mid 2000s, and contracted since 2006. This implies that from a financial point of view the problem with Palestine was not the lack of savings (or their collection), rather the ability to reinvest them in the real economy. In the absence of more detailed information it is hard to say whether this problem was the consequence of lack of demand or of an over prudential approach from the supply side. However the fact that half of the banks operating in the country were foreign certainly exposed Palestine to the risk than financial resources collected there were not re-invested in the local economy.

Other information on the functioning of the credit market can be derived from the analysis of passive interest rates (figure 2), although a precise assessment of the cost of borrowing is complicated by the fact that loans denominated in various currencies were offered at very different rates. In particular loans in Jordanian Dinar or US Dollar tended to be much cheaper than the ones in New Israeli Shekel.

Figure 2: Average interest rate on loans (2000-2009)



Source: PMA, 2010.

Overall, irrespective of the currency in which loans were denominated, the cost of borrowing steadily declined between 2001 and 2004. After that year the price of loans in New Israeli Shekel kept contracting while the one on loans in Dinar or Dollar slightly increased up to 2007. However even in the aftermath of the 2006 crisis, interest rates were still the same or marginally lower than in 2001, and in 2009 they declined further. Prima facie, thus the pattern of interest rates shows little correlation with the quantity of loans provided, for example with the contraction in 2008, suggesting that the problem was more in the demand than in the supply side. This, however, might simply be the result of banks operating by reducing the amount of loans offered (or by changing the conditions attached them) rather than on their price, a mechanism very likely to have been at work in markets characterised by high inefficiency or lack of competition.

III. THE EVOLUTION OF MICRO CREDIT IN PALESTINE

The picture above shows how despite the stable collection of deposits the official banking industry proved unable to expand its provision of financial services. Although it is to a degree still unclear whether this was demand or a supply problem, certainly poor economic performance made things worse in both respects, as raising poverty increased the number of people unable or unwilling to use banking services. This opens the door to the question of whether or not the role of the micro credit industry had expanded as the activity of official banking system contracted. Before moving to the analysis of this issue and, in general, of the pattern of development of the microcredit sector in Palestine, it is worthwhile to provide an overview of its institutional characteristics.

By the end of 2008 the micro credit industry in Palestine was made of 13 specialised institutions and one commercial bank (*Al-Rafah Microfinance Bank*) also active in the micro lending sector. Since 2004 specialised micro credit institutions started to be coordinated by the national agency SHARAKEH *(The Palestinian Network for Small and Microfinance institutions*), which among other services provided up-to-date reports on the financial performance of its nine active and four associated members. Using this information, table 2 provides a summary of the institutional characteristics and relative relevance of individual institution, mainly based on a survey conducted in 2007 (The International Finance Corporation [IFC] & The Palestinian Network for Small and Microfinance Institutions [SHAREKEH], 2007). Although most data on outstanding loans, number of clients and number of branches refer to the end of 2006, these still provide useful information in terms of the size of the sector and of the relative relevance of various institutions.[71]

Table 2: Microfinance institutions in Palestine: institutional characteristics and relative size (end of 2006 data)

Institution Name	Legal status	Date of Establishment	Outstanding Gross Portfolio 000$	No. of clients	No. of branches	Coverage Gaza/West Bank	Provision of Islamic loans	Attitude towards female clients
Active members								
ACAD: The Arab Centre for Agricultural Development	Local NGO	1988	2702	1381	8	Yes	Yes	Yes
ANERA: American Near East Refugee Aid	Int. Prog.	1967	1102	591	1		NA	No
ASALA: The Palestinian Businesswomen Association	Local NGO	1997	1715	2138	9	Yes	Yes	Only women
CHF/Ryada: Cooperative Housing Foundation	Int. Prog.	1952	9592	4132	8	Yes	NA	No
FATEN: Palestine for Credit & Development	Non-profit	1999	8294	4540	15	Yes	Yes	Yes
PARC/SLA: Palestinian Agricultural Relief Committees/ Saving and Lending Associations	Rural Coop	1983	2208	2111	NA	Yes	Yes	No
PDF/SLU: Palestine Development Fund/ Small Lending Unit	Local NGO	2001	2995	371	3	Yes	Yes	No
UNRWA/MMP: United Nations Relief & Works Agency/Microfinance Department	Int. Prog.	1991	5830	9190	9	Yes	No	Yes
YMCA: Young Men Christian Association	Int. Prog.	1948	2905	855	7	Yes	Yes	Yes
Associated members								
Reef Finance	Local NGO	2007	1,114	254	3	Yes	Yes	No
Caritas Jerusalem	Int Prog.	1967	NA	NA	NA	Yes	No	No
IRP: Islamic Relief Palestine	Int. Prog	1994	NA	NA	NA	Gaza Only	Only	No
GWLF: Gaza Women Loan Fund	Int. Prog	1995	NA	NA	NA	Gaza Only	NA	Only women

Source: IFC & SHAREKH, 2007.

The most immediate characteristic to be noticed is the extreme diversity of the sample in terms of institutional features, as in Palestine branches of international programmes operate side to side with local non-governmental and non-for-profit organisations, as well as cooperatives.

Despite the fact that different regulations apply depending on the formal legal status of each institution, the unifying element is that with the exception of the cooperatives none of the others organisations was authorised to collect deposits. Thus the sector was financed mainly through donations, in particular from USAID, the Islamic Development Bank, and the European Union. Despite the sharing of this institutional aspect, much more diversity exists in terms of size and of lending policies.

In particular three associations alone (FATEN, CHF/RYADA and UNRWA) had the lion share of the market with 63% of the total of outstanding loans and about 70% of the active clients in 2007. Apart from two dedicated organisations (IRP and GWLF), all institutions operated both in the West Bank and in Gaza. In terms of type of loans provided, most organisations provided both small/medium loans (defined as bigger than 2500$) and micro ones (below 2500$), but cases existed of institutions active only in one of the two markets.[72] As far as the provision of Islamic loans was concerned, information is less precise, and although they were among the standard products offered by most organisations, the impression is that in terms of numbers of loans this segment of the market was undersupplied.[73] Finally, in general various institutions tend to treat women more favorably as part of a more general policy of targeting the weaker segments of society, even if only two organisations MCIs (ASALA and GWLF) specialised in female clients.

As the brief analysis above shows, during the period under investigation the micro credit industry in Palestine proved to be a dynamic and diverse sector able, in theory, to serve the growing cohort of people unable or unwilling to use the formal channels of credit supply. In fact, in terms of macro performance, the picture is not entirely positive. Despite, or maybe because of, the uncertainty linked to the *Second Intifada* the sector witnessed a robust growth during the early 2000s, and still in 2005 there were expectations of future increase in the number of clients served. According to a survey conducted in that year, the number of potential clients, estimated at about 30,000 in 2005, was supposed to have increased up to 100,000 in the following 4-6 years (IPCRI, 2005). However the 2006 crisis took a toll on the development of

microcredit too and a survey dating May 2007 showed how the expected development of the industry had remained largely on paper (IFC & SHAREKH, 2007). Data from a further survey conducted in 2009 (table 3) corroborate this idea.

Table 3: Development of Microfinance institutions, borrowers, and clients

	2005	2006	2007	2008
Net Loan Portfolio (000 US$)	37,738	30,197	26,686	43,312
Ratio to banks total lending (%)	2.2	1.6	1.4	2.6
Number of branches	53	63	60	68
Number of staff	344	342	329	381
Number of active borrowers	24,978	23,528	19,750	26,661
Number of active clients	28,995	27,930	24,705	32,028

Source: SHAREKH, 2009 and PMA, 2009.

In particular while the feeling in 2005 was of a potential rapid increase in the number of clients data show that, in fact, the number declined in 2006 and 2007, although the increase evident in 2008 must be seen as a positive sign.[74]

In terms of loan portfolio, data shows a similar pattern, with the result that between 2005 and 2007 the industry lost ground vis-à-vis the ordinary banking sector despite the fact that during those years ordinary banks proved unable to expand the provision of credit. Things, however, showed sign of change in 2008 when the microcredit industry managed to surpass the 2005 level in absolute terms and got a relative bigger share of the total credit market.

As in the case of the ordinary credit system it is not easy to understand the extent to which the contraction in 2006 and 2007 was due to problems in the supply side, or in the demand side, or both. Qualitative information, however, clearly indicates that in many cases micro credit institutions took a very prudent approach in front of potential demand, largely because of the increasing level of bad loans and late re-payment (IFC & SHAREKH, 2007). As table 4 shows, in 2006, the level of late payments (either measured by PAR 30 or PAR 180)[75] jumped to an all-time high, followed in 2007 by a dramatic increase in the share of written-off loans. Although the picture improved in 2008, data on late payment suggest that the situation was still worse

than 2005, and not in line with international standard, identifying in 5% the natural level for PAR>30 (Tucker & Miles, 2004).

Table 4: Aggregate measures of risk of the main micro credit institutions
(Par 30 international standards: 5% or below)

	2005	2006	2007	2008
PAR >30 days	10.6%	47.2%	28.9%	17.1%
PAR >180 days	4.6%	22.2%	20.1%	10.6%
Written-off index	13.9%	4.8%	30.3%	4.1%

Source: SHAREKH, 2009.

The portfolio risk thus emerges as one of the main constraints witnessed by the micro credit sector and one of the most likely explanations for the inability of the sector to grow according to expectations. The importance of this type of risk for Palestinian MCIs can be better appreciated when we consider that these institutions all rely on private donations so they were much less likely to suffer from other types of risk such as problems of liquidity or change in the interest rate. In the following sections we analyse this problem by focusing on the case of ACAD. Before this, it is worthwhile to provide a brief analysis of what this institution is, of how it operates, and of the extent to which it is representative of the industry in general.

IV. ACAD: STRATEGIES AND CONSTRAINTS

ACAD is a non-profit, non-governmental organization which has been operating since 1988 but only officially registered in Jerusalem since 1993 and by the Palestinian Authority in 2001. Up to 1994 ACAD simply offered agricultural credit in kind (for example loans of equipment) without charging interest rates. Since 1995 the institution was re-organised and started offering financial loans aiming at supporting low-income-generating projects or helping entrepreneurs-in-the-making to develop businesses. However up to 2000 interest rates were only charged to cover some of the cost and still at levels well below market prices. The year 2000 represented a watershed in the history of ACAD as since that year financial self-sustainability became an explicit aim, and decisions about size of loans, interest rates and collateral started to reflect market-based considerations. In particular interest rates were set at levels able to cover the full cost of loans, while direct cooperation with banks was established to secure stronger

guarantees. This led to the introduction of what in the following sections of the chapter we refer to as 'bank guarantee', meaning the option of automatically transferring funds to ACAD in case of insolvent clients with a current account in a bank.

Despite growing attention to costs and financial self-sufficiency, ACAD nonetheless remained a non-profit organisation with an official mission which identified 'poor and low-income individuals' as clients, 'rural and/or high poverty rate Palestinian areas, particularly affected by the difficult political situation' as the geographic targets, and 'to empower and promote active participation in the economic, social and political spheres of life in Palestine' as the main goal.[76]

Clearly, a tension existed between some of the implications of the official institutional mission and some of the criteria that need to be considered in the attempt of reaching financial self-sufficiency. To an extent the problems that ACAD faced were no different from the one of many other micro credit institutions, for example when it came to the issues of financing women, delivering micro loans (notoriously more expensive), charging interest rates or demanding collateral. In this sense the experience of ACAD can provide useful indications also to other micro credit institutions operating in other areas of the world. However, ACAD also had to deal with an economic and political environment, which was in other ways idiosyncratic. For example Palestine was physically split in two areas (Gaza Strip and the West Bank) characterised by very different levels of political and economic instability (and thus risk for lenders), but also poverty and deprivation. So how much to invest in Gaza became a matter of delicate fine-tuning between conflicting aims and constraints. Another specific issue faced by ACAD was the amount of investment to be directed outside agriculture, considering that the institutional mission focused on supporting this sector, but since 2003, ACAD decided to offer loans also to businesses operating in other industries. Finally, in area in which the large majority of the population was of Muslim religion, ACAD had also to face the choice of whether or not to offer dedicated Islamic loans and, if so, how much effort to put into this market. This was not an easy decision as Islamic finance is an expensive product requiring specifically-trained and dedicated personnel. On the other hand, however, it also establishes a bonding link with

customers (with potential spill-over in terms of increased loyalty) which is absent in other forms of financial intermediation.

As far as its representativeness of the industry more in general is concerned, in terms of size ACAD was not one of the three big players but still had a non-negligible share of the market, equal in 2006 to 7.2% in terms of value of loans disbursed or 5.5% in terms of the number of clients served (IFC & SHAREKH, 2007). Further data from SHAREKH (2009) indicate that the quantitative evolution of ACAD activity was in line with the one of the sector more in general, thus this information are fairly representative of the entire period.

In relation to the borrowing and lending policy ACAD was fairly representative. Like almost the rest of MCIs, ACAD could not collect loans and its activity was based on private donations, it tended to target female clients but served male clients as well, operated in both Gaza and the West Bank, offered micro and small loans, individual and group ones, as well as Islamic financing. In this regard, ACAD specialised in the provision of the loans know as *Murabaha* (about 90-95% of total Islamic loans by 2009), *Musharakah* (about 4%), and *Musana'ah* (about 3%).[77]

V. DATA, DESCRIPTIVE STATISTICS, AND METHODOLOGY

This chapter uses a data set provided by ACAD with information on all loans financed between 1995 and 2008. Given the limited activity of the institution up to the early 2000s, most loans appeared to have been provided during the second half of the decade, during 2004 - 2008.

Given the number of limitations in the data, out of the original sample made of 6352 entries, we could only selected a sub-sample of 1265 observations, equivalent to about 20% of the total. The general criterion we used to include observations in the sample was the amount and quality of information available for each entry. As a consequence, the years towards the end of the period, when information started to be recorded in a more systematic way, are overrepresented. On top this problem, other two issues further constrained the sample

selection. Firstly, not knowing how ACAD classified loans as written-off these have been omitted, and our analysis is limited to loans which were either "closed" or "finance".[78] Secondly, given that these data have been recorded in June 2009, we excluded loans opened in 2008 whose duration was above a year and half as we do not know the outcome of these loans. The distribution of cases according to the year of the beginning of the loan is provided in table 5 below.

Table 5: Distribution of loans by year

Year	Selected sample		Original sample		*Selected/original (%)*
	Frequency	*%*	*Frequency*	*%*	
1996	1	0.1	18	0.3	5.6
1997	11	0.9	158	2.5	7
1998	2	0.2	30	0.5	6.7
1999	4	0.3	35	0.6	11.4
2000	19	1.5	485	7.6	3.9
2001	23	1.8	223	3.5	10.3
2002	5	0.4	44	0.7	11.4
2003	54	4.3	656	10.3	8.2
2004	97	7.7	968	15.2	10
2005	257	20.3	985	15.5	26.1
2006	167	13.2	397	6.3	42.1
2007	380	30	660	10.4	57.6
2008	245	19.4	1688	26.6	14.5
Total	**1265**	**100**	**6352**	**100**	**19.9**

Source: Elaboration from ACAD

Table 6 provides a picture of the sample divided according to their status.

Table 6: Distribution of loans by status

Status	Frequency	%
Closed	439	34.7
Financed	826	65.3
Total	**1265**	**100.0**

Source: Elaboration from ACAD

In our model the dependent variable (**outcome**) has been constructed by identifying 3 different outcomes of loans: paid on time (or within 30 days), paid within one to six months late (PAR > 30), paid more than 6 months late (PAR >180). The variable equals zero if the payment is made

on time, and one or two for PAR>30 and PAR>180 respectively. Table 7 below provides the frequency distribution of the dependent variable desegregated by year.

Table 7: Outcome of closed and financed loans

Year	Category	Frequency	%
1996	paid on time or within 30 days late	0	0
	1-6 months late	0	0
	more than 6 months late	1	100.0
	Total	*1*	*100.0*
1997	paid on time or within 30 days late	0	0
	1-6 months late	0	0
	more than 6 months late	11	100.0
	Total	*11*	*100.0*
1998	paid on time or within 30 days late	0	0
	1-6 months late	0	0
	more than 6 months late	2	100.0
	Total	*2*	*100.0*
1999	paid on time or within 30 days late	0	0
	1-6 months late	1	25.0
	more than 6 months late	3	75.0
	Total	*4*	*100.0*
2000	paid on time or within 30 days late	1	5.3
	1-6 months late	5	26.3
	more than 6 months late	13	68.4
	Total	*19*	*100.0*
2001	paid on time or within 30 days late	10	43.5
	1-6 months late	5	21.7
	more than 6 months late	8	34.8
	Total	*23*	*100.0*
2002	paid on time or within 30 days late	2	40.0
	1-6 months late	2	40.0
	more than 6 months late	1	20.0
	Total	*5*	*100.0*
2003	paid on time or within 30 days late	15	27.8
	1-6 months late	26	48.1
	more than 6 months late	13	24.1
	Total	*54*	*100.0*
2004	paid on time or within 30 days late	23	23.7
	1-6 months late	43	44.3
	more than 6 months late	31	32.0
	Total	*97*	*100.0*

2005	paid on time or within 30 days late		41	16.0
	1-6 months late		109	42.4
	more than 6 months late		107	41.6
	Total		*257*	*100.0*
2006	paid on time or within 30 days late		26	15.6
	1-6 months late		70	41.9
	more than 6 months late		71	42.5
	Total		*167*	*100.0*
2007	paid on time or within 30 days late		40	10.5
	1-6 months late		149	39.2
	more than 6 months late		191	50.3
	Total		*380*	*100.0*
2008	paid on time or within 30 days late		46	18.8
	1-6 months late		148	60.4
	more than 6 months late		51	20.8
	Total		*245*	*100.0*
1996-2008	**paid on time or within 30 days late**	**0**	**204**	**16.1**
	1-6 months late (PAR > 30)	**1**	**558**	**44.1**
	more than 6 months late (PAR > 180)	**2**	**503**	**39.8**
	Total Sample		***1265***	***100***

Source: Elaboration from ACAD

Results show clearly that the problem of late payment is an important issue for ACAD; in fact if we compare the share of late-paid loans to the national average (table 4) ACAD appears to be an underperformer, although in the absence of accurate data on the share of written-off loans any conclusion in this direction remains tentative.

For most entries the data set provides information about the characteristics of both the loan itself and the borrower. The former include type of loan ('normal' or 'Islamic'), interest rate charged, whether or not an extension of the beginning of repayment was allowed ("grace" period), duration, amount, economic sector, nature of guarantees (personal or bank-provided), and "purpose" (micro, small or woman-specific[79]). The latter include information on number of the people that the borrower financially supports, gender, family income, level of education, and age. Information is also available on the geographic location of the loan (West Bank vs. Gaza Strip) and on the year in which it was provided.

The explanatory variables have been constructed on the basis of the available information and are described in table 8 which also shows frequencies and descriptive statistics.

Table 8: Explanatory variables

Name	*Description*	*Encoding*	*Freq.*	*%*	*Average*	*Min*	*Max*
Type	Type of loan	Normal loan = 0 Islamic loan = 1 Unknown = 999	1027 32 206	81.2 2.5 16.3			
Int	Interest rate charged	0% (reference category) = 0 1 - 5 % = 1 6-10% = 2 11-15% = 3 16% and higher = 4	9 1 77 549 629	.7 .1 6.1 43.4 49.7			
Grace	Grace period	No = 0 Yes = 1	951 314	75.2 24.8			
Dur	Duration of the loan	In months			18.6	1	47
Amo	Amount of the loan	In US dollars			2798.8	500	15000
Sect	Sector to which the loan was given	Agriculture (reference group) = 0 Services = 1 Construction = 2 Industry = 3 Trade = 4 Others = 5 Unknown = 999	533 257 38 65 238 131 3	42.1 20.3 3.0 5.1 18.8 10.4 .2			
Guar	Type of guarantee	Bank-provided = 0 Personal = 1	610 655	48.2 51.8			
Pur	Purpose of the loan	Micro = 0 Small = 1 Women = 2	441 208 616	34.9 16.4 48.7			
Ndep	Number of people financially depending on the applicant	None (Reference group) = 0 1-6 = 1 7-10 = 2 More than 10 = 3 Unknown = 999	1 846 350 61 7	.1 66.9 27.7 4.8 .6			
Gen	Gender of the applicant	Male = 0 Female = 1 Unknown = 999	528 538 199	41.7 42.5 15.7			
Inc	Yearly income of the family of the applicant	In Us dollars			7385.1	650	105000
Edu	Education level of the applicant	None (reference group) = 0 Preparatory = 1 Elementary = 2 Secondary = 3 Diploma = 4 University = 5	30 175 206 455 122 244	2.4 13.8 16.3 36 9.6 19.3			

		Unknown = 999	33	2.6			
Age	Age of the applicant	In years			36.1	16	74
Gov	Geographic location of the loan	West Bank = 0 Gaza Strip = 1 Unknown = 999	1126 130 9	89 10.3 .7			
Year	Macroeconomic conditions in the year in which the loan was provided	0 or negative growth = 0 Positive growth = 1	214 1051	16.9 83.1			

Source: Elaboration from ACAD

An overview of the frequencies and statistics provides useful information about the policies implemented by ACAD, and how the tension between the mission and the aim of self-sufficiency was reflected in the strategic decisions about how and where to invest. To an extent, ACAD stuck to its own mission by providing, in a non-trivial amount, loans which have a micro size (about 35%), finance agriculture (which is still individually the most relevant sector with 42% of loans), and are invested in the Gaza Strip (10.3%). On the other hand, there are various signs that policies also responded to economic rationales. For example although agriculture individually remained the most important sector of investment, the other industries combined together were more relevant. Judging by the interest rate charged loans were made on market-based consideration; in about 90% of cases interest rates were higher than 10% which was the average market price between 2001 and 2008. In terms of the selection of customers, it is remarkable that about 20% of them had a university degree against an average of 5-10% nationally, suggesting that the institutional mission of supporting the worst-off members of the society was implemented only to an extent. Finally, Islamic loans were only a tiny fraction of the total (about 2.5%) reflecting the fact that the move in that direction has been very recent.

VI. MODEL AND RESULTS

The purpose of the model is to estimate the determinants of late payment using the variables described above. Because of the nature of the dependent variable the model is an *ordered logit*

regression with robust 'White-corrected' standard errors; results also report the odd ratios in order to analyse the marginal impact of each variable[80].

The analysis of the coefficients of correlations among various independent variables (see appendix 3) shows that the inclusion of all of them would expose the regression to severe problems of co-linearity. Because of this reasons we decided to omit the variable measuring the duration of the loan (***dur***) and the type of guarantee provided (***guar***) as they appear to be strongly correlated respectively to the amount of the loan (***amo***) and interest rate charged (***int***). In this case, the decision about which variables to include was theory-driven, given that ***amo*** and ***int*** are central to the debate between sustainability and outreach (Hollis & Sweetman, 1998; Robinson, 2001; Cull, Demirguc-Kunt & Morduch, 2007; Cull, Demirguc-Kunt & Morduch and 2009).

As a matter of fact bigger loans are proportionally cheaper to manage and higher interest rates can cover increasing costs surfacing when subsidies are reduced or eliminated, thus both variables can contribute to reach financial sustainability. The consequence, however, can be that poorer people might find themselves unable to apply for substantial loans or to pay high interest rates, thus economic gains for the micro credit institution can be costly in terms of social inclusiveness (Olivares-Polanco, 2005; Cull, Demirguc-Kunt & Morduch, 2007).

Strong correlation is also evident between clients' gender (***gen***) and the variable ***pur*** which records loans according to micro, small, and women specific. In this case we decided to drop ***gen***, as ***pur*** showed a lower degree of correlation to the ***amo*** than ***gen***. However, as ***pur*** (as well as ***gen***) appeared to be correlated to ***int*** as well, we run two regressions one including ***pur*** and the one dropping it. Table 9 shows the results of the two models.

Starting with the features of the loans, the regressions show that both its amount and the interest rate impacted on the risk of late repayment. Specifically, bigger loans were less likely to be paid on time, while increasing interest rates had a beneficial effect. It must be noticed that

while in the model run including ***pur***, ***int*** is only significant at 10% confidence interval (likely because of problems of correlation) in the regression run excluding ***pur***, it is strongly significant (1%). Thus this result can be considered as robust.

Table 9: Results of logistic regression

Variable	Including "Pur"			Excluding "Pur"		
	Coef.	Std. Err.	odds ratio	Coef.	Std. Err.	odds ratio
Type	0.16	0.50	1.17	0.12	0.45	1.12
Int	-0.34*	0.20	0.71	-0.37***	0.14	0.69
Grace	0.13*	0.07	1.14	0.12**	0.07	1.13
Amo	0.00***	0.00	1.00	0.00***	0.00	1.00
Sect	0.06	0.04	1.06	0.06	0.04	1.06
Pur	-0.03	0.11	0.97	-	-	-
Ndep	0.02	0.02	1.02	0.02	0.02	1.02
Inc	0.00	0.00	1.00	0.00	0.00	1.00
Edu	0.03	0.05	1.03	0.03	0.05	1.03
Age	-0.01*	0.01	0.99	-0.01*	0.01	0.99
Gov	0.59***	0.20	1.80	0.59***	0.20	1.80
Year	-0.33*	0.20	0.72	-0.33*	0.20	0.72
No. of observations		***1023***			***1023***	
Pseudo R2		***0.028***			***0.028***	

***, **, *, represents 1%, 5%, and 10% level of significant, respectively.

Interest rate has a counter intuitive influence on the risk of loan payments, where results show that the risk of late repayment are 1.41 (1/0.71) times greater for low interest rate than the higher interest rates. However, it is important to remember that the sample does not include written-off loans, thus it is by construction biased towards the selection of relatively better clients, specifically the ones who are going to pay their loans back.

In this perspective, the rate of interest can be seen as a component of the marginal cost of being late and therefore it is not surprising to see a negative correlation between the two. However, this result could also be the consequence of some non-observable characteristic of the variable, for instance a strong impact of the so-called peer monitoring effect able to counterbalance the negative selection due to high interest rates.[81] The positive correlation between the dependent variable and the amount of the loan is similarly puzzling as bigger loans

are more expensive to service than small loans and, ceteris paribus, one would expect them to be paid on time. Whatever the explanation, the fact is that in the case of ACAD the provision of bigger loans might have directly reduced costs and increased self-sustainability, but these gains were eroded by the cost of dealing with late repayment. On the contrary, the policy of charging higher interest rates had a double positive impact on risk reduction.

Risks of late repayment are less in West Bank compared to Gaza Strip. Hence, results indicate that the risks of late repayment are 1.8 times greater for Gaza Strip than in the West Bank. This result implies that political and economic conditions have a crucial role in determining the amount and risk of late repayments.

Results indicate that the odds of late repayment for Islamic loans are 17% (1.17 – 1) higher than the odds of late repayment for non-islamic loans. In other words the risk of late repayment are 1.17 times greater for Islamic than non-islamic loans. This might attributed to the fact that micro-credit institutions require more collateral for granted non-islamic loans. Furthermore, results indicate that the risk of late repayment are 1.39 (1/0.72) times greater for years with zero or negative growth rate than the years with a positive growth rate.

Moving to the variables capturing the features of borrowers, these all appear to be not significant and their contribution to the risk of being late repayment is relatively small. Results indicate that the loan amount and the age of the applicant, education of the applicant, number of dependents, as well as, the yearly income of the family of the applicant do not affect the status of payments, where odds ratio is almost one. However, one can conclude that gender might affect the risk of late repayment, were female loans are considered to be less risky than male loans. In a Muslim society like in Palestine, individuals, and even family, will not allow that his female relative to be exposed to any of the consequence of not repaying the loan.

Finally, exogenous elements such as the geographic area of investment and the macroeconomic conditions of the year of the investment proved to be correlated with risk of late payment. Not

surprisingly, investments in the Gaza Strip were more exposed to risk; in fact, on the bases of the odd ratios it appears to be the most important determinant of it. Thus the policy of commitment to that area which was part of ACAD explicit institutional mission had meant higher exposure to risk. The impact of macroeconomic conditions is less clear, as the proxy is only significant at 10%. However, it has the expected negative sign, which associates years with positive economic growth to a lower chance of late payment. Furthermore, one would expect that micro-credit institutions behave the same as banks do, with the exception of granting small amount of loans, and targeting low-income individuals.

VII. CONCLUSION

Little attention has been so far turned to the issue of micro credit in Palestine, but the available evidence suggests that it is in fact a developing and vibrant industry with a vast potential for growth. Between 1994 and 2008, the Palestine economy failed to develop according to expectations, creating the basis for increasing impoverishment of large sections of the population. Combined with the fact that ordinary banks succeeded in collecting saving but struggled in providing loans, the potential for micro credit expansion increased over time.

However, to a large extent this potential has failed to materialise and by the end of 2008 the market was still underdeveloped. Evidence suggests that micro credit organisations too suffered from the worsening macroeconomic conditions, in particular have been exposed to growing risk of late or no repayment. This happened at the same time as the maturity of the sector pushed most organisations to abandon or at least to limit policies based on non-market considerations and to start implementing different ones aimed at financial self-sufficiency, for example asking for stronger collateral, charging higher interest rates, or offering bigger loans. This might have ingenerated a vicious circle by which increasing risk has led to the supply of fewer loans, but also market-based consideration might have alienated part of the potential demand, scared by the high cost of loans or the impossibility of providing adequate guarantees.

In this perspective, the exposure to portfolio risk, the aim of financial self-sufficiency, and the ability to penetrate the market and serve segments of it neglected by ordinary banks appear to be different facets of a very complex picture. ACAD's experience between 1994 and 2008 provides an interesting point of view on these issues because although it was not among the biggest three providers of micro credits nonetheless it had a non-trivial share of the market and was fairly representative in terms of loan policies. In this case it is evident that exogenous macroeconomic conditions influenced portfolio risk, but also loan policies were important and their impact not necessarily straightforward to interpret. For example investing in Gaza, and responding to moral principles, appeared to have been linked to higher exposure to risk, but the same can be said of some market-based principles such as providing bigger loans.

Squaring the circle between these conflicting aims and policies is the challenge that the micro credit sector needs to overcome to develop according to expectations and play a substantial role in the growth of the still fragile Palestinian economy.

APPENDIX

Appendix 1: Percentage contribution to GDP by Economic Activity (%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Agriculture & fishing	9.8	9.1	7.7	7.9	7.1	5.2	5.6	5.5	5.9
Mining and quarrying	0.6	0.6	0.8	0.6	0.7	0.6	0.5	0.5	0.4
Manufacturing	11.5	12.5	11.8	12.6	13.2	13.0	11.7	11.6	11.2
Electricity and water supply	1.2	3.3	3.8	3.8	3.2	3.4	2.8	3.2	3.3
Construction	8.9	5.5	3.9	5.0	5.7	6.8	7.2	6.6	6.5
Wholesale and retail trade	11.3	9.6	11.9	9.8	9.8	9.4	9.6	9.7	10.3
Transport, storage and communications	5.4	5.6	5.6	4.6	6.1	5.8	6.6	7.4	7.2
Financial intermediation	4.4	3.6	4.2	4.1	3.6	4.4	4.3	6.0	5.8
Other services	18.1	18.5	20.5	19.8	20.1	20.4	16.7	14.8	15.2
Public administration and defense	12.6	17.6	16.7	16.9	14.3	14.1	15.7	14.5	14.2
Households with employed persons	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1
Public Hold enterprises	4.7	2.8	3.6	4.5	3.7	3.4	4.5	4.1	4.1
Net indirect taxes	11.5	11.2	9.4	10.2	12.6	13.5	14.7	16.1	15.8

Source: PCBS, 2009

Appendix 2: Types of Islamic loans[82]

IJARAH *(Leasing):* Sale of the usufruct of an asset

KAFALAH*:* A contract whereby a person accepts to guarantee or take responsibility for a liability or duty of another person

MUDARABAH: A contract between two parties, a capital owner(s) or financiers (called RABB AL-MAL) and an investment manager (called MUDARIB). Profits are distributed between the two parties in accordance with the ratio upon which they agree at the time of the contract. Financial loss is bore only by the financier(s).

MURABAHAH: Sale of a product with a specified profit margin. The financier buys a given good and sells it to the customers who pay on installment.

MUSANAHA: A contract whereby a bank finances the process of production of a given good and the customer pays the money back after selling the product.

MUSHARAKAH *(Partnership):* A contract similar to *MUDARABAH*, the difference being that both partners participate in the management and provision of capital and share profits and losses. Profits are distributed in accordance to the ratios initially set, while losses are distributed in proportion to the share of capital provided.

QARD HASAN*:* A loan provided without interest or any other compensation.

Appendix 3: Coefficients of correlations among independent variables

	Gen	NDep	Inc	Edu	Age	Type	Int	Grace	Dur	Amo	Sect	Guar	Gov	Year	Stat	Pur
Gen	1															
NDep	-0.16	1														
Inc	-0.15	0.10	1													
Edu	-0.14	-0.16	0.13	1												
Age	-0.16	0.28	0.10	-0.24	1											
Type	-0.17	0.01	-0.01	0.07	0.06	1										
Int	**0.71**	-0.16	-0.09	-0.09	-0.22	-0.41	1									
Grace	-0.34	0.11	-0.03	0.02	0.10	0.10	-0.43	1								
Dur	-0.55	0.15	0.09	0.12	0.15	0.28	-0.61	0.43	1							
Amo	*-0.54*	0.11	0.13	0.17	0.15	0.36	-0.54	0.33	**0.87**	1						
Sect	0.25	-0.13	-0.03	-0.07	-0.02	-0.07	0.27	-0.36	-0.22	-0.22	1					
Guar	**0.82**	-0.13	-0.16	-0.14	-0.17	-0.15	**0.70**	-0.32	-0.53	-0.51	0.25	1				
Gov	0.26	-0.03	-0.09	-0.12	-0.06	-0.04	0.29	-0.14	-0.18	-0.18	0.27	0.30	1			
Year	0.36	-0.17	-0.09	0.00	-0.12	0.03	0.40	-0.32	-0.41	-0.38	0.19	0.38	0.16	1		
Pur	**0.85**	-0.15	-0.15	-0.11	-0.18	-0.07	**0.73**	-0.31	-0.41	*-0.34*	0.23	0.88	0.28	0.37	0.16	1

Where: **Type** is type of loan; **Int** is the interest rate charged; **Grace** is the grace period; **Dur** is the loan duration; **Gen** is the client gender; **Amo** is the amount of the loan; **Sect** is the sector to which the loan was given; **Guar** is the type of guarantee; **Pur** is the purpose of the loan; **Ndep** is the number of people financially depending on the applicant; **Inc** is the yearly income of the family of the applicant; **Edu** is the education level of the applicant; **Age** is the age of the applicant; **Gov** is the geographic location of the loan; **Year** represents the macroeconomic conditions in the year in which the loan was provided.

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GENERAL CONCLUSION

The essays shed light on the role and performance of central banks in the presence of different currencies other than the national currency, and the consequences of absence of the national currency. In addition, they put under spotlight the monetary transmission mechanisms through which external monetary policies might affect the domestic real economy and inflation. Moreover, the essays have addressed the impact of monetary and fiscal policies on the performance of the banking system, by predicting cost and technical efficiency of banks operating in Palestine. Furthermore, the essays have addressed the historical development, role, and performance of the "Microcredit sector" in Palestine.

Chapter one uses two different approaches to investigate the sensitivity of the real Palestinian economy to internal monetary shocks as well as the effect of monetary shock in Israel, USA, and Jordan. Monetary policy effectiveness in Palestine is weak due to the high dependence of the economy on foreign aid, and the absence of national currency therefore monetary tools. Notwithstanding, there is still a space through which monetary policy can affects the real economy, namely through domestic interest rates and bank lending channels.

The final results of this chapter indicate that changes to monetary policy in Israel, USA, and Jordan will affect, to a certain degree, the real economy in Palestine. Results show a significant but low pass through effect from policy rates in Israel, USA, and Jordan onto the domestic interest rates. Furthermore, adjustments toward the equilibrium are relatively slow, where it takes one to more than three years to get the indicators back to their long rum equilibrium. In addition, the nominal exchange rate of the USD against NIS, directly affects the real Palestinian economy through imports and indirectly through affecting individuals' wealth. International aid and political conditions influence the real economy through affecting the final consumption. Domestic lending and deposit rates significantly influence final consumption and investment through affecting the inflation rate. Moreover, it is anticipated that the USD (or JD) domestic lending rates have a higher effect on real activities than that of NIS.

Chapter two uses a translog stochastic frontier cost function to estimate the cost and technical efficiency of the banking industry in Palestine during the period of 2000 – 2009. Significant differences of cost (technical) efficiency are depicted between banks by type, nationality and size. A downward trend of overall efficiency is depicted over the period of study. However, despite the downward trend, the overall average efficiency is in line with that of banks in the MENA and some Arab countries.

Results indicate that small banks show higher cost efficiency than large ones, also foreign banks were more efficient than domestic counterparts. Small banks compete with large banks primarily in metropolitan markets, and therefore, show more market discipline, which leads to higher cost efficiency. Foreign banks have had higher labor productivity, in addition to utilizing their comparative advantage of having more experience, adopting new technologies and make investment in automation. In the short term, PMAs' regulations, such as strict banking supervision and monitoring, have a negative influence on banking efficiency, because of the increase in the cost of upgrading banking technology platforms, enlarging branch networks and managing diverse activities. Measures such as increasing competition, fairness and transparency between existing banks can increase banking efficiency. These focused on reducing information gaps, between banks and customers and on allowing consumers to switch easily and cheaply between banks.

Chapter three analyses the development and functioning of the micro credit industry in Palestine during 1994 – 2008, using a quantitative approach (logistic regression). Results show that despite the increase of potential demand for micro credit, the growth of the sector has been below expectation due to the deterioration of the economic environment. One of the most important causes of this phenomenon has been the reluctance to lend caused by the growing risk of late or no repayment of loans. The risk of late payments was negatively correlated to the level of interest rate, to macroeconomic conditions, and to the age of the borrower while it was positively associated to the share of investment in the Gaza Strip, and to the size of loans.

END NOTES

[1] Palestine refers to the Palestinian Territory, and does not include that part of Jerusalem which was occupied by Israel in 1967.

[2] Absence of a national currency and presence of three other main currencies (i.e. NIS, US, and JD) make it hard to use standard techniques to investigate monetary policy shocks in Palestine.

[3] Degree of monetization and dollarization, cash-based payments system, size of the informal sector, openness of the economy and inflows of private and official financing resources

[4] Domestic refers to Palestine, unless otherwise indicated.

[5] Exchange rate of USD against NIS is expressed as one USD in terms of NISs. I did not consider the exchange rate between JD and NIS because JD is fixed against the USD therefore any change in the value of USD will be reflected in the JD.

[6] The transfer of some areas of authority to Palestinians, and establishing the Palestinian Monetary Authority (PMA) in 1995 as an emerging central bank

[7] Since the Israeli occupation in 1967, the Palestinian economy has witnessed four major events: the outbreak of the First Intifada in 1987/8; the peace agreement between Israel and the Palestinian Liberalization Organization (PLO) in 1993/4; the outbreak of the Second Intifada in September 2000; and finally, the separation between the West Bank (WB) and Gaza Strip (GS) in mid 2007.

[8] A net current transfer to the public sector is averaged to about 65.2% of total current transfers compared to 34.8% to the private sector, during the period 2000 – 2009.

[9] Contribution of variable X to growth rate of Y is defined as the multiplication of the lagged share (X_{t-1}/Y_{t-1}) to the growth rate of X ($\Delta X_t/X_{t-1}$). In our example CA surplus grew by about 213.6% in 2008 compared to 2007, which resulted from:

Item	Lagged share	Growth rate	Contribution
Trade balance	-6.6	5.9	-39.2
Net current transfers	4.5	51.4	230.7
Net income from abroad	1.2	19.2	22.1
Growth rate of Current account			213.6

[10] During 2004-2009, the average interest rate on lending was about 5.8%, 8.5% and 6.2% in USA, Jordan and Israel, respectively, and 3.2%, 4.3% and 3.2% for the deposits rate.

[11] According to the Paris Protocol, there is a restriction on determining and controlling the liquidity ratio.

[12] The agreement between Israel and the PLO, which signed in 1993/4

[13] It is worth mentioning that Israeli Government considers the GS as a hostile entity since mid 2006; and Israeli banks have refused to deal with Palestinian counterparts and end the transfer liquidity from bank branches in the WB to other branches in the GS. Consequently, an acute liquidity shortage of NIS has appeared in the GS.

[14] Most Palestinians lost more than half their savings and assets in JD due to the devaluation of the Jordanian currency after the disengagement between Jordan and Palestine in 1988.

[15] Ministry of Finance: fiscal operations, revenues, expenditures, and financing sources, 2009.

[16] 1997 is the base year during Q1 1996 – Q4 2003, and 2004 is the base year during Q1 2004 – Q2 2009.

[17] Examples of external monetary policies include: a shock in the policy interest rate in USA, Israel and/or Jordan, or a shock in the exchange rate of USD against NIS. Examples of internal monetary policy shocks include: shocks of the amount of credit facility provided by commercial banks in Palestine, and shocks of the domestic interest rates.

[18] Final consumption is defined as the sum of a household, government and of the non-profit institutions serving households.

[19] Speed of adjustment is defined as the time elapsed between moving from an initial set of macroeconomic variables to a targeted set of such variables.

[20] The Johansen technique is sensitive to the setting of appropriate lag length of the VAR model and the identification of whether there is a trend in the data, therefore whether deterministic variables (a constant and trend) should enter the cointegrating vector. It produces misleading results when specification is improperly set. Results might be biased because the number of observations is not sufficient to test for higher lag order. Trace and maximum eigenvalue statistics produces one cointegrating vectors for all models, except for Models 3 and 5, where two cointegrating vectors are used. Trace and maximum eigenvalue may produce different numbers of cointegrating equations, in such a case, trace statistics are preferred to maximum eigenvalue statistics (Alexander, 2001).

[21] The cointegrating equation is $Y_t = \alpha_0 + \alpha_1 X_t + \varepsilon_t$, where X_t is one or a set of explanatory variables.

[22] Policy rate in Jordan is excluded because of the fixed exchange rate regime between JD and USD.

[23] Federal fund rate is appended to the model as an exogenous variable, as the Palestinian economy is too small to affect the USA policy rate.

[24] Exchange rate of USD against NIS is appended to the model as an exogenous variable,

[25] Interest rates in Palestine are calculated as a weighted average of the interest rates of all banks. There is an upper and lower limit for these rates depending on the client's reputation, risk involved expectations and profits etc.

[26] There are eight Jordanian banks in Palestine with 98 branches, providing more than 55% of TCF during 2009.

[27] The JD domestic lending rate is not introduced because of the fixed exchange rate between US dollar and the JD, (it's likely to have exact multicolinearity).

[28] D06 is used to capture the effect of second Intifada (Q1 2001– Q4 2002), the death of the historic Palestinian leader, President Yaser Arafat (Q4 2004– Q2 2005), and the 2006 election victory of the Hamas party (Q1 2006 – Q4 2006). D07 is used to capture the effect of forming a new government (led by Dr. Salam Fayyad) and the flow of international aid to the new Palestinian government during Q1 2007 – Q3 2008.

[29] Most NIS loans are in the form of overdrafts and are mainly held by traders. It is therefore expected that NIS loans affect net export. JD domestic lending rates are not included because of the problem of multicolinearity.

[30] Workers of high education institutions, UNRWA, NGO's and other private sector institutions are paid in USD (or JD), which consists of about 20% of employees in Palestine.

[31] International aid is usually related to the political conflicts, increasing when tension is high and decreasing when a conflict subsides.

[32] According to PCBS data, Palestinian exports to Israel consist, an average, of more than 90% of the total exports during 1996 – 2008, while imports from Israel constitute about 75% of total imports during the same period.

[33] US and Jordanian monetary policy affects Palestinian imports through the exchange rate channel.

[34] Examples are people and employees receiving their salaries and wages in USD or JD. Also people with savings in USD (or JD).

[35] It should be mentioned that there are some efforts from the Palestinian government to control the market during the last two years.

[36] Palestinian traders, as well as many other individuals, use more than one currency in order to minimize exchange rate risks. On one hand, wealth and purchasing power of those people will increase, or at least does not decrease, when NIS is depreciated, because the USD and/or JD will equal more NIS. On the other hand, NIS appreciation will not affect commercial exchanges since most of these exchanges are in NIS (imports from Israel are about 75% of total imports, and exports to Israel are about 90% of total exports).

[37] A constant has been added to the inflation rate in order to avoid the problem of log of non-positive numbers.

[38] During the last period, the PMA made strict and clear regulations to control bank activities in Palestine. A decline in the interest rate level is now noticeable, as well as a tightening of the gap between domestic interest rates and interest rates in other countries we use their currency.

[39] Interest rate data is unpublished during Q1 2001 – Q4 2003.

[40] An average deposit rate is calculated in the same manner by using deposits ratios and interest rate on deposits.

[41] Depending on the status of scale economies prior to the merger, recent evidence suggests that the Palestinian banking industry has significant economies of density (in terms of the size of its output); however it does not have economies of scale at the aggregate level (in terms of the output and the number of branches). On the contrary, most banks suffer from diseconomies of scale which is an indication that it is not beneficial to follow a policy of increasing banking outputs by opening new branches.

[42] Total deposits include PMA, banking and public deposits

[43] External shocks are usually represented in Israeli measures, such as closures, curfews, controlling borders and restrictions on the movement of people and goods, as well as exchange rates fluctuation.

[44] The financial turbulence following the second Intifada, the 2006 elections and subsequent events as well as the outbreak of the global financial crisis at the end of 2007 has left many countries with new initiatives to increase the level of regulation on financial institutions.

[45] *Bank assets*: What a bank owns, including loans, reserves, investment securities, and physical assets. *Bank liabilities*, what a bank owes. *Net worth* is the difference between assets and liabilities.

[46] Although Jerusalem is an integral part of the West Bank that was occupied in the 1967 war, Israel denies West Bank residents and institutions access to Jerusalem. Thus, all references to the West Bank are not inclusive of Jerusalem due to lack of any data on Palestinian banking in Jerusalem.

[47] Seven banks were working in 1994 with 33 branches; five out of those seven banks were foreign with 24 branches.

[48] Extraordinary conditions such as the absence of national currency, uncontrolled borders, distorted foreign trade sector, and increasing budget deficit.

[49] PMA supervised the merger and acquisition of many banks during this period; the liquidation of Standard Chartered Grindlays bank in late 2002; the Palestine Islamic Bank acquired Cairo Amman Bank – branch of Islamic transactions in mid 2005; In addition, the PMA closed the Mercantile Discount Bank in late 2000 for not complying its instructions.

[50] This is because Al-Rafah bank was recently established in 2006.

[51] A bank that is most efficient in one period may not be the most efficient in another.

[52] Hence, average cost was almost fixed at around $0.048 per unit of output during the period 2003 – 2009, with the exception of 2007 and 2008 where it increased to about $0.051 and $0.054 respectively.

[53] Averages of bank ownership and size are calculated for the period 2000 – 2009.

[54] The mean of average cost = average total cost / (average TCF + average INV).

[55] Each foreign bank acquires an average deposits of $350 million compared to $155 million for each domestic bank.

[56] Odeh (2005) finds that the Translog model function is the appropriate function to represent the data of the Palestinian banking industry than other restrictive models such as the Cobb-Douglas model.

[57] $u_{it} = \acute{z}_{it}\delta + w_{it}$ where z_{it} is a vector of bank specific inefficiency variables, δ is a vector of unknown coefficients of the bank-specific inefficiency variables and w_{it} is the truncation at $-\acute{z}_{it}\delta$ of the normal with mean zero and variance σ^2_u.

[58] Number of employees in 2006 was estimated as the average of employees in 2005 and 2007.

[59] Net fixed assets equal to total fixed assets excluding depreciation and amortization.

[60] Total credit facility includes loan, overdraft, leasing and provisions.

[61] $LR(\mu) = -2*\{\ln[L(H0)] - \ln[L(H1)]\}$; log likelihood = 114.926 when H0: $\mu = 0$ and Log likelihood = 115.814 when H1: $\mu \neq 0$.

[62] xtfrontier function is estimated using constraints $\sum_m b_m = 1$ and $\sum\alpha_{nm} = \sum\beta_{ij} = \sum\delta_{im} = 0$.

[63] The PMA seeks to become, over the medium term, the central bank for an independent and sovereign Palestinian state.

[64] Despite the decline of cost (technical) efficiency in the short term, as a result of developments of banking supervision and monitoring, it is expected that the return of these new developments is very high in the medium and long term.

[65] Al-Aqsa Islamic Bank was listed on the terrorism list since 2002 and it was prohibited from conducting any financial and/or banking transactions with the outside world.

[66] Overstaffing is common in Islamic banks. Recently, some Islamic banks addressed this imbalance. Palestine Islamic Bank laid off about 50 workers within 2010 and 2011. This bank hired an average of 138 workers during 2000 – 2009 to produce about $70 million output, whereas another bank produces about $190 million with the same number of workers (133) during the same period.

[67] There are three main currencies used in Palestine (US dollar mainly for saving, investment and trade; New Israeli Shekel mainly for daily transactions; and Jordanian Dinar mainly for saving). The absence of a national currency hampers the designated role of the PMA as a central bank, since it cannot control interest rates on these currencies. It also makes the banking and financial sectors more vulnerable to external shocks.

[68] A set of diagnostic tests were made before the running the GSL regression, such as Breusch-Pagan Lagrange multiplier test of random effects, which show evidence of significant difference across banks, as well as, Breusch–Pagan LM test which indicates that there is no cross sectional dependence (i.e. reject the null hypothesis that residuals are correlated across entities). Finally, a Modified-Wald test used to test for groupwise heteroskedasticity, results indicate a presence of heteroskedasticity and robust order is used to control for this problem.

[69] For example in the dedicated academic publication *The Journal of Palestine Studies* only a very tiny minority of articles, among which Ajluni (2003), deal with economic issues. Similarly in journals of economics articles on Palestine are rare, the most interesting exception being a series of articles published in the spring of 2001 in the *Economic Journal*, among which Fisher, Alonso-Gamo & Von Allmen (2001). As far as economic and business history is concerned, although some research exists for the years of the British mandate, for example Mezner (1998), the general lack of interest for this area has been confirmed by the fact that it did not get any mention even in the special issue on the Middle-east published on the journal *Enterprise and Society* in 2008 *(Enterprise and Society,* Volume 9, Number 4, December 2008).

[70] The difference between the two is that while micro credit institutions focus only in the provision of loans, micro finance organisations offer a wider set of services, for example loan collection, money transfer, and insurances. Although the institutions we consider belong to both sectors, given in this chapter we mainly focuses on issues regarding the supply of loans, we use only the word micro credit even when micro finance could be used instead.

[71] The only exception being REEF whose data refer to 2008 and are derived from the institution's web site (http://www.reef.ps)

[72] Among the 9 institutions considered (ACAD, ASALA, CHF, FATEN, ANERA, PARC, PDF/PBC, UNRWA, and YMCA) 7 offered both types of financing, while CHF and PDF/PBC only small/medium loans, and PARC on micro ones (IFC & SHAREKH, 2007).

[73] Religious belief was indicated by the pool of entrepreneurs interviewed in the survey as the most important reason for not applying to loans (IFC & SHAREKH, 2007).

[74] Data refer to 9 MCI representing about 92% of the market in terms of the number of clients served.

[75] PAR>30 indicates the share of loans (in terms of amount) paid later than 30 days, while PAR>180 the share re-paid later than 6 months.

[76] Source: Acad official web site (www.acad.ps).

[77] Source: ACAD. For a list of the existing types of Islamic loans and their features, see Appendix 2.

[78] Loans classified as "closed" are the one which have been paid (fully or in part), while "financed" loans are the ones about which an agreement has been reached between ACAD and the customer to delay the final payment beyond the original deadline.

[79] In fact, despite the label, 'loans to women', these loans are allocated mainly but not exclusively to female customers.

[80] Ordered Logit models are commonly used instead of ordinary least square regressions when various stata of the dependent variable can be ordered according to a given logic (say from low to high as in this case) but the distances among them are not constant. Logit models provide the statistical probability that the dependent variable assumes one status vis-a-vis another, according to changes in the independent variables. However, because of the mathematical transformations needed to use this type of models, absolute coefficients do not measure the relative impact of each variable and they need to be transformed in odd ratios which are calculated as exp(coefficient).

[81] This is considered to be an effective contract-enforcement mechanism due to the fact that when peers are jointly responsible for of a loan they tend to select efficiently the other members of the group and they perform close and continuous scrutiny of each-other's behavior. The result is a reduction in the degree of asymmetry in the distribution of information between lenders and borrowers and, as a consequence, increasing levels of re-payment. See Stiglitz (1990) for a theoretical exposure of the argument, and Hermes & Lensink (2007) for an empirical investigation.

[82] Source: Islamic Research and Training Institute (IRTI, 2008).