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REMITTANCES AND FOREIGN AID AS SOURCES OF EXTERNAL DEVELOPMENT FINANCE: IMPACTS ON SAVINGS AND INVESTMENT IN POST-WAR LEBANON

ABSTRACT

The on-going debate on the effectiveness of Foreign aid and Remittances in stimulating savings and investment has been inconclusive. The literature shows that the effects of these two sources of external development finance differ across nations. One country that the literature failed to examine was Lebanon. This remittance-dependent country which ranked 7th in the 2009 list of top remittance receiving countries in the world (as a percent of GDP), has also received significant flows of aid and is still suffering from a huge debt burden which makes it an ideal case for study. By applying a classical multivariate linear regression model for savings and a multivariate distributed lag model for investment for the post-civil war period, the results showed that the huge flows of remittances to Lebanon, which dwarf those of aid, exert a positive influence on both savings and investment while aid, the more volatile source of foreign capital, has a negative effect on savings and a positive effect on investment, irrespective of the poor political-economy environment in the country. Despite the fact that remittances may be considered a better source of development finance, those two foreign inflows can be seen as complements rather than substitutes.

Keywords: Remittances, Foreign Aid, Savings, Investment, Lebanon

JEL Classification: E21, E22, F21

RIASSUNTO

Rimesse e aiuti dall'estero come fonti esterne di sviluppo finanziario: gli effetti su risparmio e investimenti nel Libano dopo la guerra civile

Il dibattito in corso circa l'impulso esercitato dagli aiuti e dalle rimesse dall'estero su risparmio e investimenti non è ancora giunto a conclusione. La letteratura sull'argomento dimostra che gli

effetti di queste due fonti finanziarie esterne sullo sviluppo sono diversi a seconda dei paesi. Un paese che è stato esaminato in maniera non corretta è il Libano. Questo paese ‘rimesse-dipendente’ era al settimo posto nella classifica mondiale 2009 dei paesi che ricevono rimesse dall’estero (in percentuale sul PIL). Il Libano ha anche ricevuto flussi significativi di aiuti ed è ancora gravato da un pesante debito che lo rende un caso ideale da esaminare. Si sono applicati un modello di risparmio di tipo classico a regressione lineare multivariata e un modello multivariato a ritardi distribuiti per esaminare gli investimenti successivi alla guerra civile: i risultati ottenuti dimostrano che l’enorme flusso di rimesse verso il Libano, molto maggiore degli aiuti, esercita un’influenza positiva sia sul risparmio che sugli investimenti mentre gli aiuti, che sono una fonte più volatile di capitale straniero, hanno un effetto negativo sul risparmio e positivo sugli investimenti, apparentemente incuranti dell’instabile situazione politica ed economica del paese.

Nonostante le rimesse possano essere considerate una fonte migliore di sviluppo finanziario, questi due tipi di flussi provenienti dall’estero dovrebbero essere considerati complementari anziché sostitutivi.

1. INTRODUCTION

Following the end of World War II in 1945, which was marked by the significant widespread destruction of capital and the mass death of civilians, the United Nations was established in 1946 with the aim of preventing conflicts, fostering international collaboration and providing development assistance for reconstruction. This was followed by the Marshall Plan of the World Bank in 1947 and the launch of the Point Four Program by President Truman in 1949 to provide assistance for decolonized and underdeveloped countries to commence their development journey. It is these events that have raised the curtain for international development assistance and signaled the outset of *foreign aid*.

Foreign aid is defined by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) as flows of commodities, technical assistance and financial flows which take the form of grants or concessional loans and are intended to spur and foster economic development and welfare in the recipient country. Foreign aid, which is provided as bilateral or multilateral assistance, is classified by the DAC into three categories, namely: Private Voluntary Assistance which is grants from charities and Non-Governmental

Organizations (NGOs); Official Assistance (OA) which is aid extended to countries with *per capita* income of at least \$9000; and most importantly, Official Development Assistance (ODA) which is aid given to low-income and middle-income countries and is the largest of the three (Radelet, 2006).

From the 1960s ODA started to increase steadily and continued to be the major source of external financing for developing countries until the early 1990s when it decreased sharply. The reasons were centered on issues of the fungibility of the aid received, especially in countries with prevailing corruption, in addition to the extensive conditionality and selectivity in distributing aid. Foreign aid was also being driven by political considerations of donor governments without necessarily having the best interests of the recipient countries in mind and did not show much success in its main objective of poverty reduction. While economists continue debating its effectiveness, these bad attributes caused a dilemma for foreign aid and increased the dissatisfaction of both recipient and donor countries.

Concurrent with the reduction in ODA flows was the increased globalization and integration across countries in the late twentieth century, which led to a simultaneous increase in private capital flows. Private investors benefited from the increased liberalization in financial markets and trade liberalization which satisfied their appetite for penetrating new markets. Not only did globalization result in an explosion in the flows of goods and services, but also in the flows of human capital as the number of migrants kept increasing. This movement of people was mainly facilitated by technological improvements in transportation facilities. From animal drawn carts and sailing ships to railways, steamships and air planes, transportation became cheaper and faster (Weil, 2009) and more and more people started migrating from poor countries to advanced countries in search of a better standard of living. The migration of skilled human capital posed a continuing threat of a brain drain for poorer countries as more of their highly educated doctors, engineers and scientists left to work in the developed nations. Despite this negative effect, one consequence of migration was the rise of a major source of private capital transfers i.e. *remittances*.

1.1 *The Main Policy Objectives of Postwar Lebanese Governments*

Before 1975 Lebanon had one of the strongest economies in the Middle East and was considered the major financial hub of the region because of its solid and sound banking sector. Following the oil boom in Arab Gulf countries in the 1960s, Lebanese banks became the major recipients of the region's petrodollars. However, the civil war that started in 1975 and lasted for 15 years resulted in massive destruction and retarded economic growth.

Immediately after the end of the war in 1990, governments focused on the reconstruction of the country's infrastructure and on formulating a comprehensive economic development strategy. The Ministerial Statement of 2000 outlined the fundamental policy objectives of the government and its economic vision. There were three main policy objectives, namely: (1) Initiating a liberal economic environment to support the private sector in acting as the engine of growth, (2) Encouraging and facilitating international trade with the rest of the world and further opening-up the economy and (3) Maintaining financial and monetary stability to strengthen the confidence of investors in the economy (Ministry of Finance – MOF, 2000).

The government was determined to boost private sector initiative and encourage investment in many ways. The first was in modernizing the regulatory and legal system with its investment related components, mainly, the code of commerce, the competition law, the customs law and the public accounting law. The second was through pursuing privatization, whose proceeds were to be used to reduce public debt. Finally, the government reduced tariffs and eliminated non-tariff barriers on some imported goods and adopted an open-skies policy to facilitate free international trade (MOF, 2000).

2. SCOPE OF THE STUDY

Starting at US\$20 billion in 1980, remittances grew rapidly throughout the developing world, reaching a staggering US\$317 billion in 2009 (Singh *et al.* 2011). Foreign aid flows are currently dwarfed by the flows of remittances especially in the regions of South Asia, the Middle East and North Africa (Lensink and Toxopeus, 2007). While the flow of foreign aid decreases and the debate over its effectiveness continues, remittances could, in principle, play an important role as an alternative source for development finance. However, the role of remittances in economic development is also subject to debate which makes it a contentious topic for study, similar to the

case of foreign aid, especially in their effects at the macroeconomic level on *savings* and *investment*.

With respect to the aid effectiveness debate, much of the critical literature belonging to what McGillivray *et al.* (2006) call the “It Doesn’t Work” camp went beyond arguing that aid has no correlation with growth to suggesting that it has a negative effect through increasing consumption and decreasing savings and investment. According to Bauer (1969), foreign aid is an ineffective instrument for enhancing living standards and has actually retarded economic development in recipient countries rather than promoting it. The same is the case with remittances where some studies suggest that they are spent on consumption rather than on increasing savings and investment and, hence, do not contribute to economic development as effectively as they might.

On the other side of the debate, Brown (1994), Zarate-Hoyos (2004), and Yang (2008) have studied the impact of remittances and found that they make a significant contribution to savings and investment. There are also the unconditional supporters of foreign aid who believe that aid has promoted savings and investment and is a significant growth determinant (Hansen and Tarp, 2000; Durbarry *et al.*, 1998; Dalgaard and Hansen, 2001). Moreover, According to Singh (1985), foreign aid had a strong positive impact on the rate of economic growth during the 1960-80 period in African Least Developed Countries (LDCs). However, when Singh introduced a government intervention variable to the analysis, it appeared that state intervention had a negative effect on domestic savings and on economic growth.

Since some countries were receiving huge flows of aid but still performing badly with no sign of growth, a new explanation for aid effectiveness arose which was based on the aid-policy-growth nexus. The perception was that aid works well in countries with sound economic management and favorable policy environments (sound fiscal, monetary and trade policies) (Burnside and Dollar, 2000; World Bank, 1998) and that reform programs supported by policy-based aid and adjustment loans might fail in countries with prevailing political instability, ethnic fractionalism and undemocratically elected governments that have been in power for a long time (Dollar and Svensson, 2000). Burnside and Dollar (2000) also point to the dependency of the effectiveness of aid on the decisions about how it is used, whether for investment or consumption.

The debates on the impact of remittances and foreign aid on savings and investment have been inconclusive and are still actively being pursued. It seems, however, that the impacts of these inflows differ between countries according to different economic, cultural, and political country characteristics. One country that the literature fails to consider in terms of the effects of these foreign inflows on savings and investment is *Lebanon*. This country, which suffered from a devastating civil war and which still suffers from political instability, corruption, and fiscal deficits, is also a remittance-dependent country, with remittances reaching 21.9% of the Lebanese Gross Domestic Product (GDP) in 2009. Lebanon has also received huge sums of foreign aid.

3. HYPOTHESIS

On one hand, despite being a spectacular success in countries like Botswana, Indonesia, Mozambique and Tanzania (Radelet, 2006), foreign aid might be detrimental to growth in the Lebanese case. On the other hand, the huge flows of remittances which dwarf the ODA and OA received (which from here on will be equivalently referred to as foreign aid) might act as a better alternative source of development finance and have a rather positive impact on savings and investment and, by extension, represent a significant stimulus to growth. This is the central theme this paper will investigate while asking how far foreign aid and emigrant remittances finance savings and the accumulation of capital for investment and examining which of the two is more likely to contribute to growth.

4. PREVIOUS RESEARCH

In the course of transition from economic stagnation to becoming a developed nation, there are some principal changes that need to take place and the most important of these is to achieve higher levels of savings and investment. Through forced savings and investment, the USSR successfully achieved industrialization. This experience, along with the Great Depression, has influenced development thinking and resulted in greater attention being given to the role of savings and investment in economic growth. Perhaps the most important and widely applied growth model that is centered on savings, investment and foreign aid is the Harrod (1939) – Domar (1946) model, also known as the financing gap model and the investment-limited growth model which served as the basis for the rationalization of giving aid.

The implications of the model are that increasing savings and channeling them to investment will lead to the accumulation of capital which will, in turn, increase output and generate economic growth. This linear and causal relationship starts off with an economy saving a certain proportion of its national income which will be used both to replace depreciated capital and to increase available capital stock. According to Westerberg (2005), the growth rate of GDP ($\Delta Y/Y$) is determined in the Harrod-Domar model by the equation $\left[\frac{\Delta Y}{Y} \right] = \frac{s}{k}$ such that the higher the savings ratio (s) needed to achieve a required investment rate and the lower the capital-output ratio (k), the higher the growth rate of the economy's GDP. To illustrate this further, following Westerberg's (2005) example, assume a country with a capital-output ratio (k) of 3.5 and a national savings ratio of 7%, the GDP growth rate will be 2% per year, which is often hardly sufficient to keep up with population growth. Hence, higher levels of savings are essential to achieve higher levels of growth. However, poor countries suffering from low income levels will spend high proportions of their income on covering subsistence consumption needs without being able to save anything and consequently, will not meet investment requirements for growth. The difference between the required investment level and the country's savings ratio represents the gap that needs to be financed (Easterly, 1999a and 1999b).

The Harrod-Domar model suggests that donor communities fill this gap by providing foreign aid which will augment the supply of domestic savings needed to meet the investment requirement which, in turn, is a key prerequisite for accelerating growth (Chenery and Strout, 1966). According to Mosley (1980), the growth rate will then increase from $\left[\frac{\Delta Y}{Y} = \frac{s}{k} \right]$ to $\left[\frac{\Delta Y}{Y} = \frac{s+\alpha}{k} \right]$ where (α) represents the amount of aid received. As a result, foreign aid will complement domestic investment efforts by easing the savings constraint which results in higher availability of investible resources. This way a country may set a desired growth target and determine the investment requirements for achieving that target. Following Easterly's (1999a) example, assume a target GDP growth of 6% and a capital-output ratio of 3.5. The required investment needed to achieve this target growth would then be 21% of GDP but this is limited by national savings of only 12% of GDP. Therefore, there is a financing gap of 9% of GDP between the current amount of national savings and the investment requirement which needs to be filled with foreign aid to make investment possible and, consequently, lead to the desired growth rate of 6%.

The causal relationship running from savings to investment to growth anticipated by the Harrod-Domar model was retained in the exogenous growth model of Solow (1956). According to this model, the proportion of income that is saved will be entirely channeled to investment in a closed economy and, hence, will lead to the accumulation of capital. This will result in the acceleration of growth while the economy converges to its new steady state. This also shows that countries with higher saving rates will witness rapid growth rates, but once an economy reaches its new steady state, there will be no more growth. Therefore, higher savings will increase growth only temporarily and not result in sustainable growth. They will, however, permanently raise the level of output and income as the economy is now at a higher steady state and is better off (Jones, 2002). But whether foreign aid would grease the wheels and give a runoff for this chain reaction by increasing savings is not mentioned in the Solow model but is rather the specialization of the Harrod-Domar model.

The main prediction of the Harrod-Domar model is that there is a *positive* and proportional one-to-one link from aid to investment. Countries will no longer grow at rates dictated by their marginal propensity to save since aid relieves shortages in savings by filling the gaps. The International Financial Institutions (IFIs) including the World Bank, the International Monetary Fund (IMF) and the European Bank for Reconstruction and Development (EBRD) have been the main supporters of the model and have adopted it.

5. DATA AND EMPIRICAL MODEL

The basic hypothesis that this paper will test is the effect that foreign aid is expected to have i.e., either a negative impact on savings and investment in Lebanon or no effect at all, which translates into either a negative or zero effect on growth. In contrast, it is anticipated that remittances exert a positive effect on savings and investment and, consequently, stimulate growth in Lebanon, and hence represent a better and much more effective source of external development finance than foreign aid. However, the question remains of how much savings and investment would increase or decrease as a result of an increase in remittances and foreign aid. This part explores the methodological approach and data set adopted to address these relationships as follows:

$$\text{GNS}_t = \beta_0 + \beta_1 \text{GDPPC}_t + \beta_2 \text{REM}_t + \beta_3 \text{AID}_t + \beta_4 \text{DEPint}_t + \beta_5 \text{INF}_t + \beta_6 \text{BOP}_t + \varepsilon_t \quad (1)$$

$$INV_t = \beta_0 + \beta_1 GDPPC_t + \beta_2 REM_{t-1} + \beta_3 AID_{t-1} + \beta_4 GNS_{t-1} + \beta_5 OPEN_{t-1} + \beta_6 DEBT_{t-1} + \beta_7 INF_t + \beta_8 BOP_t + \varepsilon_t \quad (2)$$

All the variables in equations (1) and (2) and their definitions are presented in table 1 below, along with the unit of measurement for each, and the data sources. The most important change made to Baldé's methodology is in the investment model which is transformed into a distributed lag model. This model measures changes in current values of the dependent variable (investment) based on current values of some explanatory variables and lagged values of other explanatory variables. In other words, the current value of the dependent variable is influenced by past values of independent variables. For example, the impact of remittances on savings may happen immediately; however, the decision to invest the remitted money requires some planning and will have impacts in the following year. Hence, the distributed lag model for investment will measure, for example, the impact exerted by remittances received in 1989 on investment levels in 1990. The remittances variable is a lagged variable whose data span the period 1989-2010 while the data for the investment variable cover the period 1990-2011. Foreign aid, gross national savings, openness and external debt are also introduced as lagged variables covering the period 1989-2010; similarly, their effects on investment might not happen immediately.

According to Baldé (2011), the economic literature agrees on a set of determinants of savings and investment. The main determinants of savings include: GDP *per capita*, deposit interest rates and inflation, to which remittances and foreign aid are added to estimate their impacts. GNS are determined by the difference between gross national income and total consumption plus net transfers according to the WBDI definition. With respect to the BOP, Baldé (2011) refers to Ricardian equivalence theorem which points to the importance of public deficits in influencing the decision to save or not to save: the higher the public deficit, the higher the anticipation of future tax increases which results in an increase in savings as a precautionary action. However, no measure of public deficit was included originally as one of the explanatory variables in Baldé's paper. Therefore, the BOP variable was added to the savings model to capture the influence of public deficits on national savings. Moreover, three additional variables were added to the investment model, namely: external debt, inflation and BOP. The addition of these variables is supported by the literature which, for example, includes macroeconomic instability (usually measured by inflation) as one of the variables affecting investment in addition to public deficits and foreign debt.

TABLE 1 - *Definitions and Sources of Variables*

	Label	Variable	Definition	Unit of Measurement	Source of Data
1	GNS	Dependent	Gross National Savings	% of GDP	IMF data and Statistics
2	GDPPC	Independent	GDP per Capita	Current Prices US Dollars	IMF data and Statistics
3	REM*	Independent	Migrant's Remittances	% of GDP	UNCTAD Statistics
4	AID*	Independent	Net Official Development Assistance (ODA) and Official Aid (OA)	% of GDP	World Bank Development Indicators (WBDI)
5	DEPint	Independent	Deposit Interest Rate	Per cent	WBDI
6	INF	Independent	Inflation	Average Consumer Prices Index	IMF data and Statistics
7	BOP	Independent	Balance of Payments	% of GDP	UNCTAD Statistics
8	INV*	Dependent	Gross Fixed Capital Formation	% of GDP	UNCTAD Statistics
9	DEBT*	Independent	External Debt	Per cent	WBDI
10	OPEN	Independent	Degree of Openness	Per cent	Penn World Table
* refers to data that were originally in current US dollars and at current exchange rates and were changed to % of GDP					

The remittances variable is a composite variable that comprises three items often defined by the BOP Manual of the IMF as: worker's remittances, compensation of employees and migrants' transfers. Worker's remittances are private transfers from migrants who have been working in the host country for more than a year whereas employee compensations are the transfers of income of migrants who have been resident in the host country for less than a year. Migrant transfers are referred to as money that migrant workers would take back home when they return indefinitely (Lensink and Toxopeus, 2007).

According to Lensink and Toxopeus (2007), the current state of data on remittances has shortcomings. This is because it is difficult to measure the significant percentage of remittances

transferred through informal channels (such as sending cash through friends or relatives instead of making bank transfers). The World Bank and IMF (2003) refers to these informal channels as “Underground Banking” channels or “Alternative Remittance Systems” because they involve transferring money through service providers called “Hawaladars” (the term originates from the word “hawala” which means “transfer” in Arabic) who operate outside the formal financial sector. Remittances may also go unrecorded because of the different forms they take. For example, remittances can be in-kind in the form of clothing, electronics, jewellery and other consumer goods whose values are not captured by the data. Therefore, the data are likely to underestimate the actual flows of remittances.

On the other hand, Baldé (2011) argues that the incorporation of compensation of employees in measurement of remittances overestimates the data since part of the compensation will never be remitted but will be spent in the host country. He also argues that these compensations include the wages of individuals such as the staff of consulates and embassies who are not migrants. The author also indicates the confusion in the recording of remittances data which are often misconceived as deposits by non-residents, export revenues and tourism receipts. These limitations may affect the reliability of the data on remittances.

The data collected for all variables comes from three main sources, the IMF Data and Statistics (2012), UNCTAD Statistics (2013) and WBDI (2012). Information on remittances were found in current US\$ from UNCTAD statistics but were changed into percentage of GDP by simply dividing the value of remittances of every year by the corresponding GDP value of the same year (times 100). This was done also for data on net ODA and OA received, for gross fixed capital formation, and for external debt data.

The net ODA and OA received are divided into two major categories: long-term loans as opposed to soft loans and grants. The bulk of long-term loans are usually those with more than 20 years of maturity and which should be repaid in foreign currency. Grants, in contrast, are gifts that do not require repayment while soft loans can be for the long-term (as much as 99 year’s maturity), are repayable in foreign or local currency at low interest rates, and come with a grace period of between 10 to 20 years (Rosenstein-Rodan, 1961). The external debt variable covers all long-term debt, short-term debt, and IMF credit that are repayable in foreign currency, goods or services (WBDI definition).

The degree of openness is usually measured as the ratio of imports plus exports to GDP. The gross domestic investment variable refers to gross fixed capital formation, which is defined by the WBDI as the changes in the level of inventories and the additional fixed assets in an economy. Fixed assets include purchases of equipment, machinery, the construction of roads, industrial buildings, schools, commercial buildings and hospitals in addition to land improvements such as fence building.

The results and findings of this methodology will be generated using the Ordinary Least Squares (OLS) estimation technique to run the regressions for both the savings model and the distributed lags model for investment.

6. RESULTS AND FINDINGS

6.1 Results of the Savings Model

The methodology adopted for this dissertation involved two econometric models. The first investigated the variations in GNS as a result of changes in six explanatory variables. An OLS estimation technique was applied to the savings model and used 22 observations from 1989 till 2010. The results are shown in table 2 below:

Comparing these results to those of Baldé (2011), some similarities and a few differences were recognized. The first similarity is with respect to deposit interest rates where the estimated coefficient, which is strongly significant at the 1% level, shows that a 1% increase in DEPint rate will result in a substantial increase in GNS by 6.12%. This is because higher deposit interest rates are translated into higher income in the future which encourages households to save more. Another similarity is that of remittances having a strong positive impact on savings, such that a 1% increase in remittances is associated with a 1.66% increase in GNS in Lebanon. Note that the p-value associated with the estimate of β_2 is [.000], i.e. zero, which is less than the 1% level of significance and, therefore, the result cannot be rejected. This result supports the hypothesis of this dissertation.

Table 2 - Ordinary Least Squares Estimation for the Savings Model

Dependent Variable is GNS				
Regressor	Coefficient		Standard Error	T-Ratio[Prob]
Constant (CON)	β_0	-172.9884	39.0916	-4.4252[.000]***
GDPPC	β_1	-0.0005923	0.0022951	-0.25808[.800]
REM	β_2	1.6599	0.35054	4.7354[.000]***
AID	β_3	-3.1681	1.1567	-2.7389[.015]**
DEPint	β_4	6.1192	1.2453	4.9139[.000]***
INF	β_5	1.2084	0.34618	3.4907[.003]***
BOP	β_6	0.15380	0.13864	1.1093[.285]
R-Squared	.73408		R-Bar-Squared	.62771
S.E. of Regression	6.1811		F-stat. F(6, 15)	6.9013[.001]
Mean of Dependent Variable	14.4564		Residual Sum of Squares	573.0872
Durbin-Watson statistic	1.5215			
*** and ** refer to 1% and 5% levels of significance, respectively				

The major difference with the findings of Baldé (2011) was in the impact of foreign aid on savings. For Lebanon, there is a negative and statistically significant (at the 5% level) reaction of GNS to changes in AID. The effect is strong, since a 1% increase in AID leads to a decrease in GNS by 3.17%. This negative influence might be attributed to the fact that aid funds projects such as schools, hospitals and roads which require maintenance to ensure their sustainability. These maintenance costs are, however, incurred by the local government and this increases its consumption spending and reduces public savings which, consequently, reduces GNS (Baldé, 2011). The negative effect of aid on savings was set out earlier and these results confirm it.

The coefficient for GDPPC was negative and statistically insignificant. Nonetheless, according to Bayoumi *et al.* (1998), differences in countries' saving rates can be explained by differences in their GDPPC. A country that suffers from very low income levels can hardly save and spends all its income on subsistence consumption. However, as income starts increasing, savings also increase. But this positive effect does not continue indefinitely because at high levels of income *per capita*, saving rates will decline. Therefore, the relationship between GDP *per capita* and savings takes an inverted-U shape.

According to Baldé (2011), the anticipation of high inflation has the effect of reducing savings because it induces households to buy now what they would purchase later at a higher price. However, the regression results of the savings model for Lebanon show that inflation has a positive impact on savings, such that an increase in inflation by 1% is associated with an increase in GNS by 1.21% and the coefficient is strongly significant at the 1% level. According to Ertac *et al.* (2003, p.1409),

“Macroeconomic uncertainty, usually proxied by the inflation rate, is expected to have a positive impact on saving, as people in such an environment would try to hedge risk by saving”.

This argument is based on the precautionary motive which persuades households to save during good times to cushion any shocks in bad times. It is also possible that higher inflation may increase nominal interest rates which increase savings (Bayoumi *et al.*, 1998). Moreover, the BOP coefficient which was added to capture the effect of public deficits on savings was positive but statistically insignificant. Nevertheless, it can still be assumed that the higher the public deficit, the higher the anticipation of future tax increases which induces households to increase their savings as a precautionary action.

The value of R-squared is 0.73408, indicating that 73.41% of the variation in GNS can be explained by the independent variables in the function. Other variables that were not included in the model and which may have an impact on savings are explained by Hansen and Trap (2000) as follows:

Hansen and Tarp (2000) point to the argument presented 40 years ago by Papanek (1972) and Newlyn (1973) which explains when to expect a positive or negative link between aid and investment. This analysis is based on the equation: $s_t = \alpha_0 + \alpha_1 a_t$ where s_t stands for savings, α_0 is the marginal savings rate and α_1 is the coefficient capturing the impact of aid (a_t) on savings. Papanek and Newlyn believe that if the α_1 coefficient is negative and greater than -1, then the impact of aid on investment will be positive. In other words, when aid has a negative impact on savings defined by a coefficient of -2, for example, only then would it have a negative impact on investment. The results for Lebanon are consistent with this argument since the aid coefficient in the savings model was $-3.17 > -1$ while that in the investment model was positive ($\beta_3 = 1.36$).

6.2 The Reliability of Results

The diagnostic tests for the savings model are shown in table 3 below. These tests examine how well the model is specified on the basis of whether it satisfies the conditions of normality of residuals, of no heteroscedasticity, and of non-autocorrelation. The functional form test is added to evaluate whether the model is linear or non-linear.

Table 3 - *Diagnostic Tests for the Savings Model*

Test Statistics	LM version	F version
A: Serial Correlation	CHSQ(1)= 1.5636[.211]	F(1, 14) = 1.0711[.318]
B: Functional Form	CHSQ(1)= 2.1395[.144]	F(1, 14) = 1.5081[.240]
C: Normality	CHSQ(2)= .81179[.666]	Not applicable
D: Heteroscedasticity	CHSQ(1)= .97246[.324]	F(1, 20) = .92494[.348]
A: Lagrange multiplier test of residual serial correlation		
B: Ramsey's RESET test using the square of the fitted values		
C: Based on a test of skewness and kurtosis of residuals		
D: Based on the regression of squared residuals on squared fitted values		

Because most regression problems involving time series data exhibit positive autocorrelation, the hypotheses usually considered in the Durbin-Watson test are for (p) the error autocorrelations as follows (Montgomery et al., 2001):

$$H_0: \rho = 0$$

$$H_1: \rho > 0$$

If $d < d_L$ reject $H_0: \rho = 0$

If $d > d_U$ do not reject $H_0: \rho = 0$

If $d_L < d < d_U$ test is inconclusive.

Based on the above, the Durbin-Watson statistic shown in table 4 was approximately 1.52 which is not a cause for alarm. For a sample of 22 observations for each of the 6 explanatory variables, this value falls between the lower and upper critical values $d_L = 0.587$ and $d_U = 1.849$, respectively, at the 1% level of significance. Therefore, the Durbin-Watson test for autocorrelation was inconclusive but the serial correlation diagnostic test on the F-test P-value shows no

autocorrelation. In the case of the tests for normality, functional form and heteroscedasticity, the diagnostics of the savings model indicate that the null hypothesis for each of the tests, is not rejected at the 5% level, i.e. (1) errors are normally distributed, (2) the relationship between the conditional mean of the dependent variable (GNS) and its explanatory variables is linear and (3) there is no heteroscedasticity. Therefore, it can be concluded that the results of the savings model are reliable.

6.3 Findings of the Investment Model

The results of the OLS estimation for the distributed lag model for investment are shown in table 4 below. Using the OLS results, the p-value of the F-statistic test for the equality of the coefficients was [.000] which is less than the 1% level of significance. Therefore, the null hypothesis that all coefficients are simultaneously equal to zero can be rejected. Furthermore, the R-squared value of 0.93072 indicates that 93.07% of the variation in the INV variable can be explained by the eight independent variables in the function.

The Durbin-Watson value of 2.4007 is higher than the upper critical value $d_U = 2.188$ at the 1% significance level. This indicates that there is no autocorrelation in the residuals. Moreover, the diagnostics of the investment model shown in table 5 below show that the errors are normally distributed and that the relationship between the independent variable (INV) and the explanatory variables is linear. However, in the case of the test for heteroscedasticity, the probability value is less than the 10% level of significance and, thus, the null hypothesis of homoscedasticity is rejected which implies that the residuals are heteroskedastic. Given the existence of heteroscedasticity in the residuals of the investment model, the White's heteroscedasticity-consistent estimator of the standard errors was used. The new OLS results are shown in table 6.

Table 4 - Ordinary Least Squares Estimation for the Distributed Lag Model for Investment

Dependent variable is INV				
Regressor	Coefficient		Standard Error	T-Ratio [Prob]
CON	β_0	-3.0935	8.9132	-.34707[.734]
GDPPC	β_1	-0.0023968	0.0008613	-2.7827[.016]
REM	β_2	0.26661	0.12718	2.0963[.056]
AID	β_3	1.3563	0.48897	2.7739[.016]
GNS	β_4	0.22910	0.069418	3.3003[.006]
OPEN	β_5	0.064126	0.086526	0.74112[.472]
DEBT	β_6	-0.16470	0.028603	-5.7582[.000]
INF	β_7	0.47737	0.12791	3.7321[.003]
BOP	β_8	0.048624	0.060919	0.79818[.439]
R-Squared	0.93072		R-Bar-Squared	.88808
S.E. of Regression	1.9702		F-stat. F(8, 13)	21.8291[.000]
Mean of Dependent Variable	28.0135		Residual Sum of Squares	50.4628
DW-statistic	2.4007			

Table 5 - Diagnostic Tests for the Investment Model

Test Statistics	LM version	F version
A: Serial Correlation	CHSQ(1) = 1.1276[.288]	F(1, 12) = .64830[.436]
B: Functional Form	CHSQ(1) = .87274[.350]	F(1, 12) = .49570[.495]
C: Normality	CHSQ(2) = .38701[.824]	Not applicable
D: Heteroscedasticity	CHSQ(1) = 3.4932[.062]	F(1, 20) = 3.7751[.066]
<p>A: Lagrange multiplier test of residual serial correlation</p> <p>B: Ramsey's RESET test using the square of the fitted values</p> <p>C: Based on a test of skewness and kurtosis of residuals</p> <p>D: Based on the regression of squared residuals on squared fitted values</p>		

Table 6 - Ordinary Least Squares Estimation for the Investment Model
Based on White's Heteroscedasticity Adjusted Standard Errors

Dependent variable is INV				
Regressor	Coefficient		Standard Error	T-Ratio [Prob]
CON	β_0	-3.0935	5.9346	-.52126[.611]
GDPPC	β_1	-0.0023968	0.0005223	-4.5891[.001]***
REM	β_2	0.26661	0.083858	3.1793[.007]***
AID	β_3	1.3563	0.44757	3.0304[.010]***
GNS	β_4	0.22910	0.081002	2.8283[.014]**
OPEN	β_5	0.064126	0.060776	1.0551[.311]
DEBT	β_6	-0.16470	0.033829	-4.8687[.000]***
INF	β_7	0.47737	0.088116	5.4175[.000]***
BOP	β_8	0.048624	0.049397	0.98436[.343]

***, ** and * refer to 1%, 5% and 10% levels of significance, respectively

The above results show that remittances, foreign aid and savings have a positive effect on investment which agrees with the results of Baldé (2011). The only difference is that Baldé (2011) finds that remittances have a higher positive impact on investment in SSA than foreign aid while the results of the investment model for Lebanon show the opposite. Contrary to the hypothesis that aid would be ineffective in the poor political-economy environment of Lebanon and would have a negative effect on investment, the results showed that for every dollar of aid received, investment increases by approximately US\$1.36 in the following year. Therefore, aid flows to Lebanon stimulate investment irrespective of the poor political-economy environment in the country. The estimated coefficient for the lagged aid variable was accepted at the 1% level of significance and so was that for the lagged remittances variable. The results also show that every dollar of remittances sent back to Lebanon is followed by 33 cents of investment the following year. This indicates that migrants have the objective of not only supporting their families back home, but also investing a certain amount of their remittances in productive projects.

According to the Solow model, in a closed economy, all that is saved is invested. This does not apply for an open economy like Lebanon, in which an increase in savings would increase the

stock of capital but decrease the Marginal Product of Capital (MPK). When the MPK is low, owners of capital would prefer to invest their capital abroad, i.e. in countries where the MPK is higher so that they can earn higher returns. Thus, in an open economy, high saving rates might lead to an outflow of investment (Weil, 2009). The regression results showed that an increase in savings has a positive effect on investment in Lebanon. The estimated coefficient of the lagged savings variable which is significantly different from zero at the 5% level shows that a US\$100 increase in savings in 2001, for example, will lead to an increase in investment by US\$22.9 in the following year, i.e. in 2002. Therefore, not all that is saved is invested. Nevertheless, the higher savings will increase the available deposits at banks and also increase the funds available for domestic credit for extending more loans and, consequently, increase investment. Moreover, openness can bring about new ideas, production methods, and technologies that would aid domestic production and increase investment. On the other hand, domestic producers may not be able to withstand the international competition from foreign multinational firms brought about into the economy through openness (Baldé, 2011). Therefore the effect of openness on investment can go either way. However, the estimated coefficient for openness was positive but statistically insignificant.

The estimated coefficient for the BOP variable was also positive but statistically insignificant. Nevertheless, according to Serven and Solimano (1992), when governments want to reduce their public deficits, they would increase taxes and reduce credit availability for the private sector which will have a negative impact on domestic private investment. In addition,

“Efforts to reduce the public deficit often involve cutting back on public investment” (Serven and Solimano, 1992, p.101).

The increase in taxes may also come as an effort to reduce external debt. The income from investment will be taxed and the tax proceeds will go to aid donors as debt service payments. Moreover, since Lebanon is a highly indebted country with a debt-to-GDP ratio of about a 125%, it will face credit constraints from international donors. For these reasons, huge external debt burdens are detrimental to investment and the regression results for the investment model confirm this position since the coefficient of external DEBT is negative and statistically significant at the 1% level, indicating that a 1% increase in debt is associated with a decrease in investment by 0.16% in the following year.

Some of the estimated coefficient results were unexpected. For example, the coefficient for the GDPPC variable was negative and statistically significant at the 1% level. This negative effect is small and could be attributed to the poor political-economy situation in Lebanon which provides few opportunities for investment. Furthermore, the inflation variable was expected to have a negative impact on investment but it appears it has a positive effect which contradicts the view in the literature (Manssorian *et al.*, 2010). The coefficient was significant at the 1% level indicating that a 1% increase in inflation increases investment by approximately 0.48%.

6.4 Remittance and Foreign Aid Flows to Lebanon: A Comprehensive Comparative Analysis

Contrary to the dominant view in the literature that remittances are spent predominantly on consumption, the results of the savings and investment models indicated that remittances sent to Lebanon do not only serve basic consumption needs but are also saved and invested in some productive activities. Remittances are a very important source of external development finance for Lebanon and may be more effective than foreign aid judging by the sheer volume of their flows in comparison to aid flows.

Aid appeared to have a huge negative impact on savings which might make it a less effective source of development finance than remittances, even though its impact on investment was higher than that of remittances. Remittances may be considered the better source for development finance since foreign aid flows are more volatile than remittance flows. Following Lensink and Toxopeus (2007), the coefficient of variation was calculated by dividing the standard deviation by the mean (times 100) for the data from 1989 to 2010 for both aid and remittances. The results, shown in table 7 below, prove that remittances are less volatile than aid and are hence a more stable and more reliable source of development finance. Nevertheless, as Baldé (2011, p. 258) points out, these two development finance flows cannot be substitutes since

“...remittances cannot actually finance major public projects such as roads, railways, airports, contrary to foreign aid”.

Instead, they complement each other, and when used properly, can both foster growth and alleviate poverty.

Table 7 - *The Volatility of Remittance and Foreign Aid Flows to Lebanon*

	Remittances	Foreign Aid
Standard Deviation	2,275,926,597	277,296,348
Mean	3,307,627,569	352,618,181
Coefficient of Variation	68.8	78.6

7. CONCLUSION

The on-going debate on the effectiveness of remittances and foreign aid in stimulating savings and investment has been investigated in this paper for the case of Lebanon. The remittance-dependent country, which still suffers from a huge debt burden, presented an ideal case for examining the roles of external sources of development finance. With respect to remittances, the results were in agreement with those parts of the literature which believe that remittances are not only spent on consumption but are also saved and invested. With respect to foreign aid, despite the fact that it appeared to have a negative impact on savings, the major finding was that it can stimulate investment irrespective of the poor political-economy environment in Lebanon, and may, therefore, stimulate growth.

This result agrees with the findings of Dalgaard and Hansen (2001) and contradicts the position taken by Burnside and Dollar (2000) and the World Bank (1998) that aid is only effective in a good policy environment with sound economic management. The Burnside and Dollar (2000) methodology which introduced an interaction term (aidx policy) to measure the influence of policies on aid was criticised by many economists including Islam (2003). The criticism was based on the “chicken and the egg” problem, since it is possible that aid, when properly used, can improve policies while good policies can improve the effectiveness of aid simultaneously.

Since remittance flows dwarf the flows of foreign aid to Lebanon and are less volatile, they present a much more effective source of development finance than foreign aid. Given the diaspora and the ever-growing increase in the number of migrants, Lebanon can regard remittances as a continuing resource. However, governments should be mindful that emigration might still pose an economic threat, as it results in a loss of output and in a brain drain, especially when most of the emigrants come from the ranks of the highly skilled individuals who cannot be easily replaced. This loss of manpower, which results in a loss of output, is translated into fewer

exports and, thus, a loss of the foreign exchange needed for ensuring macroeconomic stability (UN, 1987). Governments should also seek to avoid any possible “Dutch disease” effects resulting from the huge flows of remittances which may cause the currency to appreciate and, hence, reduce the competitiveness of Lebanese exports in the world market with negative implications for growth (Solimano, 2003).

According to Bourdet and Falck (2007), a growth-oriented aid policy can help improve the competitiveness of domestic production since a higher supply effect can depreciate real exchange rates and hence mitigate the adverse effect from remittances. This shows how aid and remittances may act as complementary sources for development finance. Governments may also encourage investment in education to improve competitiveness of export industries and encourage people to save. A “second best” alternative might be to increase tariffs on the highly demanded import goods. But this policy may have negative effects.

Remittances may be more stable than foreign aid. However, they still depend on the economic situation in host countries. For example, were there to be an economic crisis in Saudi Arabia, this might reduce the flow of remittances to Lebanon as some employees will lose their jobs. Moreover, if emigrants decide not to go back to their home country, then they will only send back remittances to shelter their family, not to invest. Therefore, governments should encourage return migration in order to gain the knowledge from the experienced migrants and can offer special bonds targeted at the diaspora with good interest rates to keep attracting their remittances (Lensink and Toxopeus, 2007; Solimano, 2003).

According to Lensink and Toxopeus (2007), remittances can stimulate growth especially when sent through formal channels and, therefore, governments should adopt policies that promote financial inclusion for all individuals from all social classes. To facilitate transfer of remittances through formal channels, governments should also consider encouraging banks to reduce transaction costs and remove exchange rate taxes on foreign currency accounts (Solimano, 2003). Collaboration between both receiving and sending countries to reduce constraints against sending remittances might also be necessary (Baldé, 2011).

Ultimately, both foreign aid and remittances play a crucial role in economic development in Lebanon. It is also likely that they both have a positive impact on growth through increasing investment and may help in the alleviation of poverty. However, these impacts on growth and

poverty reduction are not addressed here and lie outside the scope of this dissertation, but could form an agenda and a basis for future research for Lebanon.

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