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Public Debt in Lebanon: Cointegration Analysis and Forecasts

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----------ABSTRACT----------
This paper analyzes long and short term relationships between the components of the public debt in Lebanon by applying the cointegration analysis of monthly time series, from January 1994 to May 2014 (245 observations), according to Johansen's procedure. The Gross Local Currency Debt(GLCD) and the Foreign Currency Debt (FCD) are not cointegrated and are modeled by near-VAR (39) revealing bidirectional causality between them. The forecasts for May 2015 are respectively USD 40.16 billion and USD 27.375 billion. These results allow us to estimate 0.28% and 0.36% as monthly growth rates from May 2014 until May 2015 for GLCD and FCD respectively. The treasury bills at short and long terms (TBST, TBLT) are cointegrated (a constant in the cointegrating relationship). The same applies to treasury bills at 12, 6 and 3 months (TB12, TB6, TB3). For the systems (TBST, TBLT) and (TB12, TB6, TB3), the available forecasts for May 2015 are respectively in USD billion (0.766, 39.568) and (0.734, 0.544, 0.153).
Economic growth in Lebanon is affected by turmoil in Arab countries. The growth in the gross domestic product (GDP) retreated, while the gross public debt (GPD) continued to rise. It is true that Lebanon has large financial reserves due to the deposits of its citizens in local commercial banks, also Lebanon gained the confidence of international financial institutions due to its loyalty in paying foreign and domestic debts. Howeverthe Lebanese state must establish a strategic plan based on political stability that will certainly increase economic growth, as well as on oil exploration on the Lebanese coast. Perhaps, this political behavior could allow the control of public debt and enable Lebanon in gradually reducing it.
Keywords: *public debt, cointegration, forecasts, political stability.*

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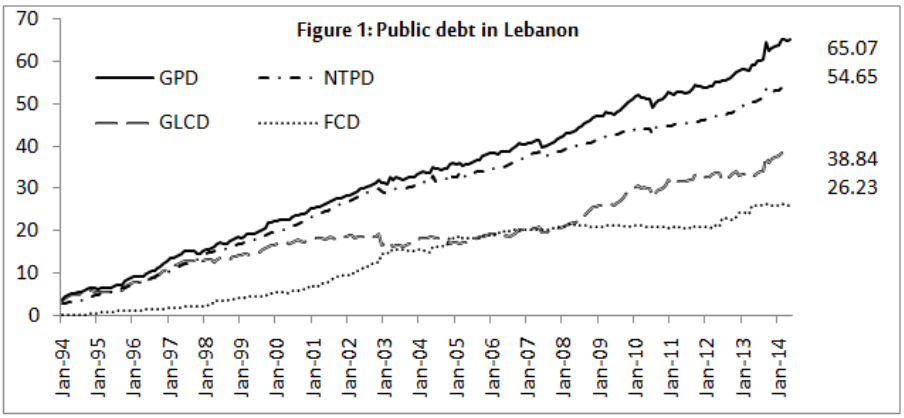
I. INTRODUCTION

When public finances are weak and public debts are accumulated, doubts about the ability of the state to bear financial cost can cause unsustainable debts. The solvency of a state reflects its ability to meet its obligations according to its debts. Political debates to keep public debt under control abound, and the sustainability of public finances is one of the most widely discussed topics in economics these days. The question is how to treat a state's solvency crisis. Indeed, if the foreign debt becomes excessive then non-resident lenders will stop providing new loans. Consequently, the state will not be able to finance its foreign deficit and renew its foreign debt, which leads to a serious crisis. However, if domestic saving is significant then the state could appeal to the domestic debt to finance the public deficit. In the literature of public debt, we report the GPD to GDP ratio (in some cases the Net Total Public Debt NTPD is used; it represents the difference between GPD and Public Sector Deposits PSD). In some countries, the debt level has reached alarming levels: for example, in 2002, this ratio reached 178% in Lebanon (≅ 146 % in 2013), and 149% in Argentina. While, Turkey, Brazil, India and the Philippines showed lower percentages (89%, 78%, 77% and 77% respectively) (Bachellerie&Couillault 2005). Hence, the national benefit is to approve a long term stabilization of the debt to GDP ratio. In 2014, the GPD to GDP ratio in the euro area EU-28 ranged from a low of 6% (Estonia) to a maximum of 177.1% (Greece). And between 2011 and 2014 its average increased from 80.9 % to 86.8%.
In Lebanon, during the period 1994-2011, the coefficient multipliers of GDP and the gross public debt are 4.18 and 7.69 respectively, thus the debt grew faster than GDP and almost doubled (7.69/4.18 ≅ 1.84). The public debt of a state is sustainable if the adopted fiscal policy could be maintained without excessive adjustment in the future. The sustainability of a debt requires that (1) the creditors have a positive assessment of the state's ability to repay its debt in the long term, and (2) the state is able to refinance its debts at maturity. These elements are largely based on the confidence of creditors and the credibility of the authorities.
The Lebanese state must seek sources to finance its public expenditures. The best known way is to use taxes or loans. Budget constraints have an algebraic formulation which connects the variation of the public debt with both the primary deficit (the difference between government spending and tax revenues), and the apparent nominal interest rate of the public debt. For more details on this formulation, we direct the reader to Fève and Hénin (2000), Berthomieu (2004), Leo (2005), Khoury, Colmant and Corhay (2008). Also there is a very

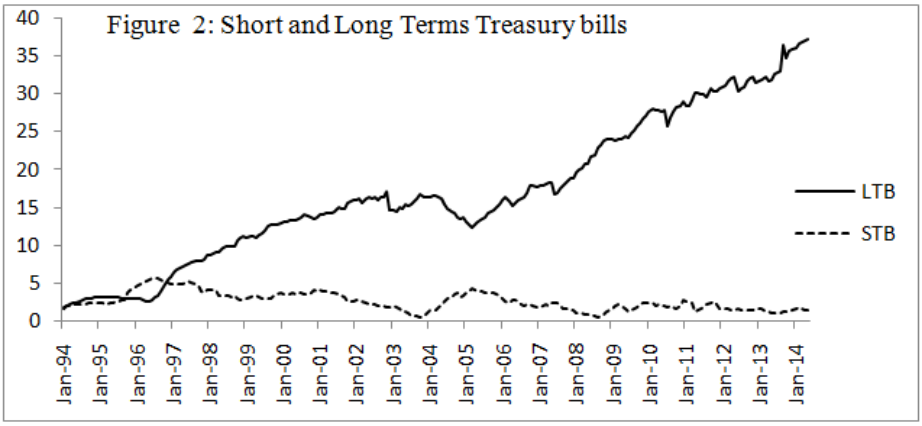
extensive theoretical and empirical literature on the topic of sustainability of public deficit and public debt (Mourad 2013). Two methods have widely been used to study the sustainability of the fiscal policy and public debt: (a) the accounting method (Gabsi 2001) consists of a step by step evaluation, year by year, and allows simulations for the future; this method is used by the IMF. (b) The "actuarial" method (Trehan and Walsh 1991, Fève and Hénin 1998) uses econometric models such as the theory of cointegration and dynamic causality. The accounting approach treats public debt as a percentage of GDP, using the current interest rate, the growth rate of GDP, the budget deficit, the interest of the public debt, the expenses, and the revenues (Berthomieu 2004). The actuarial approach is based on GDP, public debt, revenue and expenditure and the real rate of interest. This paper will not use the above approaches, but envisions a cointegaration analysis of the Lebanese public debt between, first the Treasury Bills at 12, 6 and 3 months (TB12, TB6 and TB3), second the Short Term and Long Term Treasury Bills (TBST and TBLT) Bills, third the Global Local Currency Debt (GLCD) and the Foreign Currency Debt (FCD), and then uses the estimated models VEC or VAR for forecasting. The available data cover the period from January 1994 to May 2014 (245 months). The paper is organized as follows:
Section I as introduction. Section II presents an overview of the public debt in Lebanon. Section III reviews the literature. Section IV uses Johansen's procedure to study the cointegration between the components of the public debt. Section V interprets the results and their political and economic impacts. While Section VI tries to answer the following question: Where is public debt heading in Lebanon? Finally the conclusion is offered in Section VII.

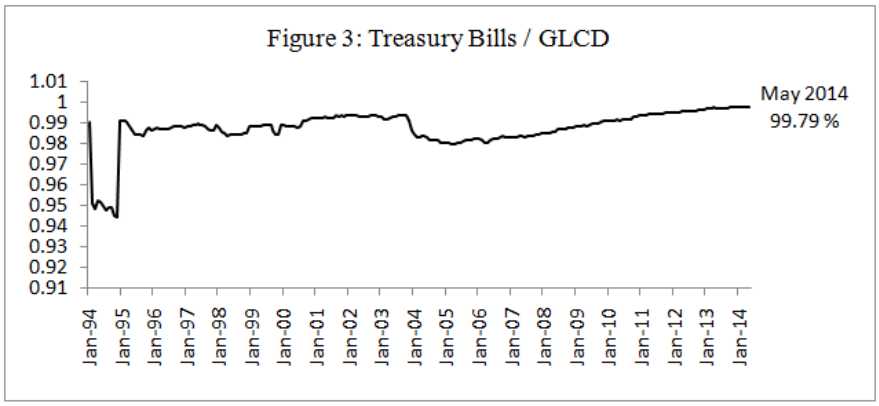
II. OVERVIEW OF THE EVOLUTION OF PUBLIC DEBT IN LEBANON

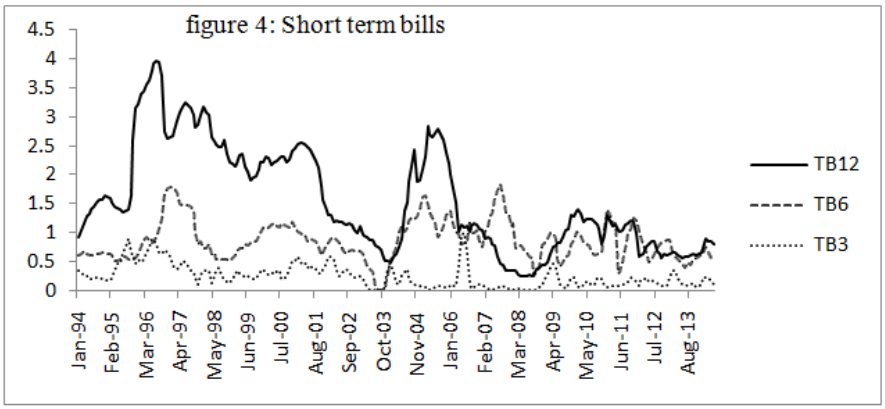
We will start by taking a look at the historical evolution of public debt in Lebanon.
Before 1975, the Lebanese economy experienced a period of prosperity and was one of the most dynamic economies in the Mediterranean and Middle East: strong growth, low inflation, a surplus in the balance of payments, fiscal equilibrium. At that time, the Lebanese state intervened relatively little in the economy and lead conservative fiscal policies. In 1989, after the civil war, it was the signing of the Taif Agreement, which opened a new era that laid the foundations for peace. Lebanon was faced with a double challenge: it was, on the one hand, to rebuild the country with limited sources of funding, and on the other hand, to stabilize the macroeconomic situation; it was a turning point in the contemporary history of the Lebanese economy after the war. The Lebanese government opted for peace and tried rebuilding a completely crushed country after fifteen years of domestic conflict and wars with Israel. This choice needed diplomatic efforts and economic policies to address the financial needs that go far beyond the country's resources. At the end of 1992, with the first parliamentary elections in twenty years and the appointment of a new government, the conditions of political and economic stabilization were met. The growth rate reached 8% in 1994 (Femise 2005), and during this year, the Lebanese government launched the reconstruction of downtown Beirut, which was destroyed during the war. During that same period, the geopolitical situation, was being affected by the Iraq-Iran war, and by the invasion of Kuwait by the Iraqi army; a war largely funded by the Arab Gulf. The Lebanese government was hampered to seek financial loans from Arab Gulf countries. Hence, it was necessary for the government to resort to domestic and foreign debt in order to support the reconstruction effort.
The consequence of such a choice was the gradual increase of the public debt in Lebanon. We recall that in the past three decades, Lebanon experienced a relatively moderate level of foreign debt. Before 1978, there was no such debt, while in 1989 the foreign debt was 41% of GDP (International Financial Statistics, Year Book 2000). Indeed, the foreign debt was around USD 404 million in 1990 and USD 448 million in 1991; 14% and 10% of gross domestic product (GDP) respectively. However, since 1993, the use of foreign funding by the Hariri government lead to an increase in the foreign public debt of the country (figure 1). Thus, the amount of foreign public debt gradually increased from 7.82% of GDP in 1992 to a peak of 90.62% in 2006, and then declined to 55.2% in 2011. The main reason for this increase in foreign debt was the conversion, since 1999, of a large part of the domestic debt into foreign debt. This conversion took place for two reasons: (1) the foreign debt had lower costs and (2) the financial account surplus was needed to offset the growing trade deficits. The foreign debt ceiling until 1995 was at a level of USD 1.34 billion, while since 1996 it began to grow and reached in May 2014 a total of USD 26.228 billion. So the foreign debt became a serious preoccupation for Lebanon. The question of repayment appeared to be very tormenting knowing that the investment capacity of the Lebanese government became quite weak and increasingly got absorbed by the desire to service the debt. We must seek funding sources based on steady growth and effective management of expenses.
It is well known on the international credit market that countries borrowing money have a grand interest to repay their foreign debt because that affects the subsequent use of new loans; this gives countries greater confidence on the part of international credit institutions (Oosterlinck and Szafarz 2005).

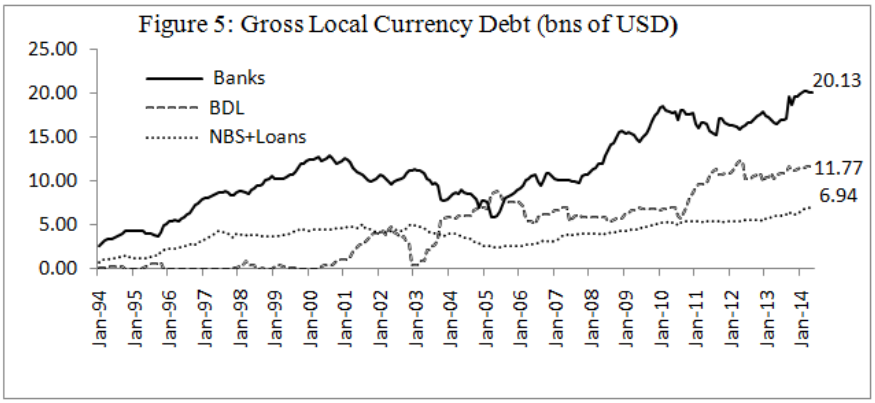


It is difficult to talk about public debt in Lebanon without mentioning the financial efforts at conferences Paris I, II and III. The first conference was in 2001, the second in 2002, and the third in 2007. In the Paris I conference, the World Bank and the European Investment Bank agreed to grant Lebanon a credit of EURO 500 million to finance development projects. The second conference of Paris II allowed Lebanon to benefit from USD 4.4 billion of international credits at preferential rates (only USD 2.4 billion were actually paid). This amount was meant to help advance a long term financing at noticeably lower interest rates than those previously granted to the government on the domestic and international markets. These funds enabled a partial restructuring of the public debt in Lebanon: they substituted the expensive debts and facilitated an agreement between the Lebanese authorities and banks (main holders of the public debt) which agreed to exchange part of their portfolio against cheaper debt. As a result, the domestic and foreign debts were established at short term with high interest rates, and at long term with low interest rates. Though the allocation of long term credit came after Lebanon's commitment to pursue a reform policy, including the privatization program, the reduction of the general expenditures, and the rise of revenues. The international conference to support Lebanon (Paris III) came after the terrible aggression waged by Israel in July 2006. That year, the GPD, which was USD 40.4 billion, made Lebanon one of the most indebted countries in the world relative to its population estimated at 3.5 million. This conference pledged an amount of USD 7.613 billion, yet the agreements were signed for USD 4.348 billion. In return for these pledges, the Lebanese government was called to perform neoliberal economic reforms and had to lower the GPD to GDP ratio from 180% (ratio observed at the end 2006) to 144%, possibly by the end of 2011. In fact the ratio exceeded expectations as it reached 134% in 2011. The GLCD rose during the period 1994-2013, from USD 4 billion to USD 37.354 billion; an annual increase of 11.8186%. Over the same period, the GDP had a fluctuation between USD 9.6 billion and USD 43.49 billion; an annual increase of 7.8465%. We note that the GPD rose from USD 4.35 billion in 1993 to USD 66.576 billion at the end 2014; from 57.7% to 148.62% to GDP ratio respectively. It is of great interest to study the structure of GLCD and see the evolution of each of its components, especially treasury bills. Indeed, the GLCD is based on two main components: long term bills and short term bills; both bills covered a total of 99.97% in May 2014. In fact, the loansare negligible compared to these two main components (figures (2) and (3)). The Short term bills (TBST) are divided into three components: TB12, TB6 and TB3 (figure 4). If we take into account the sources of debt, they can divide the GLCD into four components which are the Central bank (CB), Commercial banks (COB), Loans to public entities (Loans) and Non-Banking System Treasury Bills (NBS) (figure (5)).







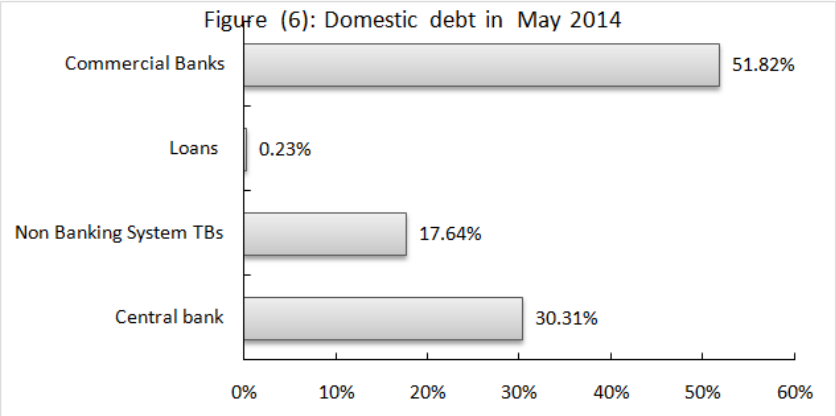


The Inspection of figure (2) provides important information about TBST and TBLT. In fact TBLT occupied the majority of the GLCD since November 1996. Before that date the two components evolved close to one another and recorded two crossings in September-October 1995 and October-November 1996. Inspecting the weight of each type of bills in the structure of GLCD, we find that TBST recorded a small value in two different dates: 3% at the end of October 2003 and 2% at the end of August 2008. While at those two dates, TBLT represented 96 % and 97 % of GLCD respectively. Indeed, since 1995, the Lebanese government adopted a strategy of converting short term debt into long term debt. Since November 1996, the percentage of TBLT varies between a minimum of 51% in 1996 and a maximum of 96% in August 2008. In May 2014, the percentages of long and short term bills are about 96.21% and 3.79 % respectively. However, the increase of TBLT's weight in the GLCD raised the dependence of the Lebanese economy on the international financial market. This dependence probably reflects the vulnerability of the Lebanese economy.

The structure of foreign debt is composed of three components from which Euro bills occupy more than 80% of its nominal value. The first government of the former Prime Minister Hariri in November 1992 faced a disaster in the Lebanese economy after a devastating civil war which lasted from 1975 until 1989. In a country without infrastructure, with a ripped public administration, and where militias replaced the state, everything had to be rebuilt; the biggest problem was to find funding sources. The persona of Hariri, one of the first business men in the Middle East, was a source of confidence for domestic and foreign creditors. Hariri was carrying an

ambitious reconstruction project designed to put Lebanon back in its place in the regional economy. Yet the public expenditure greatly exceeded collected taxes and customs revenues which were almost absent because they were under the militias' control. The force of the Lebanese pound did not quite withstand the civil war; the Palestinian conflict, the Israeli invasion of Lebanon in 1982, the anarchy of public finances, the war expenditures and the various speculations profoundly affected it. The exchange rate of one USD passed from LBP 3.81 in 1982 to LBP 2800 in the summer of 1992. However, during this period, the Lebanese banking system did not experience a collapse and Lebanon had no serious foreign debt; a stabilization policy based on the exchange rate was decided in late 1992. In fact, since November 1998, the Lebanese authority fixed the exchange rate within a very narrow range (less than ± 0.5%; 1 USD for LBP 1507.5). With the start of the first government of Mr. Hariri, the public debt was almost centered on domestic debt (figure 6). Indeed, interest rates fluctuated between 18% and 42% during the period 1992-1998. This policy increased the GLCD from USD 6.21 billion in 1994 to USD 14.41 billion in 1998 (an increase of 232%).

We conclude this section by noting that in 2010 the majority of the FCD was in USD (87.3%), in EURO (7.8%), in Kuwaiti Dinars (2.55%), and the remaining 2.39% cover other currencies like Saudi Arabian Riyals, Japanese Yen, etc (Lebanese Ministry of Finance). The structure of the FCD by the end of September 2012 was 88.4% ofEurobonds, 11.3% of loans and 0.3% of other debt.



III. LITERATURE AND EMPIRICAL REVIEW

It is necessary to mention the main research which lead the cointegration analysis in the economic and financial time series, we mean the Engle & Granger method (1987) and the procedure proposed by Johansen (1988) and Johansen &Juselius (1990).We mention a recent paper for Mourad (2014) which treated the cointegration between unemployment, GDP and public debt in Jordan and another paper (Mourad 2013) that did structural analysis and forecasts of the public debt in Lebanon with its various components. Three main results have emerged out of this paper. First, the FCD and GPD to GDP ratios have a similar trend. The two ratios turned out to be cointegrated according to Engle and Granger's two-step procedure. Second, the debt ratios take a downward trend in the ex-ante forecasts for the period 2013-2015, revealing a dynamic sustainable debt in Lebanon. In parallel, the debt ratios turned out to be non-stationary indicating an ineffective sustainability. At the level of the use of the cointegration analysis according to Johansen's procedure, we mention Salame and Chikhi (2013) for causality testing and cointegration between savings and investment in the Algerian economy, Al-Tayeb et al (2011) for the impact of interest rate on private consumption in Jordan, Cholifihani (2008) analyzed the long term and short term relationships between public debt service and GDP in Indonesia and it adopted a function model that measured GDP as a function of debt service, capital stock, labor and human capital in which all data are represented by constant local currency unit. The result shows that increasing the public external debt service slows economic growth and the elasticity of GDP will decrease if debt service increases and if the elasticity of GDP to human capital is relatively small. Mourad and Farhat (2007) elaborated a cointegration study of the foreign direct investment between five global regions: Western Europe, North America, other Developed Countries, Developing Countries and Central-Eastern Europe. We also note an important paper, Bou-Hamad et al (2013), which treated the annual foreign trade between the GCC and the United States, and concluded that no cointegration exists between the export and import ratios for each GCC country and the United States. A paper published by Mourad and Harb (2013), dealt with the cointegration regression analysis, according to the Engle & Granger procedure, for the exchange rate of EUR/USD in daily data considering the opening, the highest and the smallest prices. Finally, we refer to the newly issued book for Mourad (2015) entitled "Population Growth and Development Prerequisites in the GCC States", as it deals with the cointegration method proposed by Engle-Granger.

IV. COINTEGRATION ANALYSIS

This section focuses on the implementation of the cointegration analysis on the public debt in Lebanon using Johansen's procedure on three groups of variables: (TB12, TB6, TB3), (TBST, TBLT) and (GLCD, FCD).
To decide about the second-order stationarity, we will use the Augmented Dickey-Fuller (ADF), proposed by Dickey & Fuller (1981).

In table (2), we present the results of the ADF statistics:

Table (2):ADF test for unit roots

Variables	TB12	TB6	TB3	STB	Loans
AR order	2	19	4	2	24
Difference order	1	1	1	1	1
τ_τ	-10.05	-5.66	-14.0	-10.99	-3.04
τ_μ	-10.05	-5.61	-14.03	-10.98	-2.85
τ	-10.07	-5.63	-14.06	-11.0	-2.85
Conclusion	I(1)	I(1)	I(1)	I(1)	I(1)
Variables	LTB	GLCD	FCD	GD	NTD
AR order	16	16	6	2	7
Difference order	1	1	1	1	1
$\tau_\tau = -3.43$	-4.21	-3.61	-5.62	-19.2	-5.63
$\tau_\mu = -2.88$	-4.09	-3.57	-5.63	-19.2	-5.56
$\tau = -1.95$	-2.56	-2.11	-4.4	-15.0	-2.12
Conclusion	I(1)	I(1)	I(1)	I(1)	I(1)

We conclude that all level variables are non-stationary and can be made stationary by taking their first difference; they are said to be integrated of order 1 (at 5 % level of significance) and denoted as I(1).
The Johansen Procedure requires identifying the order of cointegration using either the trace test λ_{trace} or λ_{max} test. Though it will be limited to the first test, as generally both tests lead to the same decision.
According to Hendry &Juselius (2000), three cases will be considered:

Case I: No deterministic trend for the variable in level, cointegrating equation without constant; there is no drift in the ECM model.

$$\Delta X_t = \sum_{i=1}^{p-1} \Gamma_i \, \Delta X_{t-i} + \alpha\beta' X_{t-1} + \varepsilon_t$$

Case II: Deterministic trend for the variable in level, cointegrating equation without constant.

$\Delta X_t = \sum_{i=1}^{p-1} \Gamma_i \, \Delta X_{t-i} + \alpha\beta' X_{t-1} + \mu + \varepsilon_t$

There is a separate drift in the ECM model. This implies that the first-differenced variables in the ECM do not have the same mean. And thus the level variables may have different growth patterns though they have common stochastic growth patterns. A Monte Carlo study, realized by Crowder (2001), revealed that a VEC model with linear trends in the data has better power properties than the other Johansen Likelihood Ratio (JLR) tests.

Case III: it specifies a model with a constant restricted to the cointegrating space: no deterministic trend for the level variables, cointegrating equation with constant.

$$\Delta \boldsymbol{X_t} = \sum_{i=1}^{p-1} \Gamma_i \, \boldsymbol{\Delta X_{t-i}} + \boldsymbol{\alpha(\beta', \beta_0)(X'_{t-1}, 1)'} + \varepsilon_t$$

This model implies that the first-differenced variables in the ECM have a common mean.
In all cases, the vector $\varepsilon_t = (\varepsilon_{1t}, \dots, \varepsilon_{dt})'$denotes the vector of error terms that are assumed to be white noise. To test the null hypothesis that ε_t is independent of $\varepsilon_{t-1}, \dots, \varepsilon_{t-s}$, the Ljung-Box portmanteau test for autocorrelation can be applied. This test statistic in its multivariate form is defined according to Hosking (1980) (see also Hatemi(2002)).
To identify the optimal order of the VAR model, we will use the automatic selection criteria AIC and SBC, then the Ljung-Box statistic can be used to control the validation of the residuals like a white noise. The results are given in table (4).

Table (4): Identification of the autoregressive order of the system in level

Systems	"Optimal" VAR order	(AIC, BIC), LB		Ljung-Box statistics	
TB12 TB6 TB3	7	(2,2)	46.96 87.28 97.78	7	40.74 53.95 55.64
TBST TBLT	10	(2,2)	47.13 82.86	10	38.26 62.29
GLCD FCD	39	(1,1)	88.27 55.2	39	41.11 22.83

Inspecting this table, we find that both AIC and SBC criteria under-estimate the autoregressive order of the VAR model in levels. For this, we have overcome the proposed order to ensure errors like a white noise. In table (5), we have grouped all the test results according to Johansen's cointegration considering the three cases cited above. We selected for each system and for each case, the eigenvalues and the trace-statistics according to 95% quantile values. In cases where the cointegration is accepted, the cointegration relationship was written. In all three cases, each of the two systems (TB12, TB3 and TB6) and (STB and LTB) is cointegrated at rank 1. While the system (GLCD and FCD) is cointegrated at rank 1 in cases 2 and 3.

Table (5): Cointegration test statistics

Cases	Systems	Eigen-Values	Trace and Frac95*	Conclusion
I	TB12, TB6, TB3 = $\boldsymbol{X, Y, Z}$	0.092, 0.025,0.006	30.37,7.44,1.34 24.21,12.28,4.07	r=1
	The cointegration equation is: $\boldsymbol{COINEQ_{t-1} = X_{t-1} - 0.457Y_{t-1} - 4.987Z_{t-1}}$ (-1.88) (-6.69) * The Frac95 is the 95% quantile value for the basic model.			
II	TB12, TB6, TB3	0.098,0.057,0.018	42.93,18.38*,4.36 29.80,15.41,3.84	r=1*
	* For $\boldsymbol{r = 1}$, the critical value at 1 % significance level is 19.62. It appears that the null hypothesis is accepted for the rank r=1 with 99% quantiles for the likelihood ratio test. The cointegration equation is: $\boldsymbol{COINEQ_{t-1} = X_{t-1} - 1.298Y_{t-1} - 5.102Z_{t-1}}$ (-2.9) (-6.65)			
III	TB12, TB6, TB3	0.098,0.057,0.018	42.97,18.42,4.4 35.07,20.16,9.14	r=1
	The cointegration equation is: $\boldsymbol{COINEQ_{t-1} = X_{t-1} - 1.298Y_{t-1} - 5.102Z_{t-1} + 0.777}$ (-2.9) (-6.65) (1.84)			

I	$\boldsymbol{TBST, TBLT = X, Y}$	0.077,0.005	20.09,1.24 12.28,4.07	r=1
	The cointegration equation is: $\boldsymbol{COINEQ_{t-1} = X_{t-1} + 0.127Y_{t-1}}$ (2.28)			
II	TBST, TBLT	0.075,0.002	18.81,0.45 15.41,3.84	r=1
	The cointegration equation is: $\boldsymbol{COINEQ_{t-1} = X_{t-1} + 0.1Y_{t-1}}$ (4.87)			
III	TBST, TBLT	0.094,0.047	34.72,11.44 20.16,9.147*	r=1 at 99% quantiles: Frac99=12.53
	The cointegration equation is: $\boldsymbol{COINEQ_{t-1} = X_{t-1} + 0.108Y_{t-1} - 3.479}$ (4.51) (-7.49)			

I	$\boldsymbol{GLCD, FCD = X, Y}$	0.083,0.023	22.7, 4.77 12.28,4.07	No cointegration
II	$\boldsymbol{GLCD, FCD}$	0.096,0.000	20.77,0.002 15.41,3.84	r=1
	The cointegration equation is: $\boldsymbol{COINEQ_{t-1} = X_{t-1} - 1.041Y_{t-1}}$ (-12.19)			
III	$\boldsymbol{GLCD, FCD}$	0.127, 0.049	38.25, 10.44 20.16,9.147	No cointegration

The different long run equilibrium for the systems are given in the below table:

Table (6): Cointegration relationships for the different systems

Systems	Cases	Cointegration relationships
(GLCD,FCD)	Nothing	Nothing
(TBST,TBLT)	II	$\boldsymbol{COINEQ_{t-1} = TBST_{t-1} + 0.1TBLT_{t-1}}$ (4.87)
(TBST,TBLT)	III	$\boldsymbol{COINEQ_{t-1} = X_{t-1} + 0.108Y_{t-1} - 3.479}$ (4.51) (-7.49)
(TB12, TB6, TB3)	I	$\boldsymbol{COINEQ_{t-1} = TB12_{t-1} - 0.457TB6_{t-1} - 4.987TB3_{t-1}}$ (-1.88) (-6.69)
(TB12, TB6, TB3)	II	$\boldsymbol{COINEQ_{t-1} = TB12_{t-1} - 1.298TB6_{t-1} - 5.102TB3_{t-1}}$ (-2.9) (-6.65)
(TB12, TB6, TB3)	III	$\boldsymbol{COINEQ_{t-1} = TB12_{t-1} - 1.298TB6_{t-1} - 5.102TB3_{t-1} + 0.777}$ (-2.9) (-6.65) (1.84)

Now the appropriate models will be estimated for each of the three systems.
For the systems (TB12, TB6,TB3) and (TBST,TBLT), the cointegration was accepted for the three cases (I, II and III), however the focus will be on the third case due to the significance of the constant in the cointegration equation.
A- Estimation of the VEC model of the system (TB12, TB6,TB3) = (X, Y, Z):
The estimated VEC is:

$$\boldsymbol{\Delta X_t = 0.407\Delta X_{t-1} + 0.098\Delta X_{t-6} - 0.0307COINEQ_{t-1}}$$
(7.05) (1.69) (-3.25)

$$\boldsymbol{\Delta Y_t = 0.086\Delta X_{t-3} + 0.205\Delta Y_{t-1} - 0.184\Delta Y_{t-5} - 0.166\Delta Y_{t-6} - 0.003COINEQ_{t-1}}$$
(1.65) (3.25) (-2.92) (-2.59) (-0.29)

$$\boldsymbol{\Delta Z_t = -0.084\Delta X_{t-1} + 0.072\Delta Y_{t-6} + 0.477\Delta Z_{t-1} - 0.48\Delta Z_{t-3} + 0.159\Delta Z_{t-4} +}$$
(-2.9) (2.11) (8.05) (-7.28) (2.47)

$$\boldsymbol{0.102\Delta Z_{t-5} - 0.195\Delta Z_{t-6} + 0.0195COINEQ_{t-1}}$$
(1.76) (-3.17) (3.42)

$\boldsymbol{d = 3, p = 7, s = 52}$ and $\boldsymbol{LB(59) = 474.36 < \chi^2_{468} = 519.42}$ and hence the d residual series from the VEC model appears to be white noise. The Ljung-Box Q-Statistics at 48 degrees of freedom and at 5 % significance level are respectively 48.7, 66.6 and 58.3 for the first, second and third equations.

B- Estimation of the VEC model of the system (TBST,TBLT) = (X ,Y):The estimate near-VECM model is:

$$\boldsymbol{\Delta X_t = 0.333\Delta X_{t-1} + 0.114\Delta X_{t-7} + 0.081\Delta Y_{t-3} - 0.03COINEQ_{t-1}}$$
(5.59) (1.9) (3.01) (-2.96)

$$\boldsymbol{\Delta Y_t = -0.395\Delta X_{t-1} - 0.344\Delta X_{t-3} - 0.11\Delta Y_{t-1} + 0.189\Delta Y_{t-6} - 0.163\Delta Y_{t-9}}$$
(-2.85) (-2.48) (-1.75) (3.03) (-2.27)

$$\boldsymbol{+ 0.101COINEQ_{t-1}}$$
(4.17)

The Ljung-Box Q-Statistics at 48 degrees of freedom and at 5 % significance level are respectively 45.07 and 64.62 for the first and second equations. Estimating the VEC (9) model and dropping the insignificant

coefficients, the error correction term $\boldsymbol{COINEQ_{t-1}}$ has the correct sign (-0.03) for the equation associated to the variable $\boldsymbol{\Delta X_t}$ and it is negative enough (-2.96). Moreover the estimate coefficient on the $\boldsymbol{COINEQ_{t-1}}$ associated to the second equation (variable$\boldsymbol{\Delta Y_t}$) is positive enough (t ratio = 4.17) and by consequence the stability conditions for the VEC model are ensured.

C- Estimation of the VEC model of the system (GLCD,FCD) = (X ,Y):

In fact, we estimated a VEC model for this system. But it is not validated because the estimate coefficient on the error correction term for the first equation (variable $\boldsymbol{\Delta X_t}$) is not negative enough (t ratio= -1.31) and hence the relationship between GLCD and FCD is spurious. For this reason, we re-estimated the near-VAR (39) model, and obtained the following:

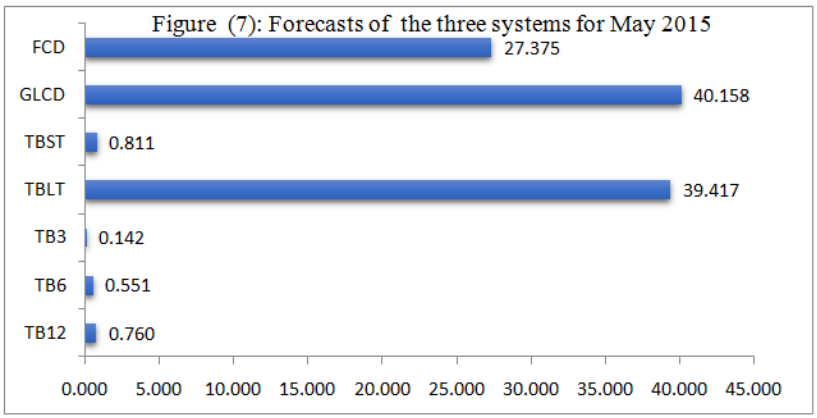
$$\boldsymbol{\Delta X_t = 0.184 + 0.122\Delta X_{t-23} + 0.192\Delta X_{t-37} - 0.296\Delta X_{t-38}}$$
(4.32) (1.63) (2.66) (-4.15)

$$\boldsymbol{+0.266\Delta Y_{t-5} - 0.167\Delta Y_{t-6} - 0.331\Delta Y_{t-16} - 0.294\Delta Y_{t-31}}$$
(3.38) (-2.07) (-3.89) (-3.13)

$$\boldsymbol{\Delta Y_t = 0.178 - 0.109\Delta X_{t-17} - 0.187\Delta X_{t-23} - 0.191\Delta Y_{t-1}}$$
(6.38) (-2.14) (-3.27) (-3.23)

The Ljung-Box Q-Statistics at 48 degrees of freedom and at 5 % significance level are respectively 54.4 and 40.9 for the first and second equations.

The forecasts for the period May 2015 are given in figure (7).



V. RESULTS AND THEIR POLITICAL AND ECONOMIC IMPACTS:

As it was shown in the paper, three random vectors are present: the first vector contains the treasury's short term bills (3, 6 and 12 months) which were represented by TB3, TB6 and TB12 respectively. The second vector contains two variables, as from the gross local currency debt (GLCD): short term treasury bills (TBST) and long term treasury bills (TBLT). The third vector contains the gross local currency debt (GLCD) and the foreign currency debt (FCD). The analysis will focus on both the short term and long term impacts of the results.

Cointegration between short term bills TB3, TB6 and TB12:

Cointegration was accepted for the three cases (I, II and III), this is why the focus will be on the third case (no deterministic trend for the level variables, cointegrating equation with constant) due to the significance of the constant parameter at 10% level.

According to figure (4), TB12 has the bigger amount in TBST followed by TB6 and TB3 respectively. Based on a period of 245 months, we found that the means for short term bills have the following percentages: 58.75% for TB12, 32.14% for TB6 and 9.11% for TB3.

The long term relationship (target) between TB3, TB6 and TB12 is as follows:

$$\boldsymbol{TB12 = 1.298TB6 + 5.102TB3 - 0.777}$$
(2.9) (6.65) (-1.84)

The above relationship shows that any short term deviation of the variable TB12 will be corrected during the consequent month by 3.07%. Let us assume a 1% increase in the variable TB6, while keeping constant TB3, then TB12 will increase by 1.298%. While an increase of 1% in the variable TB3, with a constant value of TB6, will increase TB12 by 5.102%. Financially speaking this implies the following: if the Lebanese government had

to issue three months treasury bills, then this means that it is doing so to pay for accrued bills, or to pay for sudden changes in local affairs, and this is an important indicator for the necessity to issue twelve months treasury bills that are 5 times higher than those in the three months category.
Short term treasury bills (TBST) had great importance at the start of January 1994, since they formed 52% of the gross local currency debt and even peaked at 66% in May 1996, and due to the Israeli aggression on Lebanon in April 1996 (Operation Grapes of Wrath) which resulted in the destruction of homes, schools, power plants, wells, local businesses and factories, the Lebanese state had to borrow from the short term bills in order to quickly rebuild some of the destroyed infrastructure. These bills had high interest rate, 15.75% for TB3, 17.07% for TB6 and 18.04% for TB12, and this is clearly shown in figure (4). The importance of short term bills started to slowly fade only to rise up again at the time of the assassination of Prime Minister Rafic Hariri in February 2005, as it reached 25.35% of the gross local currency debt in March 2005. After this period, short term bills decreased and reached 3.78% of the gross local currency debt in 2014. And to give a more realistic image of the cost of this type of gross local currency debt, we can see that the interest rates (yields) are currently at of 4.44% of TB3, 4.99% of TB6 and 5.35% of TB12, and these are very low values compared to previous years. This reflects the capability of the Lebanese state in using long term treasury bills, which have reached 96% of the gross local currency debt in May 2014, while its lowest was in May 1996 with 32.77%.

Cointegration between short term bills (TBST) and long term bills (TBLT):
These two variables are at the basis of the gross local currency debt (99.77% in May 2014). The long term relationship between TBST and TBLT is as follows:

$$\mathbf{TBST} = \mathbf{-0.108TBLT + 3.479}$$

(-4.51) (7.49)

This linear relationship reflects the very important long term equilibrium between the two variables. If the amount of TBLT increased by 1 billion USD within the GLCD, then the TBST will decrease by 108 million USD. To expand on this subject let us inspect the yield on long term bills. Four types of long term bills are available: TB24, TB36, TB48 and TB60 with the following respective interest rates: 5.93% 6.61%, 10.3% (coupon rate) and 6.74% (coupon rate). It is worth noting that TB48 was last used in April 2005. Thus, it is clear that the Lebanese state will benefit from long term bills because their cost will be lower than short term ones. And if we examine the VEC model for TBST and TBLT in the first difference, we will clearly see how TBST returns to its target of 3% in just one month.

Near-VAR (39) model for GLCD and FCD:
The vectors composed of the gross local currency debt (GLCD) and the foreign currency debt (FCD) are not cointegrated, this is why the near-VAR (39) model was used to explain the dynamic relationship between the two in the short run and also to make forecasts. It is worthy to note that at the end of the year 2014, the local debt and foreign debt had reached 40.963 billion USD and 25.613 billion USD respectively, which in their turn represent 61.528% and 38.472% from the total public debt.

VI. WHERE IS PUBLIC DEBT HEADING IN LEBANON?

At the end of the year 2013, the GDP in Lebanon was USD 44.352 billion while public debt was USD 63.473 billion which gives a ratio of 143.124%. The World Bank predicted that by the end of the year 2014, the GDP in Lebanon would be around USD 44.796 billion while public debt would be USD 66.576 billion (ratio of 148.62%). At the same time, the Lebanese economy is going through a clear slow down due to various reasons, especially the Syrian crisis which has split the Lebanese political scene. Also, it was estimated that around 1.5 million Syrian refugees have sought Lebanon at the end of the year 2014, according to the United Nations. For the same time period, the Lebanese population was at around 4.5 million people, and the number of Palestinian refugees has reached half a million according to the UNRWA, and let's not forget the huge numbers of foreign workers, especially the highly demanded house maids which according to the Human Rights Watch are around 200 thousand worker (a ratio of 1 worker for each 16 families). As a total, about 7 million people are living over an area of 10,452 km^2 which gives a density of 670 person/km^2.
However, and with regards to all of this and amidst turbulent regional conflicts, the Lebanese population still lives relatively well, especially those families which depend on working abroad. It is well known that Lebanon highly depends on money transfers from its expatriates; according to the World Bank, the year 2014 had about USD 8 billion. Lebanon ranks 18thamong largest recipient of remittances worldwide and 2nd among Arab countries. In fact, important factors in that growth are the money transfers sent by Syrian expatriates abroad to their refuged relatives in Lebanon, as well as the improvement of the economic situation in some of the key countries hosting Lebanese expatriates like the United States. We also note that the accumulated deposits in Lebanese commercial banks are not being beneficially invested. When Lebanon resorts to short term bills, then

naturally long term bills decrease, in other words, resort to the financial market decreases. It is known that investors usually aim for a quick and big profit, this is why they will refrain from long term investments. Here comes the role of the Central Bank to be an effective link transferring the monetary market to the long term financial market. In the latest statistic by the Central Bank, at the end of April 2015, the deposits of non-residents in Lebanese Pounds (equivalent in USD) and in foreign currencies have reached USD 27.144 billion and USD 4.106 billion respectively (exchange rate: 1 USD = 1,507.5 LBP). While at the same time the total deposits in foreign currencies reached USD 96.310 billion and deposits in Lebanese pounds reached an equivalent of USD 51.186 billion. This brings the total deposits in commercial banks to USD 147.496 billion.
What do these numbers represent? And how do they affect the public debt?
Based on the latest statistic from the Lebanese Central Bank (April 2015) on the gross public debt, which reached USD 69.456 billion, in comparison to the total deposits in commercial banks, around USD 147.496 billion (a ratio about 47%) we clearly see the capability of the Lebanese people in strengthening the global trust in Lebanese banks. This helps Lebanon in gaining the confidence of global financial institutions by obtaining more long term bills; this is evident now as according to the Lebanese Ministry of Finance, the largest foreign currency bills (Eurobond) in the history of Lebanon were issued (an additional 2.2 billion)to cover financial needs in the year 2015. Also, and according to the current Minister of Finance, this was a very successful issuance due to its low cost compared to previous issuances. This issuance was divided into two parts, the first having a value of USD 800 million due in 2025 with a rate of return of 6.2%, while the second part had a value of USD 1.4 billion due in 2030 with a rate of return of 6.65%. On the international level, Lebanon has been known to carefully and fully abide by international banking standards. This of course benefitted its banking sector as western countries, especially the United States, regard it with great trust.
On both international and regional levels, Lebanon has been able to successfully remain economically stable, especially regarding exchange rates. Even though Lebanon has been living in turmoil since 2005, after the assassination of Ex-Prime Minister Rafiq Hariri, followed by the devastating Israeli aggression in 2006, which only aggravated the tension in the political scene; which the negative consequences still echo to this day. In addition to all of that, we should not forget, the damaging impact of the Syrian war, as well as the unrest in many Arabic countries and the consequences of the global financial crisis in 2008. One of the main factors in the stability of exchange rates is the policy adopted by the Lebanese Central Bank. This policy was able to hinder unemployment as it kept it at around 8.9% (2009-2012). It also kept a steady control over inflation (average inflation rate for 2009-2013 was 4.25% according to the World Bank); this retained the capability to have low interest rates which guaranteed stable return for both creditors and debtors. The Lebanese Central Bank was among the first to apply Basel III , this obliges the Lebanese banks to a minimum capital assets ratio of 12% in 2015; instead of 2019 (date of fully applying the agreement). This affirms global trust in Lebanon regardless of the heavy load that is public debt.
Before finishing this section, the consumption expenditure in Lebanon must be mentioned; this represents the general governmental plus the household final consumption expenditures. This expenditure generally surpassed the GDP: in 1990 and 2011, it represented 164.14% and 101.21% of the GDP respectively. This means that the gross domestic saving, the difference between the GDP and consumption expenditure, was negative in the period between 1990 and 2011.
According to the World Bank, this saving noticeably improved in 2012 and 2013 because of the clear decrease in the consumption expenditure especially the household final consumption expenditure, as the savings for both years were 8.83% and 14.275% respectively. This kind of improvement in local savings can be attributed to the Lebanese families and their fear of a sudden deterioration in security due to the war in Syria, and to the absence of an elected president for more than a year. We should also point out that during the global financial crisis, from 2007 till 2013, the gross capital formation (% of GDP) was around 26.71%.

VII. CONCLUSION

At the end of this research, we are pleased to mention some of the results derived from our near-VAR and near-VEC models proposed for the different systems of the Lebanese public debt. The first is of informational nature concerning the different components of this debt. We note that domestic debt comes from the commercial banks and the central bank, and it represents a ratio ranging from a minimum of 67.49% (June 1997) and a maximum of 86.91% (January 2006). The ratio of the gross local currency debt (GLCD with respect to GPD) ranges from 47.47% in February 2005 and 94.41% in July 1994. The short term treasury bills (TBST) and long term treasury bills (TBLT)hold a ratio of GLCD ranging a minimum of 98% and a maximum of 99.8% between January 1995 and May 2014. TBLT represents a ratio of GLCD between 90.78% and 96.51% for the last five years (May 2009-May 2014). The second point of our conclusion is drawn from the cointegration analysis according to the JLR statistic (Johansen Likelihood Ratio). The components of the vector (GLCD, FCD) are not cointegrated and they are modelled by near-VAR (39). The forecasts for May 2015 are respectively USD 40.158 billion and USD 27.375 billion. Since the estimated near-VAR model reveals bidirectional causality between

GLCD and FCD, we will give more confidence to forecasts made by the VAR model. This allows us to estimate respectively monthly growth rates of 0.2788% and 0.3588% from May 2014 until May 2015. With the most confident result, the domestic debt would grow more slowly than the external debt. For the components of the vector (TBST TBLT), they are cointegratedin case III (a constant in the cointegrating relationship). One percent increases in TBLT, the elasticity of TBST decreases by 0.108 percent. The components of the vector (TB12, TB6, TB3) are cointegrated in the three cases (I, II and III). Inspecting the equilibrium relationships in case III, we note that if one percent increases in TB6 (TB3 remaining constant), the elasticity of TB12 increases by 1.298%. While if one percent increases in TB3 (TB6 remaining constant), the elasticity of TB12 increases by 5.102%. This means that TB3 is the main variable to support TB12 in the long run. For the systems (TBST TBLT) and (TB12, TB6, TB3), the available forecasts for May 2015 are respectively (0.766,39.568) and (0.734, 0.544,0.153).

Before ending this conclusion, and based on our paper entitled "Public Debt in Lebanon: Structural Analysis and Prediction" published in IRJFE (November 2013), the forecast of GDP for 2013 was around USD 46 billion but unfortunately the political conflicts in the regions of the Middle East deprived Lebanon of its economic growth especially in the tourism sector which is the main economic resource of the country; this had a negative effect on GDP estimated at 43.49 billion in 2013 (a huge loss of about USD 3 billion). This new situation has dramatic consequences for the solvency of the Lebanese state. Indeed, if the internal political conflict in Lebanon continues then the Lebanese state will not keep public debt under control, and the sustainability of public finances will not be stable.

Finally, we focus on the following points:

First, despite the divergence of the Lebanese political scene vis-à-vis the dramatic crisis in Syria and in other Middle Eastern countries, and despite the slowdown in economic growth in the country followed by a reduction in the household consumption, the commercial banks testify prosperity in deposits of residents and non-residents. These banks recorded in April 2015, a total of USD147.496 billion, that is to say 212.359% of the gross public debt. This reassures the global financial companies that will be willing to offer Lebanon long term bills with relatively low interest rates. In return, this will slowly but surely lower the ratio of internal debt to public debt.

Second, the Lebanese Central Bank was able to retain the stability of the financial markets especially regarding exchange rates.

Third, for the period 2010-2014, Lebanon has been subject to slow economic growth; the average GDP yearly growth was around 4.2% while public debt grew by a yearly average of 6.11%. This means that Lebanon cannot start a plan to lower public debt while its progression is still higher than the economic growth. In order to achieve true improvement and economic growth in Lebanon, the ruling politicians must agree on a national plan that will protect Lebanon from falling into turmoil like neighbouring Arabic countries.

Fourth, political stability and focus on tourism must be priorities as Lebanon has great touristic potential due to its Mediterranean weather, the wealth of historical monuments and sites, and many cultural festivals.

Fifth, and this may be the most important point, the Lebanese state must form a "Petroleum Sector Management Authority", and to immediately start drilling for oil in Lebanese territorial waters in the Mediterranean especially that surveys conducted by the Lebanese Ministry of Energy and Water in 2002 yielded positive results as there might be oil at around 60km of the Lebanese coast. And of course this will need high long term financial investments that could be gathered from the global financial market.

REFERENCES

[1]. Al-Tayeb, S., M., Al-Hajaya, S. and Shahateet, M.I. (2011): "The Impact of Interest Rate on Private Consumption: A Case Study of Jordan, 1976-2004", Dirasat, Administrative Sciences, Volume 38, N°2, 329-345.

[2]. Bachellerie, A. &Couillault, B. (2005) : "Soutenabilité de la dette publique et crises des pays émergents :présentation des concepts et des instruments de diagnostic". Banque de France ,Revue de la stabilité financière , N°6 , Juin 2005.

[3]. Berthomieu, C. (2004). "Dépenses publiques, croissance et soutenabilité des déficits et de la dette extérieure. Etude de cas pour six pays riverains de la Méditerranée Tunisie, Maroc, Turquie, Liban, Israël, Egypte". workingpaper FEMISE 2, CIMAFI,Nice.

[4]. Bou-Hamad, I., Mourad, M. and Duchesne, P. (2013): " Trade between the U.S. and the GCC Countries : Evidence from causality and Cointegration Analysis", International Research Journal of Finance and Economics (IRJFE), issue 112, 162-171.

[5]. Cholifihani, M. (2008): "A Cointegration Analysis of Public Debt Service and GDP in Indonesia", Journal of Management and Social Sciences, Vol. 4, No. 2,68-81.

[6]. Crowder, W., J. (2001): "Testing Stationarity of Real Exchange Rates using Johansen Tests", JEL Classification: C12; F31, working paper.

[7]. Dickey, D. A., and Fuller,W.A. (1981). "Likelihood ratio statistics for autoregressive time series with a unit root". Econometrica 49 (4): 1057–72.

[8]. Engle, R.F., and Granger, C.W.J. (1987). "Co-Integration and Error Correction: Representation, Estimation, and Testing". Econometrica, Vol. 55, No. 2, 251-276.

[9]. Fève P., and Hénin P, (1998). "Une évaluation économétrique de la soutenabilité de la dette extérieure des pays en développement". Revue économique, Vol. 49, n° 1, janvier, 75-86.

[10]. Fève, P. and Hénin, P. (2000). "Assessing effective sustainability of fiscal policy within the G-7 ". Oxford Bulletin of EconomicResearch, 62 (2), 175-195.

[11]. Gabsi, F. (2001) . "Endettement public et soutenabilité de la politique budgétaire en Tunisie". Working paper, ERED.
[12]. Hatemi-J., A. (2002): " Multivariate Tests for Autocorrelation in the Stable and Unstable VAR Models", Conference for Econometric Modelling in Pretoria, 3-5 July.
[13]. Hendry, D.F. and Juselius, K. 2000)." Explaining Cointegration Analysis: Part II", Paper provided by University of Copenhagen. Department of Economics in its series Discussion Papers with number 00-20, November 12, 1-33
[14]. Hosking, J. R. M. 1980. The multivariate portmanteau statistic. Journal of the American Statistical Association 75: 602–08.
[15]. Johansen, S. (1988): "Statistical Analysis of Cointegration Vectors" Journal of Economic Dynamic and Control 12: 231-254.
[16]. Johansen, S. and Juselius, K. (1990)":Maximum Likelihood Estimation and Inference on Cointegration with Applications to the Demand for Money". Oxford Bulletin of Economics and Statistics 52: 169-210.
[17]. Khoury, G., Colmant , B. and Corhay, A. (2008). La dette publique libanaise : Anticipation de défaut de l'Etat libanais sur la dette souveraine en devises étrangères. Workingpaper.
[18]. Leo, F.S. (2005). La soutenabilité de la politique budgétaire dans la zone Uemoa (union économique et monétaire ouest-africaine) : essai d'évaluation théorique et empirique. Working paper.
[19]. Mourad, M. (2015): " Population Growth and Development Prerequisites in the GCC ", editor: Arab Center for Research & Policy Studies, Beirut, Lebanon.
[20]. Mourad, M. (2014): "Jordan's Labor Force and the Use of Co-integration to Establish the Relationship Between Unemployment, GDP and Public Debt". The 13th Scientific Annual International Conference for Business, 21-23April 2014, proceedings volume 2, 614-638.
[21]. Mourad, M. and Harb, A. (2013): "A Predictive Model for the Daily Exchange rate of the EUR/USD Using Markov Chain and Co-integration Techniques Lebanese Science Journal, Vol. 14, No. 2, 93-113.
[22]. Mourad, M. (2013): "Public debt in Lebanon: Structural Analysis and Prediction".
[23]. International Research Journal of Finance and Economics, Issue 116,Nov,2013, 64-81.
[24]. Mourad, M. &Harb, A. (2011) : " Mesure de la Fonction de Réponse Impulsionnelle dans les Modèles Autorégressifs". Lebanese Science Journal, volume 12, No. 2, 117-132.
[25]. Mourad, M. and Farhat, M. (2007):" The Foreign Direct Investment of Outflows in the World: A Co-integration Analysis. Arab Journal of Administration, Volume 27, N° 2, 217-242.
[26]. Oosterlinck, K. and Szafarz, A., (2005). "Obligations souveraines: situation du marché, évaluation du risque-pays et gestion des défauts", De Boeck &Larcier, Anne Knops, Brussels.
[27]. Osterwald-Lenum, M. (1992): " A note with fractiles of the Asymptotic Distribution of the Maximum Likelihood Cointegration Rank Test Statistics: Four Cases", Oxford Bulletin of Economics and Statistics, 54, 461-72.
[28]. Salame, A. and Chikhi, M. (2013): "Causality Testing and Co-integration between Savings and Investment in the Algerian Economy during (1970-2011) ", Researcher Journal, 13, 121-134
[29]. Trehan B. and Walsh C.E. (1991). "Testing inter-temporal Budget Constraint : Theory and Applications to U.S. Federal Budget and Current Account Deficit". Journal of
[30]. Money,Credit and Banking, vol.23, n° 2, may, 206-223.

Other references

[31]. Debt and Debt Markets.A Quarterly Bulletin of the Ministry of Finance Issue No. 21, Quarter II 2012. and issue No. 22, Quarter III 2012.
[32]. Lebanese Ministry of Finance, 2010: Lebanon's Debt management framework for 2010-2015.
[33]. FEMISE (2005). Profil Pays Liban. Institut de la Méditerranée. International Conference for Support to Lebanon – Paris III, Third Progress Report, September 2007.
[34]. French Economy Tables, edition 2012
[35]. Fonds monétaire international: Perspectives de l'économie mondiale, Avril 2012. BankMed - Market & Economic Research Division (Lebanon Weekly report), October 2014.
[36]. International Financial Statistics, editor: International Monetary Fund (IMF), Year Book 2000

Internet Sources

[37]. The Central Bank of Lebanon :http://www.bdl.gov.lb
[38]. United Nations High Commissioner for Refugees (UNHCR) : http://www.unhcr.org
[39]. United Nations Relief and Works Agency (UNRWA): http://www.unrwa.org
[40]. Ministry of Labor Lebanon: http:// www.labor.gov.lb
[41]. Lebanese Ministry of Finance: http://www.finance.gov.lb
[42]. The World Bank: http://www.worldbank.org
[43]. Nasser Hoteit (President of the Lebanese Petroleum Authority): "The Petroleum Sector in Lebanon: History, Opportunities and Challenges", http://www.institutdesfinances.gov.lb