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Review article

Myopic consumption and wage increase: The case of Lebanon



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ABSTRACT

The paper empirically examines using cointegration analysis consumption's myopic behavior in Lebanon. Empirical results points to the existence of a one-to one long-run relationship between consumption and income over the period 1977–2013. Meanwhile, consumption and income found to be causally independent in the short run. We argue, in the light of our findings, government officials should respond to labor force demands for wage increase only if it does not jeopardize current account deficit path to an unsustainable one. Our main findings is that wage increase could be translated into growth impulses in the long-run given consumption's myopic behavior. Our finding corroborates some previous findings for Lebanon and some emerging markets.

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1. Introduction

Both Neoclassical and New Keynesian models on fiscal policy acknowledge its effect in stimulating the economy, disagreement arises on the magnitude of such policy i.e. how big fiscal multipliers are? Unfortunately, there is no universal answer for such question; it is a case by case analysis that hinges on key country characteristics like monetary policy, level of openness, debt sustainability, openness to trade, and most importantly consumption behavior since it occupies the largest portion of aggregate income. However, the case of Lebanon is no exception from this debate.

Previous studies in Lebanon have both examined government expenditure effect on growth impulses, meanwhile warned against consequences of high public debt. [Saad and Kalakech \(2009\)](#) investigated growth effects of government expenditure and found mixed results in various economic sectors in Lebanon. [Neaime \(2004, 2015a\)](#) found that Lebanon's public debt has gone unsustainable and that high public debt exacerbates the current account situation, in turn, provoking Balance of payment crisis, which could degenerate into a sovereign debt crisis similar to Greece 2010 case or an exchange rate crisis similar to Mexico 1995

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case. In this paper, we try to bridge the gap in literature by investigating government's expenditure multiplier from the consumption's behavior perspective. The originality of the paper is to test empirically whether economic agents are Ricardian consumers or not, which in turn has important implications on government's expenditure multiplier, budget deficit, current account deficit, and long term growth impulses.

In the process of examining Lebanon consumption's behavior and, in the wake of labor force demand to increase wages for Lebanese public employees, we are able to address the problem of whether it is safe to increase wages. Lebanese government's officials assert that such policy has no significant effect on GDP; on the contrary, it will backfire due to high level of public indebtedness which, in turn, jeopardizes the fixed exchange rate regime. On the other hand, labor force asserts that a permanent increase in government spending leads to a positive shock in GDP both in short and long run horizons.

Neoclassical consumption theory asserts that agents attempt to smooth consumption over their lifetime by maximizing a utility function subject to income constraint. When the model is solved for optimal path of consumption overtime, it turns out that $C_1 = C_2 = C_3 = \dots = C_T$ implying $\Delta C / \Delta Y \approx 0$. On the other extreme, Keynesian consumption models assert that agents are myopic, implying $\Delta C / \Delta Y \approx 1$. However, whether $\Delta C / \Delta Y$ goes to 0 or 1 significantly affects government multiplier, *ceteris paribus*, given the fact that consumption constitutes the largest portion of GDP. Therefore, in this paper, we will try to gauge Lebanon's consumption behavior via a VECM model. If there is a long-run relationship between income and consumption, or income granger-cause consumption, then consumption behavior is deemed to be myopic, if not, consumption behavior follows the permanent income hypothesis. On the other hand, If the $I(1)$ variables are not cointegrated, we are still able to check whether income granger-cause consumption in the context of a VAR model. The methodology allows us to avoid the problem of identifying a structural VAR in order to obtain the IRF and subsequently multiplier estimates by placing restrictions on the reduced-form VAR and, as the literature review shows next, remains a source of controversy where slightly different assumption in placing these restrictions significantly alters the multiplier estimates.

One might argue if agents face liquidity constraints, then they would be unable to smooth their consumption overtime. By way of example, [Perez \(2000\)](#) found that consumption to be responding significantly to changes in income as long as income falls below C^* (optimal fixed consumption level). However, liquidity constraints are automatically relaxed when income goes above C^* at which consumption does not respond to income changes and, therefore, agents' behavior goes back to follow the permanent income hypothesis. However, our data time span for Lebanon covers the period from 1977 till 2013, this time span is large enough to allow episodes at which income goes above C^* where agents' consumption does not repose to income which will manifest itself in rejecting the hypothesis that income granger-cause consumption.

2. Literature review

2.1. Models in the neoclassical thought

In Neoclassical models, GDP always operates at its potential level; the channel through which government expenditure affects the economy is individual wealth effect, labor intertemporal substitution effect, and firms investment. A government spending that is financed with deficit that is assumed to be collected later in the future if the government obeys the intertemporal budget constraint condition, reduces present value of future income and therefore creating negative wealth effect for individuals. In this instance, labor supply surges to account for this wealth loss as well as intertemporally substitute more labor to the present where taxes are relatively lower. Moreover, it will shift the steady-state level of economy to a higher level given firms investment in more capital stock. [Baxter and King \(1993\)](#) indicated that for such a scenario short-run multiplier is just below 1, whereas long-run multiplier is around 1.2. They also indicated the possibility of negative multiplier as low as -2.5 in instances where the increase in government spending is temporary and accompanied with a raise in taxes to keep the budget balanced.

[Burnside, Eichenbaum, and Fisher \(2004\)](#) also indicated that government expenditure leads to higher positive short run multiplier when a hump-shaped tax scheme is used rather than a lump-sum tax scheme due to intertemporal substitution effect. Overall, in the context of Neoclassical models multiplier effect can range somewhere between -2.5 and 1.2 implying that fiscal policy, and therefore government expenditure, is not a promising policy for governments to pursue.

2.2. Models in the New Keynesian Thought

The effect of government expenditure can be understood in the context of IS-LM model:

$$Y = C(Y - T) + I(i) + G \quad (\text{IS}) \quad (1)$$

$$M = P \cdot L(i, Y) \quad (\text{LM}) \quad (2)$$

Now take total derivative of both sides:

$$dy = \dot{C}dy - \dot{C}dT + \dot{I}di + dG \quad (3)$$

$$dM = L(i, Y) \cdot dP + PL_i \cdot di + PL_y \cdot dy \quad (4)$$

where

$$\dot{C} = mpc = \frac{dy}{dG}$$

$L_i < 0$, $L_y > 0$ are partial derivatives w.r.t. real interest rate and GDP, respectively.

In matrix form:

$$\begin{bmatrix} 1 - \dot{C} & -\dot{i} \\ P \cdot L_y & P \cdot L_i \end{bmatrix} * \begin{bmatrix} \frac{dY}{dG} \\ \frac{dr}{dG} \end{bmatrix} = \begin{bmatrix} dG - \dot{C}dT \\ dM - L(i, Y)dp \end{bmatrix} \quad (5)$$

Checking the effect of Government Expenditure on GDP, ceteris paribus, means to set:

$$dM = dP = dT = 0$$

$$\begin{bmatrix} 1 - \dot{C} & -\dot{i} \\ P \cdot L_y & P \cdot L_i \end{bmatrix} * \begin{bmatrix} \frac{dY}{dG} \\ \frac{dr}{dG} \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \quad (6)$$

$$|A| = (1 - \dot{C})P \cdot L_i + \dot{i} \cdot P \cdot L_y < 0 \quad (7)$$

$$\frac{dy}{dG} = \frac{1}{|A|} \cdot \begin{bmatrix} 1 & -\dot{i} \\ 0 & P \cdot L_i \end{bmatrix} = \frac{P \cdot L_i}{|A|} = \frac{P \cdot L_i}{(1 - \dot{C})P \cdot L_i + \dot{i}} \cdot P \cdot L_y > 0 \quad (8)$$

Extreme traditional keynsain model assumes that $L_y \rightarrow 0$ &/or $L_i \rightarrow \infty$ implying LM is flat.

$$\text{if } L_y \rightarrow 0, \quad \frac{dy}{dG} = \frac{1}{1 - \dot{C}} \quad (9)$$

$$\text{if } L_i \rightarrow \infty, \quad \frac{dy}{dG} = \frac{1}{1 - \dot{C}} \quad (10)$$

Ramey (2011) points that even in extended IS-LM models that allow for open economy consideration or an increase in the interest rates, the size of the multiplier remains intimately linked to $\Delta Y/\Delta C$.

New Keynesian models such as the work of Galí, López-Salido, and Vallés (2007) are able to obtain multiplier of magnitude of 2. Their finding is drawn based on two important assumptions. First, 50% or more of consumers are myopic. Second, employment is demand-determined. Therefore, under the Keynesian doctrine, government expenditure can be as high as 2 without the possibility of negative multiplier.

2.3. Empirical evidence

Literature review on estimation of government expenditure multiplier provides ample of examples. Barro (1981), Ramey (2011), Barro and Redlick (2011) all use military spending as an instrument for government spending to estimate its magnitude on the basis that this type of government expenditure is least likely to respond to economic events. However, analysis based on this methodology is subject to criticism given the fact that the events that led to such government expenditure might have influenced the economy instead of the government expenditure itself. Ramey (2011) points to episodes of government expenditure during World War II where increased patriotism could have raised labor supply which, in turn, affects GDP level rather than a mere multiplier effect.

Gordon and Krenn (2010) followed Blanchard and Perotti (2002) by using Choleski decompositions to identify government expenditure shocks. Ramey (2011) also criticized the methodology by providing an alternative interpretation of what it seems to be

a multiplier effect. She argues that anticipation effect was not controlled for, and therefore, it could be the result of firms “gearing up” for anticipated future government expenditure. Further, some empirical treatments of estimation of government expenditure impose tax elasticity restrictions in recovering SVAR to identify government expenditure and tax shocks. [Caldara \(2011\)](#) showed that small changes in imposed restrictions alter the multiplier estimates significantly.

[Ilzetzi, Mendoza, and Végh \(2013\)](#) used panel SVAR methodology to explore the question of government multiplier. They found little effect of government expenditure in the short-run. However, the medium to long run effect vary considerably depending on key-country characteristics. For countries operating under fixed exchange rate and/or low trade to GDP ratio, multiplier effect found to be of magnitude of 1.4 and 1.1. For countries operating under flexible exchange rate and/or open to trade, multiplier effect is negative. For countries with high debt burden (above 60% of GDP), government expenditure is counter-productive of magnitude of -3 .

To recapitulate, most empirical methods on estimation of government expenditure are not immune to potential problems arising from various ways of identifying government expenditure shocks in order to measure its effect under “Citrus Parbus” condition. On the hand, a slightly change in restrictions imposed on SVAR models has significant effect on multiplier effect. Further, even in studies where government expenditure proved to be significant, it turns out that the effect of the multiplier varies considerably depending on openness to trade, exchange rate regime, and public indebtedness.

3. Time series analysis

3.1. Estimation methodology

As we indicated before, our goal is to test whether consumer behavior in Lebanon is myopic as opposed to smoothing their consumption over their lifetime. This speaks to government expenditure via the effect of marginal propensity to consume (MPC) on the government expenditure multiplier. If economic agents are myopic implies a high MPC, in turn, amplifies the effect of government expenditure, otherwise agents smooth their consumption implying a near to zero MPC, and therefore a relatively low government expenditure multiplier. We tested whether income significantly affects consumption over time, both in long and short terms following [Johansen \(1988, 1991\)](#) and [Granger \(1969\)](#). We choose to select this methodology rather than estimating a structural VAR, as in most previous attempts to study the effect of multiplier, to avoid the accompanied problems of identification that we discussed earlier. In the meantime, the well-known [Blanchard and Perotti \(2002\)](#) methodology of identifying a structural VAR requires the use of government expenditure data at quarterly frequency where one of the identifying assumption is imposed; only few countries like Australia, UK, Canada, and the US recently start to collect government expenditure data at quarterly frequency and this type of data is not available for Lebanon. Data was retrieved from Euromonitor International national statistics and Eurostat databases.

3.2. Empirical analysis

We start our analysis by plotting income and consumption versus time ([Fig. 1](#)), and then we checked for stationarity process.

Income and consumption found to be following unit roots process, using three functional forms: random walk, drift, and a time trend. To corroborate that the series in levels are $I(1)$, differenced data found to be stationary at 1% level. [Table 1](#) summarizes the results of both Phillips-Perron and Augmented Dickey-Fuller tests in levels and difference as in [Dickey and Fuller \(1979\)](#).

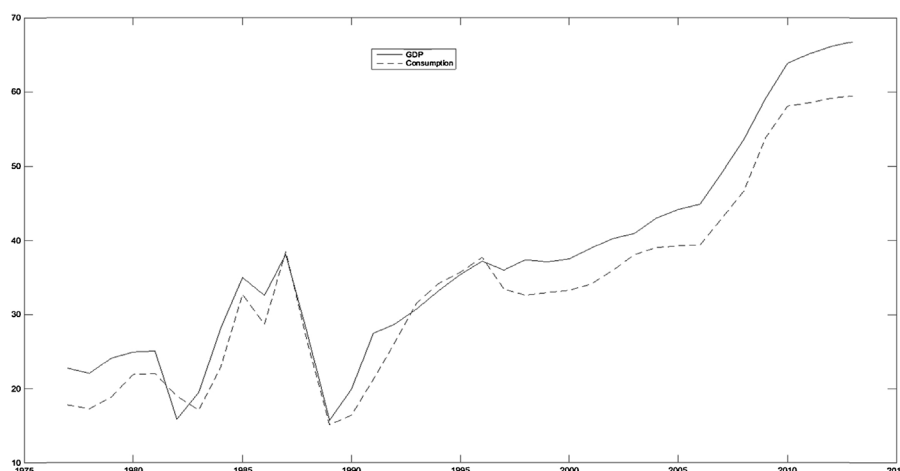


Fig. 1 – Income versus consumption (scale 10⁶).
Source: World Bank

Table 1 – Unit root test.

	Mackinnon's CVs			
	GDP	Consumption	5%	1%
Random walk				
PP	3.35	2.40	–1.95	–2.64
PP FD	–4.29**	–4.89**	–1.95	–2.64
Constant				
PP	0.79	–0.27	–2.95	–3.63
PP FD	–4.77**	–5.17**	–2.95	–3.63
Constant and time trend				
PP	–1.76	–2.48	–3.54	–4.23
PP FD	–6.07**	–5.58**	–3.54	–4.23
Random walk				
ADF	1.60	1.30	–1.95	–2.63
ADF FD	–4.45**	–4.88**	–1.95	–2.63
Constant				
ADF	0.06	–0.40	–2.95	–3.63
ADF FD	–4.70**	–5.11**	–2.95	–3.63
Constant and time trend				
ADF	–1.95	–2.20	–3.54	–4.23
ADF FD	–5.20**	–4.67**	–3.56	–4.28

*, ** Corresponds to significance level at 5% and 1%, respectively.
Source: Authors Estimates.

3.3. The model and results

$$\Delta Y_t = \gamma + \Pi Y_{t-1} + \sum_{k=1}^k C_k \Delta Y_{t-k} + \epsilon_t \quad (11)$$

Eq. (11) is a system of equations also known as Vector Error Correction Model, where ΔY corresponds to vector of variables in difference (ΔGDP , $\Delta Consumption$), Π corresponds to a 2×2 matrix, ϵ_t corresponds to vector of pure shocks, and γ corresponds to vector of constants that accounts for the increasing trend in both series over time. Maximum lag length allowed is 5, this is because it is not likely that a shock 6 years ago would affect consumption and/or GDP today. Ilzetzki et al. (2013) used maximum lag length of 4 for quarterly data, but in order to avoid model miss-specification we opt for choosing a longer lag length. Inference based on longer lag length is less likely to be affected by omitted variable bias problem, and therefore, more robust. Further, AIC, and HQIC both select a lag length of 4 equivalent to $k=3$ in our system of equations above.

Table 2 summarizes the results of Johansen approach of testing cointegration using λ_{trace} and λ_{max} statistics. Interestingly, GDP and consumption found to be cointegrated. Therefore, a long-term relationship between the variables exists and granger-cause test should be conducted in the context of VEC model to check whether a short-term relationship exists between the variables.

Existence of long-term relationship, variables are cointegrated, does not tautologically imply myopic consumption. To be safe to claim this, we tested whether a one-to-one relationship exists between income and consumption. Meanwhile, since a linear combination of the variables of interest is stationary, then standard hypothesis testing applies to test a one-to-one relationship. Table 3 reports our findings.

We failed to reject the null hypothesis at 5% and 10% levels. There exists a one-to-one relationship between income and consumption such that speed-of-adjustment, cointegration mechanism, responds only to previous period's deviation of income and consumption shocks. Therefore, we feel safe to conclude that consumption is myopic for the case of Lebanon.

Now we turn our attention to whether income and consumption granger-cause each other. In other words, does a short-term relationship exist between the two variables? Table 4 summarizes our finding.

Table 2 – Cointegration results.

Hypothesis		λ -Trace statistics	Critical value	Hypothesis		λ -Max-Eigen statistic	Critical value
H_0	H_A			H_0	H_A		
$r=0$	$r \geq 1$	28.4 ^a	15.4	$r=0$	$r=1$	28.21 ^a	14.2
$r \leq 1$	$r=2$	0.23	3.8	$r=1$	$r=2$	0.23	3.8

^a Denotes rejection of the hypothesis at 0.05 level.

Source: Authors Estimates.

Table 3 – Testing for one to one relationship.

Johansen normalization restriction imposed				
	Coef	Std. deviation	Z	P> z
Income	1	.	.	.
Consumption	–1.2	0.0439046	–27.44	0
Constant	4937898			
H ₀ : B=1	t-Stat	P> t		
H ₁ : Not B=1	0.6656	0.25		
H ₀ : One-to-one relationship exists.				
* Rejection of the null hypothesis at 0.05 level.				
Source: Authors Estimates.				

Table 4 – Granger causality.

Dependent: D(CONSUMP)			
Excluded	Chi-sq	df	Prob.
D(GDP)	2.25688	3	0.5208
All	2.25688	3	0.5208
Dependent: D(GDP)			
Excluded	Chi-sq	df	Prob.
D(CONSUMP)	0.464806	3	0.9266
All	0.464806	3	0.9266
Source: Authors Estimates.			

Results show that neither consumption nor income significantly affects each other and, therefore, there is no short-term relationship between the two variables. Again, although there does not exist a short run relationship, cointegration dynamics necessitates the elimination of short run deviations from the long-run relationship by responding to the previous period's deviation. This is ensured by that fact that at least one of the speeds of adjustment parameters is non-zero given the existence of cointegration.

4. Conclusion and future research

With debt-to-gdp ratio reaching the ceiling of 130% surpassing the 90% cliff after which most currency and debt crises were observed, Lebanon's economic and budget deficit hovers on the brink of crisis and increasingly becomes a delicate matter in the wake of Labor union fierce demands for wage increase. Questions like whether it is safe to increase wages can be inferred by examining the overall effect of fiscal policy and its effect on the economic welfare. If fiscal policy and, therefore, budget deficit matters then consumption respond to changes in income level and, thereby, wage increase could be translated into long term growth impulses. In turn, how big fiscal multipliers are, hinges on several crucial factors such as exchange rate regime, level of openness, debt sustainability, and whether a twin deficit hypothesis exists in the economy.

In this paper we tested for short and long term relationship between income and consumption in Lebanon using econometric methods. Our findings points to the absence of short term but a one-to-one long-term relationship between the two variables. This spells economic agents in Lebanon are myopic, non-Ricardian, and therefore, budget imbalances of government do affect consumption. In turn, an increase in consumption, due to wage increase, could be translated into long term economic impulses.

Our findings corroborate [Neaime \(2010, 2015a, 2015b\)](#), who argues for a unidirectional causal relationship between budget deficit and current account and therefore, a twin deficit hypothesis. However, twin deficit is a necessary consequence of myopic consumption behavior in an economy following a budget deficit. Also, our finding are partly in line with [Saad and Kalakech \(2009\)](#), who argued for growth effects in Lebanon in some economic sectors following government expenditure. Again, had not consumption been myopic, government expenditure would not have been translated into growth impulses in some economic sectors. In the meantime, evidence from emerging markets is mixed on the effect of wage increase, which calls for a country-by-country type of analysis similar to what we have done for the case of Lebanon.

On the other hand, economization of our findings are applicable in policy making context, our findings tip the balance in favor of wage increase and, therefore, policy makers should take into consideration consumption's myopic behavior when considering wage increase since it could lead to long term growth impulses. In the meantime, make no mistakes, considering the wage increase

issue requires further delicate analysis especially on the debt and current account deficit positions¹. The structure and sources of financing of both public debt and current account deficit matters and warrants more detailed and in-depth analysis before considering the wage increase policy but, at least, we are safe to conclude that from the consumption's perspective, data points to adopt the wage increase.

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¹ For deeper discussion, you may consult with Neaime (2000).