



July 07<sup>th</sup>, 2017

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## 1. Introduction

It is still fairly hard in the economics literature to come up with a decisive ratio for the public debt to GDP (debt ratio) beyond which economic growth would slow down considerably. For instance, the Maastricht Treaty failed to live up to its criterion of 60% as the debt ratio that will qualify EU members to the Euro Area when Greece and Italy were admitted at much higher ratios. More recently, and more importantly, extensive research by Reinhart and Rogoff (2010) established a threshold ratio of 90% that was widely cited as a justification for austerity measures for countries at or exceeding this threshold<sup>1</sup>. But a rigorous look at this research revealed that the data used to arrive at this conclusion were erroneous, and soon enough the conclusion was forgotten but not so much the policy implications that emanated from it<sup>2</sup>.

What we want to explore in this short note is not a new threshold for the debt ratio, but a new and simple way of analyzing debt by looking at its inverse, the GDP to debt ratio<sup>3</sup>. This ratio, GDP/DEBT, measures quite simply the average productivity of debt since debt, or the accumulation of budget deficits, can clearly be considered an input into GDP as it mobilizes and uses resources to meet government expenditures. As important, we can also identify the marginal productivity of debt,  $dGDP/dDEBT$ , which measures the impact of additional debt or budget deficits on GDP. So what we are interested in is the productivity of debt, not necessarily its threshold, sustainability, or burden; and what are some of the basic and crucial drivers behind this productivity.

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\* *The views expressed in the note are the authors', and do not necessarily reflect those of BLOM and BLOMINVEST Bank.*

<sup>1</sup> See Reinhart, C. and Rogoff, K. (2010). "Growth in a Time of Debt". NBER Working Paper No. 15639.

<sup>2</sup> See Cassidy, J. (2013). "The Reinhart and Rogoff Controversy: A Summing Up". New Yorker, April 26 Issue.

<sup>3</sup> This methodology is explored by Healy, R. (2011). *The Limits of Debt*. Strategic Analysis. Toronto: Canada

In Keynesian models of recessionary economics and an income multiplier that is greater than one, we expect the marginal productivity of debt to be larger than one. In neoclassical models of full employment, we expect it to be zero<sup>4</sup>. In reality, it could be anywhere between these two values, but what is important is how its behavior varies over time as more debt is transacted. More important is what constitutes the additional spending behind the larger debt: is it capital expenditures? Or is it current expenditures? If the latter, is it interest payments, is it salaries, is it transfers, is it appropriated money (corruption), or is it all four?

That is what we want to find out for the post-war Lebanese economy of 1993-2016. To this end, we analyze in section 2 the Lebanese public debt from the perspective of its productivity during the post-war period; in section 3 we interpret the results obtained in section 2 and provide some explanations as to why the debt has risen largely unchecked; and in section 4 we conclude the note and briefly argue for some of the essential needed policy reforms.

## **2. Analysis**

Lebanon embarked on a process of economic reconstruction in 1993; and in 1997 it adopted a system of fixed exchange rates to the USD. In addition, though the civil war was over, the country remained liable to frequent domestic and external political instabilities throughout the post-war period that were naturally harmful to economic growth, especially in a country that lacked adequate good governance. This cocktail of factors proved mostly detrimental to fiscal health as debt increased from \$4.1 billion in 1993 to \$74.9 billion in 2016 (a whopping increase by more than 18 times!), as can be seen from the Appendix. Over that period, the average productivity of debt (APD) fell from 1.8 to 0.69, and the marginal productivity of debt (MPD) fell from 0.56 to 0.26, each falling by more than 50% and indicating that debt was becoming increasingly less productive or exhibiting diminishing marginal productivity<sup>5</sup>.

However, as we can also see from the Appendix, APD revealed some curious patterns. It fell from 1.8 to 0.54 between 1993 and 2006, but it rose from 0.58 to 0.76 between 2007 and 2011, and then it fell again from 0.75 to 0.69 between 2012 and 2016. Similar patterns can be seen for MPD. So it is interesting to divide the data into these three sub-periods, and this is what we do in table (1) for the sub-period averages.

**Table (1): Sub-period Averages: APD, MPD, BD/GDP, and g**

	<b>APD</b>	<b>MPD</b>	<b>BD/GDP (%)</b>	<b>g (%)</b>
<b>1993-2006</b>	0.87	0.42	16.17	4.16
<b>2007-2011</b>	0.67	1.6	8.40	7.54
<b>2012-2016</b>	0.74	0.57	8.04	1.86

**Source: IMF and BDL Data Sets.**

<sup>4</sup> The reason is that additional debt bids up interest rates which crowd-out private spending thus making the final impact on GDP null.

<sup>5</sup> Notice that as APD fell, MPD fell and was also below APD so as to push the latter down, as one would expect from basic mathematics.

Three important observations emerge from table (1). First, the basic mathematical relation between APD and MPD holds for each of the sub-periods: during the first sub-period when APD fell, MPD's average was below that of APD so as to push the latter down (0.42 against 0.87); during the second sub-period when APD rose, MPD's average was above that of APD so as to pull it up (1.6 against 0.67); and during the third sub-period, the same behavior to that of the first sub-period was repeated with average MPD at 0.57 against that of APD at 0.74.

Second, and more important, the first sub-period was the worst in terms of debt productivity with MPD averaging 0.42 and reaching 0.13 in 2005; this can also be seen from the behavior of the budget deficit to GDP ratio, BD/GDP, and the growth rate of real GDP,  $g$ , where the former averaged a high of 16.17% in relation to a moderate average of  $g$  at 4.16%. The second sub-period was better, with average MPD recovering to 1.6. This rebound is explained by two notable developments: first, starting in 2002 onwards, monetary measures brought lower adjustments to interest rates, and fiscal reforms introduced the new VAT system, both helping to lower BD/GDP to an average of 8.4%<sup>6</sup>; second, the international financial crisis of 2008 drove a lot of capital inflows to the safe Lebanese banks, contributing in the process to an exogenous increase in  $g$  to an average of 7.54%. But this proved short-lived, since in the third sub-period with the positive implications from the financial crisis fizzling out and no new fiscal reforms being undertaken, BD/GDP remained at an average of 8.04% and  $g$  fell to an average of 1.86%; and, not surprisingly, MPD slipped to an average of 0.57 and fell to 0.26 in 2016.

Third, it is important to realize that the surge in MPD and APD during the second sub-period was to a lesser extent the result of monetary and fiscal adjustments, but to a much larger extent the result of fortuitous international developments that are largely exogenous to the internal workings of the country's political economy. So in this sense it is the "exception that proves the rule". But it does point out to an important finding: when needed reforms are put in place, the economy's debt productivity can no doubt improve.

### 3. Interpretation

The crucial question is, what stands behind the secular decline in APD and MPD? At 0.26 in 2016, the MPD is not far from zero and what the neoclassical models predict. However, we do not believe that neoclassical thinking is behind it. This is because of two reasons: first, the Lebanese banking sector is very liquid with deposits at more than 3 times GDP, so government borrowing has not crowded private spending, at least not entirely; second, the Central Bank of Lebanon (BDL) has initiated since 2008 or even earlier extensive programs of subsidized lending to the private sector in cooperation with the commercial banks<sup>7</sup>.

<sup>6</sup> As a result, primary surpluses were first observed in 2002; in fact, they continued till 2016 with the exception of 2006, 2012, and 2013. For more on the reforms in 2002, see Bolbol, A. (2007). "The Lebanese Economy: Issues in its Post-War Development, 1992-2005". Journal of Development and Economic Policies, 19, 1.

<sup>7</sup> Of course, one could argue that private spending itself could be less productive if it goes into ostentatious consumption or investment in activities that carry low growth mileage like traditional services or superfluous construction projects.

We believe that what drives the decline in debt productivity is largely the nature and composition of government spending. There are several components of public spending that could fit that bill. We start with current expenditures. First is personnel cost which increasingly absorbs 34% of total government expenditures<sup>8</sup>. And given the high percentage of goods imports in GDP (at about 40%), a considerable portion of these expenditures by households is leaked unproductively out of the economy. As to the reason behind this bloated public sector, it is no secret that it is mostly due to the patronage networks that the three (independent but competing) centers of power – the Presidency, the Legislative, and the Executive – frequently spawn inside government institutions and agencies<sup>9</sup>. Second are interest payments which constitute 32% of total public expenditures, and which accrue mainly to high-income earners who are relatively big savers, and their spending patterns are even more geared towards imports. What lies behind this snowballing debt service is the large deficits accumulated in the past – especially between 1993 and 2002 – and funded by bank deposits<sup>10</sup>. Third are transfers, and transfers to Electricité du Liban (EDL) in particular which comprise at least 10% of total expenditures. Suffice it to say here that it simply defies reason how the government can spend more than \$15 billion on EDL over the past 10 years and still large parts of the country can only have 3-6 hours of electricity on a given day!

The other main component of public expenditures relates to capital expenditures. This important component captures at most 5% of total expenditures, however it is widely considered to be the most productive since it involves investments in needed infrastructure and in projects that are usually labor intensive. And, no doubt, it is sorely missed in a country that lacks proper electricity, water supply, road networks, internet connectivity, and public schools and hospitals. As to why it is too low, the reason lies in the fact that it is the easiest to cut since it does not have a vociferous political interest group to speak for it.

The last component is perhaps the most ubiquitous but the hardest to quantify, and it relates to appropriated expenditures or “corruption”. There is only anecdotal evidence about such expenditures and it touches on transactions involving all different kinds of public activities. What makes these expenditures more pernicious is that they tend to increase in times – as is now the case – of lower GDP growth, besides the fact that they are usually siphoned off outside the country<sup>11</sup>.

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<sup>8</sup> In 2016, total government expenditures were \$14.9 billion and the budget deficit was \$4.9 billion.

<sup>9</sup> It is estimated that close to 250,000 people work in the public sector out of a total native labor force of 1.3 million, or close to 20% of the latter; this is relatively large for a country of 4 million people and a history of dominant private sector activity.

<sup>10</sup> This argument holds even if BDL carries part of the public debt, which it currently does at close to 30%

<sup>11</sup> See Healy (2011).

All the above factors seem to be driving MPD downwards but it has not yet reached zero, which is of course a very critical point. This is because once that point is reached no additional debt should be transacted, and further increases in debt would lead to reductions in GDP and to a negative MPD. To borrow from physics, the point of zero MPD is akin to the “event horizon” beyond which the gravitational pull of a black hole becomes so forceful that no matter can escape it, and the standard physics equations have no solution<sup>12</sup>. In parallel, what this means economically is that beyond zero-MPD the *black hole of public debt* will be sucking in resources with no returns and with no solutions as to how to make it collapse<sup>13</sup>. Luckily, we are not there yet, but we have to move away from the vicinity of that “space-time” as soon as we can. Below are some policy proposals that can help us do that.

#### **4. Conclusion**

This short note introduces the novel concept of “debt productivity” which views the evolution of public debt from the perspective of measuring its contribution to GDP in post war Lebanon from 1993 to 2016. We focus on the productivity of debt because we strongly believe that taking care of that will take care of the sustainability and burden of debt and make both less malignant. The note analyzes the dynamics between APD and MPD by highlighting their correlation within three specific sub-periods. More importantly, it investigates government spending -- capital and current expenditures -- that have contributed to the amassment of public debt and adversely impacted debt productivity. Except for the 2007-2011 period, it shows that debt productivity followed a declining trend with MPD reaching close to zero by 2016. And the main culprits were the composition and size of government expenditures. So, what to do about them?

With 34% of government spending going to personnel cost, these expenditures reflect largely the hard reality of confessional patronage that is at the heart of the country's political fabric. Though it is easier said than done, public sector employment can be made more productive by trying to reform the underlying system through, for instance, limiting redundant personnel, developing efficiency guidelines, and exercising better oversight.

As for the 32% in interest payments, lower political risk premiums – made possible by enhanced political stability -- coupled with a viable debt management program can decrease the burden of debt servicing over time<sup>14</sup>. In this respect, it pays to remember that bank deposits are not unlimited as a source of debt financing, and banks' capital charges are rising perceptibly with more holdings of Lebanese foreign debt especially in a climate of increasing regulations.

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<sup>12</sup> For the black hole analogy, see Mauldin, J. (2012). “*We are Headed for an Economic Black Hole*”. Business Insider, October 15.

<sup>13</sup> A *misguided* solution involves debt monetization, devalued currencies, and hyper-inflation that would cause the debt to practically “evaporate”. However, this solution is misguided for two important reasons: first, judging from the country's somewhat similar experience in the 1980s, that would be disastrous; second, the aim here is not just to reduce the debt but to *make it more productive*.

<sup>14</sup> The debt management program should of course involve tax reforms, especially on the collection side where it is estimated that almost 50% of income taxes are evaded; for more on these tax reforms, see IMF. (2017). *Lebanon: Country Report*. January, No. 17/19.

Regarding the costly EDL transfer expenditures that comprise at least 10% of government spending, we think the government should entertain not only the need to reforming public enterprises but also to privatizing them for cost and efficiency purposes. And concerning the miniscule 5% in capital spending, authorities need to weigh the current state of the country's infrastructure against fulfilling its objectives of attracting investments to Lebanon. In this era when deserts are being transformed to hubs, the geographical and human capital advantages of Lebanon have to be capitalized on by adopting a sound policy of investing in infrastructure at all levels of modernization. It is only then that Lebanon can become a successful value proposition versus the competition.

Perhaps the most challenging of all government spending is what relates to appropriated expenditures or "corruption". There is little doubt that throughout the post-war period, and despite the prevailing political/security turbulences, opportunism at the state level was well spread. In this sense, and sad to say, accountability remains at large. However, we are hopeful that, with the new regime's emphasis on clean government and the creation of an anti-corruption ministry, malpractices in mishandling government finances could be deterred, if not eliminated. The essential moral here is that good governance at the political and public sector level is probably the most important *sufficient* condition for healthy and steady growth.

In the end, the productivity of debt is ultimately bound to the productivity of the economy, especially its *tradable sector* that has the additional advantage of mitigating any severe imbalances in the current account<sup>15</sup>; and, to that effect, all structural reforms that increase the economy's productivity in this way should be welcomed<sup>16</sup>. Although as yet MPD has not hit negative territory, and the public debt has not become a black hole, there is an urgent need for all "stakeholders" to better understand the opportunity costs for a nation mastering the game of "playing on dead time". That said, we look forward to the passing of the new electoral law to be the start of setting that record straight!

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<sup>15</sup> The mitigation of imbalances in the current account will also be very helpful in shoring up BDL foreign reserves and the fixed exchange rate peg.

<sup>16</sup> For a review of such structural reforms, see World Bank. (2017). *Lebanon Economic Monitor*. Spring Issue.

Appendix

	GDP (\$bn)	Debt (\$bn)	APD	MPD	BD/GDP(%)	g (%)
1993	7.54	4.18	1.80	--	8.8	7.00
1994	9.11	6.97	1.31	0.56	19.2	8.00
1995	11.12	9.30	1.20	0.86	18.4	6.50
1996	13.00	13.34	0.97	0.47	21.7	4.00
1997	15.75	15.56	1.01	1.24	27.00	10.20
1998	17.29	18.57	0.93	0.51	18.1	3.90
1999	17.41	22.37	0.78	0.03	15.7	-0.80
2000	17.25	25.21	0.68	-0.06	24.2	1.10
2001	17.60	28.32	0.62	0.11	18.5	3.90
2002	19.09	30.74	0.62	0.62	14.1	3.40
2003	19.75	33.39	0.59	0.25	13.3	1.70
2004	20.96	35.89	0.58	0.48	8.60	5.10
2005	21.29	38.48	0.55	0.13	8.4	2.70
2006	21.80	40.38	0.54	0.27	10.4	1.60
2007	24.58	42.05	0.58	1.67	10.8	9.40
2008	28.83	47.04	0.61	0.85	9.60	9.10
2009	35.14	51.17	0.69	1.53	8.20	10.30
2010	38.01	52.62	0.72	1.98	7.50	8.00
2011	40.08	53.67	0.76	1.96	5.90	0.90
2012	44.10	57.70	0.75	1.00	8.90	2.80
2013	47.60	63.50	0.75	0.60	8.40	2.50
2014	49.87	66.59	0.75	0.74	6.00	2.00
2015	50.80	70.35	0.72	0.25	7.40	1.00
2016	51.99	74.91	0.69	0.26	9.50	1.00

Source: IMF and BDL Data Sets.

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