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The Lebanese economy was on fairly shaky grounds prior to 17 October 2019 but the economic crisis that has ensued since then was beyond anyone's expectations in its severity. Four factors have inflamed the crisis and have added to its spread: first, the Corona epidemic; second, a political uprising that had initially shown a lot of promise but that later created havoc and ultimately fizzled without any meaningful impact; third, the tragic explosion to the Port of Beirut on August, 4 2020; fourth, and most important, the absence of any government corrective measures, let alone a steady functioning government, to tackle the crisis because of the hopeless and endless bickering among the political parties. The crisis, naturally, has spawned many economic issues and problems, and what we want to do in this note is to address four of them, namely: the extent of smuggling in petroleum products; the optimal magnitude of foreign reserves; the probable size of capital outflows; and the impact on aggregate expenditures and output. We will begin by analyzing the first two issues in this Part 1 of the note.

The first issue has attracted a lot of public attention and disapproval since it deals with the presumed smuggling of petroleum products to neighboring countries. These imported products are subsidized by BDL which covers 85% of their USD cost at the official exchange rate of 1,500 LBP per 1 USD. As a result, the smuggled products represent lost foreign exchange reserves that the country can hardly afford these days.

	Y Bn \$	V Bn \$	ΔY	ΔV
2002	19.09	0.97		
2003	19.75	1.19	0.66	0.22
2004	20.96	2.07	1.21	0.88
2005	21.29	2.23	0.33	0.16
2006	22.01	2.41	0.72	0.18
2007	24.83	2.69	2.82	0.28
2008	29.12	4.28	4.29	1.59
2009	35.40	3.33	6.28	-0.95
2010	38.44	3.79	3.04	0.46
2011	39.93	4.62	1.49	0.83
2012	44.04	5.89	4.11	1.27
2013	46.91	5.11	2.87	-0.78
2014	48.13	4.75	1.22	-0.36
2015	49.94	3.85	1.81	-0.90
2016	51.21	4.09	1.27	0.24
2017	53.14	4.20	1.93	0.11
2018	54.96	4.07	1.82	-0.13
2019	49.00	6.53	-5.96	2.46
Average	37.12	3.67	1.76	0.33
H1 2020	13.00	1.46		
H1 2019	24.50	3.33		

Source: IMF; MOF; Government Reform Plan

To check whether smuggling in petroleum products occurs and to what extent, we have to work with the concept of the income elasticity of demand. The income elasticity measures the percentage change of demand for imported petroleum products that arise from the percentage change of income, assuming as is commonly the case that income is a prime determinant of demand. If Y is income (GDP) and V is total value of imports of petroleum products, then the income elasticity of demand for these imported products is given by the formula:

$$(1) \quad (\Delta V / \Delta Y) \cdot (Y / V)$$

From the table above, the income elasticity for the period from 2002 to 2019 can be estimated as: $(0.33/1.76) \cdot (37.12/3.67) = 2^1$. It is fairly elastic then (since it is greater than 1), and it means that a 1% change in income will change the value of imports by 2%. The table above has also data for Y and V in H1 2019 and H1 2020, and we can apply the estimated income elasticity to check for smuggling during that period. As we can deduce, Y fell by 46.9%, so according to the estimated income elasticity of demand V should have fallen by $46.9\% \times 2 = 93.8\%$. However, we see that V has actually fallen by 56.2% only! So the difference, 37.6%, represents excess imports that the country should not have imported and paid for, and presumably was siphoned off to neighboring countries.

The 2002-2019 period is chosen for data availability and so as to provide enough time-depth for calculating the income elasticity in the new millennium ¹

One important caveat of these calculations is that demand depends also on price. Specifically, the international price of oil has gone down considerably in the past year because of the global economic slowdown (currently at about \$44 pb); more importantly, BDL's subsidization of petroleum products has reduced significantly the USD price of these products, such that today 20 liters of petrol at the pump costs \$3 only when valued at the parallel market exchange rate, making its price perhaps the cheapest in the world. This is bound then to increase the demand and consumption of petroleum products domestically. But the thing about petroleum products is that they are price insensitive (inelastic) and whose demand is not expected to change much as a result of price changes. However, even if we allow for the price effect, this means that the 37.6% ratio obtained above represents the upper bound or limit of smuggled petroleum products as it could be lower due to higher consumption in the domestic market. Either way, the ratio remains relatively high, and it calls for the need to adjust BDL's subsidy policy given what it implies in terms of the loss of scarce foreign reserves.²

The talk about foreign reserves brings us to the second issue, which is: what level of foreign reserves should be considered optimal? To begin with, the main reason behind holding foreign reserves is to cover for international payments imbalances – especially during crises – and smooth domestic absorption (A) in the process. Various measures of reserve adequacy have been proposed in the literature, especially as the world economies have become more globalized and subject to free capital mobility. Four measures of reserve adequacy and coverage ratios stand out: 3-months' worth of imports; 1-year external debt payments; 10% worth of domestic broad money in case of foreign exchange conversions; and 10% worth of GDP in case of capital "sudden stop". For Lebanon in 2020, these values are as follows:

3-months' worth of imports: \$2.6 billion (assuming annual imports of \$10.4 billion)

1-year external debt payments: \$4.9 billion in interest and principal

10% worth of domestic broad money: \$1.7 billion (assuming M2 of 60.6 trillion LBP converted to USD at 3,500)

10% worth of GDP: \$2.6 billion (assuming GDP of \$26 billion)

Notwithstanding the fact that Lebanon has defaulted on its external (foreign currency) debt, the sum of all adequacy ratios add up to \$11.8 billion. Of course, these ratios are rough estimates and their optimal values vary depending on each country's economic circumstances.

That said, if we consider BDL's foreign assets at end September 2020, they were equal to \$26 billion, but they have declined by \$11.3 billion since end 2019! These were used mostly to cover for trade deficits during the period and partly to pay back loans. Moreover, the available \$26 billion contain \$5 billion in Lebanese Eurobonds and about \$6 billion in loans to local banks, so free liquid foreign reserves are only \$15 billion.

On first impression, foreign reserves might seem as a result to be adequate since they are higher than the "required" \$11.8 billion, but that would miss the point for four reasons. First, though BDL's free foreign assets are \$15 billion, its net foreign assets are in excess of negative \$50 billion because of all the foreign currency deposits it owes the banking sector. Second, these reserves have declined by \$11.3 billion, i.e. more than the \$11 billion promised by the Cedre conference, and have mostly funded consumption not investment – in other words, they haven't been used to increase the economy's productive capacity. Third, these reserves are looked at from a static perspective, whereas the dynamic picture is a lot bleaker, given the country's lack of access to international capital markets in the near future and the popular demand to continue with expensive subsidies on imported basic

Not to mention, of course, better policing of the borders²

goods³. Fourth and most important, these reserves seem to be buying politicians time and allowing them to dither from assuming their responsibilities and from taking hard but essential policy and reform choices.

All these reasons point to the imperative of protecting BDL's foreign reserves. And the common-sense response to this calamitous situation is to rationalize the subsidization program and, more important, to embark on a serious reform and recovery program that would open up funding from multinational and international sources. But, unfortunately, to Lebanese politicians this seems like the least common to their way of thinking.

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BDL had said that it will end its subsidization program when its free foreign reserves hit \$17B, which is the level equal ³ to required bank's USD reserves. But BDL later rescinded the idea