Preliminary "Back of the Envelop" Estimates of the Impact of CEDRE Funds on Major Economic Aggregates in Lebanon

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In April 2018, the CEDRE conference was held in Paris to provide financial assistance to Lebanon to cope with its economic problems that were aggravated by the inflows of more than one million Syrian refugees to the country. The conference pledged close to $11 billion in loans and grants to Lebanon, conditional on the implementation of economic and governance reforms. Ideally, it would have been best to study the impact of these funds using a general macroeconomic model for the country, but unfortunately such an endeavor is not possible because of data limitations, both across time and across relevant variables. What we intend to do instead is to develop partial equilibrium "back of the envelop" estimates of the impact of these funds on major economic aggregates, namely tax revenues, merchandise imports, and private loans and deposits.

The choice of tax revenues is driven by the chronic budget deficits that Lebanon has been having and that have reached in excess of 8% of GDP. To study the impact of the CEDRE funds on tax revenues, a rough estimate of the elasticity of tax revenues with respect to GDP, ETY, is calculated from the accompanying tables for 2005 to 2017. Since ETY is equal to the % change in tax revenues divided by the % change of GDP, it can be expressed as:

(1) $E_{TY} = \Delta T/\Delta GDP \times GDP/T = (\Delta T/\Delta GDP)/(T/GDP) =$ Marginal T/Average T $= 0.15/0.15=1$

An ETY = 1 means that a 1% increase in GDP will produce a 1% increase in tax revenues. Equally important, it means that the Lebanese tax system is "neutral", since an ETY that is greater than 1 means that the marginal tax is greater than the average tax and the tax system as a result will be progressive; whereas an ETY that is less than 1 means the opposite and the tax system will be consequently regressive.

As to the effect of CEDRE funds, let us assume that Lebanon receives $1 billion in funds in 2018 which the government spends on infrastructure. In a previous paper, we have estimated the income multiplier for Lebanon to be 1.35[1]. That means a $1 billion increase in government spending will increase GDP by $1.35 billion. The latter is 2.52% of the 2017 GDP (=$53.4 billion), which implies according to ETY of 1 that tax revenues will increase by 2.52% as well, or $207 million (=2.52% x $8.2 billion). Two observations can be made regarding this preliminary result. First, if the $1 billion in funds were a grant, then the net impact on the budget deficit is a reduction by $207 million; whereas if it were a loan, then the net impact is an increase by $793 million. Second, the change in tax revenues has to be adjusted to reflect the higher tax rates that were introduced in late 2017. These should elevate tax revenues by 9.3% or $19.3 million, such that the adjusted increase in tax revenues becomes equal to $226.3 million instead of $207 million [2].

The choice of imports reflects also the current account deficits that Lebanon has consistently had at more than 15% of GDP. Similarly, we can calculate the elasticity of imports with respect to GDP, EMY, as equal to 1.07, meaning that a 1% increase in GDP will increase imports by 1.07%. If we stay with the same example, then a 2.52% in GDP should increase imports by 2.69% or $624 million. Given that the $1 billion is an official capital inflow, and given that the $624 million increase in imports will contribute to current account deficits by that amount, the net impact of the $1 billion in CEDRE funds on the balance of payments is to improve it by only $376 million.

[1] Bolbol, A., Hakimian, H., and Mouradian, A. (2016). "Macroeconomic Effects of the COLA and Salary Scale Adjustments in the Public Sector: Preliminary Results from a Simple Model for Lebanon". *ABL Monthly Bulletin, No. 2/2016.*

[2] The higher tax rates are an increase in VAT from 10% to 11%; an increase in corporate tax from 15% to 17%; an increase in interest tax from 5% to 7%; and the imposition of double taxation on interest income from CDs and TBs of commercial banks. Since the higher taxes were introduced in the last quarter of 2017, and since the % change in tax revenues is equal to the % change in tax rates plus the % change in GDP ($T=tY$ so $\Delta T/T=\Delta t/t+\Delta Y/Y$), then for the last quarter the % change in tax revenues due to higher tax rates is *equal to 12.4% (% change in tax revenues) minus 3.1% (% change in GDP) or 9.3%.*

The choice of private loans and deposits signify the crucial role that banks play in mediating growth in Lebanon. Along the same lines, the elasticity of loans with respect to GDP ELY can be calculated as 1.62; and the elasticity of deposits with respect to GDP EDY as 1.66. Note that the elasticities of these banking aggregates are larger than the macro aggregates because of the money multiplier and creation process. As a result, and following the same methodology, the increase in loans should be $2.46 billion; and the increase in deposits should be $7.05 billion.

On an "other things being equal" basis, the above simple estimates provide a preliminary look at what the impact of CEDRE funds can be on major economic aggregates in Lebanon. The impact seems least favorable for budget deficits, especially in the context of CEDRE loans. But it does not have to be that way, at least for three considerations. First, the income multiplier could be larger if the CEDRE funds were seriously accompanied with reforms that positively affect the performance of public enterprises, the sustainability of public finances, and the quality of the investment climate. Second, CEDRE funds could act as a vote confidence to the economy and stimulate accordingly more private capital flows, in terms of FDI and portfolio investments. Third, the resulting confidence and abetting of risk could reflect favorably on banking activities, both on the traditional and non-traditional kinds. As a result, all three considerations could translate to sounder economic aggregates and could eliminate any underrating of their impact.

Annex

$ Billion	GDP	Imports	Tax Revenue	Loans	Deposits
2005	21.3	9.3	3.2	19.1	57
2006	22.4	9.4	3.3	21.4	60.6
2007	25.1	11.8	3.7	20.4	67.5
2008	30.1	16.1	4.8	25	77.8
2009	34.9	16.2	5.9	28.4	95.8
2010	39.2	17.9	6.6	34.9	107.2
2011	40.1	20.1	6.5	34.4	115.7
2012	44.1	21.2	6.8	43.5	125.1
2013	47.6	21.3	6.7	47.4	136.2
2014	49.9	20.5	6.9	50.1	144.4
2015	50.9	18.1	6.8	54.2	151.7
2016	51.8	18.7	7	56.9	162.7
2017	53.4	23.2	8.2	60.4	168.7

$ Billion	Δ GDP	Δ Imports	Δ Tax Rev	Δ Loans	Δ Depots
2005					
2006	1.1	0.1	0.1	2.3	3.6
2007	2.7	2.4	0.4	-1	6.9
2008	5	4.3	1.1	4.6	10.3
2009	4.8	0.1	1.1	3.4	18
2010	4.3	1.7	0.7	6.5	11.4
2011	0.9	2.2	-0.1	-0.5	8.5
2012	4	1.1	0.3	9.1	9.4
2013	3.5	0.1	-0.1	3.9	11.1
2014	2.3	-0.8	0.2	2.7	8.2
2015	1	-2.4	-0.1	4.1	7.3
2016	0.9	0.6	0.2	2.7	11
2017	1.6	4.5	1.2	3.5	6

	IMPORT/GDP	TAXREV/GDP	LOANS/ GDP	DEPOT/ GDP
2006	0.44	0.15	0.90	2.68
2007	0.42	0.15	0.96	2.71
2008	0.47	0.15	0.81	2.69
2009	0.53	0.16	0.83	2.58
2010	0.46	0.17	0.81	2.74
2011	0.46	0.17	0.89	2.73
2012	0.50	0.16	0.86	2.89
2013	0.48	0.15	0.99	2.84
2014	0.45	0.14	1.00	2.86
2015	0.41	0.14	1.00	2.89
2016	0.36	0.13	1.06	2.98
2017	0.36	0.14	1.10	3.14
Average	**0.44**	**0.15**	**0.93**	**2.81**

	ΔIMPORT/ΔGDP	ΔTAXREV/ΔGDP	ΔLOANS/ ΔGDP	ΔDEPOT/ ΔGDP
2006	0.09	0.09	2.09	3.27
2007	0.89	0.15	-0.37	2.56
2008	0.86	0.22	0.92	2.06
2009	0.02	0.23	0.71	3.75
2010	0.40	0.16	1.51	2.65
2011	2.44	-0.11	-0.56	9.44
2012	0.27	0.08	2.28	2.35
2013	0.03	-0.03	1.11	3.17
2014	-0.35	0.09	1.17	3.57
2015	-2.40	-0.10	4.10	7.30
2016	0.67	0.22	3.00	12.22
2017	2.81	0.75	2.19	3.75
Average	**0.48**	**0.15**	**1.51**	**4.67**