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## Foreign Debt Dynamics in Middle Income Countries<sup>†</sup>

FATMA DOGRUEL\* and A.SUUT DOGRUEL\*\*

### ABSTRACT

In spite of all efforts and propositions to overcome the debt problem, the economic prospects for highly indebted countries are still uncertain. Consequently, sources and effects of the external debts are widely discussed in the last two decades. In general, the changes in the debt stock linked to the flow variables, such as budget deficits, current account deficits, domestic saving gap. There also are studies on the effects of external debts to economic growth. However, these studies emphasize the causality from debt to growth. In contrast to this conventional approach, the paper presumes that a reverse causality is possible. That is, past performance of economics growth may have effect on the accumulation of the external debts. In the analyses, ten-year moving average of and standard deviation of the annual growth rates of per capita income are taken as the indicators of the economic growth performance. The paper shows that growth performance has a significant effect on external debt in selected Latin America and the Caribbean (LAC) and East Asian and Pacific (EAP) countries, and Turkey. However, link between growth performance and external debt seems that absent in selected countries in Middle East and North African (MENA) region.

JEL Codes: O10, F43, F34

Keywords: External Debt, Growth, MENA, LAC, EAP, Turkey.

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<sup>\*</sup>) Marmara University, Department of Economics, Goztepe Campus, 34722 Istanbul, TURKEY. E-mail: [fatma.dogrueel@marmara.edu.tr](mailto:fatma.dogrueel@marmara.edu.tr)

<sup>\*\*</sup>) Marmara University, Department of Economics, Goztepe Campus, 34722 Istanbul, TURKEY. E-mail: [suut.dogrueel@marmara.edu.tr](mailto:suut.dogrueel@marmara.edu.tr)

## INTRODUCTION

One of the consequences of the globalization is increase in the external debts of the developing countries. We may identify several complex and multifaceted reasons behind the borrowing need of a country: short-term or long-term dynamics can be sources of debt accumulation. We presume that past performance of economic growth may have effect on the accumulation of external debts. In other words, growth performance of an economy can be (or should be) taken as one of the major factors of indebtness. In this paper, we scrutinize the effect of level and volatility of growth on external debt stocks in selected middle income countries.

In the paper, we analyze selected emerging countries from three different geographic regions around the world: Middle East and North African (MENA), Latin America and the Caribbean (LAC) and East Asian and Pacific (EAP) countries.<sup>1</sup> The criteria that we use for selection are: the income level and labor force capacity of the country. The selected countries are middle income and labor abundant.<sup>2</sup> Furthermore, we also do not cover the countries with large population like China in EAP region, and countries with small population like Jordan and Lebanon in MENA region. Another reason for the exclusion of Lebanon is its exceptional political conditions; vast rebuilding expenditures following the long lasting civil war. In MENA region, we also exclude oil rich countries. Each region is analyzed separately in order to maintain homogeneity: Turkey is grouped with the LAC countries because of debt structure similarities.

The plan of the paper as follows: The second section outlines nature of debt problem and vulnerability of emerging countries. The third section discusses the model we employed on the link between debt and growth. The last section concludes the paper.

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<sup>1</sup> The coverage of these groups of countries:

East Asia & Pacific (EAP): Indonesia, Malaysia, and Philippines

Europe & Central Asia (ECA): Turkey

Latin America & the Caribbean (LAC): Argentina, Brazil, Chile, and Mexico.

Middle East & North Africa (MENA): Egypt, Arab Rep., Morocco, Syrian Arab Republic, and Tunisia.

<sup>2</sup> We consider The World Bank (2006) for labor abundance properties of MENA countries.

## DEBT STRUCTURE AND VULNERABILITY

Financial liberalization is a leading and controversial issue in the policy discussions on developing countries over the last decades. There are advocates of financial liberalization as well as opponents.<sup>3</sup> On the link between financial fragility and long run growth, supporters of liberalization state that liberalization strengthens financial development and this leads to higher long run growth; however, its opponents claim financial liberalization stimulate excessive risk-taking and this increases macroeconomic volatility which can lead to more frequent crises (Ranciere *et al*, 2003).

The main outcome of financial liberalization is increase in capital flows from the developed world to developing countries which are considered as a remedy to overcome the domestic saving gap problem. The forms of these flows are either direct foreign investment or portfolio investments. Direct foreign investment, which is played leading role in the growth of the developing countries, has increased as volume in this period. However, portfolio investments dominate the capital flows. Nevertheless, the implication the financial mobility is the escalation of the external debt burden of the developing economies. The level of the debt stocks in developing countries, in turn, hinders their growth performances. Developing countries experienced severe debt crises in 1980s and 1990s. Debt stock is still crucial source of crisis for many low and middle income countries. Financial crises and debt structure are interrelated.<sup>4</sup> Furthermore, crises also increase the debt stocks; De Bolle *et al* (2006)'s analyses on the twelve capital account crises in mid-1990s shows that these countries have weaker debt profile compared to their pre-crises states.

Sachs (1989) said that the financial upheavals of the debt crisis in 1980s have set back economic development by a decade or more. The outbreak of 1982 crisis had severe consequences on the emerging countries, especially LAC and EAP countries, and at the same time on the international financial system. The origin of the Debt Crises in the beginning of 1980s is described by Sachs (1989) as "(...) a combination of policy actions in the debtor

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<sup>3</sup> As opponents see Rodrik (1998) and Stiglitz (2002) among others.

<sup>4</sup> "Financial crises are associated not only with changes in the level of public debt, but also in its composition. (...)" They also illustrate "the effect of crises on the creditor composition of external sovereign debt (...)" and "(...)the focus is then shifted to a discussion of how crisis episodes were associated with changes in the creditor, currency, and maturity composition of domestic public debt." (De Bolle *et al*, 2006).

countries, macroeconomic shocks in the world economy, and a remarkable spurt of unrestrained bank lending during 1979-1981.” And, he summarizes policy actions as chronically large budget deficits, overvalued exchange rates and trade regimes against exports. The borrowing conditions between creditor and debtor countries have been deeply affected by this crisis. The causes of debt crisis in 1980s have extensively discussed by a large literature.<sup>5</sup>

Henry and Lorentzen (2003) states that bank loans were principal source of finance before 1980s;<sup>6</sup> later in 1990s bonds gained dominance in the financial markets. Starting from the years 1990s, short term financial flows became more important considering the previous period. But, outcome did not change. And in 1997, the Asian Crisis occurred. There is also vast literature on the Asian Financial Crises. In this period, we see that debt problem handled by making distinction between low and middle income countries: Debt forgiveness was discussed only for the low income countries. However, the middle income countries were faced increasing capital inflow. The financial integration of upper middle income economies with the world economy is shaped by financial globalization, and their debt stocks have continued to grow in 1990s.

The debt problem is a risk for the world financial stability as well as in the sustainable growth problem of developing countries. We have seen many measures and definitions to describe the dimension of risk. In 1980s, “debt overhang” was widely used to define the debt problem of developing countries. It represents a situation in which a country’s repayment capacity is not sufficient to repay its debt in the future. Another concept is the “debt Laffer curve”: “Larger debt stocks are associated lower probabilities of debt repayment” (Pattillo *et al*, 2002b).

The recent studies focus on measurement of risk by defining thresholds for debt indicators. For example, definition of threshold is related to debt overhang in Cordella *et al*

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<sup>5</sup> For example, Dornbush (1989), Edwards (1989) and Fisher (1989).

<sup>6</sup> Until the last decade, the share of “public and publicly guaranteed debt plus private nonguaranteed debt” was the most important part of debt of developing countries: the share of “Public and publicly guaranteed debt plus private nonguaranteed debt.” in “net resource flows” was about 81 percent in 1970-1974, 83 percent in 1975-1979, 82 in 1980-1984, 63 in 1985-1989, 50 in 1990-1995 in the composition of capital flows to developing countries (Henry and Lorentzen, 2003, Table 7.1.)

(2005), and to indebtedness in Imbs and Rancière (2005).<sup>7</sup> Reinhart *et al* (2003) tries to measure debt intolerance of a country considering its long historic records, and relates “safe” external debt to GDP thresholds to level of intolerance. “Number of default or restructuring episodes” is one of the indicators to measure debt intolerance. They found 4 cases for Argentina, 7 for Brazil, 3 for Chile, 8 for Mexico in LAC; 1 for Philippines in EA; 2 for Egypt in MENA and 6 for Turkey. There is no external default history for the Malaysia.<sup>8</sup>

Because of changing pattern of threshold levels in different studies, we do not use this concept. However, in view of these works, we may observe the changes in borrowing trends of the sample countries; and also the vulnerabilities of these economies. Table-1, Figure-1 and Figure- 2 display basic debt indicators of sample countries that are chosen from LAC, EAP, MENA regions and Turkey. The indicators are total external debt, short-term debt, long-term debt, public and publicly guaranteed long-term debt, and private nonguaranteed long-term debt as the ratio to GDP and exports. On average, total debt to GDP ratios for MENA countries are relatively higher than the other countries. Excluding Tunisia, total debt to GDP ratio exceeds 150 percent during the debt crisis in 1980s (Table-1). The figures also show that MENA countries differ from the other countries in terms of private nonguaranteed long-term debt: The share of nonguaranteed debt is very low in these countries comparing LAC and EAP countries and Turkey. This indicates that the private sector has an important role in the debt formation of LAC and EAP countries, and Turkey. Considering the other indicators, we can not observe systematic differences among these three groups of countries. For example, from end of 1990s to 2005, total debt to GDP ratios rose in Argentina and Brazil from LAC, Indonesia and Philippines from EAP, and Turkey, while the rest of LAC and EAP countries were successful in handling their debt problem. Total debt to export ratios also increased in Argentina and Brazil.

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<sup>7</sup> Imbs and Rancière (2005) proposes the following threshold levels for their various measures of indebtedness:

<u>Ratio</u>	<u>Threshold</u>
Total Debt to GDP	60%
Total Debt to Exports	200%
Present Value of Debt to GDP	40%
<u>Present Value of Debt to Exports</u>	<u>140%</u>

<sup>8</sup> Reinhart *et al* (2003) neither covered Indonesia nor other MENA countries in this paper. We considered their results for the only countries that we have analyzed in the paper.

## A MODEL FOR GROWTH AND EXTERNAL DEBT

The link between growth and debt is widely analyzed in the literature. Pattillo *et al* (2002a and 2004) discuss the interaction between growth and debt, and also the channels through which external debt affects growth. The recent literature emphasizes a nonlinear relationship between debt and growth (see Pattillo *et al*, 2002a and Clements *et al*, 2003). Clements *et al* (2003) found that “high levels of debt can depress economic growth in low-income countries”. This view is supported by many researchers: Moss and Chiang (2003) reviews that a vast literature that addresses high level debt has negative effects on growth. They summarize debt-growth link channels as i) the debt overhang, ii) liquidity constraint, iii) fiscal effect, and iv) productivity suppression.<sup>9</sup> Borensztein *et al* cites Chowdury (2001) for negative linear negative effect and Hansen (2001) for no significant effect of external debt on growth (see Borensztein, *et al*, 2006: Table 10.1, p.188).<sup>10</sup> Cordella *et al* (2005) discusses “(...) how the debt-growth relationship is affected by indebtedness levels and the quality of policies and institutions.” Although, Houssou and Heidhues (2004) found that external debt stock and debt service affect growth negatively for many developing countries (statistically insignificant); they also found that China, Romania and Egypt display positive link between debt stock and economic growth (statistically significant).

Causality from debt to growth presented by these studies is widely accepted in other studies which are not mentioned here. However, we think that it is also worthy to consider reverse causality, which is neglected in the literature. Easterly (2001), as an exception, consider the relation from growth to debt, argues that the slowdown in growth stimulate the need for debt in low, middle and high income countries. Without ignoring the links between external debt and macroeconomic policy variables, it is possible to define a link between long term growth indicators and short term macroeconomic variables. For example, Ramey and Ramey (1995) found a strong and negative relationship between growth volatility as a longer term growth indicator and the current rate of growth. On the other hand, Levine and Renelt

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<sup>9</sup> Moss and Chiang (2003) considers only the poor countries.

<sup>10</sup> Chowdury, Abdur, 2001, “Foreign Debt and Growth in Developing Countries” Paper presented at World Institute for Development Economics Research (WIDER) Conference on Debt Relief, August 17–18, United Nations University, Helsinki.

Hansen, Henrik, 2001, “The Impact of Aid and External Debt on Growth and Investment: Insights from Cross-Country Regression Analysis” Paper presented at World Institute for Development Economics Research (WIDER) Conference on Debt Relief, August 17–18, United Nations University, Helsinki.

(1992) displayed strong correlation between some macroeconomic aggregates and growth. Hence, it is possible to define a relation between growth and debt through the macroeconomic variables affected by growth. Dogruel and Dogruel (2006) argued that, the macroeconomic imbalances of the developing countries basically originated from their past performance of the economic growth. If we consider that the need for use of external resources is an outcome of domestic saving gap, in other words disequilibrium in the domestic financial markets, the direction of causality between debt and growth can be defined from growth to debt. Dogruel and Dogruel (2006, Chapter 6 and 7) uses ten-year average and standard deviation of growth rates as the explanatory variables: It is found that, rate of inflation and external debt stock can be explained by these growth performance indicators in Argentina, Brazil, Israel, Mexico and Turkey.

Following Dogruel and Dogruel (2006), we can specify the link between external debt and growth as:

$$\mathbf{D} = \mathbf{f}(\mathbf{g}_{AV}, \beta_3 \mathbf{g}_{STDEV})$$

where  $\mathbf{D}$  is an indicator for external debt which may be defined as external debt stock or annual change in debt, and  $\mathbf{g}_{AV}, \beta_3 \mathbf{g}_{STDEV}$  are ten-year average and standard deviation of growth rates, respectively. In the previous section, we presented the debt structures of the selected countries. Although they confronted similar international economic structure, their debt structures differ significantly. Therefore, variations in debt structure can be considered as an outcome of the differences in the growth performances of these countries.

Assuming that external finance requirement of a country may decrease as average growth rate increases;  $\mathbf{f}$  can be defined as a decreasing function of  $\mathbf{g}_{AV}$ . On the other hand, external finance requirement of the country increases as growth volatility increases. Because, growth volatility may create instability in the domestic market and this give a way an increase in financial need. Thus  $\mathbf{f}$  is an increasing function of  $\mathbf{g}_{STDEV}$ .

Following the argument presented above, we construct a linear estimation model in which we define causality from a long term variable to external debt:

$$[1] \quad \mathbf{D} = \beta_1 + \beta_2 \mathbf{g}_{AV} + \beta_3 \mathbf{g}_{STDEV} + \varepsilon$$

We run the model using the Panel Data Analysis. Estimation period is 1970- 2005, and we use World Bank World Development Indicators as the data source. Total debt stock to GDP is used as the dependant variable  $\mathbf{D}$  of the estimation model. Alternatively, we also run the following models in order to eliminate the effect of the correlation between  $\mathbf{g}_{AV}$  and  $\mathbf{g}_{STDEV}$ , if exists.

$$[2] \quad \mathbf{D} = \beta_1 + \beta_2 \mathbf{g}_{AV} + \varepsilon$$

$$[3] \quad \mathbf{D} = \beta_1 + \beta_2 \mathbf{g}_{STDEV} + \varepsilon$$

In addition to the differences in debt structure of the countries covered, they can be grouped into three considering their economic structures and historical backgrounds. LAC countries have similar and relatively long industrialization history. They have also experienced frequent economic crises. Due to the similar characteristics displayed by Turkey, this country is analyzed with LAC countries.<sup>11</sup> EAP countries selected in the study have entirely different industrialization strategies: In contrast to LAC countries and Turkey, these countries adapted export oriented strategies at the early stage of their industrialization route. MENA countries have, on the other hand, relatively stable macroeconomic structures under regulations and controls of states. Furthermore, the share of the manufacturing value added in GDP is smaller in these countries. Syria is not included in the panel data analyses since its debt structure differs from the other selected MENA countries.

The estimation results of LAC countries and Turkey support the model assumptions (Table-2): That is, there is a strong inverse relationship between average growth and external debts in these countries. The volatility of growth, on the other hand increases the need for the external debt. Similar results are found for EAP countries (Table-3). Although, the sign of the parameter of  $\mathbf{g}_{AV}$  is positive and statistically significant in Model-1, it is negative and statistically significant in Model-2, as expected. It seems that the effect of growth volatility on debt suppresses the effect of average growth in Model-1: When these two variables are

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<sup>11</sup> Similarities between Argentina, Brazil, Mexico and Turkey are widely discussed in Dogruel and Dogruel (2006).



used as explanatory variable separately in Model-2 and Model-3, the estimated parameters have expected signs and are significant. In contrast to LAC countries and Turkey and EAP countries, estimation results for MENA countries are not significant. Basic reason behind this result may be explained by the dominance of the governments on the borrowing decisions in MENA countries.

## **CONCLUSION**

The debt problem that middle income countries face is deepening in the last two decades. The financial globalization is the primary accelerator behind this development. Although, a vast majority of economists are favor financial liberalization and trade liberalization, and have optimistic expectation about the effect of the financial globalization-growth nexus, there are still unclear questions beyond liberalization boom that controls almost all over of middle income countries, especially in 1990s. It is clear that, the liberalization is irreversible trend in the current world economy. However, even if we assume that openness is good for growth, for the poor, and for the developing world, we should discuss the ways to reduce the vulnerabilities and crisis-prone structures of middle income economies generate by the liberalization wave.

The analyses show that growth performance has a significant effect on external debt in selected Latin America and the Caribbean (LAC) and East Asian and Pacific (EAP) countries, and Turkey. This may be related to integration of these economies with the world economy through liberalization. We should also consider the number of institutional and structural factors of the country that may be related growth volatility and rate of growth.

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**Figure-1: Selected Debt Indicators as a Ratio to GDP**

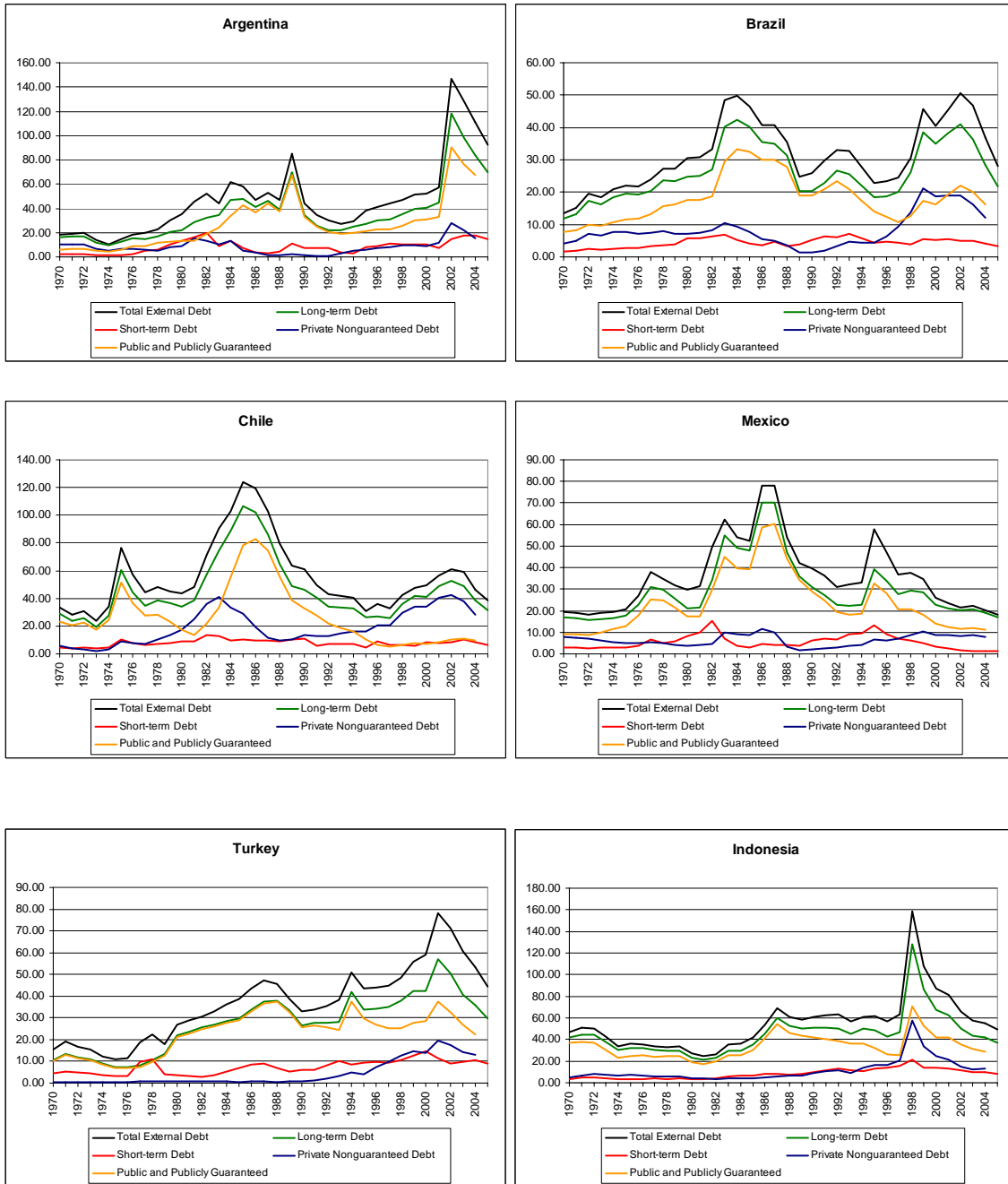


Figure-1 (cont.)

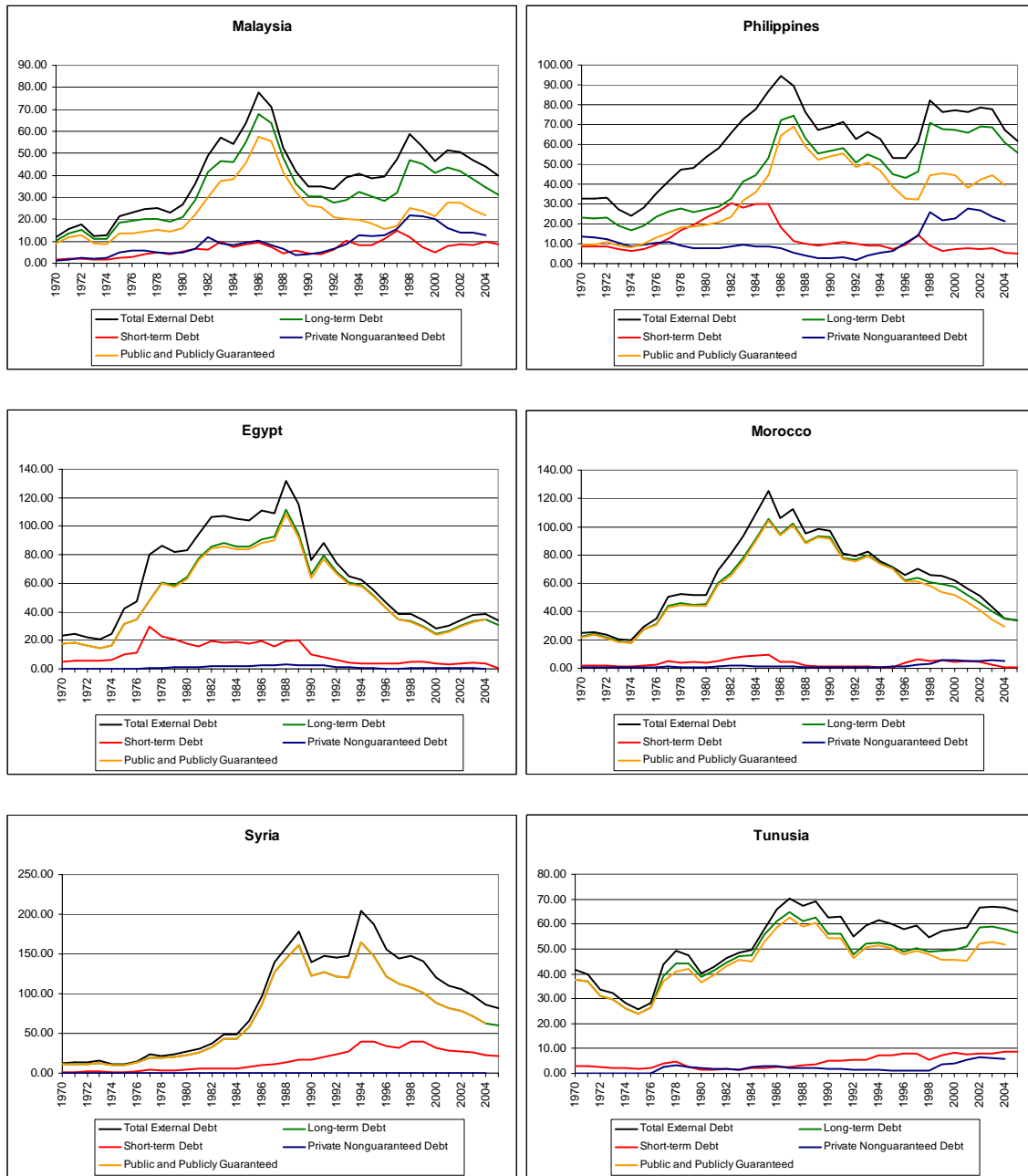
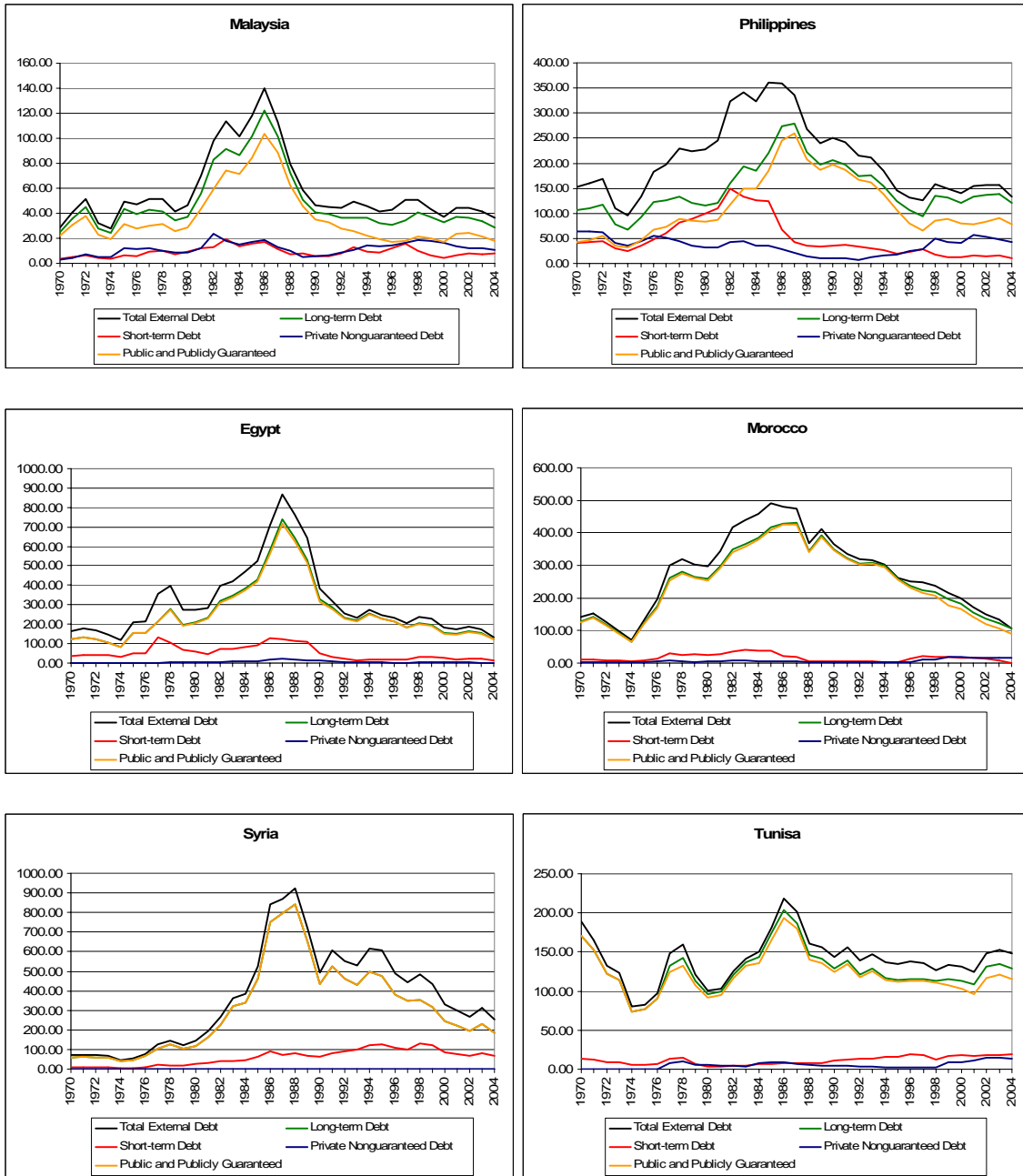




Figure-2 (cont.)



**Table-1: Total Debt to GDP Ratios (as percentage)**

	Tunisia	Syria	Morocco	Egypt	Turkey	Philippines	Malaysia	Indonesia	Mexico	Chile	Brazil	Argentina
1970	41.6	12.9	24.9	23.5	15.4	32.8	11.7	46.9	19.6	33.1	13.5	18.4
1971	39.9	13.2	25.9	24.8	19.2	32.7	15.5	50.6	19.1	28.5	15.1	18.8
1972	33.5	13.5	23.4	22.3	16.5	33.3	17.5	50.5	18.2	30.7	19.7	19.5
1973	32.1	15.6	20.6	20.7	15.5	27.4	12.5	42.3	19.0	23.5	18.5	13.7
1974	28.2	11.5	19.7	24.5	12.4	24.0	12.7	33.4	19.4	33.7	21.0	10.5
1975	25.6	11.5	29.6	42.3	10.9	28.0	21.3	35.8	20.7	76.4	22.1	14.7
1976	28.4	15.1	35.1	47.6	11.3	35.3	23.1	35.6	26.9	57.0	21.8	18.1
1977	43.7	23.7	50.8	80.2	18.7	41.6	24.5	34.0	38.1	44.0	23.9	20.2
1978	49.3	21.8	52.3	86.6	22.3	47.4	25.0	33.2	34.8	47.9	27.2	22.9
1979	47.3	23.5	51.6	82.1	18.1	48.3	22.9	33.8	31.8	45.2	27.3	30.3
1980	40.3	27.2	51.7	83.5	27.0	53.7	26.5	26.8	29.5	43.8	30.4	35.3
1981	42.8	30.9	69.2	94.3	28.9	58.3	36.1	24.6	31.3	48.0	30.9	45.3
1982	46.4	37.9	80.4	106.8	30.6	65.7	48.9	26.5	49.6	71.1	33.3	51.8
1983	48.6	49.1	93.5	107.5	33.0	72.9	57.2	35.4	62.5	90.7	48.5	44.2
1984	49.6	49.0	109.1	105.1	36.1	77.5	54.2	36.6	54.0	102.6	49.7	61.8
1985	58.1	66.3	125.0	104.2	38.7	86.7	63.8	42.0	52.5	123.6	46.5	57.6
1986	65.9	96.8	105.9	111.2	43.6	94.4	77.5	53.6	77.9	119.3	40.7	47.3
1987	70.3	139.3	112.7	109.0	47.1	89.7	71.0	69.2	78.0	102.8	40.8	52.6
1988	67.3	158.1	95.0	131.7	45.5	76.4	52.6	60.9	54.2	79.5	35.6	46.6
1989	69.0	178.6	98.6	115.2	38.8	67.3	41.9	58.5	42.1	63.5	24.8	85.2
1990	62.6	140.2	97.0	76.6	32.8	69.0	34.8	61.1	39.8	60.9	26.0	44.0
1991	63.1	147.5	81.1	88.3	33.7	71.5	34.8	62.1	36.3	49.3	29.7	34.5
1992	55.1	145.0	79.3	74.5	35.6	62.7	33.8	63.3	30.9	43.0	33.0	29.9
1993	59.5	147.3	82.2	65.0	38.2	66.5	39.1	56.4	32.4	41.9	32.9	27.2
1994	61.5	204.0	75.6	62.7	51.1	62.8	40.7	61.0	32.9	40.2	27.9	29.1
1995	60.1	187.9	71.9	55.7	43.6	53.1	38.7	61.5	57.7	30.9	22.8	38.2
1996	58.1	155.8	66.1	46.6	44.1	53.1	39.3	56.7	46.9	36.2	23.4	40.8
1997	59.4	144.3	70.4	38.4	44.8	61.6	47.1	63.1	36.8	32.7	24.5	43.8
1998	54.7	147.8	66.1	38.2	48.7	82.3	58.8	158.5	37.7	42.5	30.7	47.3
1999	57.0	140.9	65.2	34.2	55.6	76.6	52.9	108.0	34.6	47.7	45.7	51.4
2000	58.1	120.0	62.1	28.6	58.9	77.3	46.4	87.5	25.9	49.2	40.5	51.9
2001	58.8	109.8	56.5	30.0	78.0	76.4	51.2	81.7	23.4	56.3	45.5	57.3
2002	66.6	105.8	51.0	34.2	71.3	78.5	50.7	66.1	21.6	61.3	50.6	146.9
2003	67.0	98.0	43.2	37.8	60.5	77.6	46.7	57.7	22.2	58.8	46.8	128.2
2004	66.5	86.2	35.3	38.4	53.4	67.2	44.1	55.3	20.3	46.4	36.8	110.6
2005	65.2	81.8	34.2	33.9	44.5	61.6	40.1	49.0	18.0	38.2	28.0	92.3
<b>Average</b>	<b>52.8</b>	<b>87.7</b>	<b>64.2</b>	<b>64.1</b>	<b>36.8</b>	<b>60.9</b>	<b>39.3</b>	<b>55.0</b>	<b>36.0</b>	<b>55.6</b>	<b>31.5</b>	<b>46.9</b>



**Table-2: Debt - Growth Model Estimation Results**

**Argentina - Brazil - Chile - Mexico - Turkey**

Dependent Variable: Total Debt  
1970-2005

	Random Effect			Fixed Effect	
	Coeff.	t value		Coeff.	t value
Constant	12.2678268	1.90872	(b)		
g <sub>AV</sub>	-1.7990768	-2.08536	(a)	-1.9675061	-2.24395 (a)
g <sub>STDEV</sub>	7.84584836	7.07215	(a)	7.79942621	6.74886 (a)
R <sup>2</sup>	0.860433			0.861004	

Dependent Variable: Total Debt  
1970-2005

	Random Effect			Fixed Effect	
	Coeff.	t value		Coeff.	t value
Constant	50.0633116	10.31569	(a)		
g <sub>AV</sub>	-4.2500357	-4.75562	(a)	-4.3048084	-4.76853 (a)
R <sup>2</sup>	0.823962			0.82441	

Dependent Variable: Total Debt  
1970-2005

	Random Effect			Fixed Effect	
	Coeff.	t value		Coeff.	t value
Constant	4.81267474	0.93509			
g <sub>STDEV</sub>	8.74843777	8.5499	(a)	8.82372362	8.21625 (a)
R <sup>2</sup>	0.856232			0.856958	

- a) Significant at % 5
- b) Significant at % 10

**Table-3: Debt - Growth Model Estimation Results**

**Indonesia - Malaysia - Philippines**

Dependent Variable: Total Debt  
1970-2005

	Random Effect		Fixed Effect	
	Coeff.	t value	Coeff.	t value
Constant	8.78968104	0.54473		
g <sub>AV</sub>	3.74451335	1.8507 (b)	4.44031768	2.09646 (a)
g <sub>STDEV</sub>	10.0010483	6.02987 (a)	10.4699614	6.10115 (a)
R <sup>2</sup>	0.914376		0.914493	

Dependent Variable: Total Debt  
1970-2005

	Random Effect		Fixed Effect	
	Coeff.	t value	Coeff.	t value
Constant	68.9150879	10.79977 (a)		
g <sub>AV</sub>	-5.3988507	-3.85482 (a)	-5.5614419	-3.57132 (a)
R <sup>2</sup>	0.883209		0.883591	

Dependent Variable: Total Debt  
1970-2005

	Random Effect		Fixed Effect	
	Coeff.	t value	Coeff.	t value
Constant	28.0531187	3.348 (a)		
g <sub>STDEV</sub>	7.6338282	6.95146 (a)	7.68539602	6.96018 (a)
R <sup>2</sup>	0.910764		0.910844	

- a) Significant at % 5
- b) Significant at % 10

**Table-3: Debt - Growth Model Estimation Results**

**Egypt - Morocco - Tunisia**

Dependent Variable: Total Debt  
 1970-2005

	Random Effect		Fixed Effect	
	Coeff.	t value	Coeff.	t value
Constant	50.2899684	5.37066	(a)	
g <sub>AV</sub>	1.28330318	0.5915	1.59103014	0.68229
g <sub>STDEV</sub>	1.86165006	0.9527	1.82451815	0.83745
R <sup>2</sup>	0.844622		0.845826	

Dependent Variable: Total Debt  
 1970-2005

	Random Effect		Fixed Effect	
	Coeff.	t value	Coeff.	t value
Constant	55.9639268	7.6987	(a)	
g <sub>AV</sub>	1.60186772	0.73949	2.08310416	0.92443
R <sup>2</sup>	0.843671		0.844776	

Dependent Variable: Total Debt  
 1970-2005

	Random Effect		Fixed Effect	
	Coeff.	t value	Coeff.	t value
Constant	53.3257784	6.84239	(a)	
g <sub>STDEV</sub>	2.00028814	1.03572	2.19907977	1.04572
R <sup>2</sup>	0.84383		0.845129	

- a) Significant at % 5
- b) Significant at % 10