Structural Contributors to Public Revenues in Developing Countries*

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Abstract

Since 1960s and the following financial crisis in developing countries, a wide research has been conducted on financial capability of states in repayment of their debts. Though having been considered at various importance levels during the past decades, this subject seems to have today become a controversial issue in economic discourses. In principle, three indices are applied to determine the capacity of government revenues: the development degree, the degree of monetarization, and the level of national economy's interaction with the global economy. No general consensus exists on the variables manifesting their effects. In time, more other factors turned up to be studied and models embraced eye-catching advancement owing to more precise econometric measures. In this essay it has been attempted to discuss these factors and models .

Key words: Taxable capacity, Public revenues, taxes.

Introduction

Based on written documents, Williamson made a comparative study on taxable capacity for developing countries about fourteen years ago for first time.

since that time, the issue has never waned as a public sector activity, particularly state revenue policies. These policies play a crucial role in the economic development of countries.

The economic effects in the field of public finance indicate that among economic policy measures, state monetary and financial policies have a prominent and undeniable role, being a main part of economic .development policies. Although taxation policies in developing countries, are most often, are formulated to vitalize production resources, and hence proceed to encourage permanent growth and equal income distribution, studies made on these policies show that they have created some economic imbalances. These in turn evoke other problems like production inefficiency, capital flight, accumulation of unpaid debts, In most developing countries, the structure of public revenues is complex, inflexible, inefficient and unfair; meanwhile, government resources for providing financial needs of non-government production is down. Trending the rate of public revenues depends on various factors: on one hand, structural variables influence the rate and on the other, it is a subordinate to economic (particularly finance) policies.

Today, such a study is standing on the incentives different from those initially Pursued.

The early incentives of such have been changed. Investigating related economic literature in a historical sense would help us elaborate on the developments which occurred in public revenues of countries.

After a brief review of the background in part1, comes a comparative study elaboration on public revenue changes in respective countries in part 2, In part 3, key contributors to taxable capacity is analyzed. Part 4 is regarding the estimation of taxable capacity, and conclusions are presented in part 5.

1- Historical- analytical backgrounds of taxable capacity

As mentioned above, according to written documents, it was Williamson who estimated taxable capacity in developing countries for the first time. He used ration of public revenues to gross domestic product as a dependant variable.

Other researchers later completed this model using new economic measures which had substantially developed by then, and made an effort to identify structural factors effecting public revenues of these countries. They tried to estimate taxable capacity of developing countries in terms of foreign debt payments, as after the financial crises had emerged in the wake of the Berton woods system in developing countries, the first world and international financial institutions seriously posed the question: "Can these countries really cope with their debts and liabilities"?

Some economists have worked in this field, to name a few: Plasschaert, Hinrichs, Weiss, Bahl, Lotz & Morss, Chelliah, Parmena, Tait-Gratz and Eichergreen .

Contributing factors to taxable capacity of countries and research results have been presented in part 2 and 3 respectively.

In the early 1990s, with the chronic financial recession eclipsing the global economy in general and the developing countries in particular, these studies once again drew popularity. After examining the changes in public revenues of these countries in part 2, the results of the research will be classified in part 3.

2- Changes of public revenues in developing countries

Public revenues in most developing countries, especially those whose economies are dependent on the export of raw material, have experienced a lot of increasing ups and downs. An example is Iran's public revenues trajectory in figure 1.

From the comparative analysis of tax ratio in 74 developing countries presented in table 1 for three periods of 1980-81, 1986-87, and 1988-89, The following considerations are note-worthy:

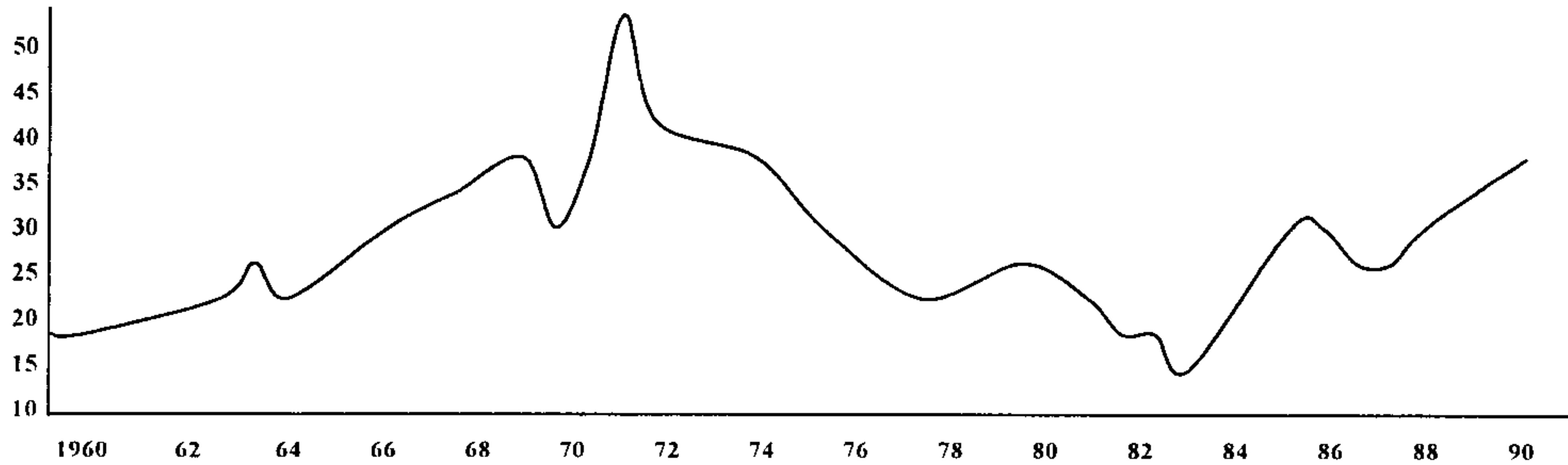## Figure 1: trajectory of public revenue in Iran (1960-1990)

Table 1: Public Revenues of developing countries sample size =T in proportion to : GDP%

Region	The ratio of public revenues to GDP					
	1980-81	T	1986-87	T	1988-89	T
Middle East	38.1 (8.4)*	5	29.5 (8.5)	5	29.7 (6.2)	5
Asia	19.7 (7.0)	13	18.7 (7.1)	13	18.5 (5.7)	13
Sub-Saharan Africa	19.7 (8.9)	35	19.3 (9.6)	35	19.1 (10.1)	
Latin America	21.1 ((9.7)	19	21.8 (9.1)	19	21.3 (10.1)	19
Developing countries	21.4 (9.7)	74	20.6 (9.2)	74	20.4 (9.4)	74
Middle-Income countries	25.0 (10.7)	39	23.7 (9.1)	39	23.3 (9.7)	39
Low-Income countries	16.5 (6.1)	32	16.0 (7.4)	32	19.0 (7.2)	32

* - Figures in the brackets indicate standard deviations
Sources: IMF, Government Finance Statistics (GFS)
               IMF, International Finance Statistics (IFS)
               World Bank, PUND African Economic and Financial data 1992.

1- Geographical association of developing countries has been considered in the first four rows whereas the fifth row is alloted to all

developing countries. The last two rows present country classification in terms of their per-capita incomes.

2- In the early 1980s, the ratio of public revenues to gross domestic product in Middle East has been more than the average ratio of the countries in other regions. Despite confusions in the financial situation of oil countries in the Middle East in the period of 1986-87 (after the anti-oil shock in 1986), the gap between the average ratio of public revenues of the region is more than that of other geographical regions. The ratio of public revenues to GDP is also more stable than other geographical regions. We can divide these regions as: Middle East, Latin America, Sub-Saharan Africa and Asia.

3- The table shows that the middle-income countries have a higher rate of public revenues share from GDP, although it has been a decreasing one. At the same time, the process of change has been rising in low-income countries, so that an 8.5 percent gap during 1980-81 between these two countries decreased to 4.3 in the period of 1988-89. Therefore, all developing countries experienced the average rate of 20.5 percent which is less than many developed countries.

Since oil countries have experienced most fluctuations in revenues, we've precisely explored their income change as in table 2. In addition to statistics of 13 members of OPEC, the table provides for those of Mexico and Cameroon.

Arab countries, having seized the opportunities yielded during the first and second oil shocks hold the highest public revenue rate to GDP, although after 1980 witnessed a bow-down to its minimum in 1986. A wide gap is outstanding between the public revenue rates in Arab countries and in other oil countries, pointing to two facts regarding their countries: dependency on oil revenues, and their particular structure of state economy in these countries.

African countries have also grasped quite a lot from two oil shocks in 1973 and 1978. Except for Cameroon with its low rate, these countries held their public revenues higher than 20 percent of GDP. The stability and increase of this rate in oil exporting countries, despite the 1986 oil anti shock which led to a sharp decrease in oil prices, show a serious financial mobilization in these countries.

Table 2: Public revenues of Iran and other oil countries (1971-1992)

Year	Arab Countries (8)*	Africa (4)	Latin America (3)	Asia (1)	All oil countries (16)
1971	Nd	13.8	12.0	12.0	16.6
1972	Nd	13.5	12.2	14.1	18.3
1973	Nd	16.9	12.5	15.1	19.2
1974	Nd	22.6	17.2	17.1	29.1
1975	63.8	22.1	16.7	17.2	26.2
1976	Nd	20.0	16.7	19.2	26.9
1977	Nd	20.1	16.4	19.2	26.9
1978	Nd	18.0	16.0	19.3	25.9
1979	68.9	20.6	16.0	22.0	25.3
1980	70.4	25.90	17.5	22.9	28.2
1981	Nd	21.9	18.6	23.7	25.8
1982	45.6	25.5	20.1	20.5	26.3
1983	Nd	21.2	20.5	20.0	24.5
1984	42.6	20.7	18.3	20.8	23.7
1985	38.3	22.3	16.7	21.0	25.3
1986	37.1	25.9	17.1	20.8	22.3
1987	Nd	22.4	18.1	19.9	19.3
1988	Nd	19.5	17.7	17.0	17.5
1989	Nd	28.1	15.9	20.1	18.4
1990	Nd	28.1	15.9	20.1	18.4
1991	Nd	Nd	17.7	18.0	Nd
1992	Nd	Nd	17.4	18.8	Nd

* Figures in the brackets determine numbers of oil countries.
Nd= not accessible statistics

Public revenues of oil countries in Latin America sign a relative stability, which is attributed to 1980s reforms, especially in Venezuela and Mexico.

This has mainly resulted from a value added taxation system. Reforms on direct taxes are also considerable. As the following:

- Incorporating a tax basis for income taxation of transport services and construction.
- Tax on net values of company shares and capital owner expenses-instead of increasing taxes on owner-ship rights.

- Deletion of taxes on bond profits.
- Setting up taxes on actual interest.

4- Changes in public revenues in Indonesia- 'one of the oil exporting countries in south east Asia- indicate that it has gradually improved its revenues till 1978 and raised its 12 percent GDP in 1971 to 19.3 percent in 1978. After the second oil shock this percent soard to 22; but like most of the developing oil countries, following the second anti-oil shock in 1986, this rate decreased. The positive effect of the second shock on Indonesian public revenues was mainly generated through 1983 reforms such as using value added taxation on alcoholic drinks, smokes, oil products and luxury commodities. By these measures it was able to get free from dependency on oil incomes. Among oil countries, it was only Indonesia that made an effort to use a tax system in response to a bad oil situation. These reforms focused on direct taxes, as extending a taxable basis of income taxes over the activities were not included in the tax system. In contrast, a tax on capital was suggested to encourage investment. Imposing equal taxes on state and private economic activities led all people with similar incomes, to pay equal taxes. Finally, imposing local taxes and hiring or training experienced tax collectors allowed Indonesia to improve its tax levels:

3- Determinant factors on tax capacity (Public revenues capability)

In order to analyze public revenue changes in developing countries and to find its factors, income capacity and tax measures adopted in these countries should be understood. This capacity is not only effected by structural factors and the unique characteristic of any economy but by economic and especially financial policies. To categorize the effects of structural factors and financial policies by means of econometrics and usual methods, we estimate the capacity of public revenues and analyze the results. Meanwhile, ratio of public revenues to GDP has been used to unify indices and to make statistics and figures of other countries comparable. Public revenues includes

all amounts received by central government and its local and dependent institution.

In economic literature regarding tax capacity and comparable analysis in the global arena, a variety of factors has been used as determinants of the income capacity of countries.

Traditionally, three groups of factors are applied for determining tax capacity of countries: the degree of development, sectoral composition of national income, and the correlation degree of national economy with global economy. Later researches have indicated some other variables like geographical as well as geopolitical status of a country.

3-1- The degree of development

The research on comparable and international analysis of public revenues of countries indicates the effect of development degree in a country beside substantial income, and facilitates the realization of taxation goals. In other words, the higher development degree, the higher its capacity through tax collection which provides necessary sources for development. Although there is a consensus on the effect of such development on taxable capacity, there are different ideas on indices identifying this factor. This factor has been assessed by gross domestic product per capita in the early studies.

Among other introduced variables, a monetarization degree can be expected to be a better index, because an economy with more developed monetary relations is more prepared for public revenues mobilization. Further monetary exchanges not only facilitates trading but allows government to collect taxes in a better way through improved control of financial and monetary exchang volume between businessmen and producers. Ratio of turning money to GDP is to show the effect of this index.

3-2- Sectoral composition of national income

Capacities of economic sectors vary for providing taxes and participation in public revenues. Generally, mines and oil sectors can

make wide exportation of taxable added value, which can be subjected to a taxation system.

A wide industrial sector should be an appropriate factor for collecting financial resources for government. Its structural characteristics allow government to estimate the activity volume of economic corporations and impose necessary taxes on them. Service sector-regardless of banks and insurance companies-especially those labeled as "informal and underground", provide less opportunity to estimate and collect taxes.

Some researchers have considered the ratio of value added in agricultural sector to GDP as an index for this factor. They believe the higher agriculture shares in national incomes, the lower trading and industrialization rates. Consequently, countries whose agricultures have a significant share in national incomes suffer from a low per capita income. Therefore in developing countries, the importance of value-added in the agricultural sector can indicate a surplus in a poor taxable private sector.

3-3-National economy interactiveness with an overwhelmingly global economy

Economic research has overwhelmingly indicated that a considerable part of tax income of developing countries is secured from taxes on foreign trade and international exchange. A high level of the country's economic exchange (as with outside world) can guarantee a high taxable capacity. Different variables such as ratio of export to GDP, ratio import to GDP, or total ratio of exports and imports to GDP, have been studied in economic literature to choose an index to introduce this factor.

In this research, to estimate foreign trade effect on the level of public revenues, ratio of export to GDP or ratio of oil and mineral export to GDP-as the case may be—was used. Tax collections will be effected by high rate of raw material export in two ways: on one hand more developed export means an increase of taxable grounds. On the other hand, because of export and import relations, restrictions on import policies increasing export volume and foreign exchange

provide for import expansion and in turn present another source for tax collecting.

3-4- Belonging to a geographical set

According to studies made on tax effort of developing countries, classification of these countries in terms of regions-like Asia, Africa, Latin America, and Middle East-provide a better opportunity for global comparisons of taxable capacities. In other words, the governments of these region sets have individually used their own income policies because of political and administrative procedures and their social culture of the region. In addition, Table 1 shows a deep gap among the rate of public revenues in different geographical settings. This factor can be introduced by an abstract variable $A_i .(A_i$ = stands for countries in $\overline{T}$ regions, A = 0 stands for other countries).

3 –5 - Other factors

Recent studies on taxable capacities of developing countries have considered other variables. For example Bergougnoux has used an abstract variable of physical limitations of accessibility to international waters – in a comparative study about African countries in French and non – French regions.

4- Estimation of Taxable capacity (public revenues capacity)

Econometrics has been used in the two periods of 1980 – 81 and 1988 – 89, on a sample of 56 countries, for a better analysis of effective factors on public revenues mobility. Then 112 observations have been brought in a data panel which include:

$$\frac{TPD}{GDP} = 0.41\frac{TxMI}{GDP} + 0.25\frac{TM2}{GDP} + 1.11 LGDPPC + 1.21$$

$$(9.82)^* \qquad (10.23) \qquad (2.09)^{**} \qquad (10.38)$$

$$\overline{R}^2 = 0.67 \qquad F^2 = 87.57$$

* all figures in brackets are T. Student and are of 1 percent significant, unless it has been specified ** (4 percent significant)

$$\frac{TPD}{GDP} = \text{ratio of revenues to gross domestic product}$$

$$\frac{TxM1}{GDP} = \text{ratio of all export and import to gross domestic product}$$

$$\frac{TM2}{GDP} = \text{ratio of monetary volume in circulation to gross domestic product}$$

LGDPPC= logarithm of gross domestic product per capita.

As expected , three explanatory variables (index of economic openness to outside world, the degree of monetarization and the rate of development) had a positive effect on the rate of potential public revenues of developing countries. In contrast, belonging to a certain geographical region didn't significantly affect results, Meanwhile a White test has been tried for T student and results have been shown in Table 3 (according to this test these statistics are significant).

In this research, tax effort has been gained from the difference of real public revenues and potential (estimated) ones. So the figures related to tax effort in table 3 has come from the difference of figures related to public revenues variables in tables 1 and 3.

The comparative analysis

1- Longitudinal analysis shows a different process for countries; while oil countries in Sub – Saharan Africa and Latin America have experienced a decrease in their taxable capacity, it has been increased in Middle East and Asian countries in 1988-90. A sharp fall of taxable capacity could arise from the second oil shock (for the first period) and anti- oil shock (for the second period).

The comparison of countries , in term of per capita income, shows this reality that middle – income countries had more capacity

generating while in the low – income countries this capacity has been decreased.

Table 3: Capacity of Public Revenuees and tax effect of developing Countries
sample size =T

Countries	Capacity of public revenue				Tax effort			
	1980-81	T	1988-89	T	1980-81	T	1988-89	T
Oil countries	32.7 (10.5)	14	22.6 (2.6)	14	+5.8 (7.3)	14	+4.9 (6.4)	14
Middle east	23.9 (2.8)	3	30.3 (4.6)	3	+4.3 (2.2)	3	-0.5 (10.0)	3
Asia	17.7 (4.4)	10	21.4 (6.2)	10	-2.8 (2.3)	10	-3.1 (4.3)	10
Sub-Saharan Africa	19.1 (7.2)	29	17.3 (3.6)	29	+0.4 4.8	29	+0.9 (5.5)	29
Latin America	19.7 (7.3)	14	19.4 4.8	14	+0.1 (6.0)	14	+0.7 (6.1)	14
All developing countries	19.6 (6.5)	56	19.1 (5.3)	56	0	56	0	56
Middle-income countries	20.4 (6.7)	30	20.8 (5.3)	30	+0.7 (5.4)	30	+0.09 (6.0)	30
Low-income countries	18.2 (6.4)	26	16.9 (2.3)	26	-1 (4.6)	26	-0.9 (5.9)	26

*Figures in the brackets indicate standard deviations
Sources: IMF, Government Finance Statistics (GFS)
                IMF, International Finance Statistics (IFS)
                World Bank, PUND African Economic and Financial data 1992.

2- When we consider countries in a period of time, it shows that the taxable capacity of oil countries, as well as Middle East countries in the first period is higher than other states, while in the next period the ranking orders of countries are disrupted and the gap among tax capacities of different regions has been reduced, but this is not the case about the classification of countries in terms of income per capita.

Following considerations on tax effort, we can consider the difference between potential public revenues with real ones:

1- Asian countries, in comparison with other geographical areas: and low income countries, in comparison with middle-income ones have had poor tax structures and could not use their income capacities effectively. In the period of 1988-89, the Middle East countries have been added to the above states-although the rate is almost zero. The situation of Asian countries has worsened during this period.

Oil countries, enjoying oil revenues and setting up reforms, have made a substantial tax attempt. Although the studied countries in the Middle east had a good situation in the first period, they experienced some loss in the next period.

2- Totally, in both periods, the Asian countries had the worst conditions, geographically, and from the income point, such a case was similar in low-income countries.

Conclusion

First, as expected, the three factors of development degree, the degree of monetariation and national economy interactiveness with global economy had positive and significant effects.

Second, although according to the model of geographical status we couldn't find any significant meaning in tax capacity confirmed in classifications Table 3 form the point of tax effort, there are some significant differences, which are mostly related to tax and economic reforms of these economies.

Third, there is a positive and significant relation between public revenues capacity and taxation attempt between governmental procedures and average income of countries.

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