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FISCAL PROGRESSIVITY IN BRAZIL

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Brazil is an extremely unequal country. Income distribution in the country is one of the most concentrated in the world. One of the alternatives to try to correct the enormous injustice of income distribution in Brazil would be a tax policy with a distributive bias, that would penalise the very rich and helped the poor (even, in some cases, with negative taxes). In other words, the huge income inequality in Brazil could be minimized by means of a highly progressive tax structure. The question that should be asked is, therefore, how progressive is the current Brazilian tax structure? Is there a number that can measure this degree of progressivity, and compare it with that of other countries?

TABLE 1
Effective tax burden on salary income
 (In %)

N. of minimum wages	Consumption	Income*	Total
Up to 2	13.13	7.82	20.95
2 — 3	12.80	7.82	20.62
3 — 5	12.38	7.82	20.20
5 — 6	12.15	9.00	21.15
6 — 8	12.03	11.00	23.03
8 — 10	11.17	11.10	22.27
10 — 15	10.69	11.73	22.42
15 — 20	9.91	12.55	22.46
20 — 30	9.13	15.86	24.99
More than 30	6.94	20.46	27.41

Source: Brazilian Federal Revenue.

Note: * Income Tax + employee's social contribution.

There are methodologies to arrive at this number. However, it has never been calculated for Brazil. It is only known that in Brazil the tax structure is not very progressive. The reason for this informal wisdom is that the Brazilian tax structure focuses heavily on consumption taxes. Consumption taxes are notable regressive, since the propensity to consume decreases with the income.

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That is, the poor end up paying more taxes because they spend all their income. The rich pay proportionally less because they save a large share of their income. In Brazil, approximately half of the total of taxes collected in all government spheres comes from goods and services. For the purpose of comparison, this proportion is of 17.6% in the United States, 20.1% in Japan, 25.4% in France, 29.2% in Germany, 30.3% in Australia and 32.7% in the United Kingdom.¹ The average for the thirty OECD member countries is 31.9%. Table 1 shows the regressive effect of consumption taxation in Brazil. Clearly, the regressivity of the consumption taxation has the effect of reducing the progressivity of the taxation on income. In Brazil, this regressive effect of taxation on consumption is particularly significant due to the strong concentration of tax collection on consumption taxes.

It should be noted that the great dependence on consumption taxes as compared to income tax is not peculiar to Brazil, but can be observed in several developing countries. This can be observed in table 2 (Tanzi; Zee, 2000), which compares the relation between collection derived from income taxes and from consumption taxes among groups of developed and developing countries in the 1985-1987 and 1995-1997 periods. This relation did not change in the period, showing that in the developed countries of the OECD this relation is 2.4 times higher than in developing countries.

TABLE 2
Collection of income taxes/consumption taxes

	1985-1987	1995-1997
OECD countries ¹	1.2	1.2
America	1.8	2.2
Pacific	2.3	1.9
Europe	1.1	1.1
Developing countries ²	0.5	0.5
Africa	0.5	0.6
Asia	0.6	0.6
Middle East	0.5	0.5
Western Hemisphere	0.4	0.4

Source: Tanzi and Zee (2000).

Notes: ¹ Excludes Czech Republic, Hungary, Korea, Mexico and Poland.

² Sample includes African 8 countries, 9 Asian countries, 7 Middle East countries and 14 Western-Hemisphere countries

Obs.: Primary data: Revenue Statistics (OECD) and Government Finance Statistics (IMF).

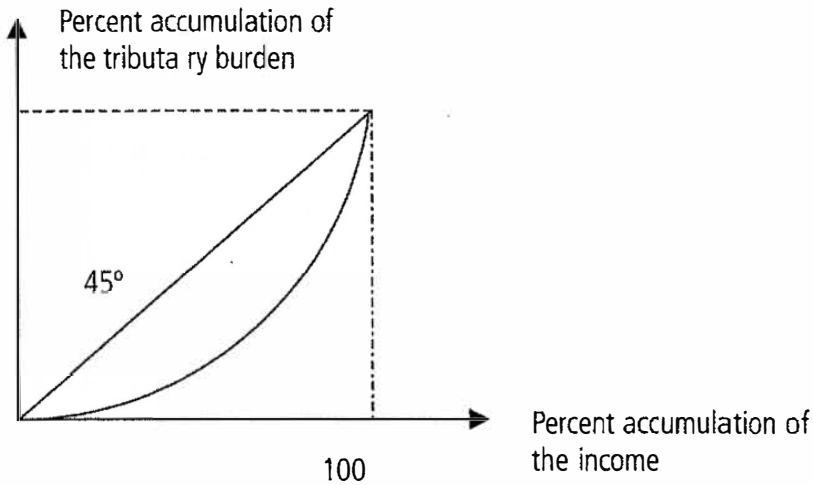
1. Source: OECD Revenue Statistics. Taxes on goods and services as a percentile of the total collected in the country. Data for 2002.

The reasons for this high dependence on consumption taxation vis-à-vis income taxes derives from the following two-fold factors that are common to the non-developed economies:

- 1) Economic structure of these countries, resulting in low participation of salaries in the national income and in a high degree of informality in economic activities and occupation of man power.
- 2) Policy restrictions resulting from the high degree of income inequality of these countries, mainly in cases, such as Brazil, where the Gini coefficient exceeds 0.50. These restrictions are of two types.
 - a) in order to reach a high tax revenue, the richest should be taxed at a much higher proportion than the poor;
 - b) the economic and political power of the richest prevents tax reforms with a greater degree of progressivity, particularly in personal Income Tax and property tax.

How then can one calculate a number for the degree of tax progressivity in Brazil? What methodology should be used to infer this level of progressivity? When we know the distribution of income and the tax burden, it is enough to calculate a Gini coefficient, with a Lorenz curve on a graph where the accumulated percentage of the income is drawn according to the accumulated percentage of the tax burden. The resulting curve forms an area with the shape of a half-moon, with the straight 45-degree line (picture 1). The bigger this area, the more progressive the tax structure. A Lorenz curve coinciding with the straight 45-degree line, for example, would represent a neutral tax structure (that is, the 10% poorest pay exactly 10% of the burden, the 20% poorest pay 20%, and so).

PICTURE 1



Prepared by the authors.

The problem of this methodology is that it requires knowledge of the tax burden distribution by income bracket. This data is difficult to obtain and subject to errors. Here we will use an alternative approach, developed by the Public Finances Coordination (Ipea's Directorate of Regional and Urban Policy). Our attempt to measure the degree of fiscal progressivity in Brazil is based on fluctuations of two aggregated variables: tax revenue and income.

The intuition is quite simple. Imagine, for instance, an economy with a progressive tax burden. The total revenue collected could be represented by $T = t(Y)$, where T is the tax collection, t is the tax rate and Y is the income level. If the tax is progressive, then t increases with the increase in Y . If the tax is neutral, then t is constant in Y and therefore variations in T only reflect variations in Y . If the tax is regressive, t decreases with the increase in Y and therefore an increase in Y generates a less than proportional increase in T .

Then, in a situation of economic growth, income grows fast, and everyone gets richer. If the tax is progressive, collection increases more than proportionally to income. In the real world, where there are discontinuities in $t(Y)$ function, the economic growth would have the effect of pushing larger shares of the income into heavier tax brackets. In any case, T increases more than proportionally to Y when taxation is progressive. The more progressive the tax structure, the greater the increase in T proportionally to the increase in Y . Analogously, progressivity makes T drop more to in relation to Y in the event

of a recession. Therefore, the relative volatility of tax collection and income contains a relevant piece of information on the degree of tax progressivity – regressivity of the system. The more volatile the collection proportionally to the volatility of the income, the greater the degree of progressivity.

The method consists of calculating the proportional standard deviation of the aggregated tax collection and income. The progressivity index is the ratio of the standard deviation of the collection to the standard deviation of the income.² The database used is the *International Financial Statistics*, of the International Monetary Fund. For the collection series we take the revenues of central governments, excluding transfers, as well as revenues of local governments. For the income series, we take the Gross Domestic Product. Both series were deflated by the implicit deflator of the GDP. The data have annual frequency and the values considered are for the period from 1965 to today, depending on the availability of data for each country.

TABLE 3
Tax progressivity index based on relative volatilities

Country	Index
France	5.324
South Korea	4.452
Italy	4.297
Denmark	3.497
Germany	3.429
Japan	2.881
Canada	2.606
United States	2.567
Australia	2.451
New Zealand	2.178
Spain	2.163
Brazil	1.842
Belgium	1.833
United Kingdom	1.715

Source: IMF, International Financial Statistics.

The results are presented in Table 3. The progressivity index of the federal taxes is calculated for Brazil, as well as thirteen other economies. In all of them the index suggests progressive taxation structures. That is, in no country the index was below one, which would indicate volatility of lesser collection

2. The proportional standard deviations were calculated on the basis of data filtered with the Hodrick-Prescott filter, which eliminates very low frequencies, which can be treated as trends, from the total fluctuations.

lower than the volatility of the aggregated income. Among these fifteen economies, Brazil is the third country with the lowest degree of progressivity. These results suggest that the progressivity of the federal taxes is not used in Brazil as a mechanism to address the huge social and economic inequalities. This lack of stronger progressivity could be a reflection of the Brazilian tax collection structure, overburdened by indirect regressive taxes.

With more than half of the fiscal collection in Brazil coming from consumption taxation, and only 16% from income taxation, an increase of the progressivity of the Income Tax (for example, introduction of a rate of 35) would not be a very efficient instrument to increase of the progressivity of the total collection. Perhaps a better strategy would be a gradual change of the tax structure, in which collection would depend less and less on indirect taxes and increasingly on direct taxes.

The method of relative volatility is no doubt less complete than the traditional method of the Lorenz curves and Gini coefficients. Looking only at the aggregated data, one cannot, for example, compute the effects of income distribution changes over the collection. A precise panorama of the degree of tax progressivity can only be obtained with the traditional method. However, the computational ease and the ease of comparing different economies make the volatility index an extremely useful instrument, particularly for economies that do not have microdata available to build the traditional index. The progressivity index based on relative volatilities requires only aggregated income and taxation series, which are usually widely available, even for developing economies.

Moreover, it is also important to observe the differences of composition of Income Tax collection between developed and non-developed countries. In developed countries, the personal Income Tax is about 3.5 the 4 times higher than the corporate Income Tax. In developing countries, more revenue is collected with the corporate Income Tax. Again the factors that explain this difference are related to the economic structure of these countries and to policy restrictions, such as the differences in the participation of salaries in the national income, sophistication of the tax administration and political power of richest. The fact that developing countries explore personal income proportionally as a collecting source generates other distortions in the tax structure, such as the need to collect taxes on foreign trade transactions. From 1985 to 1987, foreign trade taxes of a group of developing countries reached 4.2% of GDP, compared to 0.7% of

GDP for OECD countries. From 1995 to 1997, there was a drop in the collection of these taxes to 3.5% of GDP and 0.3% of GDP, respectively. However, for the developing countries this collection exceeds the total collected with the personal Income Tax in the two periods, as shown in tables 4 and 5.

Therefore, taking into account the international experience, one can observe a positive correlation between the income level of the countries and their tax structure. Thus, countries with higher income levels tend to concentrate their tax collection on direct taxes, such as Income Tax. In turn, countries with low and average income levels tend to have tax structures more concentrated on indirect taxes, particularly on consumption taxes. However, the progressivity gains obtained with this change of composition in taxation should be carefully evaluated. An optimum mix of taxation should also take into consideration the incentives for labour supply and capital accumulation. In this case, compensatory measures by means of public expenditures focused on the poor also represent effective fiscal instruments to increase fiscal progressivity in Brazil.

TABLE 4
Composition of the tax revenue per group of countries (1985-1987)
 (As ratio of GDP)

	Income Tax			Consumption Tax				Social Security
	Total	Companies	Personal	Total	General	Excise ⁵	Foreign Trade	
OECD countries¹	13.9	2.8	11.3	11.3	6.0	3.8	0.7	8.8
America	14.0	2.5	11.4	7.6	3.4	2.2	0.6	5.8
Pacific	17.1	3.9	13.2	7.5	2.3	3.7	0.8	2.8
Europe	13.3	2.7	11.0	12.4	6.8	4.0	0.7	10.1
Developing countries²	4.9	2.8	1.7	10.3	2.3	2.6	4.2	1.2
Africa	6.3	2.9	3.1	11.7	3.2	2.3	5.7	0.4
Asia	5.7	3.5	2.1	9.5	1.9	2.5	3.6	0.1
Middle East	4.7	4.3	1.0	9.1	1.5	2.4	4.4	1.2
Western Hemisphere	3.7	1.8	1.0	10.6	2.6	3.0	3.7	2.4

Source: Tanzi and Zee (2000).

Primary data: Revenue Statistics (OECD) and Government Finance Statistics (IMF).

Notes: ¹ Excludes Czech Republic, Hungary, Korea, Mexico and Poland.

² Sample includes African 8 countries, 9 Asian countries, 7 Middle East countries and 14 Western-Hemisphere countries.

TABLE 5

Composition of the tax revenue per group of countries – 1995-97

(As proportion of the GDP)

	Income Tax			Consumption Tax			Social Security	
	Total	Companies	Personal	Total	General	Excises Foreign Trade		
OECD countries¹	14.2	3.1	10.8	11.4	6.6	3.6	0.3	9.5
America	15.4	3.0	12.3	7.0	3.7	2.0	0.3	6.1
Pacific	16.3	4.3	11.4	8.4	4.3	2.6	0.6	3.5
Europe	13.7	2.9	10.6	12.4	7.3	4.0	0.3	10.8
Developing countries²	5.2	2.6	2.2	10.5	3.6	2.4	3.5	1.3
Africa	6.9	2.4	3.9	11.6	3.8	2.3	5.1	0.5
Asia	6.2	3.0	3.0	9.7	3.1	2.2	2.7	0.3
Middle East	5.0	3.2	1.3	10.3	1.5	3.0	4.3	1.1
Western Hemisphere	3.7	2.3	1.0	10.6	4.8	2.3	2.6	2.5

Source: Tanzi and Zee (2000).

Primary data: Revenue Statistics (OECD) and Government Finance Statistics (IMF).

Notes: ¹ Excludes Czech Republic, Hungary, Korea, Mexico and Poland.² Sample includes African 8 countries, 9 Asian countries, 7 Middle East countries and 14 Western-Hemisphere countries.