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PUBLIC DEBT AROUND THE WORLD: A NEW DATASET OF CENTRAL GOVERNMENT DEBT

BY

**DANY JAIMOVICH
UGO PANIZZA**

INTER-AMERICAN DEVELOPMENT BANK

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Abstract*

Commonly used datasets on the level of public debt provide incomplete country and period coverage. This paper presents a new dataset that includes complete series of central government debt for 89 countries over the 1991-2005 period and for seven other countries for the 1993-2005 period.

Keywords: Public Debt, Debt Management, Fiscal Sustainability

JEL Codes: H63, F34, E63

* Both authors are with the Research Department of the Inter-American Development Bank. Emails: Danyj@iadb.org and Ugop@iadb.org. We would like to thank Eduardo Borensztein and Eduardo Levy-Yeyati for helpful comments. The views expressed in this paper are the authors' and do not necessarily reflect those of the Inter-American Development Bank, and the data on debt reported here should not be considered official statistics of the Inter-American Development Bank. The authors cannot guarantee the accuracy of the data reported here and accept no responsibility whatsoever for any consequence of their use.

1. Introduction

The most widely used sources of macroeconomic data are the International Financial Statistics (IFS) published by the International Monetary Fund and World Development Indicators (WDI) published by the World Bank. Public debt data contained in these datasets are plagued by missing observations, limiting their use for empirical research that requires data on the stock of public debt. This paper covers this gap, compiling a dataset with a comprehensive cross-country coverage of central government debt.¹

Table 1 shows IFS and WDI coverage of data on public debt for the seven largest industrial countries (G7), the five largest countries in Latin America (LAC) and East Asia (EAP), and the three largest countries in Eastern Europe (ECA), Middle East (MNA), South Asia (SAS), and Sub-Saharan Africa (SSA). IFS and WDI have data on public debt for 19 out of these 29 countries. Even within the G7 group, IFS and WDI lack data for one country (France) and provide incomplete coverage for others (data for Japan end in 1993, and data for Germany and the United Kingdom are reported with a considerable delay). The situation is even worse if we move to Latin America, where IFS and WDI do not report data for three of the five largest countries. In East Asia, IFS and WDI report data for four of the largest five countries, but for two of these countries the most recent data are for the late 1990s, and for the third the most recent data are for 2001. IFS and WDI do not have data for two of the three largest economies in the Middle East and North Africa region (Egypt and Saudi Arabia) and lack recent data for four of the six largest economies in South Asia and Sub-Saharan Africa.

While global datasets like the IFS and WDI have limited information on public debt, there are some datasets that have good coverage for a limited subset of countries: the OECD for its member countries, Cowan, Levy-Yeyati, Panizza, and Sturzenegger (2006) and ECLAC (see Martner and Tromben 2004) for Latin America, and Jeanne and Guscina (2006) for 19 emerging market countries.² However, up to now there was no single source of data with a complete

¹ We realized that obtaining data on public debt was a serious problem when we started working on a paper aimed at measuring the determinants of debt growth (Campos, Jaimovich and Panizza, 2006). Data availability is particularly limited in regard to domestically issued public debt. Data on external public debt for developing countries are generally available from the World Bank's Global Development Finance (GDF) dataset; even in this case, however, the data present some problems, since GDF separates the public and private component only for long-term debt, and it does not report data for industrial countries. Moreover, it somewhat controversially defines external debt as that held by non-residents.

² The International Monetary Fund (2003) assembled a dataset comprising up to 54 countries (34 developing and 29 industrial) but does not make the data available. Another dataset that covers a large number of countries is the World

coverage of a large cross-section of countries. The dataset presented here (henceforth, JP) aims at filling this gap.

Our data, which is available at http://www.iadb.org/res/pub_desc.cfm?pub_id=DBA-005 comprises three groups of countries. For the first group, which consists of 89 countries including all the major economies with the exception of the transition countries of Eastern Europe, we have full coverage of central government debt over the 1991-2005 period and incomplete coverage going back to 1970. The second group comprises seven transition countries for which we have full coverage of central government debt for the 1993-2005 period and incomplete coverage for previous years. The third group consists of 44 small countries for which we have incomplete coverage for the 1970-2003 period. Note that groups 1 and 2 include the 50 largest economies and hence all countries reported in Table 1.³

Two comments are in order at this point. First, the debt data refer to gross central (as opposite as to general) government debt and therefore may not be fully comparable across countries with different levels of fiscal centralization (see Cowan et al., 2006, for a discussion of comparability issues). Second, unlike in Cowan et al. (2006), these data come from secondary (in most cases, official) sources and, hence, may reflect different definitions of gross debt and central government, or official misreporting –a drawback, it is worth noting, shared by IFS and WDI official statistics.⁴

2. Sources

We build our dataset largely on five publicly available sources. First of all, we used IFS data and obtained figures for total debt by adding line 88A..ZF (Domestic Debt) and line 89A..ZF (Foreign Debt), using WDI as our second source whenever IFS data was not available. Our third source was the OECD's *Central Government Debt Statistical Yearbook*, which contains

Economic Outlook (WEO) dataset assembled by the Research Department of the IMF but, again, this dataset is not publicly available.

³ The five largest countries not included in groups 1 and 2 are: Ukraine (ranked 51st, our data start in 1999); Kazakhstan (ranked 53rd, our data start in 1997 and end in 2003); Croatia (ranked 57th, our data start in 1995); Libya (ranked 63rd, our data end in 2002); and Zimbabwe (ranked 65th, our data end in 1997).

⁴ IFS sends forms with precise definitions that the countries must fill and send back, and in theory the statistical department of the IMF does conduct a quality control. However, the large discrepancies between IFS and data and Article IV data (which are the ones used by IMF economists) suggest that the quality of IFS data is not very high (for evidence on discrepancies between these two sources of data see Pellicchio and Cady, 2005). Note that we did perform some quality check on the data. In particular, we graphed the evolution of the debt over GDP for each

incomplete series covering 29 countries for the 1980-2003 period. Our fourth and fifth sources were the CLYPS (Cowan et al., 2006) and ECLAC (Martner and Tromben, 2004) datasets that cover as many as 22 Latin American countries.

After that, it was detective work. In fact, the more substantive contribution of the paper came after exhausting the sources mentioned above, which entailed a meticulous search from all possible sources: official websites (Central Banks, Ministries of Finance, and Debt Management Offices), Eurostat, publications and reports by investment banks, reports, and documents from the IMF (Article IV reports, Recent Economic Development Reports, Special Issues Papers), making sure in all cases that we use publicly available information (our dataset does not include confidential data).⁵

3. Brief Description of the Data

Table 2 present a list of the variables included in the dataset. Table 3 describes the main characteristics of our public debt data. We restrict our sample to the balanced panels of groups 1 and 2 and hence use data for 96 countries yielding a total of 1,426 observations. Out of these 96 countries, 24 are industrial countries (yielding a total of 360 observations) and 72 are developing countries (yielding a total of 1,066 observations).

The table shows that, when compared with industrial countries, developing countries have higher levels of public debt (the difference is 10 percentage points if we compare averages and 6 percentage points if we compare medians) and that the developing regions with the highest levels of debt are Sub-Saharan Africa and the Middle East. Latin America and South Asia have intermediate levels of debt (not too different from the average for industrial countries) and East Asia and East Europe have the lowest levels (well below the level of industrial countries). If we classify developing countries by income levels, we find that low-income countries have much larger levels of debt than medium-income countries (100 percent of GDP versus 52 percent of GDP). As expected, we find that HIPC countries have high levels of debt (well above 100

country and whenever we observed either a big jump or a level of debt that was not consistent with our priors, we investigated the cause of this problem and, if appropriate, corrected the data.

⁵ Note that IFS data often differ from the information reported in Article IV documents (Pellechio and Cady, 2005). Whenever possible we tried to reconcile information from different sources, starting from the levels reported by those that we deemed most reliable and completing the series based on growth rates from alternative sources.

percent of GDP) but that emerging market countries have relatively low levels of debt (lower than the average level for industrial countries).

Column 5 of Table 3 shows that there is much more variability among developing countries than among industrial countries (the standard deviation of the latter group is two-thirds that of the former). This difference is due to both larger within-country variability (indicating that developing countries are subject to large changes in their debt ratios) and larger cross-country variability (indicating that the group of developing countries is much less homogenous than the group of industrial countries).

Table 4 reports summary statistics for the data available in IFS and WDI (as before, we only focus on the 1991-2005 period and only include countries in groups 1 and 2) and shows that this dataset include 18 countries fewer than ours and about half the number of observations (762 versus 1,426). IFS and WDI data suggest lower debt ratios. This is probably due to the fact that some countries with explosive debt ratios stop reporting their data and hence are dropped from the IFS and WDI.

Figures 1-3 plot our data for three groups of countries. Figure 1 plots simple averages for industrial countries, emerging market countries, and other non-HIPC developing countries. It shows that in industrial countries public debt grew in the first half of the 1990s and decreased in the second half of the 1990s; in the last five years public debt has remained more or less stable. In EM countries, debt decreased substantially in the first half of the 1990s, increased substantially over the 1997-2002 period, and decreased in the last three years. In fact, for most years for which we have data EM debt has been lower than debt in industrial countries. In non-emerging, non-HIPC developing countries, public debt followed the same trajectory of EM countries but with less pronounced swings. Interestingly, by 2005 the three groups of countries had similar levels of debt.

Figure 2 shows a similar graph but, rather than reporting simple averages, uses weighted averages (where countries are weighted by GDP). We now find that industrial countries show a clear trend, with debt increasing from 45 to 60 percent of GDP over the period under observation. Public debt in non-emerging non-HIPC countries also grew for most of the years for which we have data but started decreasing in 2002. We find that the evolution of debt in EM countries is similar to what we found in Figure 1, but we now find that EM countries have much

lower levels of debt (indicating that larger EM countries have lower debt than smaller EM countries).

Figure 3 focuses on HIPC countries. The dotted line reports simple averages and the solid line denotes weighted averages. The figure shows that public debt in this group of countries increased in the early 1990s, dropped in the 1994-1996 period, remained more or less constant over the 1997-2002 period and then dropped dramatically in the last 2 years. Also in this case, we find that larger countries tend to have lower levels of debt (the solid line is always below the dotted one).

4. Conclusion

In this paper, we present a new database on public debt that addresses the deficiencies of the most commonly used sources on public debt. As we plan to keep updating the dataset, we invite users to let us know about possible problems and mistakes. All suggestions will be acknowledged in future versions of the dataset.

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Table 1. Data in IFS and JP

| COUNTRY | IFS+WDI DATA | JP DATA |
|----------------|---------------------|----------------------|
| G7 | | |
| Canada | 1974-2003 | 1974-2005 |
| France | - | 1991-2005 |
| Germany | 1975-1999 | 1975-2005 |
| Italy | 1988-2002 | 1980-2005 |
| Japan | 1975-1993 | 1975-2005 |
| United Kingdom | 1970-2000 | 1970-2005 |
| United States | 1956-2004 | 1970-2005 |
| LAC 5 | | |
| Argentina | - | 1990-2005 |
| Brazil | - | 1991-2005 |
| Chile | 1988-2002 | 1988-2005 |
| Colombia | - | 1990-2005 |
| Mexico | 1965-2004 | 1970-2005 |
| EAP 5 | | |
| China | 1990-1999 | 1990-2005 |
| Indonesia | 1972-2001 | 1972-2005 |
| Korea | 1970-1997 | 1970-2005 |
| Philippines | 1949-2003 | 1970-2005 |
| Thailand | - | 1980-2005 |
| ECA 3 | | |
| Poland | 1994-2002 | 1993-2005 |
| Russia | - | 1993-2005 |
| Turkey | 1988-2001 | 1970-1981, 1985-2005 |
| MNA 3 | | |
| Egypt | - | 1991-2005 |
| Israel | 1972-2001 | 1972-2005 |
| Saudi Arabia | - | 1990-2005 |
| SAS 3 | | |
| Bangladesh | - | 1990 - 2005 |
| India | 1974-2003 | 1974 - 2005 |
| Pakistan | 1970-1993 | 1970 - 2005 |
| SSA 3 | | |
| Nigeria | 1968-1998 | 1970-2005 |
| South Africa | 1990-2003 | 1970-2005 |
| Sudan | - | 1991-2005 |

Table 2. Variables Included in the Dataset

| Variable Name | Description |
|----------------------|--|
| COUNTRY | Country Name |
| WBCODE | Three letters country code |
| YEAR | Year |
| DEBT_GDP | Debt over GDP in percent |
| GDP | Current GDP in Billion USD |
| WBREGION | Region (World Bank Classification) |
| INCGROUP | Income Group (World Bank Classification), 1=LOW, 2=MEDIUM, 3=HIGH |
| GROUP | Takes value 1 for group 1 countries (countries with full data for the 1991-2005 period). Takes value 2 for group 2 countries (countries with full data for the 1993-2005 period). Takes value 3 for group 3 countries (countries with incomplete data) |
| BALANCED | Takes value 1 for group 1 countries over the 1991-2005 period and for group 2 countries over the 1993-2005 period. Takes value zero for all other countries and periods |

Table 3. Main Statistics of the New Public Debt Database

| | Countries | Obs. | Mean | Median | Standard deviation | Within country St. Dev. | Across country St. Dev. | 25 th percentile | 75 th percentile | Min | Max |
|----------------------------------|-----------|------|--------|--------|--------------------|-------------------------|-------------------------|-----------------------------|-----------------------------|-------|--------|
| ALL | 96 | 1426 | 61.17 | 52.39 | 43.98 | 18.8 | 39.88 | 32.46 | 76.75 | 0 | 335.29 |
| IND | 24 | 360 | 53.36 | 48.84 | 30.65 | 12.34 | 28.62 | 33.57 | 64.39 | 1.5 | 152.28 |
| DEV | 72 | 1066 | 63.83 | 54.67 | 47.37 | 20.54 | 42.86 | 32.3 | 81.74 | 0 | 335.29 |
| BY REGION | | | | | | | | | | | |
| EAP | 8 | 120 | 44.68 | 44.59 | 28.93 | 12.99 | 27.52 | 18.7 | 65.35 | 3.42 | 118.11 |
| ECA | 9 | 121 | 38.17 | 34.5 | 22.12 | 13.03 | 18.93 | 19.33 | 56.15 | 5.18 | 92.4 |
| LAC | 22 | 330 | 55.68 | 45.57 | 43.79 | 18.47 | 40.58 | 30.8 | 66.3 | 8.17 | 304.5 |
| MNA | 11 | 165 | 75 | 74.8 | 44.57 | 24.56 | 38.89 | 44.76 | 103.39 | 0 | 189.31 |
| SAS | 7 | 105 | 63.33 | 57.8 | 21.5 | 6.79 | 21.93 | 47.62 | 85.85 | 26.45 | 105.9 |
| SSA | 15 | 225 | 91.85 | 79.7 | 62.81 | 29.32 | 57.36 | 42.98 | 114.52 | 13.08 | 335.29 |
| BY INCOME GROUP | | | | | | | | | | | |
| LOW | 17 | 255 | 99.89 | 80.37 | 63.92 | 29.93 | 58.11 | 55.06 | 126.62 | 13.08 | 335.29 |
| MED | 55 | 811 | 52.49 | 46.8 | 33.62 | 16.54 | 29.45 | 26.63 | 70.71 | 0 | 207.57 |
| HIPC and EMERGING MARKETS | | | | | | | | | | | |
| HIPC | 11 | 165 | 125.97 | 102.82 | 64.03 | 36.12 | 55.28 | 75.23 | 176.1 | 44.02 | 335.29 |
| EM | 31 | 457 | 51.34 | 45.57 | 32.31 | 19.14 | 26.35 | 27.66 | 67.69 | 3.42 | 181.9 |

Table 4. Statistics for Public Debt Data Available in IFS and WDI

| | Countries | Obs. | Mean | Median | Standard deviation | 25th percentile | 75th percentile | Min | Max |
|------------------|------------------|-------------|-------------|---------------|---------------------------|-----------------------------------|-----------------------------------|------------|------------|
| ALL | 78 | 762 | 53.8 | 48.47 | 36.4 | 28.83 | 67.97 | 0.9 | 247.38 |
| IND | 20 | 187 | 46.75 | 44.23 | 26.91 | 28.83 | 54.41 | 2.26 | 128.53 |
| DEV | 58 | 575 | 56.1 | 50.8 | 38.73 | 28.81 | 72.49 | 0.9 | 247.38 |
| BY REGION | | | | | | | | | |
| EAP | 8 | 75 | 45.72 | 52.77 | 27.93 | 11.95 | 66.62 | 0.91 | 111.47 |
| ECA | 9 | 91 | 39.27 | 37.41 | 21.68 | 21.12 | 56.1 | 5.17 | 99.88 |
| LAC | 17 | 160 | 45.97 | 38.15 | 30.33 | 24.1 | 65.68 | 2.54 | 147.5 |
| MNA | 8 | 79 | 75.77 | 74.76 | 33 | 57.52 | 98.89 | 19.07 | 183 |
| SAS | 7 | 76 | 54.22 | 59.8 | 24.56 | 42.33 | 72.11 | 9.33 | 148.16 |
| SSA | 9 | 97 | 77.79 | 50.23 | 61.14 | 32.49 | 115.21 | 0.9 | 247.38 |

Figure 1. Simple Averages

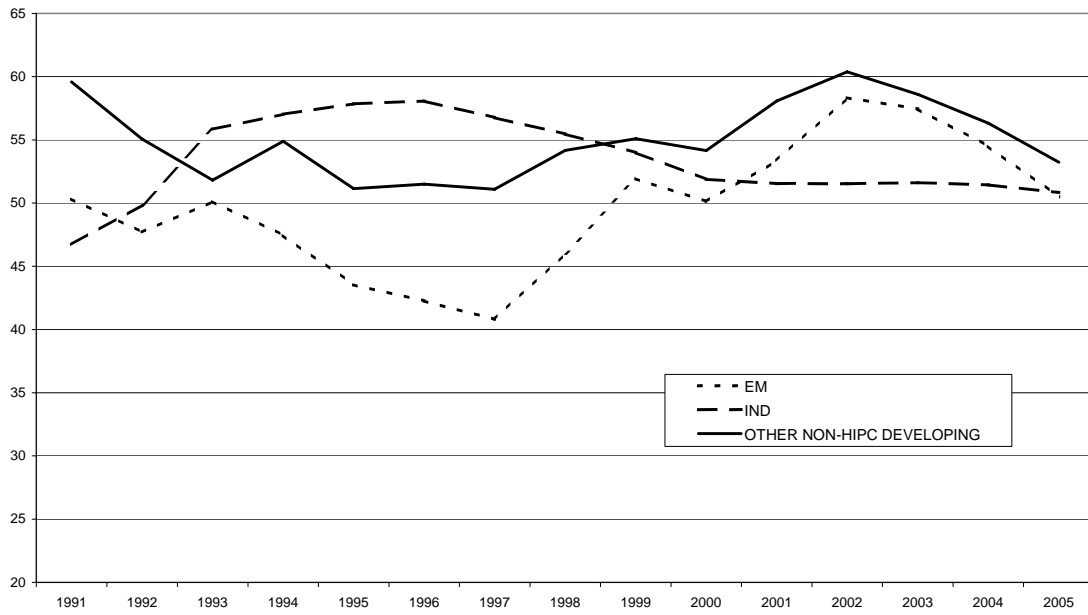


Figure 2. Weighted Averages

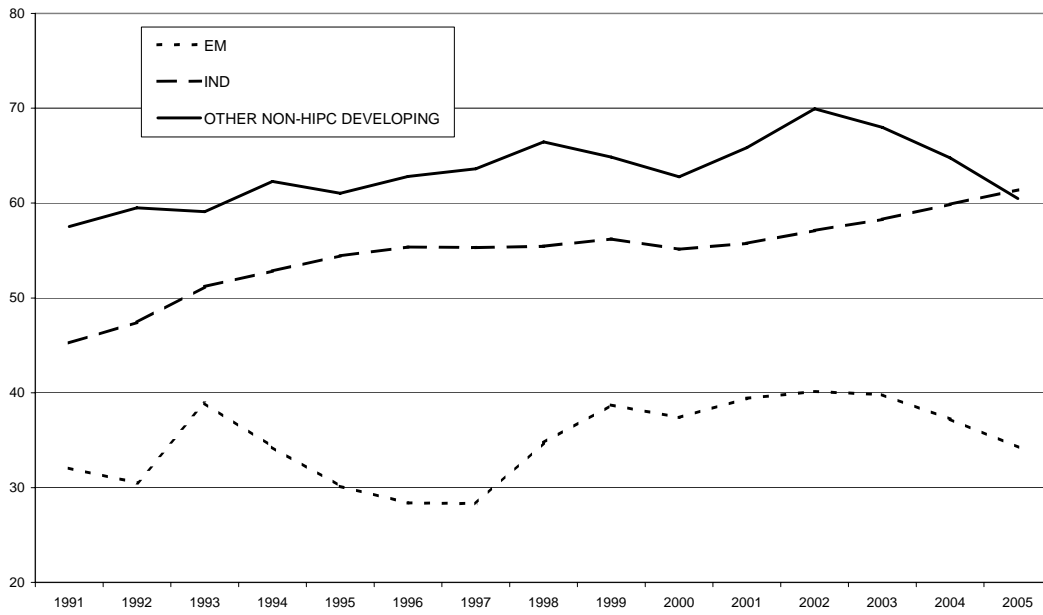


Figure 3. HIPC Countries, Simple and Weighted Averages

