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CASE Working Papers

Fiscal Sustainability: Conceptual, Institutional, and Policy Issues

Marek Dabrowski

No 4 (128)



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Abstract

Since 2008, the world economy has been facing the consequences of the global financial crisis. One consequence has been the rapid growth of public debt in many advanced economies, resulting from overly optimistic estimates of the fiscal situation before the crisis, declining government revenues and increasing social expenditures during the crisis, costs associated with the restructuring of the banking system, and countercyclical fiscal policies, among others. Emerging market economies appeared more resilient immediately after the 2008–2009 crisis; however, declining commodity prices and decelerating growth during 2014–2016 have weakened their fiscal positions.

Faced with a growing debt burden, many governments have attempted to determine the “safe” level of fiscal deficit and public debt. However, this is not an easy task. There is no single standard of fiscal safety for all economies. Furthermore, a globalized economy and irregular business cycles make it difficult to determine in which phase of the cycle a given economy is at any moment. This is essential to the assessment of fiscal indicators.

Experience shows that default risk may occur at various, and sometimes seemingly very low, levels of public debt. In fact, a “safe” borrowing level is country specific and depends on many factors and often-unpredictable circumstances. However, given the tense situation in global markets, the “safe” level of public debt is now lower than in previous decades. Another argument in favor of a cautious approach to setting this level concerns the highly pro-cyclical nature of measures such as the fiscal deficit-to-GDP or public debt-to-GDP ratios.

Lessons from the latest crises also highlight the importance of more accurate estimations of countries’ contingent fiscal liabilities, namely those relating to the stability of the financial sector. Looking ahead, estimations of other contingent liabilities, particularly those related to social welfare systems (the implicit debts of the public pension and health systems) are of primary importance in the context of an aging society and a population decline. In most countries, these liabilities far exceed official public debt figures. That is, official debt statistics do not present an adequate picture of a nation’s public debt and the true fiscal burden that will be passed on to the next generations of taxpayers.

Introduction

Financial crises related to excessive sovereign indebtedness have a long history going back to the very beginning of the territorial organization of societies. These crises have had different forms, depending on the stage of development and sophistication of the monetary and financial systems: lowering the silver or gold content in coins (currency debasement), printing paper money not backed by gold or silver reserves or outside the accepted issue norms, and refusing to repay loans or government bonds (classic default), among others.¹

In many instances, the government, which is unable to respect its liabilities, transfers their liabilities to other parts of the financial system, especially to the central bank and to commercial banks, through so-called quasi-fiscal operations (QFO) (see Section 1.2), which leads to currency and banking crises. However, such crises have, in fact, fiscal roots, in that they are caused by the inability of the government to live within its financial means.

It is evident that public debt crises have always caused negative consequences in the economic, social, and political life of nations. A bankrupt government cannot efficiently perform its main functions – namely, to provide public goods. Worse, sometimes it is ready to resort to expropriation measures against its citizens and businesses, violating basic property rights and economic liberties, in order to climb out of a financial hole. This has been demonstrated throughout history (for example, in France before the 1789 revolution or in Argentina during 2001–2002).

Depending on the scenario, default may result in high inflation or hyperinflation, depreciation of the national currency, a banking crisis, loss of personal savings, the impoverishment of large sections of society, a loss of public confidence in the government, internal political destabilization, a decrease in the country's credit rating, or a decline in its external political prestige for years to come.

The chronic nature of sovereign debt crises has resulted in the growing interest of analysts in finding both their real causes and the mechanisms of cross-country transmission—the so-called *contagion* effect. In this paper, we will try to answer the frequently asked question:

¹ The most interesting and comprehensive analysis of the history of financial crises, including public debt crises, is offered by Reinhart and Rogoff (2009).



what is the “safe” level of public debt (i.e. what level helps to avoid the risk of sovereign default)? Simultaneously, we will address various conceptual, institutional, and statistical dilemmas related to the definition and measurement of public debt.

The above questions have become particularly important following the beginning of the global financial and economic crisis in 2007–2009 and its subsequent European phase (2010–2013), which began with the *de facto* Greek sovereign insolvency in the spring of 2010. As a result, during just few years, the public debt indicators of many developed countries sharply deteriorated and doubts as to their future solvency appeared.

In most emerging market and developing economies (EMDE), public debt indicators were not as dramatic as in developed countries. However, the experience of developed economies suggests that unfavorable external shocks may quickly deteriorate the situation. Such a shock materialized in the second half of 2014, when commodity prices declined sharply, leading to a growth slowdown and revenue contraction in many EMDE and, in particular, in oil-producing countries.

Furthermore, the history of financial crises in the 1980s and 1990s convincingly demonstrates that the danger of sovereign default in EMDE may occur at much lower levels of public debt than in developed countries. If a considerable portion of EMDE public debt is held by non-residents, their vulnerability to external shocks may grow additionally.

The purpose of this paper is to examine the “safe” level of public debt based on international experience.² However, we will begin our analysis by looking at the definition of public debt in accordance with the international standards given by the International Monetary Fund (IMF) Government Finance Statistics (GFS) and the European System of Accounts 1995 (ESA95) (Section 1). Unfortunately, these definitions do not include certain large-scale public financial liabilities, especially those related to public pension systems, public healthcare systems, and implicit public support to the stability of financial – especially banking – systems. These liabilities are analyzed in Section 2. This is followed by a discussion of the different measures of public debt (Section 3), sources of public debt financing and their comparative advantages and disadvantages (Section 4), and the factors that determine the dynamics of the public debt-to-GDP

² This paper is a revised and updated version of the report “Determining the Possible Limit of Public Debt and Acceptable Correlation Between Domestic and Foreign Debt” written in 2013 in the Russian language in the framework of the project of the Russian Presidential Academy of National Economy and Public Administration (RANEP) “Evolution of Approaches to the Organization of Government Expenditure Funding: Tax and Debt Policies.” Its original English language version under the title “Factors Determining a ‘Safe’ Level of Public Debt” was presented at the XV April International Academic Conference on Economic and Social Development organized by the Higher School of Economics (HSE) in Moscow, April 1–4, 2014 (<http://www.hse.ru/data/2014/04/10/1320215855/Dabrowski.pdf>). The author would like to thank RANEP for the opportunity to work on this topic and HSE for the opportunity to publicly present this paper and to benefit from conference discussion. At the same time, the author accepts the sole responsibility for the content and professional quality of this research work and for the presented opinions, conclusions, and recommendations.



ratio (Section 5). In Section 6, we will discuss the critical level of public debt at which a risk of sovereign default may occur, and in Section 7, the international experience of fiscal rules in respect to level of public debt. Finally, Section 8 offers conclusions for macroeconomic policy.

1. Definitions of Public Debt

An analysis of the “safe” level of public debt, especially in cross-country comparisons, requires a clear definition of public debt. Otherwise, we will compare the incomparable and offer ambiguous recommendations.

Definitions of public debt may vary by country due to differing methodologies, technical problems with data collection and aggregation, or deliberate attempts to present fiscal records in a more favorable way. Such attempts at “creative” fiscal accounting are caused by the desire to either circumvent the constitutional and legal limits of fiscal deficit and public debt (see Section 7), submit an artificially “dressed up” fiscal report to international organizations (for instance, the IMF), or mislead financial investors.

The critical elements of the definition of public debt relate to:

- the entities included in the general government;
- the moment of the recording of government revenues, expenditures, and liabilities; and
- contingent liabilities.

1.1. GFS and ESA95 Standards

The two most popular international methodologies of government finance statistics are:

- the 2001 version of the GFS, modified and supplemented in subsequent years (see GFSM, 2013); and
- the ESA95 (see ESA95, 2013).

In principle, the methodological approaches to the statistics of public finances in both standards are similar. Differences concern technical details that have no direct importance for our analysis (see Bjorgvinsson, 2004).



1.2. General Government

The determination of the boundaries of the general government (GG) is essential in both methods, despite the institutional specifics of individual countries. However, these institutional specifics make cross-country comparisons of separate GG components difficult or impossible. For example, the role of the central budget in a federal state is very different from that of a unitary country. The same concerns regional and local budgets, extra-budgetary funds, autonomous state agencies/units, and pension and medical insurance funds, among others. Only the application of the widest possible statistic aggregate, such as the GG, makes cross-country analysis possible.

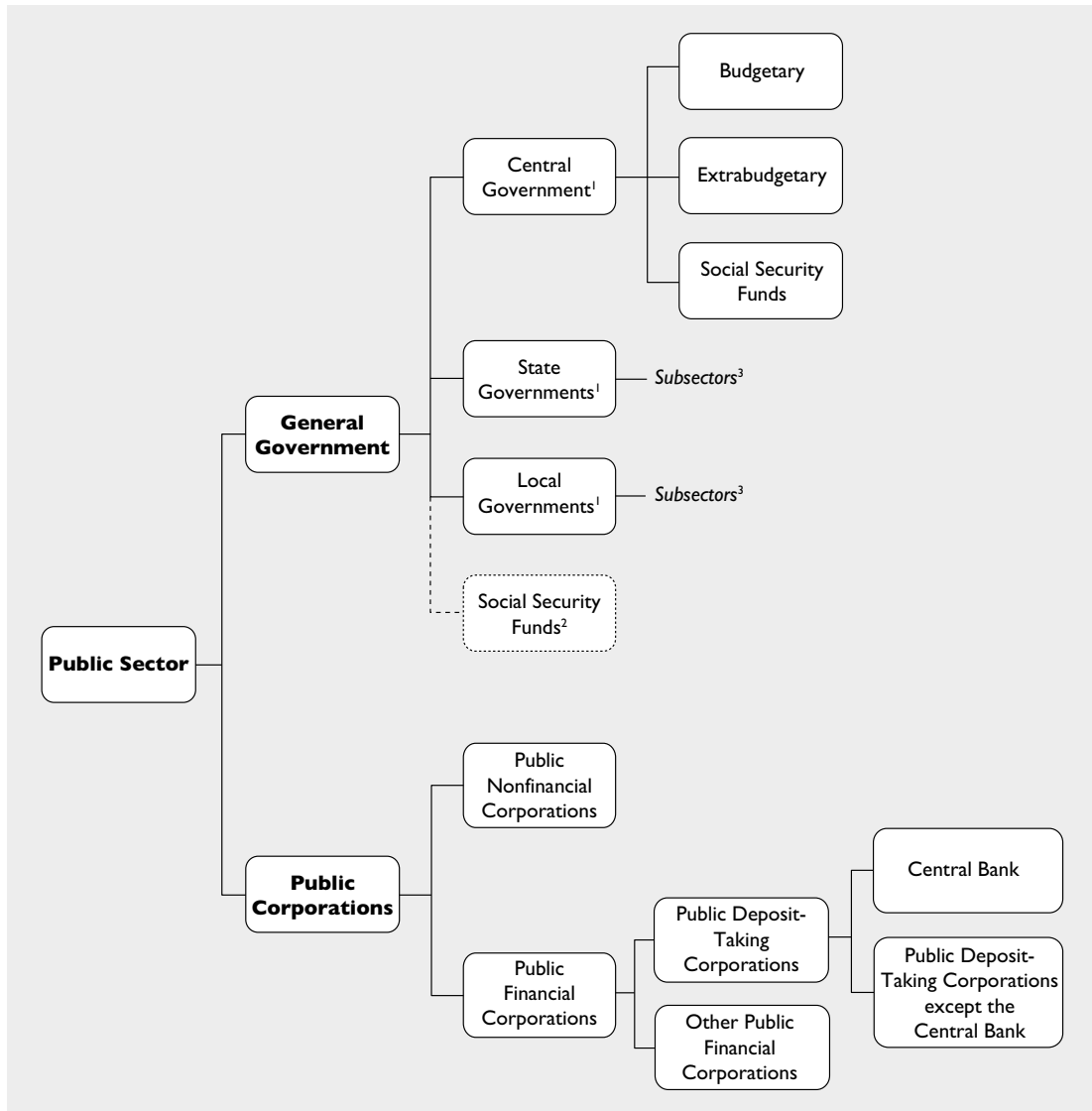
A clear definition of GG limits is also important to prevent “creative” fiscal accounting. To artificially improve fiscal statistics (for instance, fiscal deficit and public debt), many governments move select expenses and liabilities off the state budget, to either extra-budgetary funds or to different public agencies or units. In principle, the broad definition of the GG should incorporate these funds and organizational entities.

According to GFS standards (see GFSM, 2013: para. 2.69), the GG “...consists of resident institutional units that fulfill the functions of government as their primary activity, and includes all government units and all nonmarket nonprofit institutional units (NPIs) that are controlled by government units.” Thus, the definition of the GG includes the following components (Figure 1):

- central or federal government;
- regional governments or governments of federal entities in the case of federal states;
- local authorities (municipalities, communes, counties, regions, and districts, among others);
- pension funds, medical insurance funds, and other social insurance funds at all governmental levels; and
- budgetary units and extra-budgetary funds, and organizations at all governmental levels.

The Government Finance Statistics Manual (GFSM) (2013) also provides a broader definition of the public sector, which includes all GG units and public corporations. As shown in Figure 1, the public corporations category includes nonfinancial public corporations and financial public corporations that, in turn, consist of public deposit-taking corporations, except the central bank (i.e. commercial banks), other public financial corporations, and the central bank of the state.

Figure 1: Main Components of the Public Sector



Source: GFSM (2013)



1.3. Quasi-Fiscal Operations outside the GG

Despite the broadly defined boundaries of the term GG, many governments attempt to circumvent these boundaries by involving units outside the GG in the process of implementing governmental policy. As a result, the related state expenditures and liabilities are moved beyond GG fiscal statistics. Such practices are referred to in the literature as QFO.

In most cases, QFO are performed by public sector organizations that are outside the GG, such as the central bank, state commercial banks, and other state financial institutions, as well as nonfinancial public enterprises, especially in the energy and transportation sectors.

The largest potential for conducting QFO lies in the monetary, credit, and exchange rate policy of central banks, state commercial banks, and other financial institutions.³ For example, these financial institutions can grant credits to targeted groups of economic entities at a preferential interest rate (i.e. below market level) that are occasionally recognizably insolvent. Other measures include support for insolvent banks by the central bank (under the pretext of providing liquidity), selling currency at an official exchange rate (in the multiple exchange rate system) to the government and selected groups of enterprises, and serving public debt on non-market conditions, among others.

However, nonfinancial public enterprises are also often involved in QFO. For instance, state-owned energy companies must supply energy and gas at prices below their cost-recovery level, as well as to customers who are in permanent arrears (Paczynski et al., 2009). This is a particularly frequent practice in the countries of the Middle East and North Africa (MENA) region (Sdravovich et al., 2014). The same pertains to public transport enterprises (for instance, railway transport) and public utilities enterprises.

Several years ago, QFO seemed to be the “childhood disease” of transition economies and some developing countries, and it was believed that the scale of this disease would gradually decrease (Markiewicz, 2001; BIS, 2003). However, with the start of the global financial crisis of 2008–2009, the popularity of QFO returned to an unexpected location – namely advanced economies, where central banks had implemented various “non-orthodox” measures to stimulate the economy and support the financial system. Among others, these non-orthodox measures included the intensive purchase of various types of securities in the secondary market, which were sometimes of doubtful quality.

For instance, the US Federal Reserve System subsequently implemented several rounds of quantitative easing (QE). Its interventions aimed to improve the liquidity and quality of commercial bank assets led to the accumulation of a large stock of mortgage-backed securities

³ See Mackenzie and Stella (1996) for overview of different forms of QFO in public financial institutions.



(see Taylor, 2010). In fact, this intervention was a hidden form of bank recapitalization without the use of budgetary funds.

Two large US federal housing development corporations, *Fannie Mae*⁴ and *Freddie Mac*,⁵ also deteriorated the quality of their assets considerably during the crisis, eventually requiring additional budget support.

In turn, the European Central Bank (ECB) was involved in buying treasury bonds from the peripheral countries of the Eurozone – namely, Greece. These operations helped to support insolvent governments and potentially insolvent banks (see Dabrowski, 2012).

Present-day QFO in advanced economies are associated with the same negative consequences as traditional QFO in developing countries or transition economies (specifically those at an early stage of transformation). First, QFO distort fiscal statistics. Fiscal deficits and public debts are, in fact, higher than officially reported. Second, at the stage of withdrawing from non-orthodox monetary policy measures, central banks may have to admit considerable losses, which causes a decline in the GG balance. Finally, QFO may have inflationary consequences (see Park, 2012), which means an indirect hidden tax on holders of money balances.

4 See <http://www.fanniemae.com/portal/about-us/company-overview/about-fm.html>.

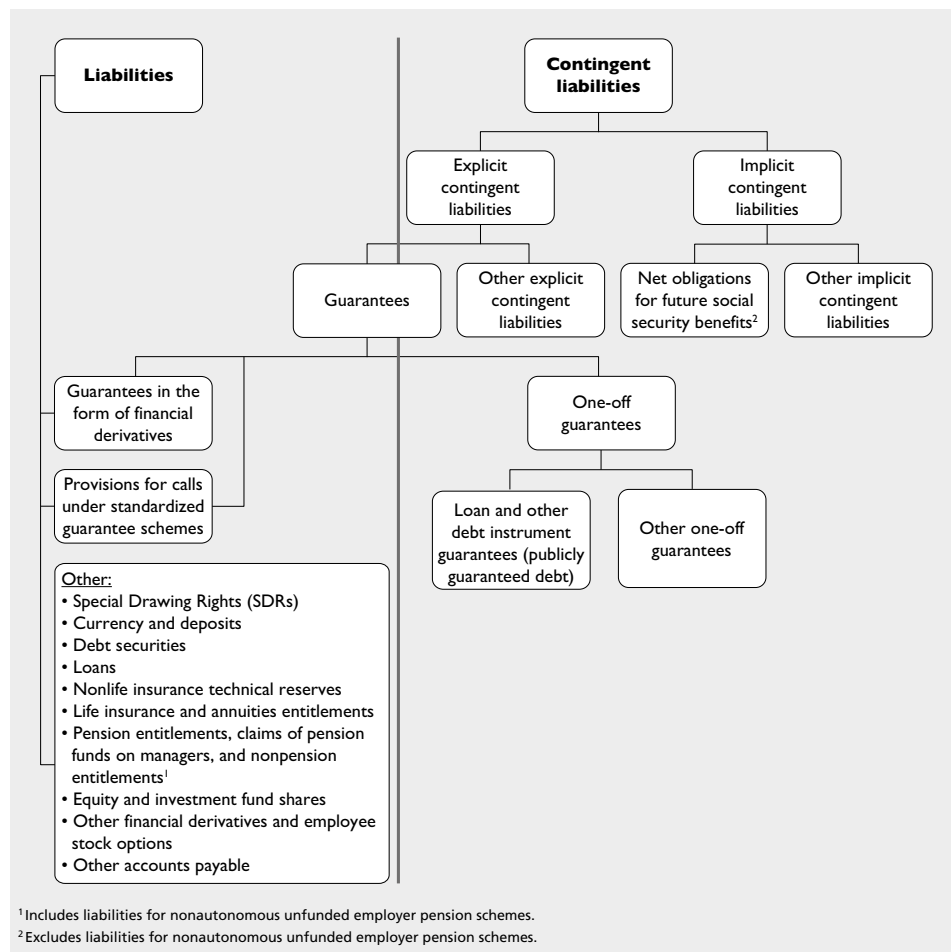
5 See http://www.freddie.mac.com/news/corp_facts.html?intcmp=AFMRCE.



1.4. From the Cash Principle to the Accrual Method

In the previous version of the GFS, dated 1986 (GFSM, 1986), fiscal flows and, accordingly, the balance of the governmental budget or the GG (surplus or deficit) were recorded on a cash basis. A consequence of this was the artificial reduction of government expenditures, deficits, and public debts through the building up of budget arrears. This was a frequent practice in countries of the former Soviet Union (FSU) in the 1990s.

Figure 2: Liabilities and Contingent Liabilities in the GFS



Source: GFSM (2013)



In the new version of GFS, dated 2001 (GFS 2001, see GFSM, 2013), and in the ESA95 (2013), the cash method was replaced by the accrual method. According to the GFS, “... transactions are recorded when economic ownership changes hands for goods, nonproduced nonfinancial assets and financial assets and liabilities, when services are provided, and for distributive transactions when the related claims arise” (GFSM, 2013: para. 3.57). As a result, budgetary arrears do not artificially reduce fiscal expenditures, deficits, or public debts. Rather, it becomes simply one form of deficit and public debt financing.

1.5. Contingent Liabilities

Another problem of budgetary accounting relates to the contingent liabilities arising as a consequence of various types of credit guarantees, deposit insurance, other mandatory insurance programs, and pension systems, among others. Figure 2 provides an overview of these contingent liabilities.

The green vertical line delimits the contingent liabilities that shall be accounted for in the current public debt statistics as well as the liabilities that remain outside this statistic until they will be called upon. In principle, all standard contingent liabilities, such as government guarantees to export credit or other standard credit programs/schemes, are subject to evaluation in accordance with the respective credit risk ratios (calculated on a historical basis) and are registered in the current public debt statistics. Non-standard one-off guarantees, where an evaluation based on historical credit risk ratios is impossible, remain outside the current public debt statistics.⁶ The same pertains to implicit contingent liabilities, which we will discuss in Section 2.

⁶ However, one-off budgetary guarantees, provided to admittedly insolvent borrowers, should be immediately registered as public debt.

2. Public Liabilities Not Included in the Definition of Public Debt

2.1. General Comments

Despite serious efforts to clarify the definitions of public debt in the GFS 2001 and the ESA95, many government liabilities remain outside public debt statistics, as illustrated in the right part of Figure 2.

In formal terms, these liabilities are contingent public liabilities—either *explicit contingent liabilities*, which have a one-off non-standard nature and are difficult to evaluate in terms of risk of discharge (see Section 1.5), or *implicit contingent liabilities*.⁷

The GFS 2001 method recommends preparing separate statements on the explicit contingent liabilities not included in the current public debt statistics and on the implicit liabilities of the state pension system (GFSM, 2013, Chapter 7). The ESA95 standards do not contain a similar recommendation. As a result, most contingent liabilities remain outside the public debt statistics. International statistic databases (for instance, of the IMF, World Bank, or Eurostat) have yet to incorporate them.

However, the situation is changing. Following the GFS 2001 methodology, the European Union (EU) adopted a new set of standards, the ESA2010 (2013), in May 2013, which also requires separate statements on the implicit liabilities of the state pension system (ESA2010, 2013: para. 17.121 and the next ones). Moreover, changes in the pension system that influence the level of future implicit public liabilities shall be reflected in the public debt statistics (see Section 2.2).

It is worth noting that some contingent public liabilities, especially implicit ones, are very large, sometimes exceeding the official public debt. In particular, this concerns implicit liabilities in the public pension system, public healthcare system, and financial sector.

⁷ According to Polackova (1999), explicit government liabilities result from legislation or contract. Implicit liabilities are kinds of moral obligations "...of government that reflect public and interest-group pressures."



2.2. Pension Liabilities

Unfunded pension liabilities originate from the specific design of public pension systems based on an implicit intergenerational contract: pensions of current pensioners are funded by pension contributions or taxes paid by the currently employed (the pay-as-you-go (PAYG) system). Those who pay pension contributions or taxes today expect that the next generation of workers and taxpayers will fund their pensions after they retire. As a result, a substantial *implicit pension debt* from the unfunded pension scheme is created (Kane and Palacios, 1996). In some Organisation for Economic Cooperation and Development (OECD) and EU countries, this debt was estimated at between 75% and 300% of GDP (Table 1) during the 1990s and 2000s, when *projected benefit obligation* (PBO) and *indexed benefit obligation* (IBO) methods were used (see Eichhorst et al., 2011). In many cases, these figures exceeded the level of official GG gross debt considerably (see Section 6).

Table 1: Implicit Pension Debt in OECD and EU Countries, % of GDP

COUNTRY	CHAND AND JAEGER (1996)	KUNE (1996)	HOLZMANN ET AL. (2004)
Belgium		101	
Canada	94		
Denmark	117		
France	265	112	
Germany (West)	221	186	
Greece		245	
Hungary			203
Ireland		78	
Italy	357	207	
Japan	166		
Lithuania			155
Luxembourg		219	
Malta			234
The Netherlands		144	
Poland			261
Portugal		128	233
Romania			256
Slovakia			210
Slovenia			298
Spain		129	
Sweden	131		
UK	117	92	
US	106		

Comment: The calculations of Chand and Jaeger (1996) and Kune (1996) were based on the PBO method and the calculations of Holzmann et al. (2004) on the IBO method (see above).

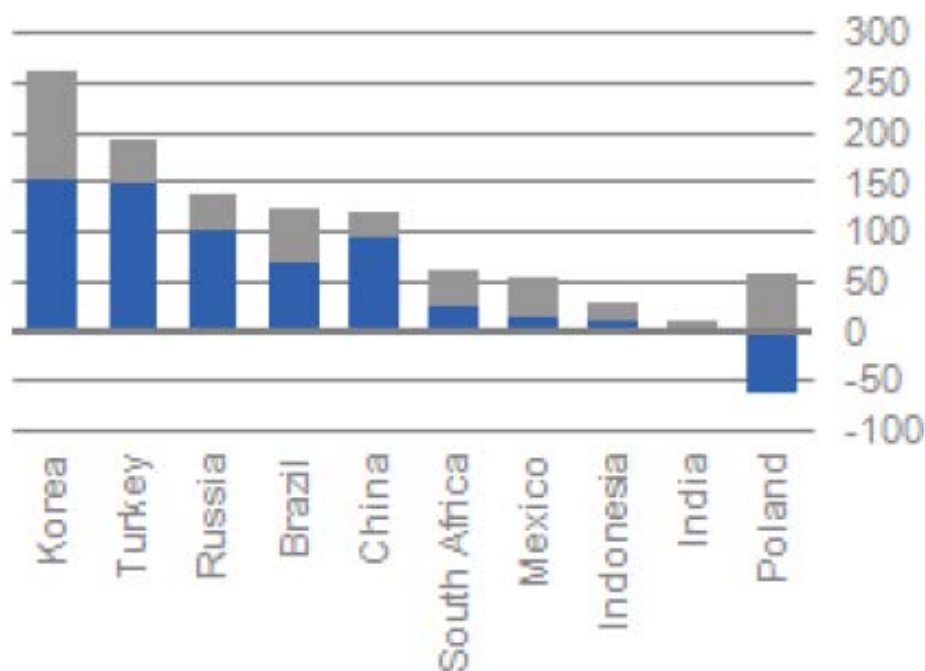
Source: Eichhorst et al. (2011)



Deutsche Bank (2013) estimates a growth in public pension liabilities by 70–100% of GDP for Brazil, Russia, and China and up to 150% for Turkey and South Korea from 2011–2040 (Figure 3). These estimates were based on another method, the *net present value (NPV) of future spending increase*.

The negative population growth and increasing life expectancy of many countries results in the constant growth of future pension liabilities. These tendencies can be compensated for by increasing the retirement age, eliminating pension privileges for certain sectors and professional groups, raising the labor market participation rate (especially for women), encouraging legal migration, improving pension contribution payment discipline, and decreasing the average pension to average wage ratio (i.e. the *replacement ratio*). Despite their political unpopularity, it seems necessary to adopt these measures to avoid a potential sovereign default.

Figure 3: Growth of Implicit Social Liabilities in EMDE, % of GDP, 2011–2040



Comment: Blue columns signify the growth of public pension liabilities and grey columns signify the growth of liabilities in the public healthcare system (see Section 2.3).

Source: Deutsche Bank (2013)



Pension reforms can help to stabilize the level of implicit contingent liabilities in the unfunded pension scheme – specifically, reforms such as transitioning from a *defined benefits system* to a system based on individual accounts, where the amount of a future pension depends on both the total amount of pension contributions paid by a future pensioner and the size of the pension fund available at the time when pensions are paid (*the defined contribution system*). In the latter system, population aging reduces the replacement ratio. However, it creates an incentive for later retirement, leading to greater contributions to the public pension fund.

In fact, future public pension liabilities can hardly be considered “contingent.” The probability of these liabilities being called upon is not lower than that of explicit public debt instruments (e.g. treasury bonds). Public pension liability estimation is also possible, as future demographic forecasts and pension legislation are known; although, some methodological problems in the field of national accounts and public finance statistics should be resolved (see Lequiller, 2004).

The absence of future pension liabilities distorts official public debt statistics. There are countries where the explicit public debt remains very low, but the implicit debt of the public pension system is much higher (e.g. Russia).

Furthermore, the absence of public pension liabilities in public debt statistics creates negative incentives in the area of pension reforms. In the 1990s and 2000s, several transition economies (e.g. the Baltic countries, Hungary, Kazakhstan, Macedonia, Poland, and Slovakia, among others) replaced part of their PAYG system with a mandatory fully-funded pension system, the so-called second pillar, operated by private pension funds. In this system, a portion of the mandatory pension contribution is redirected to the individual saving accounts of future pensioners. The inevitable result of this reform was the growing deficit of the traditional, unfunded segment of the pension system and an increasing official GG deficit and debt, despite the decrease in future implicit pension liabilities.

When the fiscal situation in many countries sharply deteriorated due to the global financial crisis, several decided to reverse pension reforms and transfer pension fund liabilities back to the PAYG system. Such measures were taken by Argentina, Hungary, and Poland and, to a lesser extent, by other countries of Central and Eastern Europe (CEE) (see Barbone, 2011; Jarrett, 2011). The official statistics of the GG deficit and debt in accordance with GFS 2001 and ESA95 standards have improved, but implicit pension liabilities have increased again. However, under the conditions of the new reporting standards, the ESA2010, practices of “creative” fiscal accounting, such as the previously mentioned, will be at least partially reflected in the current fiscal statistics.



2.3. Public Healthcare Liabilities

Implicit fiscal (intergenerational) liabilities also exist in the public healthcare system (*unfunded health liabilities*). The mechanism is similar to that of the public pension system; though, the amount of contingent liabilities is more difficult to estimate for many technical reasons.

Present-day taxpayers pay mandatory contributions to public medical insurance funds or as general taxes (the exact system of funding public healthcare services is less important here), and most will require health services in the last years of their life. Negative demographic trends and population aging contribute to increasing the hidden debt. Technological progress in medical services and the related increase in costs is an additional factor contributing to the growth of future public healthcare liabilities.

Available estimates of implicit public healthcare liabilities look worrying: in many cases, these liabilities exceed implicit pension liabilities (see Section 2.2). For example, Medearis and Hishov (2010) estimate implicit public healthcare liabilities for EU countries and the US within the range of 20% (Hungary) to over 500% of GDP (Luxemburg). Interestingly, liabilities in the US public healthcare system (which provides limited coverage) exceed 200% of GDP. In many EU countries, the situation is even worse: in Denmark, France, the Netherlands, and Spain, public healthcare liabilities exceed 200% of GDP; in Poland and Sweden – 300% of GDP; and in Finland, Ireland, and Slovakia – 400% of GDP.

According to the IMF assessments quoted by Deutsche Bank (2013), the NPV of the increase of liabilities in the public healthcare system in EMDE between 2011 and 2050 will be considerable, amounting to 30–50% of GDP in South Africa, Russia, Turkey, Brazil, and Mexico, over 50% of GDP in Poland, and over 100% of GDP in South Korea (Figure 3).

The example of Poland demonstrates the differences between both methodologies. However, regardless of these differences, the size of the future implicit liabilities of public health care systems remains serious in most countries. Reforms aimed at limiting the growth of expenses, reducing abuse of the right to publicly-funded medical care, introducing partial copayments for public medical services, and eliminating various group privileges in insurance contributions, among others, are urgently needed to arrest the further expansion of implicit health liabilities (see Clements et al., 2011).

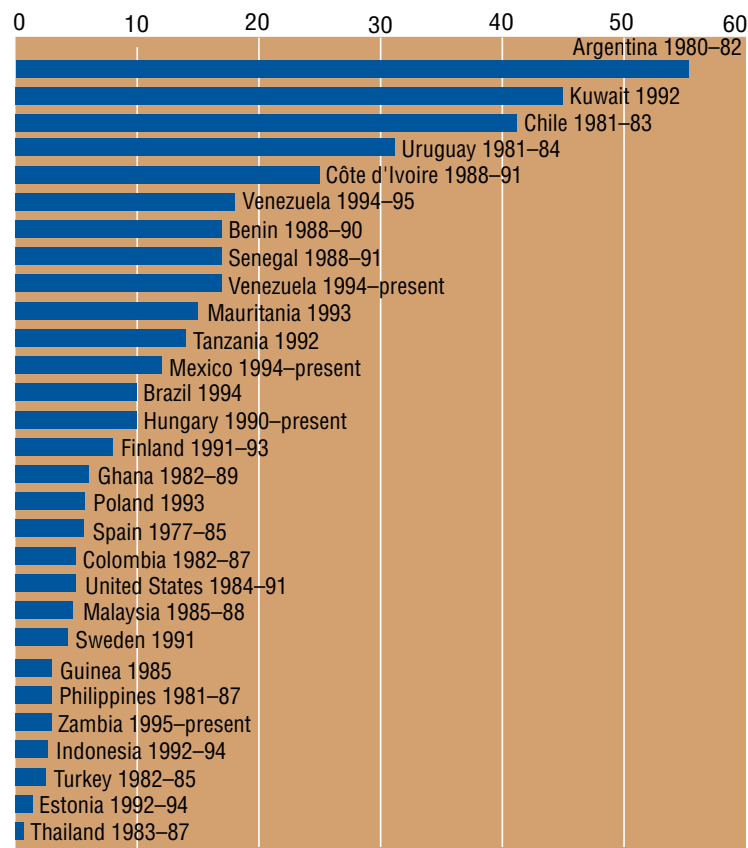
2.4. Contingent Liabilities Related to Financial Stability

The functioning of the *fractional-reserve* banking system results in banking crises from time to time. To avoid a banking panic, the collapse of the entire country's financial system, the spread of the crisis to other countries (*contagion effect*), and adverse shocks to the real economy,



governments must often support insolvent banks by replenishing their capital. Occasionally, several years later, these expenditures can be at least partly recovered by the proceedings from the privatization of banks nationalized during the crisis.

Figure 4: Costs of Resolving Banking Crises, % of GDP



Source: Polackova (1999)

The adverse fiscal consequences of bank crises are usually considerable, which is confirmed by the comparative historical analysis of Reinhart and Rogoff (2009). Figure 4 presents the IMF's estimate of the expenses of bank crises in the 1980s and 1990s – before the wave of financial crises in 1997–2001 in Asia, the FSU, and Latin America; the global financial crisis in 2007–2009; and the European financial crisis in 2010–2013.



The consequences of the recent global crisis were very serious for the public budgets of many countries, especially Cyprus, Greece, Iceland, Ireland, Latvia, Slovenia, Spain, the UK, and the US. As banking system rehabilitation in the EU is far from completion, the list of countries that must provide considerable budget support to the banking system may increase.

Based on this experience, one may speak about the future public liabilities originating from the government's responsibility to ensure the stability of the banking and financial systems. Most of these liabilities have an implicit and contingent nature. There are also examples of explicit contingent liabilities, especially those related to the deposit insurance system. In theory, such a system shall be self-funded (from bank contributions). However, in regards to a large-scale crisis, the funds accumulated in the deposit insurance system are often insufficient, and the government must provide additional support.

The experience of Ireland in the fall of 2008 offers a good example. The government, confronted with the threat of a banking panic, provided 100% guarantees for all deposits. Looking back, this decision was a great mistake (see Honohan et al., 2010), as it resulted in an increase of Ireland's public debt by almost 100% of GDP (see Table 3).

The size of the banking system related its contingent liabilities depends on many factors, such as the ratio of bank assets to GDP (the higher the ratio, the more potential liabilities can emerge); the structure of the banking sector (a concentration of banks increases the risk of a systemic banking crisis); its ownership structure (state ownership increases the risk of crisis; the same pertains to private ownership if the bank is involved in related lending); and the quality of banking legislation, regulation, and supervision.

2.5. Other Contingent Liabilities

Besides contingent liabilities related to the financial system, there are also other kinds of implicit public liabilities. These liabilities may result from an inefficient system of fiscal federalism (i.e. expectations of federal government bailouts of regions and municipalities), natural monopolies and other infrastructural enterprises (especially in the public sector), and the need to eliminate the consequences of past QFO (see Section 1.3), among others (see Polackova, 2009).

3. Absolute and Relative Public Debt Measures

Both absolute and relative public debt measures are used in macroeconomic, fiscal, and financial analyses. Cross-country public debt analyses use relative measures (see Section 3.2), as it is necessary to take into account the different-sized economies and currencies in which the national public debt is recorded. In most cases, absolute public debt measures serve internal budget control and monitoring. They are also used in the system of national accounts to illustrate various financial and inter-sectoral flows and balances. Furthermore, they serve as the numerator in the calculation of relative public debt measures.

3.1. Absolute Public Debt Measures

In cross-country public debt analyses, the basic category is the *total gross debt of general government*. In accordance with the GFSM (2013: para. 7.238), “*gross debt consists of all liabilities that require payment or payments of interest and/or principal by the debtor to the creditor at a date or dates in the future. This includes debt liabilities in the form of SDRs [Special Drawing Rights], currency and deposits, debt securities, loans, insurance, pensions and standardized guarantee schemes, and other accounts payable. Thus, all liabilities in the GFSM 2001 system are debt, except for equity and investment fund shares and financial derivatives and employee stock options. Debt can be valued at current market, nominal, or face values.*”

The indicator of the total gross debt of the GG illustrates total public indebtedness, regardless of the particular GG segment where it occurred. This is the only option for conducting cross-country comparative analyses without the necessity to consider the constitutional and institutional specifics of the public finance systems in individual countries.

However, analysis of the debt of individual GG entities, such as the federal or central government, federal entities (states, provinces, or regions), municipalities, and pension or other social funds, may be useful for internal purposes (especially for budget monitoring and control).

Analysis of the debt of individual GG entities makes sense when their fiscal powers and responsibilities are clearly defined, such as, for example, when a federal government does not bear any formal or actual responsibility for the debts of federal entities or municipalities (e.g. in



the case of US and Canadian federal models, see Bordo, Markiewicz and Jonung, 2011). In such circumstances, information about a federal debt is meaningful for both analytical purposes and for financial markets. If there is no such clear delimitation of responsibility, financial markets will assume implicit federal/national responsibility for the public debt on a sub-national level.

Table 2: Gross and Net GG Debt, % of GDP, 2014

COUNTRY	GROSS DEBT	NET DEBT
Australia	34.1	15.7
Brazil	63.3	33.1
Bulgaria	26.4	-2.3
Chile	15.1	-4.4
Denmark	44.6	4.9
Finland	59.3	-50.1
France	95.6	87.9
Germany	74.9	51.9
Italy	132.5	112.6
Japan	249.1	126.2
Kazakhstan	14.7	-19.5
Mexico	49.5	43.2
Netherlands	68.2	33.0
New Zealand	30.8	7.6
Norway	27.9	-244.0
Pakistan	64.9	58.2
Qatar	31.7	-93.6
Saudi Arabia	1.6	-53.6
South Africa	47.1	40.4
Sweden	44.9	-19.3
Turkey	33.5	24.6
UAE	15.7	-223.3
UK	88.2	79.7
US	105.0	80.6

Source: IMF World Economic Outlook, April 2016

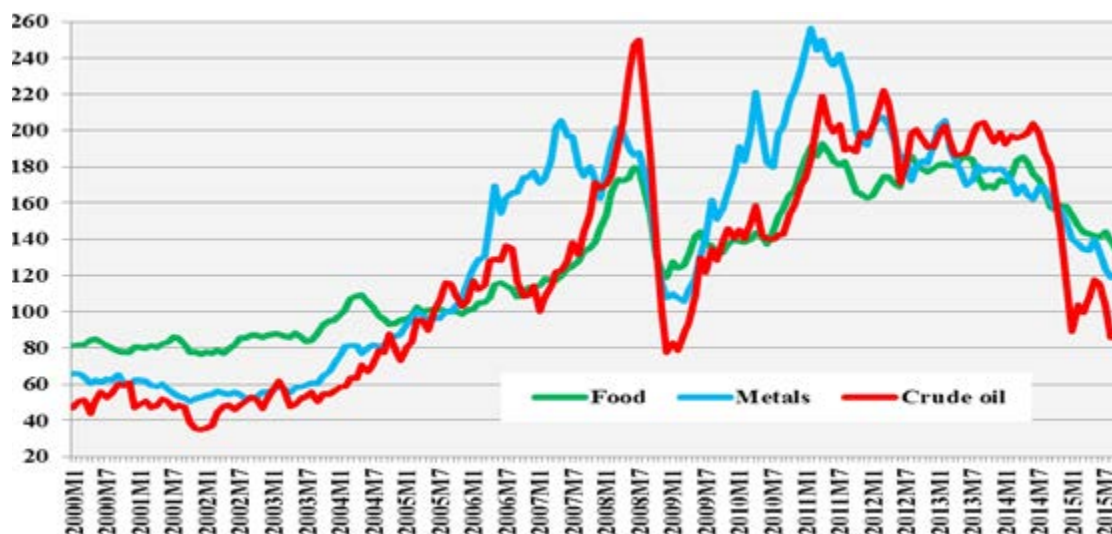
Beside total gross debt, fiscal statistics use the indicator of GG *total net public debt*. In accordance with the GFSM (2013: para. 7.245), it is calculated as “... *gross debt minus financial assets corresponding to debt instruments. These financial assets are: monetary gold and SDRs, currency and deposits, debt securities, loans, insurance, pension, and standardized guarantee schemes, and other accounts receivable.*”



Gross and net debt can differ substantially, as seen in Table 2. This often occurs with large official creditors (e.g. Japan) and certain commodity exporters (especially oil producers, such as Norway and Saudi Arabia) who enjoy high resource rent and are able to form *sovereign wealth funds* during times of commodity booms. However, it is worth noting that the fiscal situation of oil and other commodity producers has deteriorated sharply since mid-2014 when commodity prices more than halved (see Figure 5 and Dabrowski, 2015).

Using net debt instead of gross debt has both advantages and disadvantages. On the one hand, it seems conceptually and methodologically correct to take into consideration both sides of the government's balance sheet (i.e. not only its liabilities, but also its assets, which can occasionally be substantial if well managed).⁸ Specifically, it provides a more balanced picture of the government's long-term fiscal position.

Figure 5: Commodity Price Indices, 2000–2015 (2005 = 100)



Source: IMF Primary Commodity Price System, http://www.imf.org/external/np/res/commod/External_Data.xls

On the other hand, net public debt is not always easily measurable (due to incomplete statistics for public financial assets) and does not provide a complete picture of current and future sovereign solvency. This is due to the different qualities of public financial assets and the various degrees of their liquidity. In particular, this concerns government loans, which are

⁸ See Detter and Foelster (2015) on the management of public assets.



often granted based on political rather than economic criteria and, therefore, are hardly recoverable.

The experience of Russia in the 1990s was very telling in this respect. Russia inherited from the USSR not only public debt, but also financial claims to countries of the FSU and other developing countries, such as Cuba, Mongolia, Vietnam, and several Arab and African states. The nominal debt claims as of March 1, 1993 were estimated by the Ministry of Finance of the Russian Federation at USD 148.8 billion (Duma, 2003). That is, on paper they exceeded the amount of debt of the former USSR. However, the actual recoverability of these loans was extremely low and did not exceed 10%.

Many countries, including Argentina, China, India, Indonesia, and Russia, do not have internationally comparable statistics for total GG net public debt. The IMF World Economic Outlook statistic database as of April 2016 contained this data only for 95 out of 189 countries.

Absolute measures of both gross and net debt are usually reported in the national currency. Liabilities in foreign currencies are converted into the national currency at an official exchange rate. These components of the total public debt may be undervalued in countries that do not have a convertible currency.

3.2. Relative Public Debt Measures

Relative public debt measures allow for the possibility of cross-country comparisons, as well as qualitative evaluations of the amount of debt burden. The most popular measure is the ratio of gross or net debt-to-GDP. This measure compares the amount of a country's public debt to its economic potential.



Table 3: GG Gross Debt in EU and G7 Countries, % of GDP, 2007–2014

Country	2007	2008	2009	2010	2011	2012	2013	2014
Austria	64.8	68.5	79.7	82.3	82.1	81.6	80.8	84.2
Belgium	86.9	92.4	99.5	99.6	102.2	104.1	105.1	106.7
Bulgaria	17.5	14.7	14.6	14.3	14.5	16.8	17.2	26.4
Croatia	37.1	38.9	48.0	57.0	63.7	69.2	80.8	85.1
Cyprus	53.6	44.6	53.4	56.3	65.8	79.3	102.5	108.2
Czech Republic	27.8	28.7	34.1	38.2	39.9	44.6	45.2	42.7
Denmark	27.3	33.4	40.4	42.9	46.4	45.2	44.6	44.6
Estonia	3.7	4.5	7.0	6.6	5.9	9.5	9.9	10.4
Finland	34.0	32.7	41.7	47.1	48.5	52.9	55.4	59.3
France	64.2	67.9	78.8	81.5	85.0	89.4	92.3	95.6
Germany	63.6	65.0	72.5	81.0	78.4	79.7	77.4	74.9
Greece	102.8	108.8	126.2	145.8	171.6	159.0	176.9	178.4
Hungary	65.6	71.6	78.0	80.6	80.8	78.3	76.8	76.2
Ireland	23.9	42.4	61.8	86.8	109.3	120.2	120.0	107.5
Italy	99.8	102.4	112.5	115.4	116.5	123.3	128.9	132.5
Latvia	7.2	16.2	32.5	40.3	37.6	36.9	35.9	38.5
Lithuania	16.7	15.4	29.0	36.3	37.3	39.8	38.8	42.5
Luxembourg	7.0	14.4	15.4	19.6	19.1	22.0	23.3	22.9
Malta	62.4	62.7	67.8	67.6	69.9	67.5	68.6	67.1
Netherlands	42.4	54.5	56.5	59.0	61.7	66.4	67.9	68.2
Poland	44.2	46.6	49.8	53.3	54.4	54.0	55.9	50.4
Portugal	68.4	71.7	83.6	96.2	111.4	126.2	129.0	130.2
Romania	12.7	13.4	23.3	30.5	33.9	37.6	38.8	40.5
Slovakia	29.9	28.2	36.0	40.8	43.3	51.9	54.6	53.3
Slovenia	22.7	21.6	34.4	37.9	46.1	53.4	70.5	80.8
Spain	35.5	39.4	52.7	60.1	69.5	85.4	93.7	99.3
Sweden	38.1	36.7	40.2	37.6	36.9	37.2	39.8	44.9
UK	43.5	51.7	65.7	76.6	81.8	85.3	86.2	88.2
Canada	66.8	67.8	79.3	81.1	81.5	84.8	86.1	86.2
Japan	183.0	191.8	210.2	215.8	231.6	238.0	244.5	249.1
US	64.0	72.8	86.0	94.7	99.0	102.5	104.8	105.0

Source: IMF World Economic Outlook, April 2016

However, this indicator is far from perfect. First, as follows from historical analyses, the debt-to-GDP ratio is not the only factor that determines the level of fiscal and financial risk of a country. That is, a public debt crisis may occur at various levels of the public debt-to-GDP ratio (see Section 6). Second, this measure is strongly pro-cyclical (i.e. it decreases in boom years and increases in times of recession or slowing growth). For instance, Table 3 shows the rapid increase of the GG gross debt-to-GDP ratio in EU countries during 2007–2010 as a consequence of the global financial crisis.

Pro-cyclicality relates to the construction of the indicator. In boom phases, the fiscal balance improves, which contributes to a decrease in or the slower growth of public debt



(the numerator). However, the nominal GDP (the denominator) grows faster. Furthermore, in countries that borrow in foreign currencies, the amount of public debt denominated in the national currency (the numerator) decreases as result of its appreciation. During a financial crisis and recession, these trends work in the opposite direction. Moreover, some contingent public liabilities that are not included in public debt statistics (see Section 2) may be called in as result of a crisis, additionally increasing the amount of the GG debt. Most often, this concerns implicit guarantees to a banking system (see Section 2.4).

Table 4: GG Gross Debt in EU and G7 Countries, % of Revenue, 2007-2012

COUNTRY	2007	2008	2009	2010	2011	2012
Austria	126.5	132.1	142.7	149.6	150.6	150.5
Belgium	174.5	183.0	199.0	196.4	197.5	195.8
Bulgaria	42.7	34.2	39.4	47.3	48.6	52.7
Croatia	82.5	74.7	91.9	111.6	126.8	140.6
Cyprus	130.6	113.5	145.8	150.0	179.0	216.8
Czech Republic	69.3	73.7	88.9	98.2	103.6	115.1
Denmark	48.8	60.9	73.5	77.8	83.3	82.1
Estonia	10.1	12.4	16.6	16.5	15.7	25.1
Finland	66.7	63.4	81.5	91.8	90.9	98.5
France	128.8	136.6	160.9	166.4	169.5	174.2
Germany	149.1	151.8	165.0	188.8	180.3	181.0
Greece	263.2	277.6	338.1	365.3	401.6	351.8
Hungary	147.1	160.2	170.2	180.3	151.3	171.5
Ireland	67.4	124.8	186.8	261.4	305.8	340.5
Italy	224.3	231.0	250.6	259.0	261.9	266.1
Latvia	25.4	56.8	108.6	125.9	120.0	115.7
Lithuania	49.1	44.9	82.7	107.8	115.5	123.7
Luxembourg	16.7	34.1	34.9	45.7	43.8	49.6
Malta	153.8	157.7	171.6	175.2	178.5	177.9
Netherlands	99.7	125.2	132.5	136.9	144.1	153.6
Poland	111.6	119.1	136.9	146.2	146.5	145.0
Portugal	166.2	174.4	211.4	225.7	240.4	303.1
Romania	33.5	36.9	73.9	89.9	100.4	113.5
Slovakia	91.4	84.9	106.1	126.9	130.1	157.7
Slovenia	54.6	52.1	83.1	88.8	108.0	122.9
Spain	88.3	108.9	153.9	168.0	194.8	231.6
Sweden	73.7	72.0	78.9	75.4	75.1	74.1
UK	108.0	123.3	169.8	197.0	209.2	212.2
Canada	145.3	161.1	189.0	197.7	207.3	214.5
Japan	567.4	532.6	699.1	676.7	728.0	765.2
US	176.1	194.6	261.5	290.1	301.7	318.7

Source: Moody's Statistical Handbook, November 2013



As result, the ability of the public debt-to-GDP ratio to predict the risk of a debt crisis and to provide an assessment of a country's macroeconomic and financial stability is limited. Attempts to eliminate its shortcomings may take different approaches:

- expanding the definition of public debt to include a portion of the contingent liabilities (see Section 2);
- comparing the nominal public debt (numerator) to a “potential” GDP (denominator) rather than the actual GDP in order to weaken the pro-cyclicality factor; or
- replacing the GDP with another macroeconomic aggregate, such as total GG revenue (actual or potential).

These proposals are not easy to implement and would require radical changes to public finance statistics – not just for a single country, but also at the international level. At the same time, even the successful implementation of these proposals would not entirely eliminate the pro-cyclicality of public debt measures.

For example, most existing methodologies for the estimation of “potential” GDP are based on “filtering” and extrapolating past GDP trends. However, the future trajectory of GDP growth may differ substantially from past trends (due to the limited regularity of business cycles).

In turn, the amount of GG revenue also greatly depends on the business cycle. This was demonstrated during the years of the market boom of the mid-2000s and the subsequent global financial crisis of 2007–2009 (see Dabrowski, 2012). As a result, the dynamics of the changes in the public debt-to-revenue ratio (Table 4) do not substantially differ from the dynamics of the changes in the public debt-to-GDP ratio (Table 3).

Nevertheless, financial investors consider the potential revenue of the GG in decision-making, which can explain the continued tolerance of financial markets to the large gross public debt of Japan (very low VAT rates, which may be increased at any time) and the US (numerous tax exemptions, which can be eliminated, and the option to increase the personal income tax).

4. Sources of Public Debt Financing

4.1. Domestic and External Sources of Public Debt Financing

Government debt can be financed from different sources: either domestic or external and official or commercial. The difference between domestic and external sources is based on residence: it is either within the borrowing country or outside its borders. Foreign exchange laws in most countries distinguish between residents and non-residents, and this classification can be used as the basis for determining the sources of public debt financing.

Among domestic official sources, central bank financing (i.e. monetizing government debt) shall be mentioned. Central bank financing results in the creation of additional money with potential inflationary consequences. Governments use central bank financing when other sources of financing are unavailable. Often, it occurs during wars, revolutions, state failures, periods where the government is unable to collect taxes, and extreme populist experiments in economic policy. Under normal conditions, there are constitutional and legislation limits to this type of financing, and occasionally there is a full ban on the monetary financing of public debt⁹ in order to protect central bank independence and the stability of the national currency.

Interestingly, under the conditions of the global financial crisis and an ultra lax monetary policy, many countries returned, in an indirect way, to this source of public debt financing. Within the framework of QE, central banks purchased government securities in large amounts in a secondary market. However, the formal purpose of QE is to increase the supply of money rather than to monetize the public debt.

To finance its gross debt, the government can also use its financial and non-financial assets, such as government deposits, other financial reserves (for example, originating from the fiscal surpluses of previous periods), sovereign wealth funds, and proceeds from selling government property (privatization).

However, in most of advanced economies and emerging markets, public debt is financed primarily in financial markets: through issuing government bonds of various maturities and,

⁹ We mean a direct credit to the government or the purchase of government securities in a primary market. Central banks can buy government securities in the secondary market or accept them as collateral against credit to commercial banks (i.e. use them as monetary policy tools).



sometimes, by direct borrowing from commercial banks. Budget arrears (see Section 1.4) represent the least “civilized” form of official debt financing (except monetary financing).

External financing can be provided by both official and commercial sources. Official sources consist of loans and credits from international financial institutions and regional integration blocks (the IMF, the World Bank, the EU, the Eurasian Economic Union, and regional development banks) and bilateral governmental loans. External commercial sources are the same as in the case of domestic funding: proceeds from the sale of government assets (privatization), government bonds placed in international financial markets, and loans from commercial banks and other financial institutions.

4.2. Benefits and Risks of External and Foreign Currency Borrowing

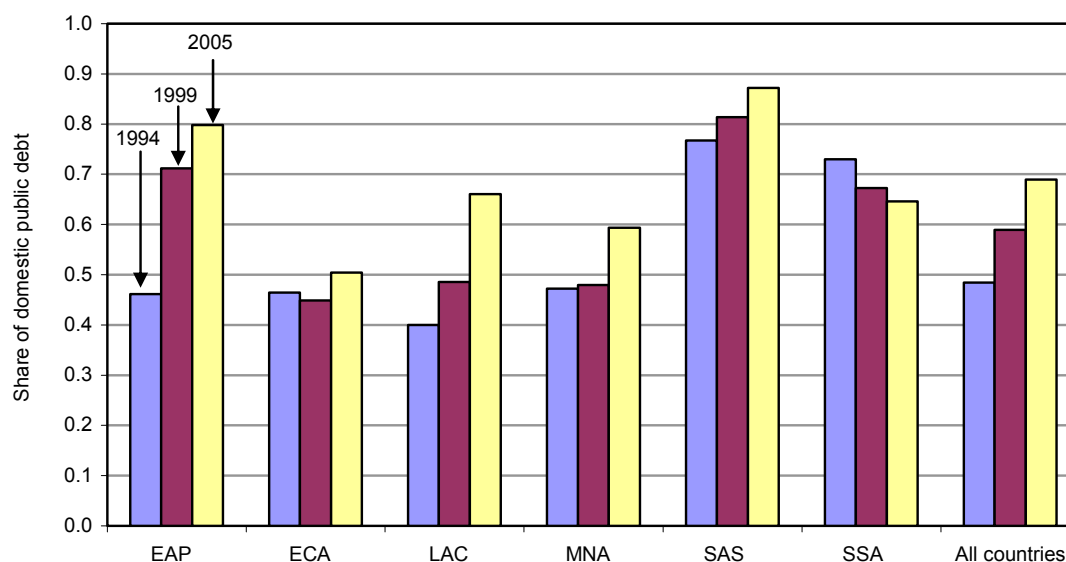
Apart from the classification of financial sources based on residence (Section 4.1), the second important criterion relates to the currency of borrowing: either national or foreign. These two classifications are not identical. In a world of unrestricted capital movement, non-residents can purchase government securities and lend to the government in its national currency, and residents can finance public debt denominated in a foreign currency.¹⁰ In financial analyses, sometimes these two criteria are confused, assuming the identity of the currency and residence, which is not necessarily in line with the reality of contemporary financial markets.

In extreme circumstances, the necessity to borrow from abroad may originate from an absence of non-inflationary domestic sources, as a result of either the poor development of the financial market or a lack of confidence of the residents in the future creditworthiness of the government. In the second case, it is also difficult to borrow from commercial external sources, and international financial institutions, such as the IMF or the World Bank, are the only available sources. However, these loans and credits are conditional on the acceptance of a fiscal consolidation program by the borrowing country.

Similar limitations concern borrowing in the national currency. In countries with a recent history of high inflation or hyperinflation, borrowing in the national currency is either impossible or very expensive (due to the high interest rate required by creditors). This situation, where economic agents (in both the government and the private sector) cannot borrow in their national currency, termed “original sin” by Hausmann (2001), is the primary rationale behind the so-called hard peg in the form of either a currency board or a unilateral dollarization or euroization.

¹⁰ To complicate the matter, there are also government securities that are formally denominated in the national currency and sold primarily to residents but indexed to changes in the national currency's exchange rate. For example, in the early 1990s, the federal government of Mexico issued *tesobonos* indexed to the US dollar.

Figure 6: Share of Domestic Debt in Total Public Debt, EMDE, %, Weighted Average



Comment: EAP: East Asia and Pacific, ECA: Eastern Europe and Central Asia, LAC: Latin America and Caribbean, MNA: Middle East and North Africa, SAS: South Asia, SSA: Sub-Saharan Africa
Source: Panizza (2008)

Lack of confidence in a national currency and a high level of spontaneous dollarization or euroization can continue for many years after the end of an episode of high inflation or hyperinflation or a currency crisis.

In less extreme cases (i.e. in the absence of a strong mistrust in the national currency), borrowing in a foreign currency may look attractive, at least in the short-term, due to lower interest rates. International markets with financial instruments denominated in global currencies are also deeper and more liquid than the domestic market of any emerging market economy using its own currency (even with the participation of non-residents). As a result, it is possible to borrow internationally in greater amounts and more cheaply. However, borrowing in a foreign currency creates unhedged liabilities. When a national currency depreciates, the total public debt denominated in the national currency (and its relation to GDP) increases automatically.

The opening of a public debt market in a national currency to non-residents deepens the market as well as increases its liquidity and competitiveness, which helps to decrease yields on government securities. However, there are often concerns about the stability of these markets in regards to adverse external shocks. According to the prevailing stereotype, in the



case an adverse shock, non-residents are the first to leave the market, while residents remain. Such a scenario is possible, as experienced by Hungary in October-November of 2008, when primarily non-residents sold their government bonds denominated in forints. However, in other cases, like Russia and Ukraine in 2008–2009 or Latin America in previous decades, residents leave the domestic debt market first.

It seems that the business model of financial investors (an orientation towards long- or short-term investment) is more important for the stability of the government bond market than the residence of investors. More generally, the opening up of an economy to the external world (including financial market integration) offers numerous benefits, but causes it to be more vulnerable to external shocks and dependent on global business and financial cycles.

Table 5: Share of Debt Denominated/Indexed in Foreign Currency in GG Total Public Debt, Selected EMDE, %, 2003–2012

COUNTRY	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CEE										
Albania	25.9	25.2	25.1	24.3	23.2	27.5	33.3	37.5	38.1	38.6
Bosnia and Herzegovina	98.9	98.9	98.9	98.6	96.7	54.9	60.2	64.6	64.2	61.3
Bulgaria	90.6	87.5	84.1	80.8	76.2	75.7	76.7	74.3	73.7	77.6
Czech Republic	3.5	9.3	12.3	11.9	9.4	13.8	16.2	17.7	16.3	18.4
Hungary ^a	–	25.7	28.2	28.1	28.7	37.6	44.7	44.6	49.5	40.9
Latvia ^a	49.6	56.6	56.0	58.1	61.6	47.7	78.2	83.9	86.2	87.7
Lithuania	61.2	61.7	60.3	68.4	67.2	64.2	70.3	73.6	74.0	75.6
Poland	32.4	26.7	27.4	25.5	23.5	25.7	25.7	26.3	30.1	29.8
Romania	81.5	76.6	82.3	80.2	65.6	59.7	59.9	58.3	57.7	58.9
Serbia	61.5	58.0	58.6	59.0	61.5	64.0	57.5	59.6	60.9	59.4
Turkey ^a	46.3	41.5	37.6	37.2	31.3	33.8	29.1	26.7	29.6	27.4
FSU										
Armenia	94.4	92.9	90.8	88.4	86.9	82.7	88.2	86.9	86.4	85.6
Belarus	29.4	22.8	23.9	14.3	24.6	28.3	50.2	46.4	75.6	48.8
Georgia	–	–	79.2	78.5	78.1	85.1	85.0	85.7	85.6	84.5
Kazakhstan	64.2	48.5	32.2	27.2	22.1	18.4	18.9	23.7	23.0	19.4
Moldova	87.7	83.7	81.2	80.4	79.1	83.9	84.9	83.4	90.8	91.1
Russia	81.2	79.9	75.2	48.6	32.8	30.6	33.8	28.1	22.4	21.7
Ukraine	73.6	77.6	79.7	84.4	78.8	75.4	67.3	64.4	61.7	48.1
Middle East and North Africa										
Egypt	28.1	23.4	21.0	19.5	18.6	18.4	18.9	16.9	15.4	14.7
Israel	25.5	25.5	26.2	25.1	22.6	19.8	18.5	17.1	17.4	15.9
Jordan	76.7	72.0	69.2	65.3	58.7	38.7	35.3	36.6	31.0	28.0
Lebanon	49.1	53.4	51.9	53.3	54.6	48.5	45.2	42.5	42.4	45.7
Morocco	27.2	23.9	21.1	19.7	20.0	21.0	22.8	24.0	23.1	23.7
Tunisia ^a	64.8	63.5	64.2	60.1	58.6	61.2	58.7	60.9	58.3	60.9



COUNTRY	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Asia										
Bangladesh	66.7	66.0	65.0	64.5	62.9	56.7	53.8	51.7	49.0	47.9
China	16.2	9.7	8.5	4.7	3.2	2.6	2.2	1.9	1.6	1.5
India	7.5	7.1	6.6	6.2	5.9	6.4	5.9	5.8	5.9	5.4
Indonesia	51.4	54.0	54.3	49.6	48.1	52.1	47.4	46.2	45.0	42.8
Malaysia ^a	19.8	16.0	13.1	10.3	7.3	6.6	3.8	4.1	4.0	3.4
Pakistan	47.8	47.0	46.3	45.7	45.2	44.7	48.2	46.2	42.6	38.9
Philippines ^a	53.2	53.0	50.0	49.9	46.9	49.4	50.2	47.3	45.5	39.9
Thailand	21.6	16.7	13.1	8.0	4.6	3.4	2.2	1.8	1.5	1.3
Vietnam	76.9	75.8	70.4	68.4	67.7	62.7	60.5	59.5	61.0	56.9
Sub-Saharan Africa										
Ghana	83.3	77.8	76.8	40.8	48.4	50.5	54.0	52.7	50.6	47.3
Kenya	58.4	59.1	57.9	54.7	49.5	50.5	50.8	46.1	48.6	47.4
Nigeria	73.6	68.8	61.9	22.3	16.3	18.2	16.5	13.5	14.3	13.8
South Africa	14.5	12.4	12.6	14.0	14.3	17.8	13.5	9.7	9.9	9.2
Latin America										
Argentina	75.8	75.6	51.4	52.1	52.8	52.5	54.1	58.8	60.1	59.0
Brazil	23.7	20.3	15.7	11.3	7.6	8.3	5.6	5.4	4.8	5.0
Chile ^a	90.7	84.0	71.7	67.8	51.5	40.0	22.8	17.3	17.2	16.1
Columbia	49.5	44.6	35.8	36.5	33.6	34.2	33.6	31.2	30.8	27.8
Mexico ^a	39.3	38.1	33.6	21.4	19.5	19.0	19.1	19.7	21.2	19.7
Venezuela ^a	64.8	65.6	67.7	64.8	69.9	75.3	66.7	59.4	61.7	50.6

Comment: ^a: central/ federal/ national government

Source: Moody's Statistical Handbook, November 2013

Despite the potential advantages of external debt financing, its role in EMDE decreased gradually (see Figure 6 and Panizza, 2008). This seems to be the result of the development of financial markets and the progress towards macroeconomic stabilization achieved by the EMDE in the 1990s and 2000s.

A similar picture is provided by Table 5, which presents the share of debt denominated or indexed in a foreign currency in GG total debt in selected EMDE. Transition economies (in CEE and the FSU) record relatively high shares as compared with other regions. Russia, Kazakhstan, and the Czech Republic are exceptions. However, there are substantial differences between countries in the same region, such as between Argentina and Brazil, India, Pakistan, and Bangladesh, Vietnam and China, Malaysia and Indonesia, and Hungary and the Czech Republic.

5. Factors Determining the Dynamics of the Public Debt-to-GDP Ratio

Despite the analytical shortcomings discussed in Section 3.2, the public debt-to-GDP ratio serves, most often, as the main measure of the quality and reliability of fiscal policy in a given country. Therefore, it is useful to analyze the factors that determine its dynamics.

The relationship between an increase in GG gross debt, a GG primary deficit/surplus, the dynamics of real GDP, and the real interest rate of government borrowing can be described by the following equation (see Escolano, 2010).

$$d_t - d_{t-1} = \frac{r_t}{1+g_t} d_{t-1} - \frac{g_t}{1+g_t} d_{t-1} - p_t \quad (5.1)$$

Where

d_t is the GG gross debt-to-GDP ratio at the end of period t

d_{t-1} is the GG gross debt-to-GDP ratio at the end of period t-1

r_t is the real interest rate in period t

g_t is the rate of growth of real GDP between t-1 and t

p_t is the ratio of the primary fiscal balance (deficit or surplus) to GDP in period t

It follows from Equation 5.1 that an increase in the GG gross debt-to-GDP ratio can be explained by:

- the GG primary deficit (i.e. when a non-interest GG expenditure exceeds its revenue) and
- a real interest rate of GG borrowing that exceeds the real growth rate of GDP.

Equation 5.1 illustrates the pro-cyclical character of the public debt-to-GDP ratio that was discussed in Section 3.2. During a boom phase, the real GDP growth rate is higher, debt financing is more easily available (and is reflected in lower real interest rates), and the fast growth of



budget revenue helps to improve the primary GG balance. During a recession, these indicators deteriorate, which leads to an increase in the public debt-to-GDP ratio.

Furthermore, if financial markets have doubts about a government's creditworthiness, the real interest rate increases rapidly, which additionally worsens the prospects for government solvency. This kind of vicious circle of market expectations¹¹ was observed before many sovereign debt crises (e.g. Mexico in 1994, Russia in 1997–1998, Argentina in 2000–2002, Greece in 2009–2010, Ireland in 2010, Portugal in 2010–2011, and Cyprus 2012–2013).

Equation 5.1 does not directly determine the role of inflation. After the beginning of the recent global financial crisis, some economists advocated for a moderate increase of the inflation rate as a measure to stimulate economic growth and to depreciate the stock of public debt (see Blanchard, Dell'Ariccia, & Mauro, 2010). However, the analysis of Equation 5.1 suggests that the only way, in which higher inflation can influence the debt-to GDP ratio is through real interest rates. If financial markets did not expect higher inflation, then real interest rates would decrease. However, such a scenario is relatively unlikely because financial markets can forecast higher inflation and prevent a decrease in real yields on government securities by demanding higher nominal interest rates in advance.

Equation 5.1 does not take into account changes in exchange rates. In fact, it holds only for countries whose governments do not borrow in foreign currencies. This is a somewhat unrealistic assumption for most EMDE (see Section 4.2). To incorporate exchange rate fluctuations, it is necessary to augment Equation 5.1 and include debts in foreign currencies (Ley, 2010):

$$D = D_h + eD_f \quad (5.2)$$

Where

D is total GG debt

D_h is debt in the national currency

D_f is debt in a foreign currency

e is the exchange rate (the price of a unit of foreign currency in the national currency)

Depreciation of the national currency increases the debt burden while appreciation decreases it.

¹¹ In economic literature, it is sometimes referred to as a mechanism of *multiple equilibria*.

6. Level of Public Debt and Default Risk

Following the EU Maastricht criteria (see Section 7), many analysts began considering a level of gross GG debt lower than 60% of GDP as relatively safe in terms of default risk. However, when looking at the history of debt crises (including financial crises with strong fiscal components) shown in Table 6, it is clear that problems with government solvency and its access to financial markets can occur at levels lower than 60% of GDP. Moreover, these issues can sometimes occur even when the debt-to-GDP ratio is decreasing (for example, see Latvia, Serbia, and Ukraine in 2008).

However, there are a number of advanced economies (see Tables 2 and 3), such as Austria, Belgium, France, Germany, Japan, the Netherlands, the UK, and the US, whose gross public debt exceeds, sometimes significantly, 60% of GDP and who are still considered fiscally solvent by financial markets. These countries hold the high credit ratings.

Table 6 shows that the fiscal problems of countries in crisis usually deepen after the start of the crisis as a result of a depreciating national currency, increasing interest rates, the costs associated with bank restructuring, and a declining GDP.

The Maastricht criterion of 60% of GDP and the upper limit of the GG deficit of 3% of GDP was a result of a political compromise among EU member countries and reflected the macroeconomic reality of the early 1990s. Furthermore, a country with a public debt-to-GDP ratio exactly equal to 60% could afford the fiscal deficit of 3% of GDP allowed by the Maastricht Treaty only when its real GDP grew by at least 3% per year (assuming that inflation was not higher than 2%, see Dabrowski, 2012). At that time, a growth rate of 3% was common in Western Europe. However, current average growth rates are substantially less. Hence, the fiscal deficit must be lower than 3% of GDP in order to stabilize the level of public debt in relation to GDP.

**Table 6: GG Gross Debt Before, During, and After Public Debt Crises, % of GDP**

COUNTRY	THE YEAR OF THE BEGINNING OF THE CRISIS (T)	T-3	T-2	T-1	T	T+1	T+2
Argentina	2001	31.9	36.3	38.1	44.8	137.7	116.4
Cyprus	2012	53.4	56.3	65.8	79.3	102.5	108.2
Greece	2010	102.8	108.8	126.2	145.8	171.6	159.0
Hungary	2008	60.5	64.7	65.6	71.6	78.0	80.6
Iceland	2008	24.6	29.3	27.3	67.6	82.9	88.3
Ireland	2010	23.9	42.4	61.8	86.8	109.3	120.2
Italy	2011	102.4	112.5	115.4	116.5	123.3	128.9
Latvia	2008	11.2	9.2	7.2	16.2	32.5	40.3
Portugal	2011	71.7	83.6	96.2	111.4	126.2	129.0
Romania	2009	12.5	12.7	13.4	23.3	30.5	33.9
Serbia	2008	54.1	40.3	33.4	32.4	36.0	43.7
Slovenia	2013	37.9	46.1	53.4	70.5	80.8	83.3
Spain	2011	39.4	52.7	60.1	69.5	85.4	93.7
Turkey	2001	n/a	n/a	51.3	77.9	74.0	67.7
Ukraine	1998	n/a	n/a	28.9	46.5	59.0	43.8
Ukraine	2008	17.1	14.3	11.8	19.7	34.1	40.6
Ukraine	2014	36.9	37.5	40.7	70.3	80.2	

Source: IMF World Economic Outlook, April 2016

Analyzing Table 6 and the credit rating of particular countries, it becomes obvious that the level of public debt in relation to GDP is not the single factor determining the potential risk of sovereign default. Other factors and circumstances as discussed above must also be taken into consideration, such as:

- debt dynamics – rapidly growing debt creates an additional risk factor;
- outstanding debt maturity – short maturity can cause problems with debt rollover;
- availability of liquid financial assets (i.e. the difference between gross and net debt, see Section 3.1);
- share of non-residents among creditors – a high share may increase the risk of their sudden exit from sovereign bond markets in the case of a global or regional crisis (see Section 4.2);
- share of short-term investors among creditors – the dominance of short-term investors also increases the risk of their sudden outflow in the case of an adverse shock;¹²

¹² However, if the public debt market is sufficiently liquid, the differences between long- and short-term investors essentially disappear. In cases of market stress, all may exit quickly.



- share of debt liabilities denominated in foreign currencies (important in regards to currency depreciation, see Sections 4.2 and 5);
- presence of contingent liabilities, especially in the banking and financial systems (see Section 2.4 on the consequences of the banking crises in Cyprus, Iceland, Ireland, Latvia, Slovenia, Spain, the UK, and the US, which led to rapid increases in the public debts of these countries);
- government openness and transparency – in particular, with respect to the public debt management system and the availability of complete information on the country’s public debt (IMF, 2001);
- financial reputation of the country – specifically, past episodes of default, high inflation and hyperinflation, banking crises, and the stability and reliability of the national currency, among others;
- political stability and the political ability to make the decisions necessary for fiscal consolidation, and the predictability of a country’s economic policy;
- presence or risk of the emergence of internal and external conflicts; this may substantially decrease the perception of a country’s solvency;
- tax potential of the country (see Section 3.2) and the availability of non-tax sources of revenue, including rent revenue related to natural resources;
- level of financial market development and liquidity;
- external demand for the country’s sovereign debt and other financial instruments, and the international role of the national currency; this factor explains the readiness of financial markets to finance the high level of public debt in the US, the UK, Japan, and the Eurozone; and
- international financial markets – specifically, changes in global liquidity and the mood of investors, as well as investor responses to unexpected shocks.

In summary, there is no a single norm of “safe” borrowing. Each country must define its maximum level of public debt based upon its macroeconomic and credit history and the experience of other countries, while considering its own particular situation. As the risk of default is determined by many factors and sometimes unpredictable circumstances (e.g. global shocks and panic in international markets), maximum debt should be set at a relatively low level and incorporate a sufficient margin of safety.

7. Normative Public Debt Ceilings

Many countries introduce direct or indirect limits on the level of public debt. Direct limits usually set the upper ceiling of public debt in either nominal value or in percent of GDP. Indirect instruments involve either the balanced budget principle or a maximum level of fiscal deficit, or a maximum growth rate of budget expenditure, assuming that such measures can help in reducing the public debt or at least slowing down its growth.

The above-mentioned norms and limits are called *fiscal rules* and are determined either by the constitution or by secondary legislation. Fiscal rules concern either the entire GG or its components (e.g. central (federal) government, federation entities, regions, and municipalities, among others). In some federations, member entities (e.g. states, provinces, or regions) adopt their own fiscal rules via constitutions or charters. For example, in the US, states cannot rely on federal government bailouts in case of a default and must maintain budget discipline themselves (Bordo, Markiewicz, & Jonung, 2011).

The EU and its Member States are the leaders in adopting and developing fiscal rules. This process began with the signing of the Maastricht Treaty in 1992, which introduced the Maastricht criteria of a GG deficit not higher than 3% of GDP and a GG debt not higher than 60% of GDP (as discussed in Section 6). The purpose of these norms was to ensure the stability of the common European currency, the euro. These upper limits were repeated in the Treaty on the Functioning of the EU, signed in Lisbon on December 13, 2007 and enacted on December 1, 2009.¹³

Additional fiscal rules were introduced in the Stability and Growth Pact (SGP) adopted by the European Council in Amsterdam on June 17, 1997 (European Council, 1997). The SGP strengthened the Maastricht criteria and introduced both sanctions (including financial sanctions) for breaching the criteria and the Excessive Deficit Procedure (EDP), which obliges those who breach the criteria to reduce their deficit to the 3% of GDP (or lower) level and provides support to meet this obligation. Like in the case of the Maastricht criteria, the justification for the SGP was to protect the stability of the euro and to avoid the problem

¹³ See <http://register.consilium.europa.eu/pdf/en/08/st06/st06655-re07.en08.pdf>.



of “free riding,” which occurs when a member country with poor fiscal discipline benefits from the common currency and can borrow at low interest rates (at the cost of others).

From the very beginning, enforcement of the Maastricht criteria and the SGP faced a *collective action* problem (i.e. there was a lack of consensus among EU Member States to undertake the actions required to maintain fiscal discipline). The reason was the large number of countries that were unable to follow the rules (Dabrowski, 2012). Consequently, they were not politically ready to punish their fellow Member States that had breached the rules. Ultimately, the SGP was weakened in 2005 through the addition of various exception clauses.

However, after the beginning of the Greek debt crisis in 2010, the SGP was strengthened by the addition of new and this time more automatic and financially painful sanctions. It also strengthened various preventative measures and introduced closer monitoring of public debt (Dabrowski, 2012). The earlier version of the SGP had focused solely on the deficit.

In addition, in 2011, the European Parliament and European Council adopted a directive recommending that all EU Member States introduce upper limits for public debt and fiscal deficits into their own national constitutions and legislation. Furthermore, since 2012, a procedure for monitoring national draft budgets was introduced under the name of the European Semester.¹⁴

Finally, on March 2, 2012, all EU Member States except the UK, the Czech Republic, and Croatia signed the Fiscal Compact,¹⁵ which came into force on January 1, 2013. In general, the Compact sets forth the principles of enhanced fiscal discipline inside the EU and at the national level, especially for Eurozone countries, in the form of an intergovernmental treaty.

As a result of the above legislative initiatives at the EU level, the process for adopting new fiscal rules in EU Member States was accelerated. The European Commission conducts periodical surveys and analyses of these regulations and maintains a fiscal rules database.¹⁶

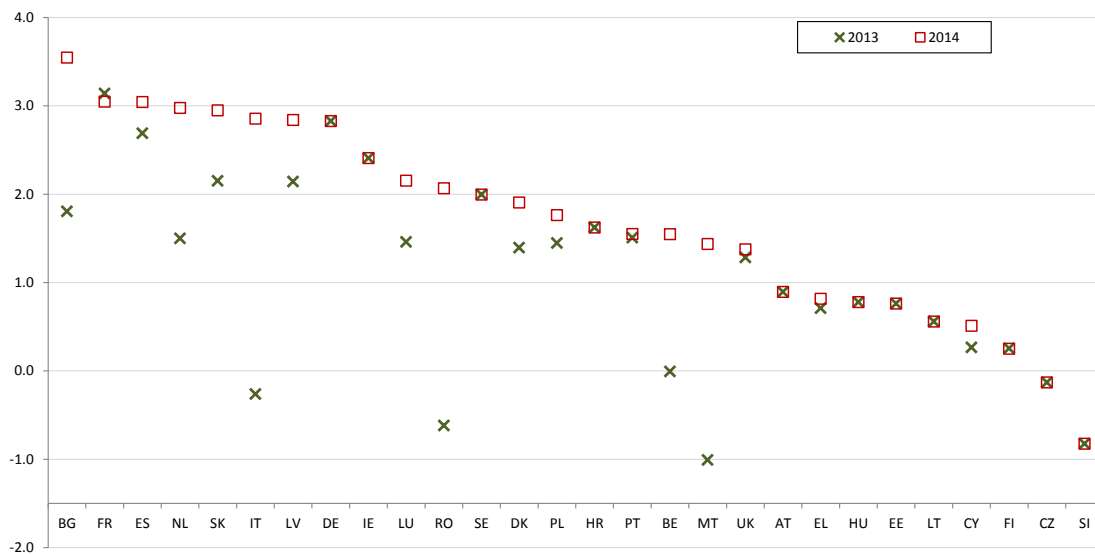
Due to differences in national constitutions and legal systems, national fiscal rules are not homogenous and, consequently, are not easily comparable. Nevertheless, the European Commission attempted to calculate a cumulative fiscal rules index (FRI) for each EU Member State, which is presented in Figure 7. The strictest rules were adopted in Bulgaria, France, Spain, the Netherlands, Slovakia, Poland, UK, Italy, Latvia, Germany, Ireland, Luxembourg, Romania and Sweden. With more relaxed rules, Slovenia, Czech Republic, Finland and Cyprus founded themselves on the other end of the spectrum.

14 See <http://www.consilium.europa.eu/special-reports/european-semester> for details of this procedure.

15 Its full title is the Treaty on Stability, Coordination, and Governance in the Economic and Monetary Union. See http://www.eurozone.europa.eu/media/304649/st00tscg26_en12.pdf.

16 For the results of the latest survey (from the end of 2014), see http://ec.europa.eu/economy_finance/db_indicators/fiscal_governance/documents/fiscal_rules_database_en.xls.

Figure 7: Fiscal Rules Index for EU Member States, 2013-2014



Source: http://ec.europa.eu/economy_finance/db_indicators/fiscal_governance/documents/f4_nfr_ms_en.pdf

One of the first explicit constitutional provisions on the upper limit of public debt (60% of GDP) was adopted in Poland in 1997. To accompany this change, Poland set two further maximum levels of public debt via secondary legislation (50 and 55% of GDP). A breach of these limits was to trigger corrective fiscal measures. In practice, however, subsequent governments have preferred to resort to creative fiscal accounting to avoid the adjustments required.

A similar constitutional regulation (total GG debt not higher than 60% of GDP) was adopted in Spain in 2011; however, different from Poland, it allowed for some exemptions – namely for recessions, natural disasters, or other emergencies. In Bulgaria, since 2003, the forecasted public debt-to-GDP ratio at the end of the budget year cannot exceed that of the previous year. However, this regulation becomes active only if the public debt-to-GDP ratio exceeds 60%.

Germany, however, chose another path, adopting a constitutional amendment in 2009 known as the “debt break” (*Schuldenbremse*); although, the amendment is not directly related to the level of public debt (Economist, 2011). Starting from 2016, the debt break sets the ceilings for the “structural” deficit (i.e. the cyclically-adjusted deficit) of the federal budget and the budgets of federal lands (*Länder*) at a level not higher than 0.35% of GDP. Commencing



from 2020, federal lands will not be allowed to maintain a structural deficit. However, the constitution of Germany provides exceptions during times of natural disasters and deep recessions.

Several other EU countries have followed Germany's lead: Austria (2011), Italy (2012), and Slovenia (2013). Similar constitutional regulations were also adopted earlier – by non-EU member Switzerland in 2001 and by Sweden in 2007 (when the regulations came into effect). Interestingly, the Swedish constitutional amendment requires a structural fiscal surplus of 1% of GDP.

Contrary to Europe and despite numerous legislative initiatives, the US Congress was never able to adopt a “balanced budget amendment” to the federal constitution; although, similar constitutional rules are in force in most states. For example, in 1995, after the adoption by the House of Representatives of a constitutional amendment setting a maximum nominal federal debt ceiling, the amendment failed by just one vote of the required majority in the Senate.

Although since the first World War there has been a practice of using federal law to set the upper borrowing limits of the US government, this practice should not be perceived as a systemic restriction on the growth of public debt. Despite partisan conflicts, these limits have often been revised upward (Austin & Levit, 2013). Rather, the practice serves as a tool to allow the federal government to place US Treasury bonds on the market. Furthermore, the upper debt limit is often not coordinated with the budget appropriation laws that define the expenditure commitments of the federal government.

The effective constitutional and legal regulations that discipline a government's finances favorably influence financial market confidence in a given government (as these regulations mitigate the risk of a country's default) and help the country to borrow at lower interest rates (Hatchondo, Martinez, & Roch, 2012).

8. Conclusions for Macroeconomic Policy

Since 2008, the world economy has been facing the consequences of the global financial crisis. As a result, many economic policy paradigms have been revised, and this process is far from complete. The policy area, which needs a fundamental rethinking (especially in advanced economies), relates to the role of public finance and fiscal policy in ensuring economic growth and financial stability. The primary task will be to develop a new analytical approach and detailed indicators, which are necessary to provide a correct diagnosis and effective recommendations.

The rapid growth of public debt in many advanced economies, which has reached record-high peacetime levels, has raised serious doubts about the future creditworthiness of these countries. The causes of this debt explosion are numerous: overly optimistic assessments of fiscal sustainability before the crisis, the costs of the crisis itself (decreased government revenues, an automatic increase in social expenditures, and the costs of banking system restructuring), and countercyclical fiscal policy aimed at overcoming the recession (Dabrowski, 2012).

Leaving aside the question of the efficiency of and economic rationale behind a countercyclical fiscal policy, implementing this type policy during a deep financial crisis requires the development of sufficient fiscal buffers during “good” times.

The same is true regarding financial support for the banks and other enterprises affected by the crisis. Again, it is outside the scope of this paper to discuss the economic rationale of this type of support. However, if one considers such support feasible and necessary, adequate budget space must be created for it in advance.

All of this leads us to the question of what are the “safe” levels of budget deficit and public debt during “normal” or “good” times.¹⁷ Most likely, these levels are lower now than in the early 2000s. At the same time, one should not forget that there is no single norm of fiscal safety. As experience suggests, the risk of default may occur at various levels of public debt, and, sometimes, at a very low level by international comparison. In fact, the “safe” borrowing level varies by country and can depend on many, sometimes unpredictable, factors and circumstances (Section 6).

¹⁷ Due to globalization and the irregularity of business cycles, it is difficult to determine at which phase of the cycle a given economy is.



The additional argument in favor of a cautious analytical and policy approach is associated with the highly pro-cyclical nature of relative measures of deficit and debt (see Section 3.2) that are applied in cross-country analyses. Furthermore, these measures very often serve as the basis of the formal fiscal rules described in Section 7. There has yet to be good substitute for the debt-to-GDP ratio (the debt-to-revenue ratio is also pro-cyclical). However, one should not forget about its analytical limitations.

The experience of the 2007-2009 global financial crisis also points to the necessity to improve estimates of contingent liabilities, especially those that relate to financial sector stability (Section 2.4).

Looking ahead, the correct estimation and accounting of public debt and other contingent liabilities (especially implicit liabilities of the public pension and healthcare systems) are fundamentally important in the context of population decline and aging. In some countries, such liabilities exceed the official public debt by several times. As a result, official statistics often do not paint an accurate picture of a government's debt and the true size of the fiscal burden that will be inherited by the next generations of taxpayers.

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