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**ECONOMICS**

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*Sociology*

**Irina Bilan,**  
*Department of Finance, Money and  
Public Administration,  
Faculty of Economics and Business  
Administration,  
"Alexandru Ioan Cuza"  
University of Iași,  
Iasi, Romania,  
E-mail: irina.bilan@uaic.ro*

**Angela Roman,**  
*Department of Finance, Money and  
Public Administration,  
Faculty of Economics and Business  
Administration,  
"Alexandru Ioan Cuza"  
University of Iași,  
Iasi, Romania,  
E-mail: aboarini@uaic.ro*

*Received:* June, 2014  
*1st Revision:* September, 2014  
*Accepted:* October, 2014

**DOI: 10.14254/2071-  
789X.2014/7-4/4**

**JEL Classification:** E31, E51,  
H63

**Keywords:** public indebtedness, inflation, money supply, debt  
amortization.

## Introduction

As various countries resorted more and more to public indebtedness in order to raise additional financial resources unobtainable by the usual mean of taxes, theoretical and practical concerns to identify and assess the effects of state indebtedness on different aspects of the economic and social life intensified in recent years.

When promoted with caution and on appropriate destinations, public indebtedness can prove to be an enhancing factor for national economy's growth and development. However, when promoted without limits, on inadequate structures and for covering state's unproductive expenditure, public indebtedness can lead to undesirable effects. The over indebtedness of one country may adversely affect its economic growth rate, while budgetary expenditure on interests can affect public authorities' ability to carry out other types of public expenditure, with negative social consequences.

Referring to the monetary front, public indebtedness is usually appreciated to have a neutral character. Unlike other alternatives of raising public financial resources, it is not

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Bilan, I., Roman, A. (2014), Interconnections between Public Indebtedness and Inflation in Contemporary Economies, *Economics and Sociology*, Vol. 7, No 4, pp. 59-70. DOI: 10.14254/2071-789X.2014/7-4/4

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## INTERCONNECTIONS BETWEEN PUBLIC INDEBTEDNESS AND INFLATION IN CONTEMPORARY ECONOMIES

**ABSTRACT.** This paper aims to analyze the specific interconnections established between public indebtedness and inflation, both from the perspective of considering inflation as a result of public borrowing and of voluntarily promoting inflation to reduce the (real) value of public debt and to ease its burden. It identifies the channels through which these effects are occurring, it determines the conditions of their manifestation and evaluates their relevance for different (developed and developing) contemporary economies. Although promoting irrational public borrowing may lead to inflation, such a correlation proved to be quite difficult to identify in the practice, especially for currently developed economies.

considered to adversely affect one country's monetary stability, as it mostly involves only the redistribution of the resources already existing in the economy. However, there are some particular cases when public authorities' indebtedness through means of public borrowing can lead to an increase of the existing money supply and, thus, create favorable conditions for the manifestation of inflation. Also, when significant public debts are accumulated, public authorities could be more willing to reduce them by unconventional means, such as the amortization through inflation.

On such grounds, the paper aims to analyze the specific interconnections established between public indebtedness and inflation, both from the perspective of considering inflation as a result of public indebtedness through means of internal and external (in foreign currency) borrowing and of voluntarily promoting inflation in order to reduce the (real) value of public debt and, thus, ease its burden. The qualitative assessments made with regard to these interconnections' channels and circumstances of occurrence will be completed with quantitative ones aiming to identify, based on the analysis of relevant statistical data provided by national (the National Bank of Romania) and international (IMF, European Commission) institutions, possible connections between public indebtedness and inflation in the practice of various developed and developing countries.

The paper is divided into three main sections, as follows: the first one is assessing the effects of public indebtedness on the money supply and inflation; the second one evaluates the possibility of public debt amortization through inflation and identifies its circumstances of occurrence; the third one is devoted to the analysis of the correlation between public indebtedness (evaluated through the annual growth rate of nominal public debt) and the annual inflation rate, for various developed and developing countries. The paper ends with conclusions.

## **1. The Effects of Internal and External Public Indebtedness on Money Supply and Inflation**

The potential effects of public indebtedness on inflation are resulting from the possible impact of loans contracting by public authorities on the supply of money and thus on the price level and the purchasing power of money. The negative impact of loans contracting for budget deficit financing on price levels is widely accounted for in the literature, mainly for developing countries (Patience and Augustine, 2008; Zebulun and Tapas Kumar, 2010; Avgeris and Katrakilidis, 2013; Catao and Terrones, 2003; Lozano, 2008; De Haan and Zelhorst, 1990). However, appropriate explanations on the internal mechanisms of this effect are sometimes missing.

It is generally accepted that loans contracted by public authorities to finance annual budget deficits should be treated differently from those contracted over the short-term, to cover cash deficits of the current budget execution. If the first ones, being launched on longer terms and usually directly on the financial market, do not increase the money supply, not the same thing happens in the conditions of treasury deficits financing. Frequently their coverage is achieved by *contracting short-term loans from the central bank, as an advance on the account of future budgetary revenues*. Such flows have no natural corresponding in real flows, and the danger exists that expected budgetary revenues will not be raised, not even later (Filip, 2002). In the latter case, the repayment of loans is postponed until the procurement of other compensating resources, the money supply issued without corresponding support in goods and services possibly causing disruptions to the assembly of monetary and financial flows and to the real ones, resulting in the manifestation of inflation.

The finding of such negative effects on money supply led, in many modern economies, to the prohibition by law not only of the direct financing of the (annual) budget deficit by inflationary money issuing, but also of public authorities' access to debt resources from the central bank, on short-term, in order to cover the temporary gaps between their

receipts and expenses. In the Economic and Monetary Union countries, for example, the concern for monetary stability and ensuring budgetary discipline led to the prohibition, by the Treaty of Maastricht (art. 101(1), of providing loans, even on short-term, by national central banks to various public entities. When preparing for Romania's integration into the European Union, this interdiction was also assimilated in our national legislation through the Law no. 312/2004 concerning the statute of the National Bank of Romania (art. 7).

An increase in the money supply and, by this means, a possible deterioration in the purchasing power of the domestic currency can occur not only in the context of public authorities indebtedness to central banks, but also to *commercial banks or other credit institutions* (savings banks, investment banks, foreign trade banks, etc.), because of their ability to create scriptural money and of the specific refinancing relationships that they establish with the central bank.

The impact on the amount of money in circulation depends on how public debt securities are perceived, either as adding to existing bank assets or as a substitute for them. When commercial banks maintain the liquidity coverage ratio unchanged, government securities come to replace loans granted to the private sector of the economy in their asset portfolio, so that the total money supply is not affected and, therefore, there is no danger of inflation. Conversely, when commercial banks accept (or have to accept) to modify their liquidity coverage ratio, government securities no longer appear as a substitute but complementary to other bank assets, so that both bank assets and liabilities grow, which implies the growth of the broad money supply (including the scriptural money held in deposit accounts at commercial banks) and thus a possible increase of prices and rising inflation.

A more consistent increase in money supply, with inflationary potential, is possible when, by purchasing public debt securities, credit institutions reduce their lending resources and hence turn, in order to complete them, to loans from the central bank. The determinant of money supply increase is, on this background, the involvement of the central bank in the process of lending to commercial banks, through the practice of refinancing operations, operations that could lead to an increase of liquidity in the banking system.

In relation to this channel for money supply increase, it is necessary to note that, in many contemporary economies, banks are an important category of (direct and indirect) lenders to public authorities. The data summarized in *Table 1* show that in the case of some European Union Member States, such as Belgium, Italy and Poland, the share of public credit in overall assets held by monetary financial institutions, other than central banks, has frequently exceeded 10%, after 2000. In contrast, in other countries, such as Bulgaria, Latvia and especially the UK, the share of public credit was substantially smaller, either as a result of lower public debts or of developed domestic financial markets, allowing public authorities to raise debt resources mainly from other institutional lenders.

It can also be seen that the requirements set by the status of member country of the European Union or, in the case of some countries in Central and Eastern Europe, the status of preparing for integration, and the favorable financing conditions in the financial markets were reflected, in the period before 2008, in a reduction, in all analyzed countries, of the share of government loans in total assets of the monetary financial institutions.

Once the economic and financial crisis emerged, however, the trend was reversed in almost all countries included in the analysis, the increase being more pronounced in countries with riskier public debts, such as Italy, Ireland, Portugal and Spain. The explanation for increasing banking sector preference for public debt securities holding derives not only from the lack of viable lending alternatives to the real economy, on the background of the difficulties encountered by the private sector of the economy, but also from the significant amount of funding requested by public authorities, in the context of the substantial budget deficits they had to cover.

Table 1. The share of public credit in overall assets of the aggregate monetary balance of monetary financial institutions (other than central banks) in some EU Member States (2000-2012)

Country	2000	2002	2004	2006	2008	2010	2012
Belgium	22.9	21.5	19.5	14.8	11.1	11.1	10.5
Bulgaria	...	...	8.7	6.7	4.4	5.0	6.6
France	9.1	9.0	8.5	7.7	6.7	7.0	5.9
Germany	11.8	11.1	11.2	9.8	7.6	9.2	8.7
Ireland	7.3	6.6	8.2	5.6	4.3	7.8	7.3
Italy	11.9	10.1	10.1	8.2	11.2	13.3	14.8
Latvia	...	...	4.0	2.1	5.2	2.6	2.8
Lithuania	...	...	10.8	5.4	4.2	6.5	8.0
United Kingdom	0.7	0.7	0.6	0.3	0.4	1.3	1.4
Poland	...	...	19.7	17.1	15.9	16.9	14.8
Portugal	3.2	3.1	3.0	2.8	2.4	11.0	7.7
Spain	11.2	11.8	9.1	5.0	5.0	7.2	10.4

Source: authors' calculations based on data from the European Central Bank (2014).

Although lending to public authorities can be considered, in principle, to be no risk bearing, which justified the preference for such placements, the realities of the sovereign debt crisis highlighted the existence of real risks, involving losses for creditor banks. More relevant may be considered the case of Greece where banks, as private lenders, suffered losses of billions of euros by writing off part of the Greek government debt, thus creating favorable conditions for a durable increase in the money supply in circulation, with potential negative effects on the price level.

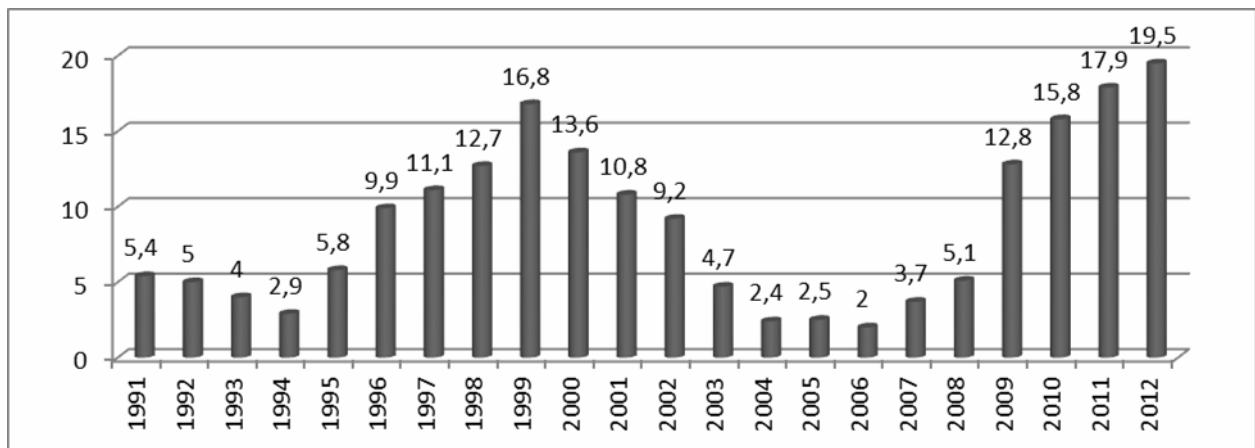


Figure 1. The share of public credit in overall assets of the aggregate monetary balance of monetary financial institutions (other than central banks) in Romania (1991-2012)

Source: authors' calculations based on data from the European Central Bank (2014) (for the period 2005-2012) and the National Bank of Romania (2014) (for the period 1991-2004).

Regarding the particular situation of Romania, on the background of a domestic capital shortage and a low degree of development of financial markets, the procurement of borrowed financial resources by public authorities, from the domestic market, was achieved, in the first decade of transition, especially through indebtedness relationships with commercial banks. Banks were the only creditors of the government until 1998. On such a background, as the data in *Figure 1* show, the volume of loans granted to public authorities,

either directly or through the purchase of their debt securities from the financial market, expressed as a share of total assets of credit institutions, increased continuously until 1999, when it reached 16.8% of the total.

Although, subsequently, substantial improvements were registered, they did not last. Since 2007, on the background of worsening consolidated budget deficits and the turmoil from the foreign markets, limiting access to debt financing in these markets, Romanian public authorities were practically forced to turn again to the resources of commercial banks. The share of public credit in overall assets of credit institutions increased significantly, from only 2% in 2006 to 19.5% in 2012. Although the overall assets of monetary financial institutions increased during 2006-2012, from 51.91 billion euros to 91.2 billion euros, the value of public credit reflected in their structure increased in a more pronounced rhythm, from 1.0 billion euros to 17.7 billion euros. According to our calculations, the amount of 17.7 billion euros represented approximately 34.6% of the total direct public (government and local) debt existing at the end of 2012, estimated at about 51.3 billion euros.

Based on the foregoing, we believe that through the way of raising borrowed financial resources, in significant proportions from banks, Romanian public authorities did not support the disinflation process but created favorable conditions for feeding the inflation and deteriorating national currency's purchasing power. In this regard, Romanian public authorities could be held responsible for their insufficient concern for the development of an effective domestic market for government debt securities, allowing to raise a greater amount of borrowed resources from other institutional investors (insurance companies, pension funds, etc.) or even individuals and businesses, so that no real increase in the money supply would occur, but only a redistribution of the financial resources already existing in the economy.

Amplifying the volume of money supply, on the background of public authorities' indebtedness, is not specific exclusively to domestic debt but, on the contrary, conditioned by the practiced exchange rate regime, *it can also occur when public authorities are contracting loans from abroad, denominated in foreign currency*. In the case of a fixed exchange rates regime, central bank takes a firm commitment to intervene on the foreign currency market through foreign currency sale/purchase transactions, in order to maintain the exchange rate at a certain level. When public authorities are contracting loans from abroad, the central bank intervenes by buying foreign currency, which has the effect of increasing foreign exchange reserves but also, simultaneously, increasing the supply of domestic currency on the market. On the contrary, in the case of a pure floating regime, the central bank does not have to intervene to keep the exchange rate at a certain level. When public authorities sell on the currency market the amounts borrowed on foreign currency, the monetary base and money supply are not affected. However, there may be registered an appreciation of the national currency, with negative impact on the balance of trade.

Although the indebtedness of public authorities can generate, in some cases, the increase of the money supply, it is necessary to note that *not any increase in money supply in circulation will automatically lead to inflation*. Although the increase in money supply may lead, in the first instance, to a price increase, this may not signify a permanent, inflationary increase, when it is produced later also an increase in the quantity of goods and services on the market, reflected in an equivalent increase in the demand for money.

Therefore, when debt resources are used by public authorities to finance activities having as a final result an increase in production (primarily investment projects), the initial increase of the money supply will find its correspondence in an increase in volume of goods and services which are the object of transactions, and the price increase will not be permanent. Thus, public indebtedness to finance actions that involve the growth and development of the national economy does not generate, in principle, inflation (Jain and Kaur, 2009). On the contrary, if the resources are used to cover final consumption expenditure without a final

result the further increasing of GDP, the increase of the prices can be permanent and the financing activity can become inflationary.

## 2. Accepting Inflation as an Alternative Public Debt Reduction Option

On the background of high public debt accumulations in some developed and developing countries, *the possibility to "accept" inflation as mean of public debt amortization* emerged. When public debt raises to unsustainable levels, the central bank could conduct a loose monetary policy, putting into circulation an additional amount of money so as to create an inflationary bias and to reduce the real value of interest expenditures and credit rates (Caron, 2007). Thus, although the nominal size of the debt remains unchanged, inflation acts to reduce its real size and therefore its burden.

*The degree of central bank independence to the government*, in other words the ability of public authorities to influence the stance of monetary policy, as well as the *credibility* of the latter are factors determining the possibility of promoting inflation in order to reduce the real burden of public debt (Krause and Moyon, 2013; Martin, 2013). Ensuring the full independence of the central bank reduces the risk it promotes inflation to amortize public debt, while a low degree of monetary policy credibility makes it possible for inflation to be at least partly anticipated, being reflected in higher interest rates requested by cash holders when lending money to governments. In this way, the effects on the real value of public authorities' financial liabilities are greatly diminished.

*Public debt's structure* also represents an important landmark for appreciations, from this point of view the amortization through inflation becoming a viable option subject to the fulfillment of a plurality of conditions:

- *An important share of public debt must be expressed in the national currency of the indebted country*, whose purchasing power is reduced under the impact of inflation. In the case of foreign currency debt these effects do not occur, as foreign currency resources for loan repayments and interests are purchased, on the background of inflation, at higher exchange rates reflecting the impact of national currency depreciation against the foreign currency in which public debt is denominated;
- *Public debt instruments may not provide investors with protection against inflation*. Public debt amortization through inflation is not an option if a large share of the debt results from floating rate debt instruments or debt instruments indexed to the growth rate of prices or exchange rates, when the value of the principal and/or interest is periodically adjusted to meet the changes in prices or exchange rates;
- *Long-term public debt must hold a significant share in total public debt*, as the amortization through inflation is not applicable for short-term debt.

In light of previous requirements and considering the particularities of public debt structures in different countries, the amortization through inflation finds fertile ground especially in the currently considered developed economies. The temptation to inflate the debt away might be greater for these countries when public authorities are significantly indebted in national currency to the nonresidents of that country, in which case the negative effects of inflation could be at least partly transmitted to foreign countries. For developing or underdeveloped countries, borrowing mostly from abroad (especially from international financial and banking institutions) and in foreign currency, the potential effects of inflation on reducing public debt burdens would be much lower.

This implication of public debt turns out to be extremely relevant in the current context of strong, unsustainable public debt growth registered in many developed countries. Against the background of a still fragile economic recovery and of the difficulties experienced by public authorities of overindebted countries in ensuring a drastic reduction of their budget

deficits, the amortization through inflation is sometimes invoked in the literature (Amo-Yartey *et al.*, 2012; Aizenman and Marion, 2009; Bilan, 2010) as a potential solution to restore public finance sustainability and reduce public debt levels to more acceptable levels. We consider, however, that such a desindebtedness strategy, although very tempting and easy to implement, is not without negative consequences, as inflation risks getting out of control.

In relation to United States' situation, heavily affected by the crisis, J. Aizenman and N.P. Marion (2009) are warning about the temptation of the U.S. authorities to allow the emergence of inflation in order to reduce the burden of public debt. According to the calculations of these authors, an inflation rate of 6% per year for four years would ensure the reduction of U.S. government debt expressed as a share of GDP with 20%, a scenario similar to the one after the Second World War. This temptation is fueled, in the authors' opinion, by the major proportions of the debt held by non-residents, which would allow for the U.S. debt burden to be partly passed on to other countries.

Regarding the euro area Member States, the possibility of amortization of their public debt through inflation is apparently limited, given the fundamental objective assumed by the European Central Bank to maintain price stability and a high degree of independence of this bank. However, in the context of sovereign debt crisis deepening, the fidelity of this institution to the assumed mandate was seriously questioned, existing the risk that it sacrifices its primary objective to others more stringent, as that of reducing the debt burden of overindebted member states. B. Eichengreen appreciated in this regard that it is not entirely clear that (moderate) inflation will not be part of the public debt story in the euro area countries (Eichengreen *et al.*, 2011).

Effectively, despite the general contesting attitude regarding the lack of budgetary discipline in the European Monetary Union Member States, the European Central Bank agreed, in times of crisis, not only to lend money to the banking system through loans secured by (highly risky) government bonds, but also to acquire amounts of securities issued by governments of countries with problems such as Greece, Portugal, Ireland, Italy and Spain, along with other central banks members of the Eurosystem, from the financial market in order to ensure its stabilization. Thus, at the end of 2011, in the balance sheet of the Eurosystem were present bonds issued by governments from euro area countries purchased on the secondary financial market under the Securities Market Programme in total amount of 211.4 billion euros (ECB, 2012, p. 16). Although without pretending to determine, unequivocally, a direct link between the two phenomena, we can see that, per all Member States of the euro area, the harmonized index of consumer prices increased, according to Eurostat, with 2.72% in 2011 and 2.49% in 2012, thus being exceeded the 2% quantitative target for assessing price stability by the ECB (Roman, 2009, p. 205). On the contrary, the period before the crisis was characterized by maintaining the growth rate of the harmonized index of consumer prices to a level closer to the 2%, varying between 2.08% and 2.19% in 2003-2007.

### **3. Some Evidence on the Interconnections between Public Indebtedness and Inflation in Contemporary Economies**

Although, according to above mentioned reasons, there are sufficient reasons to believe that promoting irrational borrowing of public authorities may lead, in particular circumstances, to inflation, such a causal relationship is quite difficult to identify in practice, due to the diversity of factors that mark the evolution of the inflation rate in a country and in a certain amount of time.

Table 2. The evolution of the nominal public debt annual growth rate and inflation rate in some developed and developing countries (2000-2012)

Country	Indicators <sup>1</sup>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Argentina	PDR(%)	5.2	11.2	256.4	1.9	8.5	-18.5	8.0	9.4	10.4	11.4	5.5	16.6	17.4
	IR (%)	-0.7	-1.5	41.0	3.7	6.1	12.3	9.8	8.5	7.2	7.7	10.9	9.5	10.8
Bulgaria	PDR(%)	...	0.7	-12.4	-8.5	-6.5	-14.0	-9.5	-7.9	-4.1	-0.6	-1.0	10.4	23.4
	IR (%)	11.3	4.8	3.8	5.7	4.0	7.4	6.1	11.6	7.2	1.6	4.5	2.1	2.8
China	PDR(%)	31.7	19.0	17.3	14.7	13.4	10.1	7.4	48.7	2.3	13.1	123.5	-10.5	-1.5
	IR (%)	0.9	-0.3	-0.4	3.2	2.4	1.6	2.8	6.5	1.2	1.9	4.6	4.1	2.5
France	PDR(%)	2.7	3.1	7.0	10.2	7.3	6.4	0.6	5.2	8.8	13.3	6.8	7.7	6.6
	IR (%)	2.0	1.3	2.2	2.2	2.0	1.6	1.4	2.6	1.0	0.9	1.8	2.4	1.3
Germany	PDR(%)	0.6	0.9	4.2	6.8	5.1	4.8	3.1	1.1	4.0	7.1	16.4	1.3	3.8
	IR (%)	2.2	1.4	1.2	1.0	2.3	2.1	1.4	3.1	1.1	0.8	1.9	2.3	2.0
Greece	PDR(%)	11.4	7.7	4.8	5.5	9.0	6.7	14.8	6.8	9.6	13.9	10.0	8.3	-13.7
	IR (%)	3.7	3.5	3.5	3.1	3.1	3.5	3.2	3.9	2.2	2.6	5.2	2.2	0.3
Island	PDR(%)	2.2	26.2	-3.0	0.0	-6.8	-18.5	35.1	8.2	173.7	26.5	5.5	20.0	1.4
	IR (%)	4.1	8.7	2.0	2.8	3.9	4.1	7.0	5.9	18.1	7.5	2.5	5.3	4.2
Ireland	PDR(%)	-12.7	11.5	1.1	3.4	2.2	0.4	-1.5	7.8	68.8	31.4	37.9	17.4	13.2
	IR (%)	3.3	5.5	3.8	4.6	3.2	2.5	2.3	2.5	3.2	2.1	-2.8	-0.6	1.6
Kuwait	PDR(%)	-12.1	-5.2	-3.8	-6.4	-7.1	2.7	-6.6	23.8	0.4	-10.8	8.6	-4.5	-1.9
	IR (%)	0.4	2.9	-0.3	0.9	2.6	4.5	3.6	7.5	9.0	1.2	4.0	4.8	2.9
Latvia	PDR(%)	11.9	25.2	6.2	20.5	14.8	-0.6	3.4	4.1	141.2	55.3	18.3	5.3	5.7
	IR (%)	1.7	3.2	1.5	3.5	7.4	7.1	6.8	14.0	10.4	-1.4	2.4	3.9	1.6
Lithuania	PDR(%)	-12.4	2.4	4.4	3.9	1.0	9.4	12.2	11.8	4.1	55.3	33.9	13.4	9.4
	IR (%)	1.6	2.1	-0.9	-1.3	2.8	3.0	4.5	8.2	8.5	1.2	3.6	3.5	2.9
United Kingdom	PDR(%)	-1.6	-3.5	4.0	9.7	10.2	9.0	8.6	7.7	21.9	26.8	22.1	11.2	7.3
	IR (%)	0.9	1.1	1.5	1.4	1.4	2.1	2.8	2.0	3.9	2.1	3.4	4.7	2.6
Nepal	PDR(%)	...	8.4	6.2	9.4	5.6	-2.4	5.9	-3.9	8.0	15.6	8.8	7.8	13.2
	IR (%)	0.6	3.4	3.5	6.1	2.0	6.7	8.3	4.7	10.7	11.1	9.0	9.7	11.5
Pakistan	PDR(%)	9.6	12.9	-1.5	1.5	4.4	10.3	8.3	8.7	26.8	26.7	17.1	19.1	17.9
	IR (%)	3.8	3.6	2.9	2.6	7.0	9.9	7.1	7.4	19.3	9.6	11.8	13.3	11.3
Portugal	PDR(%)	5.0	11.5	9.9	5.9	7.4	12.4	6.2	12.8	6.5	13.7	15.1	14.6	10.1
	IR (%)	3.8	4.0	4.0	2.3	2.6	2.5	2.5	2.7	0.8	-0.1	2.5	3.5	2.1
Moldova	PDR(%)	-16.5	1.7	-5.4	5.3	-13.4	-5.0	4.9	-1.0	-11.9	36.4	18.0	-0.1	10.0
	IR (%)	18.5	6.4	4.4	15.7	12.5	10.0	14.1	13.1	7.3	0.4	8.1	7.8	4.1
Romania	PDR(%)	...	34.6	29.6	14.5	9.3	-2.4	-14.7	21.6	32.7	69.8	36.8	17.0	14.1
	IR (%)	40.7	29.6	17.6	14.1	9.2	8.8	4.9	6.6	6.3	4.7	8.0	3.1	5.0
Slovakia	PDR(%)	16.7	5.6	-4.7	7.6	13.0	-12.2	-0.4	7.7	3.2	19.9	20.9	10.8	25.0
	IR (%)	8.4	6.7	3.1	9.2	5.7	3.7	3.5	2.4	3.5	0.0	1.3	4.6	3.4
Slovenia	PDR(%)	44.7	10.1	11.1	3.5	7.0	3.5	6.7	-2.7	2.5	52.2	10.3	23.4	10.1
	IR (%)	8.9	7.0	7.2	4.6	3.3	2.3	2.8	5.6	2.1	1.8	1.9	2.1	2.5
Spain	PDR(%)	3.4	1.1	1.4	-0.4	1.9	0.9	-0.4	-2.2	14.3	29.3	13.8	14.3	20.3
	IR (%)	4.0	2.5	4.0	2.7	3.3	3.7	2.7	4.3	1.5	0.9	2.9	2.4	3.0
Sudan	PDR(%)	9.3	6.5	12.0	12.9	0.3	-6.2	-4.9	12.2	19.9	12.4	25.4	14.3	70.9
	IR (%)	3.4	7.4	8.3	8.3	7.3	5.5	15.9	8.8	14.9	15.5	15.4	18.9	44.4
USA	PDR(%)	-4.1	3.2	7.9	10.8	19.3	5.9	3.9	5.6	15.8	15.3	14.4	8.6	8.1
	IR (%)	3.4	1.6	2.6	1.9	3.2	3.7	2.2	4.1	0.7	1.9	1.7	3.1	1.9

1. PDR = nominal public debt annual growth rate (%); IR = inflation annual rate (%).

Source: authors' calculations based on data from IMF (2013).



The data in *Table 2*, highlighting the comparative evolution of the annual growth rate of public debt and inflation rate in 22 developed and developing countries, after 2000, confirm the previous statement. If, in some countries and periods, a significant increase rate of public debt is accompanied by an increase in inflation, and a reduction in the growth rate of public debt is associated with a reduction in the inflation rate, which may indicate a possible inflationary impact of public debt (China, 2003-2011, France, 2001-2007, Moldova, 2001-2008), in other cases the evolution of the two indicators is, on the contrary, the opposite (Argentina, 2005-2012, Bulgaria, 2003-2011, Moldova, 2008-2012).

However, interpretations must be made with caution, as we have to admit the existence of a reverse conditionality, meaning that an increase in inflation may lead, through the effect of worsening budget deficit and increasing financing needs of public authorities, to a faster growth of public debt. In the interpretation we must also take into account the fact that the effects of an increase in government debt on the inflation may occur over time, because of the time required for prices to adjust when the supply of money in circulation increases (as may be the case of Kuwait in 2007-2011).

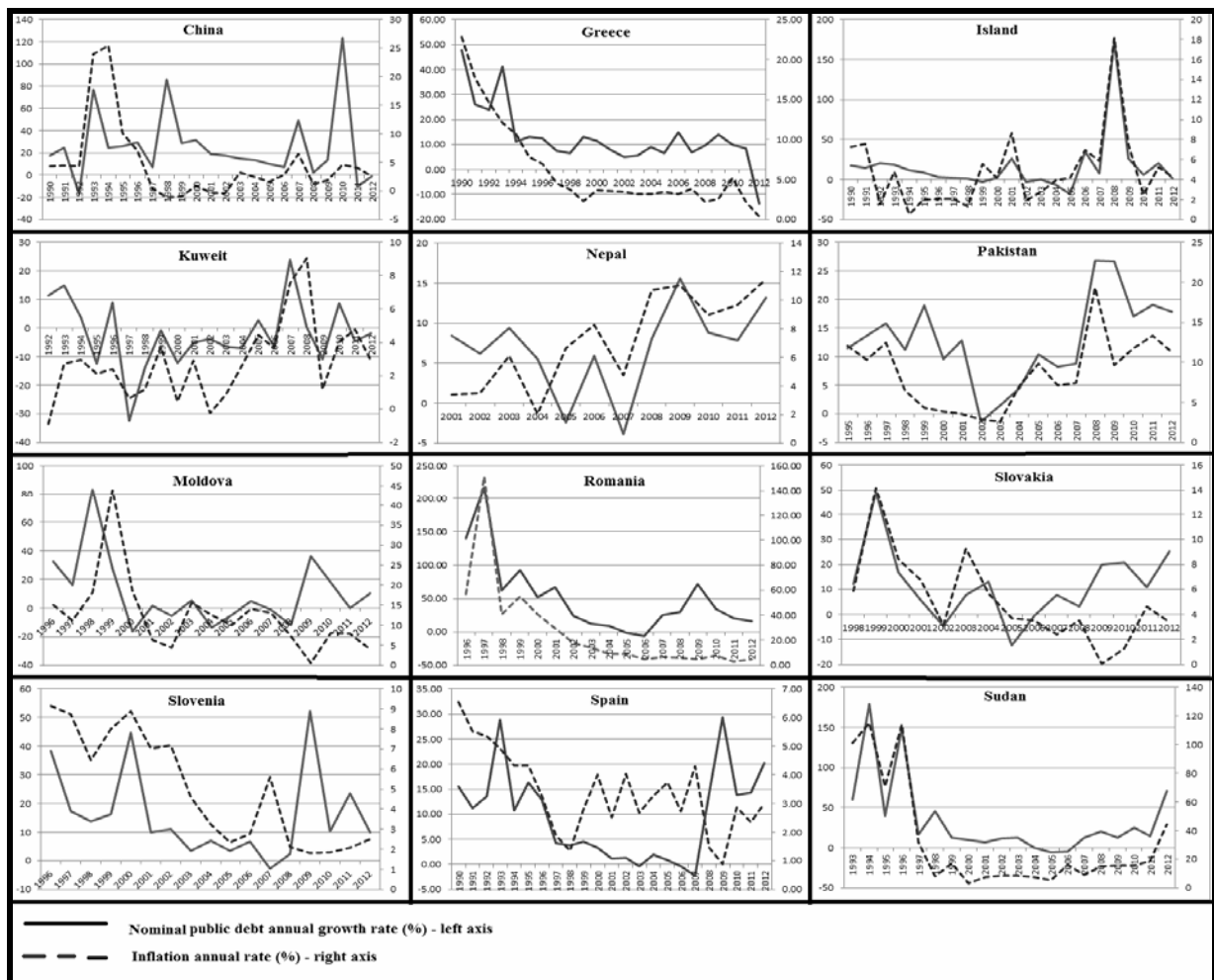


Figure 2. The evolution of the nominal public debt annual growth rate and inflation rate in some representative countries (1990-2012)

*Source:* authors' calculations based on data from IMF (2013) and Eurostat (2014).

If, in the case of some "normal" size increases in public debt, potential inflationary effects are elusive, sudden and large increases in debt are often accompanied by a major

amplifying of inflation. In this regard, we can invoke examples such as that of Argentina (2002), China (2007, 2010), Iceland (2008), Pakistan (2008), Ireland (2008) and Sudan (2012). In Argentina, the increase of public debt with 256.4%, in 2002 was accompanied by a record annual inflation rate of 41%. Similarly, in Iceland, a public debt growth rate of 173.7% in 2008 led to an inflation rate of 18.1%.

Although usually quite weak, the link between the growth rate of public debt and inflation appears to be, however, stronger in some countries and periods of time. It may be mentioned, as suggested by the data summarized in *Figure 2*, the situation of countries like China (1991-1997 and 2006-2011), Iceland (2000-2012), Kuwait (1997-2012), Nepal (2000-2012), Pakistan (2000-2012), Moldova (1996-2008) etc. We can see that they are, in their majority, developing countries, which confirms the findings of the specialized literature which shows that debt financing of the budget deficit in less developed countries is, to a greater extent, inflationary (Jain and Kaur, 2009, p. 82).

Possible inflationary effects of public debt can be found, however, also in some developed countries such as Greece and Spain, amplified on the background of the economic and financial crisis. In Spain, for example, the unprecedented growth of public debt in 2009, with 29.3%, was followed by an increase of the inflation rate from 0.9% in 2009 to 2.9% next year, given that the previous analyzes revealed an increase of the share of government securities in total assets of monetary financial institutions.

It can also be noticed the particular case of Slovakia and Slovenia, currently developed countries from Central and Eastern Europe which crossed, like our country, a process of transition to a market economy, and for which the link between the growth rate of public debt and inflation rate appears to be quite strong in the period preceding the adoption of the single currency. This situation is not confirmed, however, in the subsequent period, given the rigors of the new statute, of European Monetary Union member country, and ceding the prerogatives of monetary policy to the European Central Bank.

As regards Romania, the data confirm the hypothesis of a possible inflationary impact of public authorities' indebtedness in the transition period to a market economy. The notable increase in public debt in 1997 and 1999 was accompanied by a correspondent increase of the inflation rate, while the reduction of the growth rate of debt in 1998 and in 2002-2006 made possible some significant progress regarding disinflation. This impact was, in fact, also certified in other papers, being seen a direct relationship between the budget deficit financing and the inflation (Moșteanu *et al.*, 2003; Anghelache and Belean, 2003), made possible on the background of using debt resources mainly for consumption purposes or low social and economic efficiency public investments.

## Conclusions

Unlike other alternatives of raising public financial resources, public indebtedness generally is not considered to adversely affect one country's monetary stability, as it mostly involves only the redistribution of the resources existing in the economy.

However, our paper revealed some particular cases when public indebtedness through means of public borrowing can lead to an increase of the money supply and thus create favorable conditions for the manifestation of inflation. This could happen when public authorities resort to short-term loans from the central bank to finance treasury deficits or when public authorities indebt themselves to commercial banks or other credit institutions, due to their ability to create scriptural money and to the refinancing relationships that they establish with the national central bank.

Also, when significant public debt is accumulated, public authorities could prove to be more willing to reduce it by unconventional means, such as the amortization through

inflation. This implication turns out to be extremely relevant in the current context of strong, unsustainable public debt growth registered in many developed countries, although such a strategy involves high risks, such as inflation getting out of control.

The analysis conducted on the situation of 22 countries pointed out the existence of some possible inflationist effects of public indebtedness in the case of some of them, mostly developing ones, although we were not able to certainly establish the existence of a direct conditionality between the increase in public debt and inflation. From this point of view, we intend to continue this research by empirically testing the impact of public indebtedness on inflation, also taking into consideration other factors of influence on the latter and emphasizing possible particularities for different country groups, such as developed and developing states.

The assessments made with regard to Romania's situation revealed the existence of a potential contribution of public authorities' indebtedness to the proliferation of inflation during the first decade of transition, leading us to the conclusion that a more rapid establishment of a rigorous regime for the (direct and indirect) access of public authorities to the National Bank of Romania's resources would have had positive effects on ensuring the necessary premises for monetary stability as well as on stimulating a rational behavior of public authorities in spending public resources, forcing them to act more prudently and responsibly.

### Acknowledgement

This work was supported by the European Social Fund through Sectoral Operational Programme Human Resources Development 2007–2013, project number POSDRU/159/1.5/S/142115, project title “Performance and Excellence in Doctoral and Postdoctoral Research in Economic Sciences Domain in Romania“.

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