How to Stabilize Debt while Running Deficit

Václav Rybáček[1] | *Jan Evangelista Purkyne University, Ústí nad Labem, Czech Republic*

Abstract

Main aim of the paper is to discuss the relation between government deficit and debt and the importance of the aggregate known as stock-flow adjustments. The development of Czech government´s debt confronted with deficits in the last years gave raise to a number of questions which are dealt with in the following text, mainly the way how debt can be stabilized or even decreased if budget balance ends up regularly in huge deficits. The second task addressed in the text is the case of the net debt concept. Net debt is presented primarily not as alternative to EDP debt, but rather as supplementary indicator making the picture on fiscal situation more complete. In the last part, the characteristics of EDP debt and net debt are discussed; the development of both indicators is then compared using the figures published for the Czech Republic.

Keywords

Government, deficit, debt, stock-flow adjustment

JEL code

H10, H62, H63

INTRODUCTION

Recent development of deficit and debt in the Czech Republic brought into light the question of mutual relation between these fiscal indicators. A decline in debt concurrently with rising deficit is considered to be against the intuitive logic that a lack of resources is to be financed by borrowings from other economic sectors; in other words, that running deficit automatically implies rising indebtedness. Changes in debt are driven purely by deficits only if there are no other factors having impact on the changes in debt; these factors are discussed in the following paragraphs.

The situation in public finance is usually monitored through Maastricht deficit and debt indicators, which are presented mostly in relative terms, i.e. compared to nominal GDP. Rising (or declining) nominal level of GDP lowers (increases) the levels of both deficit and debt. Thus, changing nominal level of GDP can be left aside as a factor explaining potential deviation between the development of deficit and debt. So, to make following discussion and its conclusions clearer we will discuss the mutual relation between absolute values of deficit and debt.

From the methodological point of view, the following analysis is based on the indicators compiled according to the methodology ESA2010. Before proceeding to the analysis it is worth to mention that there is a number of methodological differences between State budget and State debt and the fiscal indicators utilized in the Excessive Deficit Procedure whose mutual relation will be analyzed in the following paragraphs (i.e. Maastricht criteria).[2] However, the logic of mutual relation between EDP deficit and debt is akin to that presented by the ministry of finance between State budget balance and State debt.

[1] Czech Statistical Office, Na padesátém 81, 100 82 Prague 10, Czech Republic. E-mail: vaclav.rybacek@czso.cz.

[2] For more details on these differences see: Vebrova, Rybacek (2014).

1 STICKING TO THE RULES AND THE BEHAVIOR OF GOVERNMENTS

The Maastricht criteria are widely used for public finance management and it's monitoring by analysts as well as general public. The introduction of the Maastricht criteria had the ambition to avoid hazardous behavior of the EMU members to run deficit and debts due to the expectation that costs of resulting inflation will be spread among all monetary union members. On the other hand, the need to meet the ceiling of deficit and debt had created certain kind of incentives for government to apply a creative accounting. Number of studies has attempted to explainn the impact of the fiscal rules on the behavior of governments and changing relation between deficit and debt in the last decades.

Milesi-Ferretti and Moriyama (2004) using balance sheet approach found out that countries running up EMU were shifting fiscal activities from restricted to non-restricted instruments. This trend has been accompanied by significant decumulation of assets with no effect on the real fiscal position. This shows not only changing behavior after the introduction of fiscal rules, but also a certain insufficiency of EDP debt concept due to its limited view only on gross value of government liabilities. Decumulation of assets as a reaction to the need to take fiscal measures is also confirmed by Easterly (1999).[3]

That (gross) definition of EDP debt gives rise to room for accounting tricks is further confirmed by Hagen and Wolff (2004). According to the authors, a systematic relation between deficits and changes in debts can be found after the introduction of fiscal rules. In other words, there is an evidence of a creative accounting shifting deficits to so-called stock-flow adjustment reconciling deficits with the changes in debt.

Blejer and Cheasty (1991) objected that fiscal rules are applied to the measurable fiscal aggregates, however, the question whether are they economically meaningful remains quite open. Hagen and Wolff (2004) consider the extent of stock-flow adjustments as an indication of a creative accounting. As creative is considered a situation in which an improvement in fiscal balance does not imply positive changes in the government net worth. However, it should be noted that rapidly developing methodology of government statistics continuously addresses wider range of methodological issues making the delimitation of relevant aggregates stricter.

In the following text, we will analyze the behavior of the Czech government over the last almost 20 years with more detailed focus on data for the last four years. As shown, the decumulation of assets as a tool how to make the debt statistics more favorable has been used in the Czech Republic in the last years. At the same time, behavior of the Czech governments before and after the joining the European Union and its potential change will be analyzed as well.

2 CHANGES IN DEFICIT AND DEBT OVER TIME

Following chart provides an overview of the currently published data on Maastricht deficit and changes in the value of Maastricht debt. As it is evident, in years 1996 or 2014 the deficit wa accompanied by declining debt. Moreover, it can be drawn from the chart that the extent of changes was different in number of years, thus the change in debt has been evidently driven not only by deficit in given years but other factors have contributed to this development.

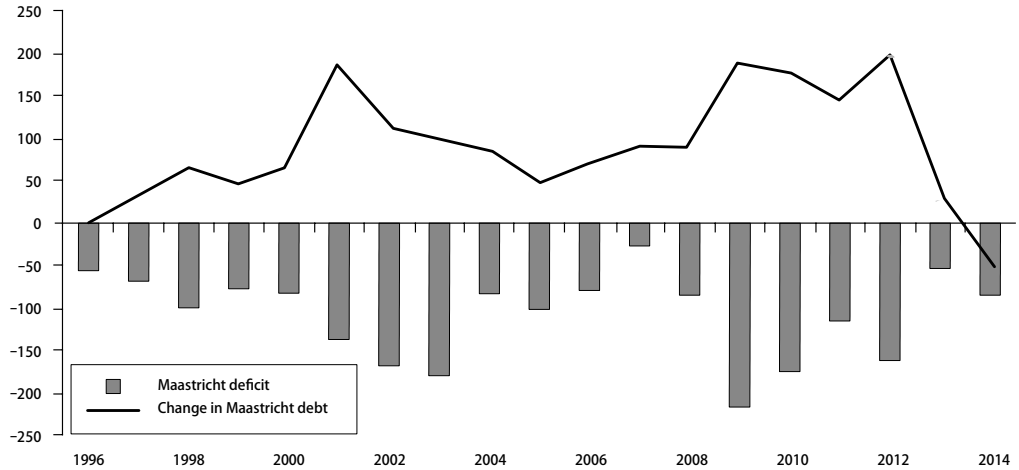
The relationship between deficit and debt can be formalized in the following way:

$$D_{(t+1)} = D_{(t)} - BB_{(t+1)} + SFA_{(t+1)}, \quad (1)$$

where D represents a nominal level of debt at the end of period "t", BB signifies balance of budget and SFA stands for stock-flow adjustments. According to the formula, a nominal level of debt at the end of year

[3] In form of privatization or crude oil production, etc.

Figure 1 Maastricht deficit and changes in the debt, the Czech Republic, mill. CZK



Source: www.czso.cz

(t+1) shows the impact of the level of debt at the end of previous year (t) further influenced by the balance of revenues and expenditures in year (t+1) and by a number of factors grouped in the aggregate SFA.[4]

The relation between SFA and changes in debt can be summarized as follows:

SFA = 0, then change in debt corresponds to deficit/surplus (BB),
SFA > 0, then a rise in debt exceeds deficit or a decrease in debt is less than surplus,
SFA < 0, then a rise in debt is lower than deficit or a decrease in debt exceeds the surplus.

The aggregate SFA is crucial for understanding of existing deviations in the development of deficit and changes in debt. SFA comprises the influence of net financial transactions carried out with financial instruments, revaluation of these items and also other changes in volume of debt instruments. For now, we leave aside the case of other changes in volume whose impact on the level of debt is usually avoided by the statistical offices so that they are zero or negligible.

In the case of revaluation, its importance depends mainly on the structure of currencies in which debt is denominated and the level of contractual exchange rates if debt instrument issued by government institutions in foreign currency is hedged against exchange rate risk. It is worth to mention in this respect that changes in the market prices of government debt securities do not affect the nominal level of Maastricht debt. The reason is the fact that nominal debt is valued at nominal values instead of market prices.

One of the most important adjustments recorded under SFA reflects the fact that governments issue debt securities above or below the face value. The difference between issue price and par value thus represents an important part of reconciliation between deficit and debt as recorded in the notification table (table 3 in the set of the notification tables). The same holds true in the case of early redemption or buy-back operations with government bonds carried out by government (as the issuer). It is evident

[4] Contributions of relevant factors to changes in debt of government sector are indicated in the table 3A of notification table which are transmitted and published by the Czech Statistical Office twice a year.

that adjustments resulting from revaluation can have potentially significant impact on the differences between deficit/surplus and change in debt as defined for the EDP purposes.

The last group of factors is represented by so-called financial transactions which are recorded in financial account within national accounts. Financial transactions usually drive the course of the aggregate SFA the most as can be drawn from table 3 in the notification tables. From national accounts perspective, financial transactions must be conceptually distinguished from non-financial transactions forming budget balance (BB). One of the main differences between both types of transactions is their impact on balance sheet. Transactions recorded only in the financial account (pure financial transactions) do not lead to a change in the net worth. However, this does not apply to non-financial transactions except for those related to accumulation of non-financial assets recorded in the capital accounts (acquisition of non-financial assets).

To show this conceptual difference, we can put the privatization of public companies as an example. If government decides to sell its share in a company, this decision is considered as a pure change in portfolio, i.e. reduction in holding of shares and increase in deposits without any impact on net worth. On the contrary, any payment of interests is taken as distributive (non-financial) transaction linked to financial transaction and causing a decrease in the net worth.

Generally speaking non-financial transactions have their counterparties in financial accounts,[5] i.e. they are linked to transaction with one of the financial instruments. The financial account consists of eight instruments structured by liquidity;[6] large part of these instruments does not represent highly liquid assets counted in the monetary aggregates M1 or M2, but takes the form of less or low liquid assets as insurance technical reserves or (and especially) other accounts payable or receivable. It implies that non-financial transactions (payment of interest, purchasing of services, etc.) do not inevitably result in cash outflow or inflow, and that the level of debt instruments is not automatically influenced by non-financial transaction.

To be concrete, non-financial transactions are very often *inter alia* connected with a transaction in financial instrument referred to as "other accounts payable" or "other accounts receivable". As an example the church restitutions can be mentioned – financial compensation amounting to CZK 59 bil., respectively. This expenditure has been accounted for in 2012 without any impact on neither indebtedness nor holding of cash. In fact, this expenditure gave rise to the transaction in other accounts payable (AF.8) not counted in the amount of total debt.

The financial compensation has affected the relation between debt and deficit expressed by the formula (1) in the following way (in CZK mil.):

$$D_{(t+1)} = D_{(t)} - BB_{(t+1)} + SFA_{(t+1)}$$
$$D_{(t+1)} - D_{(t)} = BB_{(t+1)} + SFA_{(t+1)}$$
$$0 = +59 - 59$$

This clearly illustrates that budget balance deficit (–BB) caused by the compensation has not been covered by transactions in debt instruments, but this expenditure amounting to CZK 59 bil. has been "financed" by transaction in non-debt instruments (–SFA) as other accounts payable (AF.8). We can conclude that from the perspective of debt statistics financial transactions can be divided into those having impact on debt and financial transactions with items not counted in total debt, i.e. with no impact on debt.

---

5 Except rare cases of barter, etc.

6 Monetary gold and special drawing rights (AF.1), currency and deposits (AF.3), debt securities (AF.3), loans (AF.4), equity and investment fund shares or units (AF.5), insurance, pension and standardized guarantee scheme (AF.6), financial derivatives and employee stock options (AF.7), other accounts payable/receivable (AF.8).

So, we can come to the general finding that any change in debt can be caused by transactions recorded in either BB or SFA. Due to the linkage of both aggregates, an inappropriate distribution of transactions carried out by government is automatically transferred to the other aggregate with the opposite sign. Main aim of statisticians is then to avoid such a situation and to record each transaction correctly in line with the currently applied methodology.

However, there is an ongoing debate on which transaction should have an impact on BB and which should be treated as pure financial transactions. The attention is paid mainly to capital injections, i.e. subsidizing of loss making public companies in various forms – cash, purchasing of shares, etc. Even if these transactions can be referred to as purchasing of shares in the accounting or budgetary systems (SFA = 0), in fact they represent provision of financial assistance (BB<0, SFA>0). Other important topic, so-called concept of super-dividend, is of a similar nature. Although receiving of dividends is generally treated as transaction positively impacted BB, if the transfers exceed a profit in previous year it is partly recorded as pure financial transaction (worsening in BB, increase in SFA).

3 "CONTRADICTORY" CHANGES IN DEFICIT AND DEBT, EXAMPLES

Distinguishing between financial and non-financial transactions can lead to different trends in the development of deficit and debt. This can be clearly illustrated in some years. In 2012, the rise in debt significantly exceeded the need for deficit financing. In the system of national accounts, cash inflow raised by bond issuances (rise in liabilities) has been retained on deposits (rise in assets) except a part used to cover existing lack of revenues. As a result, "excessive" issuance has led to the accumulation of assets (reserves).

By use of the formula mentioned above, we can demonstrate the situation at the end of 2012 formally as follows:

$$1\,803\,585\ (D_{(t+1)}) = 1\,604\,009\ (D_{(t)}) + 157\,889\ (BB_{(t+1)}) + 41\,687\ (SFA_{(t+1)})$$

Despite of quite massive issuance of debt securities, the amount of SFA seems to be surprisingly low. However, it should be kept in mind that large part of the deficit in 2012 has been "financed" by transactions with other financial instruments, notably transaction recorded under the item other accounts payable. That was the case of church restitutions, as mentioned above, and the correction of EU subsidies. Both exceptional transactions have negatively impacted the aggregated SFA through transaction with other accounts payable (AF.8). Taking this into account, the accumulation of cash from "excessive" emissions significantly exceeded the level of SFA.

The opposite case has happened in the year 2014 when deficit was financed by the decrease in assets accumulated in the previous years (deposits) and by transaction in the cash-pooling system operated by the central bank. To use the formula (1), it can be stated:

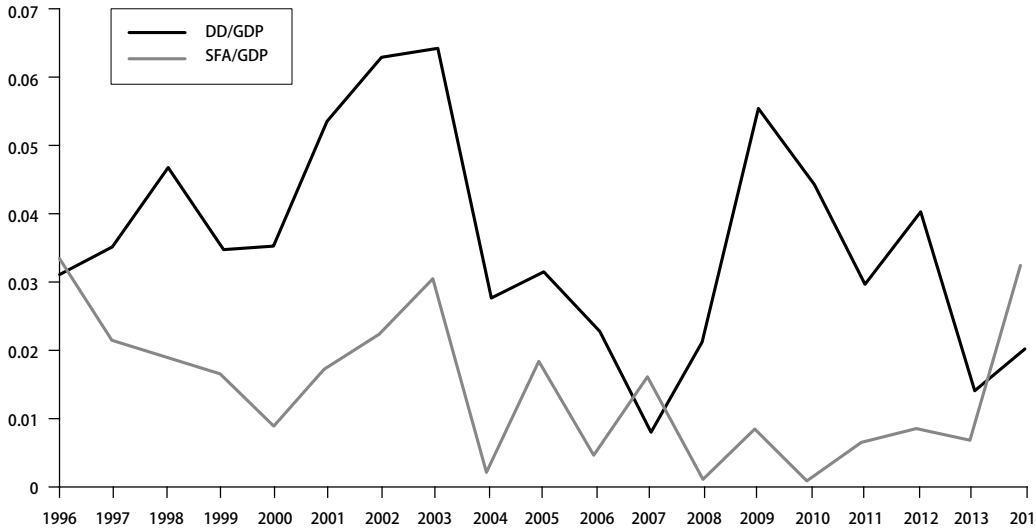
$$1\,816\,137\ (D_{(t+1)}) = 1\,839\,726\ (D_{(t)}) + 84\,558\ (BB_{(t+1)}) - 108\,147\ (SFA_{(t+1)})$$

Reduction in debt with simultaneously rising deficit has been reached by engagement of liquid assets; this observation is clearly represented by high transaction in SFA (–108 147). Decrease reported in the aggregate SFA has been dominantly caused by reduction in holding deposits. In other words, lack of revenues (deficit) and decrease in debt has been financed by drawing the deposit balances.

This development has been enabled by reserves accumulated in the previous year and by the intensive use of cash in the cash-pooling system.[7] The following chart shows the development of DD and SFA expressed as a percentage of GDP.

[7] Cash-pooling represents the way the liquidity is managed within a group of units; in reality, these units share their deposits for the purpose of cash-flow optimization within the group. According to law, the central government can manage the deposits of some other institutions.

Figure 2 Share of DD and SFA on GDP, the Czech Republic, 1996–2014



Source: www.czso.cz

The value of SFA exceeded DD in three years (1996, 2007 and 2014). In 2007, the subsectors of local government institutions and health insurance companies reached high surpluses resulting in the accumulation of assets. At the same time, significant part of revenues of the central government institutions from bond issuances was held in form of financial assets.

It should be mentioned that before 2004 not insignificant part of deficit has been covered by the transaction with SFA due to transformation of the Czech economy.[8] Nevertheless, the importance of SFA has been rather decreasing after 2004 implying that SFA has not been used as "a creative tool" to meet the fiscal rules (Easterly, 1999). However, especially from 2011 onwards, SFA has again gained its importance in the explanation of the relation between deficit and changes in debt.

4 NET DEBT

As has been shown, the assessment of SFA should be considered as necessary component of the analysis of Maastricht criteria. The importance of SFA is strengthened by the gross nature of EDP debt, i.e. it is defined as a sum of selected items only on the liability side of balance sheets. This approach has its serious limitations. It does not refer to actual financial position of government because a given level of debt does not carry information whether government faces liquidity problems or on the position of government on the financial market. Moreover, official value of debt does not give an indication whether government is able to service its debt without further borrowing due to accumulated assets or whether government is able to keep on financing the expenditures in time of limited access to the financial market.

Current approach to debt has evidently its limitations which could be overcome by either change in definition itself or by supplementing with other indicator. One of these alternatives is the net debt concept. The concept of net debt is considered to provide from some perspectives a more relevant (supplementary) information on financial situation of the government, debt sustainability and fiscal risks

[8] We mean mainly transaction of the transformation institutions, privatization receipts, etc.

(Dippplesman, Dziobek, Mangas, 2012); it can be used by analysts, policymakers or rating agencies to assess the solvency of government and for other purposes.

The definition of net debt still remains quite open question. Generally, the indicator of indebtedness on the "net" basis is affected not only by the amount of given liabilities but also by the value of selected assets held by government institutions. The first step is to select appropriate assets reducing the amount of gross debt to net debt concept. This issue is discussed later in the text; for this moment we take into account the corresponding items on the asset (currency and deposits, debt securities and loans); this approach is in line with the manuals GFS2014 and the Manual on government deficit and debt.

Table 1 Structure of balance sheet of government institutions, the Czech Republic, 2014, bil. CZK

Balance sheet of government institutions (bil. CZK)

	Assets (market values)	**Liabilities (market values)**	**Liabilities (EDP, face values)**
Non-financial assets	12 809 698		
Financial Assets/Liabilities	1 707 246	2 435 376	1 816 137
Currency and deposits	376 784	9 974	9 958
Debt securities	194 325	1 883 491	1 624 566
Loans	135 839	183 405	181 613
Equity and investment fund shares or units	807 864		
Insurance, pension and standardized guarantee scheme	2 959	11 283	
Financial derivatives and employee stock options	408	4 681	
Other accounts receivable	369 559	342 542	

Source: www.czso.cz

The following Table 1 shows the balance sheet of the Czech government institutions at the end of 2013 whereas selected liability items are shown valued at market prices (creditor approach applied in ESA) and at nominal values (debtor approach applied in EDP).

We can draw from the table that government institutions own mainly non-financial assets (buildings, roads, mineral resource, lands, etc.). Non-financial assets can be exploited as financial source, i.e. non-financial asset can be deliberately converted into cash if sold on the market; however from the historical perspective this is quite rare case occurring mainly in time of financial distress. If non-financial assets are sold to raise cash, this has a positive impact on the aggregate BB.

Minor part of total assets is held in form of financial instruments, mainly currency and deposits and shares. Currency and deposits are considered as the most liquid assets and they are to be counted in net debt. Debt securities and loans have their counterparty on the liability side in gross debt, thus will be also taken into account for net debt quantification. However, the case of debt securities valuation should be kept in mind due to different valuation method. Different approaches are clearly shown

on the liability side in Table 1. While the value of debt securities at market prices has reached CZK 1 883 billion, for the EDP purposes the value of debt securities has been CZK 1 625 billion. Non-negligible difference is caused by many factors especially the credibility on the financial market, government bonds interest rates and by overall situation on the bond market.

The following chart shows the development of EDP debt and net debt over time in the Czech Republic.

It should be admitted that this comparison is just an approximation mainly due to slight differences between the valuation methods. Whilst EDP debt is valued at face values, i.e. market value and accrued interest are both eliminated;[9] items on the asset side are preferably valued at market prices if these are observable or can be reliably estimated. Mainly value of debt securities can be to some extent affected by market prices or interest accrued whereby the latter can more or less influence the value of all items counted in net debt indicator.

Nevertheless, comparison between assets valued at market prices and liabilities at face value can be theoretically justified. On the liability side, it shows real financial position of government because face value carries the information on the obligation at the maturity. On the asset side, the value of bonds at market prices shows the amount of money which can be gained on the market by selling assets to repay debts which are to be repaid.[10] However, it could be objected that market prices (at which assets are valued) are only a matter of history. Especially in time of crisis and asset prices fluctuation, actual situation can change very quickly affecting the solvency of government.

As can be seen in the Figure 3 both indicators show similar (rising) trends from the very long-term perspective. However, from the shorter-term perspective, the changes in both indicators can show different behavior with (even with opposite signs), mainly in the years already mentioned above. In 2012, there is a sharp increase in EDP debt rising by 4.7 percentage points. Due to large accumulation of assets, net debt has increased only by 1.6 percentage points. On the contrary, in 2014 EDP debt has decreased by 2.4 percentage points. Nevertheless, indebtedness expressed in terms of net debt has increased by 0.6 percentage point. Different trends in 2014 just reflect the fact that deficit and change in debt has been financed by decrease in assets.

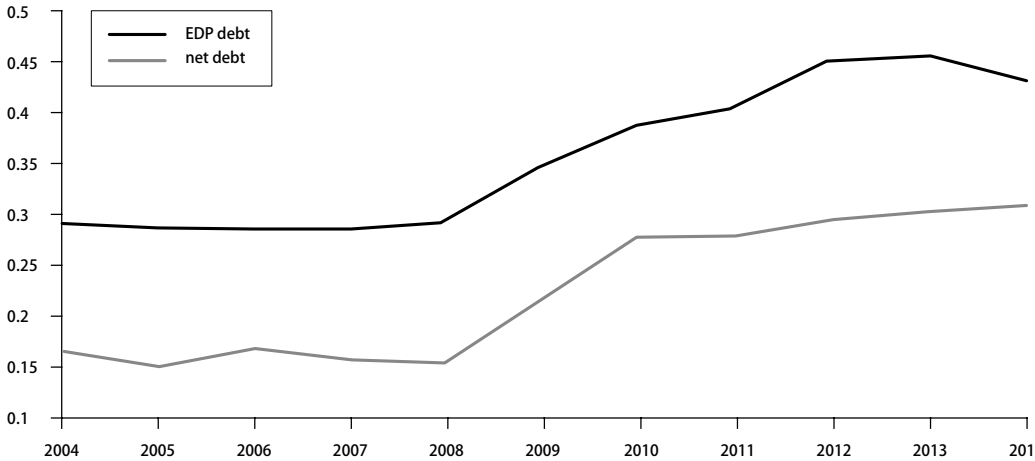
Although the indicator on net debt provides important information on solvency or sustainability of government financial situation (Hartwig, Rodríguez-Vives, Slavík, 2011), further practical and methodological obstacles inevitably occur. Selecting instrument is only the first step in the process of net debt quantification. Notably the case of shares should be carefully assessed. Some part of shares can be undoubtedly traded on the market. However, it could be misleading in many cases to count given share in net debt due to the fact, that the aggregate of shares contains shares in strategic enterprises or institutions providing public or quasi-public goods. Rather case-by-case approach considering tradability and attractiveness for potential buyer could be applied.

Pros and cons of net debt just mentioned are rather indicative. The aim of this brief discussion is purely to demonstrate that both economic indicators have their strengths and weaknesses and they should be taken rather as complementary instead of competitive indicators. It is worth to mention that further indicators can be potentially also used in the analysis, among other the net worth of government sector (Milessi-Ferretti, Moriyama, 2004, Easterly, 1999) defined as a difference between total value of assets and total value of liabilities, alternatively net financial worth quantified as a difference between financial assets and financial liabilities. However, the uncertainty

[9] However, there is an exception in case of deposits on the liability side. When interest on deposit accrues, it is reinvested in the instrument, thus increasing the value of debt. The meaning of this approach is that EDP debt is valued at face value representing the amount of money which the debtor is obliged to repay at maturity. In case of deposits, if the owner can withdraw its deposits, the debtor is obliged to repay the amount of debt including the value of accrued interests.

[10] However, serious problem with consolidation arises in the case of government repurchase of its own bonds.

Figure 3 EDP and net debt, the Czech Republic, 2004–2014, % of GDP



Source: www.czso.cz, own calculation

in the valuation of items counted in this very comprehensive indicator makes the international comparison highly complicated.

CONCLUSION

As has been shown in the previous paragraphs, the key issue for the understanding of the relation between deficit and debt is the aggregate of "stock-flow adjustments" which covers economic flows and other factors having impact on government debt. Especially accumulation or decreasing in assets has its importance in the discussion on the relation between both indicators. This has been demonstrated on the example of Czech government institutions, mainly for years 2012 and 2014. As has been shown, the amount of SFA in the Czech government accounts does not clearly signify a creative accounting as understood in Hagen and Wolff (1999). However, the importance of SFA as an explanation of the development of both fiscal indicators in the Czech Republic has been rising in the last years. It has also been stressed that in the fiscal analysis the indicator on EDP debt should be supplemented by the indicator of net debt where value of liquid assets is subtracted from EDP debt. Analyzing of both EDP and net debt is preferable also due to the fact that they can show different trends over the years as has been demonstrated in the case of the Czech Republic.

References

BLEJER, M., CHEASTY, A. The measurement of Fiscal Deficits: Analytical and Methodological Issues. *Journal of Economic Literature*, 1991, Vol. 29, No. 4.

DIPPELSMAN, R., DZIOBEK, C., GUTIÉRREZ MANGAS, C. A. *What Lies Beneath: The Statistical Definition of Public Sector Debt*. IMF Staff Discussion Note, IMF, 2012.

EASTERLY, W. *When is fiscal adjustment an illusion?* World Bank, 1999.

EUROSTAT. *Manual on Government Deficit and Debt.* Implementation of ESA2010, Luxembourg, 2014.

EUROSTAT. Measuring net debt: theory and practice [online]. Available at: <http://ec.europa.eu/eurostat/documents/1015035/2041365/Measuring-net-government-debt-theory-and-practice.pdf/0c4f104d-856c-4818-adbf-cfc7ea07ad9c>.

HARTWIG LOJSCH, D., RODRÍGUEZ-VIVES, M., SLAVÍK, M. *The Size and Composition of Government Debt in the Euro Area*. European Central Bank, Occasional Paper Series, No. 132, 2011.

HAGEN, J., WOLFF, G. *What do deficits tell us about debt? Empirical evidence on creative accounting with fiscal rules in the EU*. Deutsche Bundesbank, Discussion Paper, No. 38, 2004.

MILESI-FERRETTI, G., MORIYAMA, K. Fiscal Adjustment in EU Countries: A Balance Sheet Approach. *International Monetary Fund Working Paper*, No. 143, 2004.

OFFICIAL JOURNAL OF THE EUROPEAN UNION. *Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union.* 2013, 174/1.

VEBROVA, L., RYBACEK, V. How to Read Government Deficit and Debt. *Statistika: Statistics and Economic Journal*, 2014, No. 3, pp. 32–46.