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Budget spending and economic growth in Croatia

Dynamics and relathionships over the past two decades[*1]

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Abstract

The objective of this research is to analyze the relationship between government budget spending and the effect on the growth and structure of the GDP of Croatia during the past two decades. The starting working assumption (hypothesis) is that the volume of total budget expenditure (including the foreign borrowing) has not been realizing appropriate effect on GDP growth. In the analysis of these relationships we primarily use the method of vector autoregressions (VAR). The main result of the analysis showed that, in accordance with theoretical assumptions, the structure of expenditures is essential for the effects of budgetary spending on economic growth. We determine the positive effects of investment spending and purchases of goods and services and the negative effects of other categories of current spending. The reduction of capital expenditures during the recession presents a particularly adverse trend, which reduces the rate of growth of the economy in the long and short term. A fundamental conclusion of the research is that the budget expenditures have not adequately affected the GDP growth. Therefore, it is possible to affect the economic growth by changing the structure of budgetary spending, as well as directing public borrowing to investment financing.

Key words: *budget spending, gross domestic product, vector autoregression, structure of expenditures, public debt, Croatia*

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1. Introductory discussion – defining the problem and subject of investigation

The relationship of budget spending and economic growth over the past twenty years of the Croatian independence has made a fundamental mark in regards to its general socio-economic development. The quantitative side of such an assessment is corroborated by a large relative ratio of the total government spending to GDP (reaching even more than 50 percent of the value). On the qualitative side, the government spending had an impact on virtually all aspects of the functioning of the Croatian society: both those of tangible and intangible nature. However, having in mind such facts we can argue that the relationship between these two social phenomena was very complex. It was ambiguous and certainly not unidirectional. A crucial basis for the realisation of this relationship, if we use a political-economic jargon, was the process of intertwining of economic and political management criteria. The latter criteria are clear and indisputable: government consumption is directed by purely political criteria. These criteria were colliding with the criteria of the transition of the Croatian economy towards capitalism. The circumstances and conditions that emerged within them have been creating a very wide field of problems from which the Croatian economy and society has not recovered to this day. These problems led to an economic recession which, at the end of the last decade, has gradually surpassed into economic and social crisis, i.e. to general social crisis.

Although the causes of the crisis in the Croatian economy and society are partially generated by external reasons, we argue that they are fundamentally of domestic origin. Therefore, the following text will focus on those reasons. However, for the purposes of objective scientific evaluation it is certainly worthwhile to note that the global (the "external") world economic crisis was caused by the market fundamentalist doctrine (the doctrine of free markets) (Horvat, 1999.2002: 429:440). A responsible and objective economic science has been warning about such disastrous and unsustainable model that managed economies and societies of the modern world (Sever and Associates, 2009: 218-219). This model particularly disastrously affected economies and societies that have adopted mechanisms of market economy. The tragedy of this doctrine is even greater because it was not, and has never been able to provide mechanisms for resolving economic and social crisis of contemporary societies which was caused by its manifestation in the first place. The solutions are, as was always the case during the past century in such emergency situations, on the opposite of this conception. It is not the first time since the Great Depression that the government has to blend its power (defined by the material strength that comes from its control of the substantial part of total production) in order to regulate the imbalance in economic and reproductive cycles. At this point we have to mention domestic thinking about the ways of "solving" the recession and crisis. The view was that the priority should be to maintain stability.

It was placed in the foreground. This fact shows that the "monetarist mindset" has been deeply ingrained in the society. The stability of the zero growth rate of the gross domestic product (GDP) has been gradually crossing into the zone of negative growth. This resulted with even greater imbalance of the real sector and government finances. Economic policy of stability (which by definition means, ceteris paribus, a low utilisation level of available resources) cannot direct economic growth towards the higher level of economic activities. The fixed cost of money and capital, fixed exchange rate and low stable prices have not been able to stop the falling of economic system into recession and economic crisis.

We argue that the causes of instability that led to the economic recession and the crisis should be sought in the previous period. The roots of indebtedness come from unfunded government consumption and financial imbalances of economic subjects' accounts. Indebtedness has been disturbing the economic balance and led to worsening economic and social conditions of work and life (Sever and Associates, 2009:222-223). Due to the economic openness the reflections of the global crisis have been added to the problem of indebtedness. The exports have been decreased due to declining external demand, banking costs have been increased and sources of foreign lending to businesses have been significantly reduced. Imbalance due to excessive investment in large-scale infrastructure in the previous period, adversely affects the economic and social situation and does not match the potential of this infrastructure to ensure payment of past due instalments by its cash inflow. A high degree sub-investment in the technological base of production companies presents an additional imbalance with significant and potentially dangerous consequences. Most of these companies can not compete on the international market due to the large backlog of technological development and high relative prices caused by the exchange rate policy. The reasons for such state can be related to the operation of global liberal economic model that put the competition of companies in the foreground. In such circumstances, the competitors from small companies had no chance. Flawed monetarist economic policy of 'three anchors' (the unrealistic policy of stable exchange rate in particular), which has been running for more than a decade and a half (as the essential components of the so-called Stabilization program in 1993), is the original cause of the prominent problems and imbalances in the functioning of the economic system. The exchange rate policy has led to unsustainable imbalances of imports and exports and a significant loss of the domestic market share. All this resulted with the consequences in form of closure of many manufacturing enterprises, rise of unemployment, the surge of pension-related spending and reduction of revenues of central and local budgets. From the standpoint of this research, it should be emphasised that all these problems focus in rising imbalances of the government budget. This imbalance has generated lending of both absolutely and relatively increasing mass of foreign capital. Surely this would not be the biggest problem if that (foreign) capital has been pouring into production, and thus creating added value. Therefore, it is important to show what

happened to the financial management of this resource. Thus, we come at the threshold of analysis of relationship of foreign debt (capital) and economic growth of the Croatian economy over the past two decades. In fact, we need to research the subject of the analysis contained in relationship of overall government spending, its structure and growth of GDP over the past two decades of the development of Croatian economy. In this research we confirm a working assumption (hypothesis) that the volume of total budget expenditures (including expenditures financed by foreign borrowed capital) has not adequately affected the GDP growth. We also pose two auxiliary assumptions: (1) that the structure of budgetary expenditure has not been encouraging for the growth of GDP and (2) that the use of foreign capital (debt) was not appropriate to the needs of production growth in particular.

The organization of presentation of the research material is systematized as follows: after the introductory discussion and problem definition, the second chapter of the text discusses recent theoretical studies and their results; the third section contains the necessary documentation as the basis of quantitative analysis of the relationship of mass and structure of government consumption expenditures, in fourth chapter we present the method (model) (autoregressive) of analysis; the fifth chapter presents the results of the analysis and their evaluation, and finally, in the sixth chapter we emphasize the main conclusions based on the research results.

2. Recent theories and research findings

Recent economic literature provides insight into a number of empirical studies that cover issue of relationship between government and economic growth. If we avoid earlier Keynesian and other literature, the contemporary research of relationships of government (budgetary) spending and economic growth, has been particularly notable since the beginning of the eighties of the last century. However, the results of these researches are ambiguous. They have been dependent on a doctrinal conception and methodological approaches. However, since then and in the following two full decades, all these studies can be essentially reduced to a common denominator: they were based on the neoliberal theoretical orientation and its fundamental endogenous methodological template. Together with discussion of the relations related to budgetary spending (government spending) we will devote special attention (briefly) to the results of recent theoretical research on the relationship of borrowed foreign capital and economic growth, which is very important for the evaluation of the development of the Croatian economy over the past two decades.

2.1. The results of the research on the relationship of budget spending and economic growth

In the early eighties of the last century a significant and negative relationship between the real per capita GDP growth rate and the level of the relative ratio of government consumption in GDP was determined (Landau, 1983:783-92). The analyses that followed have been changing the methodological concept of defining the content of aggregate government spending. The authors of the studies have been adjusting the methodological conception of defining to the process of restructuring of fundamental category of government expenditures. In the midst of the eighties, the analysis which was performed on a sample of 47 countries changed the conception of expenditure coverage. This conception excluded public investments and transfers and included expenditures for defence and education (Kormend, and Meguire, 1985:141-63). However, this analysis showed no significant relationship between the average real GDP growth rate and the ratio of government consumption in GDP. However, a bit latter, Grier and Tullock (1987) performed the extended analysis on the sample of 115 countries that had same methodological conception as the before mentioned research. By the more sensitive analysis they determine negative relationship between the real GDP growth rate and the increase of the ratio of government expenditures in GDP. At that time one more research was conducted (Barth, and Bradley, 1987). Their results also showed a negative relationship between government expenditure and the GDP growth. However, the weakness of that research lies in the small sample of 16 countries (OECD). Nevertheless, their results deserve attention because they obtain, for example, insignificant effect of public investment on the GDP growth. After this research there were a number of studies on this issue in the late eighties and the early nineties. It is important to address research conducted by R.J. Barro (1989, 1990). He performed methodological changes in the conception of the content of government expenditure categories, especially in terms of investment. Barro assumed that the ratio of expenditure to GDP (or g / y) is constant for each country over time, and that public and private capital depreciates at the same rate. He also warned that, according to the theory, the relative GDP growth rates of (y) in relation to g / i (the ratio of expenditures and investment) depend on the government behaviour (decisions). If the government optimizes path to the maximum growth relationship of y and g / i would show a small correlation. On the other hand, this relationship will be positive (or negative), depending on whether the government is committed to insufficient (or excess) production of public services (Barro, 1990:123). Barro also determines the possibility that the increase of resources directed towards creating supply of public goods and government services is in conjunction with the lower per capita GDP growth rate. This result confirmed the assumption that countries (based on the sample of 76 countries) are approaching the mass of public investment that maximizes the rate of economic growth. These studies contribute to understanding that the structure of government expenditure is an important factor of the long-term

economic growth. By the analytical variations of the relationships of government consumption (excluding investment spending), the GDP and the total (gross) investment, Barro compared these results with the theoretical propositions. These results shed light on the understanding of the economic growth in many countries. Finally, it has to be noted that these studies, from the government perspective, constantly focus on the identification of the effects of "human capital", market imbalances and political stability. Thus, from the beginning of the nineties of the last century, Barro argues that the endogenous model of the economic growth assumes constant returns on methodologically broad concept of capital. He extends the model by inclusion of funding of public (government) services by taxes. Previous models were not able to generate long-term economic growth without relying on exogenous changes in technology or demographic changes. General feature of these models are constant or increasing returns in the factors that can be accumulated.

One of the first studies that showed results on the productive function of government expenditures was published at the very end of the eighties (Aschauer, 1989). This research analysed the broader context of the interdependence of expenditures, structure of public capital and economic growth (productivity as a component of that growth was particularly examined) of USA economy (1949-1985). The analysis of decomposed structure of public capital and productivity showed weak effects of the total government expenditures on productivity growth. Furthermore, the results show a non-significant effects of civil and military expenditure (neither the specification of these expenditures showed more significant results). The same is the case with the effects of compensations to employees and military capital stock. The impact of value of construction and equipment of the public sector was determined to be significant for the productivity of the entrepreneurial sector of the U.S. economy. On the other hand, measuring of the dependence of productivity on the factors in the public sector, showed a slowdown of investment activity and productivity. In that sense, the sensitivity of productivity was particularly strengthening. It is important to note that, from the perspective of the neoliberal theory, the increase of investment spending has stronger impetus to GDP that the equal increase of current public expenditures. Finally, it was determined that public investments lead to four to five times larger output of private entrepreneurs than the realized public investment expenditures.

The relationship of productivity and economic activity of USA from 1929 to 1986 was investigated by Edgar A. Peden (1991:153-173). His research rests on the idea that the orthodox neoclassical theory of productive economic growth allows for the growth of government economic activity beyond the elementary level. it is believed that such growth integrates the market and provides the delivery of public goods. This results in acceleration of economic growth. On the other hand, increasing economic activity of the government hinders economic growth through taxes (by

creating imbalances within the economic system) and dependence on government expenditures. According to that, government economic activity is defined by the ratio of expenditures in GDP (definition of the government power). The research on the relationship of productivity and government expenditures in the case of US economy and according to the classical methodology of "supply-side economy" shows the maximum level of productivity at the level of ratio of 20% of expenditures in GDP. The level of productivity was much lower at the value of ratio at 35% (as was the relationship between the mid-eighties of the last century). One of the research goals was to find factors that limit the rise of productivity. The research shows that the reduction of the growth rate of the U.S. labour productivity in the second half of the twentieth century (3,5% from 1947-1957, and 1% from 1976-1986, for example) was caused by increased economic activity of the government (Peden and Bradly ,1989:229-45). According to them, the ratio of government expenditures in GDP in the year 1929 was only 10% and till the midst of eighties has been increased to 35%. Methodological and analytical paradigm of neoliberal theory lead to three results of direct effects of the government size on productivity (Peden and Bradly, 1989:169): firstly, when the ratio of expenditures was low and stable, productivity has achieved a growth rate around 2%; secondly, the rise of productivity is related to the rise of government expenditures up to about 17% of GDP (which indicates the optimal level of that ratio) and, above that level, expenditures reduce productivity growth; thirdly, that the decrease of the productivity growth after the Second World War, particularly during the seventies and eighties, was caused by "dramatic growth of the state" (government spending. This is a typical conclusion of neoliberal methodological approach. Different conclusion would be surprising. However, this is very distant from the scientific truth. Many aspects are ignored such as: the decline of the competitiveness of American economy (i.e. companies) and, on that basis, decrease of their profit which reduced the relative share of corporate income taxes in total taxes (Auerbach, Poterba, 1988:32-49); the increase in inequality in the distribution of income and capital (which took on dramatic proportions in late twentieth century) (Slemrod, Bakija, 2001). Thus, the Paden's analysis was not complete enough in order to be able to conclude that the increased government activity leads to slowdown of productivity. On the contrary, Scandinavian societies present the opposite example. That economic and social model can withstand high level of government expenditures as long as is able to maintain a high growth rate of GDP and productivity.

The research results lead to establishment of appropriate principles that govern relationship between government expenditures and the level of economic development (Lindauer-Velenchik, 1992). From the extensive research there are two basic conclusions: first (which was observed much earlier by A. Wagner), that the developed economies recorded a steady trend of increase of relative ratio of expenditure in GDP, which was particularly pronounced in the second half of the

twentieth century, with no signs of slowing, for example, during the eighties (this finding coincides with the previous results). Second, that the increase of ratio of expenditures in GDP or national income did not have the same intensity in all (types of) economies. That ratio depends on the level of economic development (measured by GDP or national income per capita) in a way that more developed economies record higher ratio of expenditures. Emerging economies had a relatively lower ratio of GDP or national income for the government economic activity, as they, via facti, have a lower fiscal capacity. The relationship of politics and economic growth was also investigated (Alesina-Rodrik, 1994:465-90). Their starting assumption is that economy produces consumption goods, i.e. income and wealth, which are distributed by the politics. The empirical results of this research show that inequality and ownership of income negatively correlate with alter economic growth: inequality in use of income and wealth and higher rates of taxation result in lower economic growth.

Up to the midst of nineties there were numerous researches on the issue. However, the results of these studies are ambiguous. Therefore, it is concluded (Hansson, Henrekson, 1994:381-401) that it is no possible to determine whether government expenditures have positive or negative effects on the growth of production. Such dilemma can be resolved only by appropriate econometric test. In this regards in many of those studies (if not in most of them) it is determined that government expenditures negatively affect economic growth. It is important to remind that this is mostly related to the government spending. This refers equally to the past, as for present period. Thus, it was gradually realized that the problem (is in measurement as some argue) was in methodological approach (Hansson, Henrekson, 1994:396). The problem is in the "aggregate" approach: government spending and investments are aggregates of GDP. Therefore, a more appropriate methodological approach was chosen: decomposition of government expenditures and their effects on productivity growth of the private sector. For the purposes of such methodological and analytical paradigm they use a production function form that accounts for the convergence effects. The model includes disaggregated types of government expenditures for 14 OECD countries and 14 industries in period from 1970 to 1987. The research results are as follows: (1) total expenditures, current spending and transfers have continuously negative effects on the growth rate of global productivity (TFP – total factor productivity); (2) no relationship was found between government investments and global productivity; (3) expenditures on education have a positive effect on the increase of global productivity (the regressions show increased effects of these types of expenditures); (4) the effects of government spending on the productivity of the private sector realise through their impact on total productivity; (5) no significant relationship was determined between different categories of government expenditures and marginal productivity of capital and labour.

In the midst of the nineties of the past century the IMF publishes important research on the relationship of government expenditures, taxes and economic growth (P. Cashin, 1995). They use (common for that period) endogenous model that measures effects of public investments, public transfers and taxes on economic growth. Theoretical construction of the model was tested on the sample of 23 developed economies in period from 1971 to 1988. On the basis of this time series the results confirm effects of public investments on economic growth. By that time the theoretical relations between these factor (government expenditures, taxes and economic growth) was not present in the neoclassical model[5]. Studies in late XX century emphasized the role of fiscal policy in stimulating economic growth rates. This was ascribed to the direct effect of government expenditures on the production function of the private manufacturing sector (Easterly, 1989, 1990, Barro, 1990; Barro-Sala-i-Martin, 1992, 1995). These research results have improved the results of previous analysis of effects of fiscal policy on economic growth. Previous analyses were too focused on the effects of government expenditures, while they at the same time neglected the effects of "tax imbalance". This syndrome, however, has remained the same until present. The current pressures on government spending, as a rule, ignore the fact that taxes are factors that cause imbalance in the functioning of economic systems in general and the economic slowdown. Cashin's study, therefore, stressed out the new contribution to the research on relation of government expenditures, taxes and economic growth: (1) the social capital is used in endogenous growth models by analysing the impact of public finance variables, rather than the government services, (2) the model takes into account the competition in the use of public capital, unlike with the previous concept of uncompetitive and inability of exclusion of citizens from the consumption of public goods and services (3) the model has the ability to separate out and highlight the reduction of economic growth caused by the tax imbalance, but also to indicate the effects of encouraging the growth through capital accumulation and transfers; Previous studies of relationship between government and economic growth did not separately determine different impacts of taxes, transfers and investments in public capital on the economic growth rate); (4) the hypothesis of stimulating effect of capital accumulation and transfer payments was confirmed. In addition, negative effects of taxes that change relative process were determined. Proof of significantly positive effects of transfer payments on economic growth is particularly important (this was not possible to determine by previous panel regression techniques). Therefore, productive public inputs promote economic growth. These are public

[5] We do not want to suggest that this problem is forgotten within the framework of neoclassical doctrine. The reason is in the standpoint that the standard neoclassical model assumes that the marginal product of each factor of production converges to zero with the unit increase of individual factors, and all other factors constant. Namely, within the early neocassical models (Solow, 1956; Swan, 1956) technhical progress (changes) presents a source of long-term economic growth, where fiscal policy has a small efect on the rate of capital accumulation or long term growth of production.

investments and transfer payments, which (as inputs) generate positive externalities that increase private investments, and thus, economic growth too. However, we should bear in mind that the government has to secure the payment of taxes in order to be able to finance public expenditures. These taxes reduce marginal return on the private capital and, at the end, decrease economic growth. Thus, from there comes the conclusion on the "trade-off" in different variants of contribution of the government to the economic growth[6].

In the mid-nineties Ramey and Ramey (1995) publish the research on the relationship of instability of socio-economic systems and economic growth. They determine the negative impact of instability of government expenditures on economic growth. On the basis of the sample of 29 countries (OECD) it was determined that the countries with higher level of instability record lower economic growth rate. In addition, the results show that ratio of investments in GDP has a minor role in the relationship between the instability and dynamics of production. These results show that the earlier theoretical argument of lack of relationship between economic cycles and economic growth were flowed. These positions have neglected some essential elements of these relationships. The theoretical standpoint on the investment relationship between the instability and economic growth was not confirmed as well. At the same time, the research shows negative effects of instability of government expenditures on economic growth. Moreover, political instability may be important cause of instability in government expenditure. This notion is complementary with the results of previous studies which have shown that political instability in the socio-economic system leads to lower economic growth (Alesina et al, 1992). In order to reduce the prevalence of such instabilities the conditions defined by gradual convergence and harmonization of expenditures and stimulated by globalisation of international economic relations had to be created. Such dynamics can be observed, primariliy within the EU as the "most globalised" association of the contemporary world. The analysis of the relations of the composition of government spending, economic growth and globalisation, it was particularly reviled that the structure of government expenditures becomes simpler over time (Sanz-Velasquez, 2004). This analysis presents, for example, features as: (1) the dynamics of harmonisation (driven by globalisation) increasingly accentuates the share of productive expenditures, and reduces the share of expenditures allocated to unproductive purposes; (2) in contrast, the demand for spending on social welfare increases as the country is more open to international trade, since the purpose of these expenditures is in reducing the exposure to external risks; (3) it seems worthwhile to emphasise here that the authors cite Barro's paper (1990) where the argument is that the structure of expenditures should be considered

[6] The studies show that this "trade-off" can be observed in emerging economies, for example, when acomplishing goals such as: appropriate level of GDP, level of prices and balance of payments surplus (D' Souza , 1996, p. 2603).

as important factor of long-term economic growth (Barro, 1990: 61) and that the strengthening of the government would direct activities towards the simplifying the structure of expenditures. In regards to these arguments, the issue is whether the OECD member countries harmonized their composition of government expenditure during the nearly three decades (1970-1997). The tendency towards such features in the structure of expenditures is well known, although it slowed down from the early eighties. The authors suggest that it can be assessed that the process of harmonisation presented two structural models: the so-called "representative" model (12 countries) which marks the average for the OECD countries, and the second one, "common" where eighth members of the association were included. The latter model can be distinguished by the high share of social welfare expenditures and substantially lower share of expenditures for services of transport and communication. It is surely worthwhile to mention the results recent research on the relationship of economic growth and government expenditure in a sample of seven countries of Southeast Europe (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, and Serbia). The research was conducted by Alexiou, 2009. He argues that the relationship between the government expenditures and economic growth is far from being clear-cut. This assessment is supported by the comparative survey of empirical studies which suggests that this relationship is generally negative if it is presented relative to GDP and, on the other hand, positive when the annual relative changes are used (Alexiou, 2009:5). According to his research, out of the five variables used (public capital expenditures, development grants, private investments, trade openess and labour force), the first four show positive and significant effect on the economic growth. The labour force variable does not have a significant effect on the economic growth (Alexiou, 2009:11).

In discussing relationships of government expenditures and economic growth it is important to consider (at least some) standpoints of the theory of growth of the government. The first step is to define the size (power) of government in the sense of its ratio in distribution of GDP, i.e. national income (Strulik, 2007). There is a consensus that the power of the state rises with decreasing or slowing of the income dynamics. The power of the state in developed economies stagnated or even declined over the last two decades. This was preceded by a long period of three decades after the Second World War with the growth of income per capita and the rising share of government in the distribution of GDP. There were high economic growth rates in the most of the Western economies. Strulik provides some interpretations of that growth through the phenomenon of transitional dynamics. These processes operated during the reconstruction after the Second World War or after the structural reforms were implemented. For these purpose the neoclassical production function was used although the analysis and interpretation of the size of the government could be carried out in an endogenous growth model (it is considered that the application of endogenous growth model is not appropriate). The economic activities of the governments in many countries have been able to

realize continuous economic growth. However, during the last two decades of the last century in some countries, including the U.S., government spending decreased (measured by the ratio in GDP). This reduction of government spending and weakinging of the "welfare state" is explained by the concequence of growing competition of the measures of fiscal policy. This was a convenient argument in order to be able to "supress" the attack of neoclassical (market – fundamentalist) doctrine and rich elites on the power of the post-war state, and "welfare state" in particular. The material power of the state was particularly tried to be reduced by neutralization of fiscal policy measures. The consequences are well known.

2.2. External debt and economic growth – the results of the recent research[7]

The essential suggestion of the literature on the level of foreign debt of emerging economies, for example, is that this source of financing promotes economic growth through the capital accumulation and rise of productivity. The issue that comes to the fore is to explain the reasons why large debt retards economic growth and which processes lead to such phenomenon. This issue is relevant, nota bene, for the Croatian society. The most of the theoretical standpoints were determined by the so-called "debt overhang theory" (Krugman, 1988). The proponents of this theory argue that a certain mass of borrowed capital that jeopardize the ability to service debt can lead to reduced interest of domestic and (in particular) foreign investors. The reason for that is in the assumption of expected (future) increase of tax burden for the purposes of repaying the debt. We argue that this moment is almost not stressed out in discussion on the Croatian "indebtedness position". Therefore, investors review their investment options. This leads to misallocations and poor quality of investments. The consequence is in slowdown of productive economic growth. The latest scientific findings about the non-linear relationship of debt and economic growth through the capital accumulation or productivity are particularly important. Such a relationship was determined in the case of group of poor countries with higher level of income. It was determine that the average impact of debt becomes negative at the level of 160-170% of exports and 35-40% of GDP (Cooley-LeRoy, 1981: 6). Furthermore, it was found that if the mass of debt doubles, in economies with average indebtedness, the annual per capita GDP reduces between half and one percentage point (Cooley-LeRoy, 1981: 6). Only few studies that cover issue of non-linear debt effects on economic growth show that debt becomes too high when it reaches 50% of GDP or 200% of exports (Pattillo, Poirson, Ricci, 2002: 7). However, some researches show much lower "threshold" where the debt crisis is initiated. Thus, it is argued that this "threshold" is at only 15% of GDP in the economies with problems of payments and inflation. There are also studies that have found negative impact of debt on the economic growth. For this purposes they

[7] See Sever (2005).

use dynamic linear model of relationship of debt and economic growth in emerging economies. A significant and negative effect of debt is determined.

A large step has been taken in the search of answers to the question of channels through which debt affects the economic growth. That answer is important for the Croatian situation as well. There is a substantial lack of such research. The disaggregation of the function of economic growth is well known: accumulation of capital, human capital and residual factor of global productivity. However, these "decompositions" were subject of research of just a few studies. However, the channels of debt effects on growth are dealt only by the study of Pattillo, Poirson, Ricci, 2004. They provide valuable insights:

(1) in the nonlinear relationship between debt and economic growth:

- the effect of debt on growth is very different at a low level of indebtedness; at this level they found generally positive effects for the global production and negative for the capital (on average); the findings are often insignificant;
- on the higher level of debt there are strong negative effects on economic growth, on average; doubling of debt at or above the "threshold" will reduce the per capita GDP growth by about 1%.

(2) regarding the sources of economic growth:

- a high level of debt has a profoundly negative effect on the accumulation of physical capital and global productivity; doubling of debt, on average, will reduce the growth of per capita GDP in the case of physical capital and global productivity by about 1%;
- the low level of debt tends to exert a positive effect on the overall level of production and negative effect on the capital, but in general this effect is not significant.

The general conclusion is that the doubling of the debt under conditions of high indebtedness will reduce per capita GDP growth by 1%, where global output is reduced by 2/3 and per capital accumulation of physical capital by 1/3; on the contrary, the effects of high levels of debt to the accumulation of "human capital" are of very modest significance.

The results of these studies are consistent with the arguments that the great mass of debt least to weakening of investment incentives and potential to introduce appropriate measures of economic policy. Likewise, it is difficult to determine the effects of debt on human capital accumulation due to the long gestation period of such effects.

Finally, we can conclude that the basic research on the issue of foreign debt and indebtedness (in principle for the emerging economies) assumes that this economic and financial category stimulates the GDP growth. This operates by the "complementary role" towards the domestic savings i.e. mobilisation of domestic sources (factors) of development, such as capital accumulation. This is followed by the industrialisation (Chawdhury, 2001: 18). In recent period the studies suggest negative relationships between the foreign indebtedness and economic growth. It is emphasised that such findings are related to the crowding-out effects of domestic savings by the foreign capital inflow. However, they do not provide complete specification of variables that have to be taken into account within the statistical testing of relationships of debt and economic growth (Cooley-LeRoy, 1981). Thus, there are still many puzzles that have to be highlighted related to this issue. Some of these issues are the following (Pattillo, Poirson, Ricci, 2004: 20): does the high debt limits the capital accumulation through the reduction of public investments, private investments and external direct investments; which are the mechanisms through which a high level of debt reduce the major factors of production; does negative effects of high indebtedness on the economic growth and its sources varies among countries according to the general quality of the economic policy; furthermore, in that case, which are the types of policies important for promoting economic growth even in the circumstances of high level of income; finally, would the earlier high mass of debt, without new borrowing, had different effects on growth than the high present mass of debt with new borrowing on a larger scale. Of course, these issues have to be analysed in the Croatian case as well.

3. Fragments of the analysis of relations between budget spending and economic growth in Croatia

An important feature of the Croatian economic development over the past 20 years is a continuation of already (roughly) ten-year stagnation. (Družić, Tica, 2002, Sever et. al., 2009) In contrast, it has been recorded an inappropriate and very inelastic volume of government budget spending in, via facti, terms of declining domestic supply. Of course, we do not engage in judgment whether this spending was justified from the social and political standpoint. The fact is that such spending has breached the material accounts of the society with all the consequences, such as accumulation of foreign borrowing.

3.1. The framework of the budget spending[8]

Budgetary spending was an expression of an imbalance of the real sector (supply of goods and services) and continuous financial needs of the government. The data in the table 1 illustrates this relationship. They present a "ceiling" of the government spending and its material possibilities marked by the GDP growth rate. It is possible to set up these relationships in a manner to be able to compare the growth of available funds (of total supply by taking into account the balance of international trade). However, this is not necessary, since we are interested in showing the lack of general government revenues.

Table 1: Economic and financial framework of the government spending and causes of the foreign public debt increase

– current prices

Years	Average annual GDP growth rate – constant prices (%)	Value of GDP (mln. HRK)	Total general government expenditures (mln.HRK)	Ratio of total general government expedntiures in GDP (%)	General government deficit (mln. HRK)	Ratio of government deficit in GDP (%)
1	2	3	4	5	6	7
1994	5.9	87,441	38,274	43.8	3,498	- 4.0
1995	6.8	98,382	47,882	48.7	3,935	- 4.0
1996	5.9	107,981	54,297	50.3	4,273	- 4.0
1997	6.8	123,811	61,058	49.3	6,464	- 5.2
1998	2.5	138,392	70,871	51.2	6,029	- 4.4
1999	- 0.9	141,579	76,575	54.1	6,297	- 4.5
2000	2.9	152,519	81,036	53.1	13,298	- 8.7
2001	4.4	165,640	82,841	50.0	10,884	- 6.6
2002	5.2	179,390	86,025	48.0	12,458	- 6.9
2003	4.3	193,067	94,167	48.8	11,358	- 5.9
2004	4.2	245,550	104,154	42.4	7,727	- 3.1
2005	4.2	264,367	112,175	42.4	9,074	- 3.4
2006	4.7	286,341	119,798	41.8	7,504	- 2.6
2007	5.5	314,223	129,699	41.3	2,983	- 1.0
2008	2.4	342,159	139,427	40.7	4,689	- 1.4

Note: The total general government consumption (column 4) includes expenditures and government annual repayment on the basis of external public debt.

Source: Data on expenditure and GDP growth rates in the CNB Bulletin. Other data are derived

[8] See Sever et. al. 2009.

Balancing of the total available financial potential of the government in the previous period (starting from the end of the nineties) shows that it was possible to prevent the collapse of economic growth in that period. However, instead of rising of investment spending, it seems that a great deal of public funds was spent on different forms of "current spending". Such policy was continued in the next period as well and such behaviour was a strong generator of the public financial crisis (imbalance). This happened despite of different signals that indicated retardation of the GDP growth rate. It is important to mention ones more that this was the turning point when the generators of future growth of foreign, and public debt in particular, were activated. The consequences are well known, such as unsustainable high unproductive spending which was generated by excessive borrowing. From these economic and financial comparisons it was already noticeable that, from the end of nineties, the government was not able to finance current level of spending. That was certainly one of the indicators of increasing complexity of functioning of economic and financial system. These complex conditions, from that moment, have been worsening. However, in order to be fair, we have to state that the government was exposed to increasing pressure of some development priorities. This was one of the "forces" that pressured government towards more spending. Thus, the government, also from the perspective of mentioned global relations, turned to increased spending and borrowing.

In these complex economic and financial circumstances one more factor crucial for the present crisis situation of the Croatian economy came into the fore. And this factor might be decisive as well. This is, of course, the outflow of the net income. In regards to that, the indicators that reveal relations between certain economic and financial categories are presented in the table 2 below.

Table 2: Relationships of GDP growth, the external debt, revenues and expenditures

– current prices

– mln. HRK

Years	GDP growth rate	Relationship of revenues and expenditures of the consolidated general government (expenditures = 100)	Growth rate of the foreign public debt	Annual repayments of the foreign public debt	The relationship of repayments and growth rates of of the foreign debt (growth rate =100)
1	2	3	4	5	6
1994	4.871	105.0	- 82	1,065	-1298.8
1995	10.941	107.0	- 601	1,102	-183.4
1996	9.599	112.4	12.248	1,999	16.3
1997	15.830	110.0	4.670	2,338	50.1
1998.	14.581	114.0	5.981	2,892	48.4
1999	3.187	102.3	6.225	1,338	21.5
2000	10.940	96.8	9.990	2,490	24.9
2001	13.121	96.5	3.548	3,747	105.6
2002	13.750	105.2	1.267	6,085	480.3
2003	13.677	105.8	6.808	3,153	47.5
2004	14.015	102.3	4.288	9,867	230.1
2005	18.817	102.6	- 3.976	11,664	-293.4
2006	11.974	104.2	- 3.594	12,067	-335.7
2007	27.882	106.7	12.954	10,929	84.4
2008	27.936	103.4	5.579	9,168	164.3

Source: Derived from data in the Table 3, the CNB and statistical reports of the Ministry of finance. The growth of public debt from the year 2003 is based on data on state and projection of the public debt of the MF, ending with the year 2006 (foreign guarantees and debt of HBOR is added). For the remaining two years we use data from the Bulletin of CNB, no. 147, p. 13 (a table at the end of the second column) with the conversion of public debt in HRK, for which we use an appropriate exchange rate GBP / EUR in the Table H9 of the same newsletter

Important comparisons are provided by the column 2 with columns 4, 5 and 6. The data show that the outflow of net income has started in the previous period. "Scissors" were closing on the two sides: on the one side, the debt repayments have been reaching the GDP growth rate. On the other hand, repayments have surpassed the growth rate of the capital inflow. The outflow has exceeded the inflow of foreign capital, particularly in year 2005 and 2006. That economic and financial flow is one of the causes of the latest crisis of the Croatian economy. This was followed by the outflow of capital. In addition to that, the unproductive spending of borrowed capital worsened the situation. Such policy has intensified the poor state of economy and public finances. This crisis has to be stopped but the question is there solutions to accomplish such a goal. One of the indicators of the "health status" of national

economies is the relation of growth rates of production (GDP) and external obligations repayments. In the recent period these relations have reached the level where appropriate and urgent short-term measures are necessary (in order not to intensify the problem). This has to be based on the appropriate strategy which, at least in the middle term, has to direct public finances towards the recovery. That, unfortunately, did not happen. The creation of budget deficit covered by foreign borrowing continues.

Table 3 in the appendix shows trends of the expenditure categories of the consolidated general government in period 2005-2010. It can be observed that the bulk of budgetary spending is related to the compensation of employees and social benefits. From the year 2008 the crisis changes the structure of expenditure in an unfavourable direction. In that sense, in relative terms the ratio of expenditures in GDP increases. Expenditures for the compensation of employees and social benefits have been particularly increasing. In addition, capital expenditures are decreased as well, both in relative and absolute terms. Thus, unfortunately, it can be concluded that the government budget is pro-cyclical. Government spending is continuously financed by borrowing. However, in recessionary conditions the relative increase of expenditures is caused by reduction of GDP and does not represent devised "ex-ante" operation of the government, but "ex-post" reflection of negative economic dynamics. Such borrowing is not anti-recessionary because it lacks the multiplier effects due to orientation to fill the fiscal gap.

3.2 Fragments of the analysis of spending of the foreign borrowed capital[9]

When evaluating the basic structure of borrowed capital on the basis of external loans it has to be noted: first, that the Croatian government has imported about 40 bln. HRK or 5,2 bln. EUR (by the exchange rate of 7.6712) in period from 1996 to 2004. From 2004 to 2008 there was an inflow of about 11 bln of HRK or 1,5 bln. EUR. If we sum up the borrowing in the whole period we obtain about 51 bln. HRK or 6,7 bln. EUR. The strategically important question is where this capital was directed. Such an enormous amount of additional factor of economic growth should have been reflected on the economic growth (GDP growth rate). We try to obtain this answer by analysis of the structure of government spending[10]. We balance the borrowed foreign capital within the flow of reproduction of public sector i.e. financial activity managed by the (general) government. For such purposes we use available aggregate data on government spending and important data from Bureau of Statistics on the sources of investment financing. The answer might be

[9] See Sever et. al. 2009.

[10] By methodologically common financial aggregated that can be obtained through statistical sources on government finances (MF and CNB). We have to warn about changes in the methodology of public finance management applied in the recent period.

approximated within the framework of conditional balance of the (general) government investment spending and the use of foreign debt (we should search for these answers in the system of national accounts). We conduct balancing in order to enable better understanding of derived financial relations that come from the assumption that the growth of foreign public debt was directed to investments.

Table 4: The elements for balancing the investment potential of the general government

– current prices

– mln. HRK

Year	Foreign public debt	Payments for investments from funds and budget	Capital revenues of the general government
1993	833	191	. . .
1994	751	225	361
1995	1,352	835	979
1996	13,600	1,463	1,593
1997	18,096	4,608	1,195
1998	23,562	6,140	2,740
1999	30,400	7,394	6,975
2000	40,280	7,298	3,738
2001	44,014	5,184	6,066
2002	45,281	5,072	3,151
2003	51,913	5,916	4,214
2004	56,092	6,849	3,920
2005	59,629	7,812	3,427
2006	56,035	8,734	2,392
2007	68,989	10,546	4,901
2008	74,568	9,889	3,084

Note: The table provides the elements for balancing the investment potential of the government.

Source: Data on public foreign debt were obtain from the Bulletin; payments for investments from the Statistical Yearbook and Press-releases of the Bureau of Statistics (data available only for the year 2008); capital revenues come from the annual reports of MF and the tables of revenues from consolidated general government balance sheet (Capital revenues)

It turns out that in all of the respective years the government had a surplus of capital available for financing of its investments. Of course, provided that all growth of the debt is directed to payments, as we assume in this case). Simply stated, the Croatian government had a surplus of capital that could be directed to investments. The issue is why this capital didn't end up in investments.

In regards to that we obtain one more important conclusion. By comparing current revenues and expenditures (table 5) we determine that the expenditures surpassed the revenues only in two years (2000 and 2001). In all other years current revenues have exceeded current expenditures. That notion has far reaching consequences and leads to an important conclusion: problem of Croatian public financing is not in the source of current financing. The same is valid both in the case of general and central government. Via facti, it was not necessary that the government borrows capital for current budget spending but only for the investment purposes.

Table 5: The foreign public debt and investment potential of the general government

– current prices

– mln. HRK

Year	Foreign public debt (Annual growth)	Payments for investments from funds and budget less column 2	Capital revenues less column 3	Current revenues	Current expenditures	Diffference between revenues and expenditures (financial savings of the government) (5 – 6)	Total difference of the reveneus (4 + 7)
1	2	3	4	5	6	7	8
1994	- 82	307	54	39,883	35,607	4,226	4,280
1995	644	191	788	46,451	43,409	3,042	3,830
1996	12.248	- 10,785	12,378	52,778	46,941	5,837	- 3,355
1997	4.496	112	1,083	58,987	53,608	5,379	6,462
1998	5.466	674	2,066	69,947	61,342	8,605	10,671
1999	6.838	556	6,420	68,028	66,485	1,543	7,963
2000	9.880	- 2,582	6,320	70,867	73,175	- 2,308	4,012
2001	3.734	1,450	4,616	72,777	75,404	- 2,627	1,989
2002	1.267	3,805	- 654	79,679	75,764	3,915	3,261
2003	5.632	284	3,930	85,734	81,034	4,700	8,630
2004	4.179	2,670	1,250	92,507	90,478	2,029	3,279
2005	- 3.976	11,788	- 7,361	99,674	96,270	3,404	- 3,957
2006	- 3.594	12,328	- 9,936	109,902	103,468	6,434	- 3,502
2007	12.954	- 2,408	7,309	121,815	114,114	7,701	15,010
2008	5.579	4,310	- 1,226	131,654	123,567	8,087	6,861

Note: Table shows the interdependence of the financial flows of the general government or volume of use of borrowed foreign money and own capital revenues (investment potentials). This potential is constructed so that for the each year the growth of public debt (difference between the two years) is subtracted from the sums paid out from the investment funds and the budget (i.e., investments financed by the state). The difference, the amount of investment which is not covered by the increment of external debt, decreases the category of capital revenues

Source: Derived based on the data in previous tables

If that is the case, very clear solutions for the stable functioning of the budget financing follow. These are suggested by the theory and applied in the practice: the so called "golden rule". The question is where were the funds from the last column (8) of the table 5 directed. From the year 2000 this amount has been accumulated on the level of about 35.6 billion. This question opens other issues as well. Regardless of the changes of methodology and weaknesses of approximation and determination of certain values (calculation of the value of debt in national currency) these questions remain important and valid. This thesis is confirmed by quantitative analysis. The GDP growth rate has not been sensitive enough on the huge mass of (borrowed) foreign capital during the recent period. It is important to find an explanation for such state. We argue that this is due to the fact that this capital was not used for investment (financing of development) but for other, unproductive purposes.

4. Methodology of the analysis

The analysis of the dynamics of certain categories of expenditures is made more difficult by the changes of budgetary methodology or adjustment to the new budget classification which is conditioned by transition from guidelines of government financial accounts by the IMF from the year 1986 to the new guidelines from the year 2001. Thus, it is possible to analyse the categories of expenditures by quarters from the second half of 2004. This refers for the consolidated central government even though for the purposes of the analysis it would be preferable to use consolidated general government data. However, this dataset enables analysis of impact of individual categories of expenditures particularly due to the fact that budget structure from the nineties is relatively stabile. Dynamics of expenditure categories is presented by figure 1. As it can be observed we use the following variables:

R – total expenditures

RNZ – compensation of employees

RDU – expenditures for goods and services

RKA – interest

RSU – subsidies

RPC- grants

RSN-expenditure on social benefits

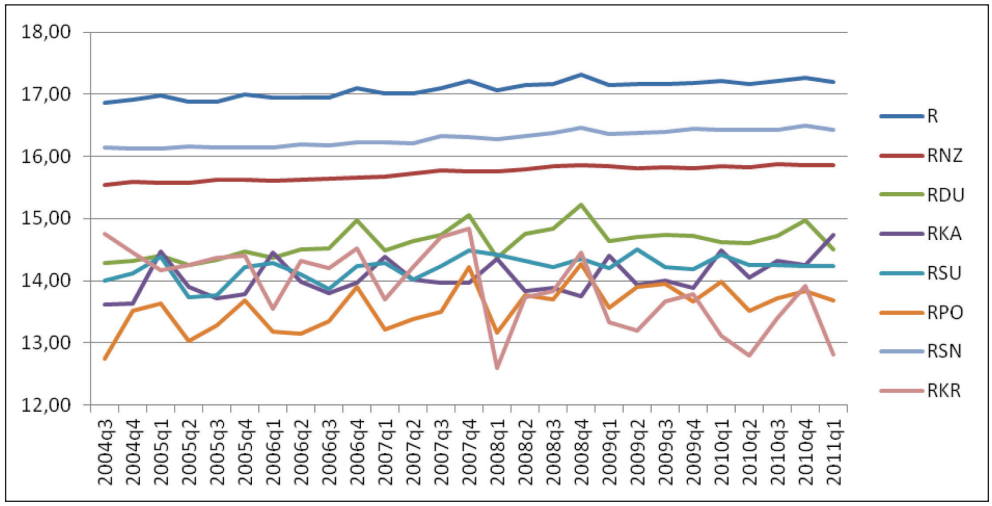
RKR – Capital expenditures

As it is already mentioned above, it can be observed that the total expenses and a part of the current expenditures (compensation of employees and social benefits)

are characterized by a relatively stable trend of moderate growth, while all other categories fluctuated significantly. We can observe particularly pronounced abrupt decline in capital expenditures from the first quarter of the year 2008. Such a saving of the government through the reduction of capital expenditures is characteristic response to recessionary conditions; however, it presents a pro-cyclical measure in the period of crisis. On the other hand, in terms of the budget constraints and the inability to borrow additional funds this presents the only solution in the short term.

Figure 1: The dynamics of the categories of expenditures (the second quarter of 2004. – first quarter 2011)

– natural logs, constant prices based on previous year



Source: Online databases of the Ministry of Finance (www.mfin.hr)

R-total expenditures, RNZ-compensation of employees, RDU – expenditures for goods and services, RKA – interest, RSU – subsidies, RPC – grants, RSN – expenditure on social benefits , RKR – Capital expenditures

Since the movement of the variables of GDP and budgetary variables have a pronounced seasonal effects by quarters, prior to analysis it was necessary to de-season the time series (using Census X-11, the multiplicative variant).

The character of the data and the impossibility of setting a priori theoretical assumptions about the impact of certain categories of expenditure suggests that such effects can be analyzed using the empirical non-structural (or a-theoretical) modelling method such as vector-autoregressions (VAR, vector-autoregression) or error Correction Models (ECM error correction model). However, before deciding on the choice of methods it is necessary to investigate the characteristics of each data series in order to determine which method is most appropriate. In case that the

variables are stationary at the same level and co-integrated, it is preferable to use the ECM, otherwise VAR method is more appropriate. It is also of great importance to investigate the optimal length of differentiated variables in the model. A short time series does not leave much room for too many lags due to the loss of degrees of freedom, but, for the same reason, this requires that we analyze as few variables as possible. It is therefore necessary, first of all, to examine the presence of unit roots in individual time series. Table 6 shows the evaluation of stationarity of the variables based on the expanded Dickey-Fuller test (Dicky, Fuller, 1979, Lutkepohl, 2004)

Table 6: Augmented Dickey-Fuller unit root test

Variables	Levels		First-differences	
	AIC[a]	SIC[b]	AIC	SIC
BDP	-0.30229	-0.30229	-3.15178	-4.79064*
RDU	-3.40236***	-3.40236***	-3.74552**	-9.99567*
RKA	-2.16710	-2.16655	-0.81746	-6.09463*
RKI	-5.00861*	-5.00861*	-8.44419*	-8.44419*
RNZ	-2.92303	-2.92303	-3.32368***	-3.45176***
RPO	-1.02628	-1.50165	-0.58932	-1.43781
RSU	-4.54685*	-4.54685*	-5.68603*	-5.68603*
RSN	-3.48376***	-3.48376	-3.23277***	-3.23277

*, **, ***, significant at the level of 1%, 5% and 10%

[a]Akaike information criterion

[b]Schwarz information criterion

Source: Authors

The unit root tests showed that the variables are not integrated in the same order. For some variables we can not determine with certainty whether they feature stationarity or not (variables of expenditures on interest and social benefits). Namely, the values of the ADF (Augmented Dickey-Fuller test) indicate near unit root processes. In any case, we can argue that most of the variables are stationary at first level, I (1). These variables are GDP, expenditure on goods and services and interest. Capital expenditure and subsidies are stationary both at levels and in first differences. A variable grant has not been found to be stationary in both cases.

Due to these individual characteristics of time series, in the further analysis we use the variables of GDP, spending on goods and services, capital expenditures, expenditures for employee benefits and expenditures for subsidies. Also, because of the shortness of the time series we do not take more than four endogenous variables in the evaluation of the model. This is due to the fact that by increasing the lags of the larger number of variables we significantly lose degrees of freedom. Since in the model we use five endogenous variables in each of the four model specifications

we release a single variable. Also, for the same reason, it is not possible to lag variables to a greater extent. Therefore, as "ad hoc" policy or "rule of thumb" we took into account the time lag of four quarters as the logical choice.

After selection of variables and assessment of the level of their integration, it is important to determine whether the variables are co-integrated, i.e. whether the same linear combination of non-stationary variables is stationary. The test of co-integration is developed by Johansen (1991, 1995). In the entire set of model specifications we recorded co-integration relationships; however, when evaluating the ECM model, the level of F-test and adjusted R^2 of the overall model were unacceptable. We argue that these results are due to small sample size, and therefore can not determine with certainty the reliability of co-integration relationship and ECM models. Therefore, we take an approach of evaluation of VAR models.

For the purposes of analysis we apply the full VAR model were a general mathematical representation is:

$$y_t = A_1 y_{t-1} + ... + A_p y_{t-p} + Bx_t + \varepsilon_t \qquad (1)$$

Where y_t denotes a vector of k endogenous variables, and x_t vector of d exogenous variables, A_1,..., A_p and B are matrices of the coefficients that have to be calculated. ε_t presents a vector of shocks of the variables that are in the same time correlated or uncorrelated with own lagged values and independent from the variables on the right side of the model.

5. The results of the analysis and discussion

Since there is a high probability that the budget categories are mutually correlated, the VAR analysis was based on the Choleski decomposition. Specifically, the problem of the impulse response function in its general form is that an exogenous shock affects only one variable. Such an assumption is appropriate if the residuals of all variables in the model independent. Otherwise, if they are correlated, then it is likely that a shock in one variable affects another shock, correlated variables, and thus the whole model. Choleski decomposition removes the correlation between the residuals of variables in the model and makes the model more robust and accurate. However, such improvement can have consequences, because the order of variables in the model becomes important, i.e. residuals of the variables which are most correlated come first. It is very difficult to empirically determine such a sequence and the usually approach is to take into account theoretical notions (Lutkepohl, 2004). It is important to note that, within certain specifications, we tested different combinations of the order of variables, but the results have not significantly changed. Despite of that, our logic is to primarily set variables of current

expenditures, and then capital expenditures. The structure of current expenditures is more stable and not to that sensitive to the business cycle. This situation suggests exogeneity of the variables, and the lack of correlation between pairs of variables. This conclusion is confirmed by the Granger causality test.

In order to determine establish mutual causation of the variables in the model, we conduct a Granger causality test between pairs of variables (Table 7). The test results indicate that the budget expenditures do not cause the growth of GDP. On the contrary, the current revenues are defined by the level of gross domestic product. This situation supports the need for changes in the structure of budgetary expenditures.

Table 7: Granger causality test

	Direction of causality	
BDP	$\Rightarrow$	R*
	$\Rightarrow$	RDU***
	°	RKR
	$\Rightarrow$	RNZ*
	°	RSU

*, **, ***, significant at the level of 1%, 5% and 10%

Source: Authors

The results of the analysis are given in the appendix by figures 2-5. As noted, because of the limitations imposed by small length of the time series, all categories of expenditure could not be analyzed within the same model of VAR. In this model all the variables are endogenous, the omission of important variables can have large effects on the quality of the calculated multiplying the effects of which are presented impulse response functions. As a compromise, therefore, presents four specifications of the model to the analysis of categories of expenditure made more robust. In each of the model omitted one of the endogenous variables. Table 8 summarizes the results of certain specifications with regard to the impact of changes in exogenous variables on the growth of GDP.

Table 8: The effects of the model variables on the GDP growth rate in the long term period (20 quarters)

	Dependent variable: GDP				
Specification	GDP	RNZ	RDU	RSU	RKR
Model 1	0.070635 (0.10538)	-0.133704 (0.10751)	-0.005484 (0.06201)		0.025943 (0.06309)
Model 2	0.047607 (0.06395)	-0.085381 (0.05996)		-0.008813 (0.02128)	0.003476 (0.03505)
Model 3	0.058058 (0.06549)	-0.077812 (0.07104)	0.001192 (0.02194)	-0.012386 (0.08190)	
Model 4	0.174895 (0.13106)		0.057570 (0.15051)	-0.022238 (0.04121)	0.013913 (0.03689)

Source: Authors

The results above are presented graphically. For the sake of brevity we only show the impulse response functions that indicate the reaction of GDP to changes in other variables. The first part of the figures 2-5 shows short-term (marginal) effects of changes in certain variables on the growth of GDP, while the second part shows the accumulated effect (in 20 quarters, or five years). In this sense, the first part can be interpreted as a short-term and the second as a long-term multiplier effect. Despite the different model specifications, we can observe the following regularities.

1) In all three models (Figure 2, 3 and 5), capital expenditures have a positive effect on economic growth in the short and long term;

2) We find the impact of expenditures on goods and services positive in the long term, with greater fluctuations in the short term;

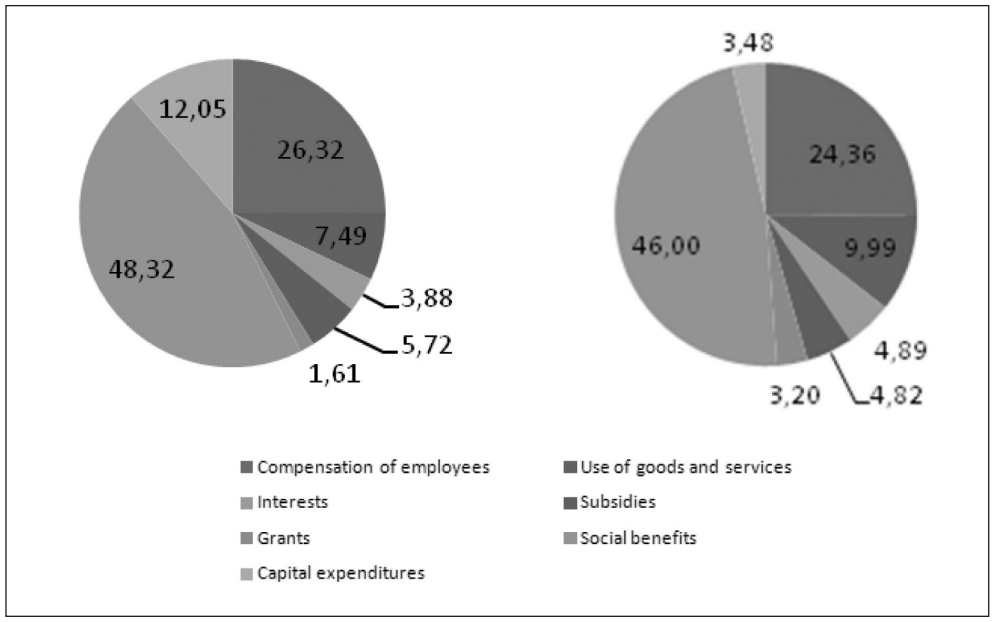
3) Variables of the current consumption, compensation of employees and subsidies in all cases show a negative effect on GDP in the long term;

4) It is interesting to observe that the subsidies in all specifications in short term increase the GDP, while in the long run they affect it negatively.

The results of the analysis have important policy implications for the budgetary spending. Figure 6 shows a comparison of the structure of expenditure categories of the second quarter in years 2004 and 2010. Although the compensation of employees decreased, it can be seen that the structure remained relatively stable, except that the capital investment fell by nearly 10%. Preliminary analysis clearly indicates that the capital expenditure in the short and long run raises the growth rate. In the long term (five years) one-time increase in expenditures for capital of 1% increases GDP by 0.3% to 3% depending on the specification of the model. These results clearly indicate the importance of increased investment in times of crisis, and opposes to a substantial reduction in investment for short-term objectives

of fiscal consolidation. Such a policy of budgetary spending can lead to adverse effects – low growth rates in the short and long term, and the deepening problems in the fiscal sphere, i.e. rise of deficit and public debt due to the reduction in growth rate.

Figure 6: Comparison of expenditure structure (the second quarter of 2004 and 2010)



Source: Online databases of the Ministry of Finance (www.mfin.hr)

In our analysis we carried out all available tests to ensure statistical significance and robustness of the model. First of all, we tested the stability of VAR models by calculating the characteristic unit roots – which did not indicate a presence of the unit root (Table 9). Stationarity of the model is an important prerequisite for the reliability of the model. The stability of the model can be seen visually (figures 2-5) – the initial pulse converges to the zero by the fifth year which indicates the absence of an explosive trend.

In order to determine whether the endogenous variables in the model can be treated as exogenous we conduct multivariate VAR form of Granger causality / block exogeneity Wald test (Table 10). These tests are trying to determine whether lagged values of excluded variables affect the endogenous variable. The outcome, in most cases, indicates the absence of causality between the variables of the model. Also, in all model specifications, we implement VAR portmanteau test for determining the autocorrelation of the residuals (Table 11). These tests clearly present the

absence of autocorrelation. Jarque-Bera normality test also indicates that the model residuals are normally distributed (Table 12). The distribution of residuals is asymmetrical. However, such occurrences are common when it comes to small samples. We can therefore conclude that the assessment of the multiplier effects is reliable.

Finally, in order to determine which variable has a most substantial effect on the change in GDP, we perform a decomposition of variance (Table 13). In this respect, compensation of employees and GDP (business cycle) have largest influence on the changes in the variance (about 90% in any given period). In the specification without the expenditures for employees together with the GDP the most influential variable are expenditures on goods and services (up to 17% of the explanation of variance of GDP in the 20th quarter). This situation is not surprising given the higher proportion of expenditures for employee benefits and expenses for goods and services, but also their profound long-term effect on the growth of GDP.

6. Concluding remarks

The results of the application of econometric model in this paper have unquestionably proved our hypothesis about the inadequacy of the budget spending effects on the GDP growth. The adverse impact of budgetary spending arises from the inadequate structure within which the largest share of spending goes for compensation for employees and social benefits. In addition, such an unfavourable structure was financed by privatization receipts and borrowing. Such an orientation of the budget spending had the opportunity costs in the form of reduction of budget expenditures, which have multiplying effects. Despite high investment activity of the government in the years of prosperity, such investments could have been even higher. The borrowing for the purposes of the current budget spending has also prevented the financing of investment and government spending as part of anti-recessionary policy since the year 2008. On the contrary, a significant reduction in capital expenditure caused by the fiscal consolidation operates pro-cyclically and maintains a strong negative or low GDP growth rates. We can, therefore, conclude our results of research contribute to scientific questioning and understanding of the facts related to relations of the structure of spending, the external debt and the GDP growth.

Surprisingly, despite of the theoretical literature that testifies about the importance of the structure of budgetary expenditures, there has been no research on the impact of categories of expenditure to GDP growth in Croatia. One reason for this situation is certainly in the brevity of time series that are available to researchers. It is certainly worthwhile, however, to point out that this problem is one of the limitations of this research. At this point, in fact, it was not possible to analyze all

categories of budget expenditures. Also, due to a short time series, unit root tests, tests of causality and normality and the evaluation of the model itself lose their reliability. Therefore, in the future research it is important to focus on panel regression analysis of the structure of budgetary expenditures in the world economies. Such an analysis would give answers to different results in terms of economic development, but would also highlight ambivalent successes in the anti-recessionary measures in the domain of fiscal policy of individual economies.

A further object of the analysis should be to determine multiplier effects of individual categories within the each categories of budget (for example, to answer to the question of the optimal structure of capital expenditure). Evaluation of budgetary spending shows the need of undertaking economic and financial measures to change its structure. This change should be in direction of supporting activities which would be beneficial to economic growth. But also we have to be cautious about the fiscal consolidation measures aimed at restraining the total budgetary spending without taking into account changes in the structure of the reduction of public spending. Such a budgetary policy, which is confirmed by the data, leads to reduction of the GDP growth rates in the short and long term. This exposes fiscal authorities to the spiral process of unsustainable fiscal policy. Therefore, we need a radical departure from the previous conception of fiscal policy through the category of expenditures. Only in this way it is possible to exit the recession and state of stagnation. Continuation of current tendencies is not sustainable. That is the reason why the anti-recessionary measures of investment financing and reduction of certain categories of current spending would lead to the solution of problems of public debt sustainability. Such measures would, however, also ensure the adequate rates of growth in the short and long term, which is a priority of our development.

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Proračunska potrošnja i ekonomski rast u Hrvatskoj[1]
Kretanja i odnosi tijekom protekla dva desetljeća

Ivo Sever[2], Saša Drezgić[3], Helena Blažić[4]

Sažetak

Cilj je istraživanja analizirati odnos proračunske potrošnje (državnih rashoda) i djelovanje na rast i strukturu BDP RH tijekom protekla dva desetljeća. Polazna radna pretpostavka (hipoteza) jeste da volumen ukupne proračunske potrošnje (uključivši i vanjski posuđeni novac) nije ostvarivao odgovarajući učinak na rast BDP. U analizi navedenih odnosa koristi se, prije svega, metoda vektorske autoregresije (VAR metoda). Glavni rezultat analize pokazao je da je, u skladu s teorijskim pretpostavkama, struktura rashoda ključna za djelovanje proračunske potrošnje na ekonomski rast. Utvrđuju se pozitivni učinci potrošnje na investicije te kupovinu dobara i usluga te negativni učinci ostalih kategorija tekuće proračunske potrošnje. Pogotovo su nepovoljne tendencije u smanjivanju kapitalnih rashoda u vrijeme recesije, što umanjuje stopu rasta gospodarstva u dugom i kratkom roku. Temeljni je zaključak istraživanja da proračunski rashodi nisu ostvarivali primjeren učinak na rast BDP-a. Stoga, moguće je utjecati na gospodarski rast izmjenama strukture proračunske potrošnje, ali i usmjeravanja javnog zaduživanja prema financiranju investicija.

Ključne riječi: *proračunska potrošnja, bruto domaći proizvod, vektorska autoregresija, struktura rashoda, javni dug, Hrvatska*

JEL klasifikacija: *E60, H50, H60*

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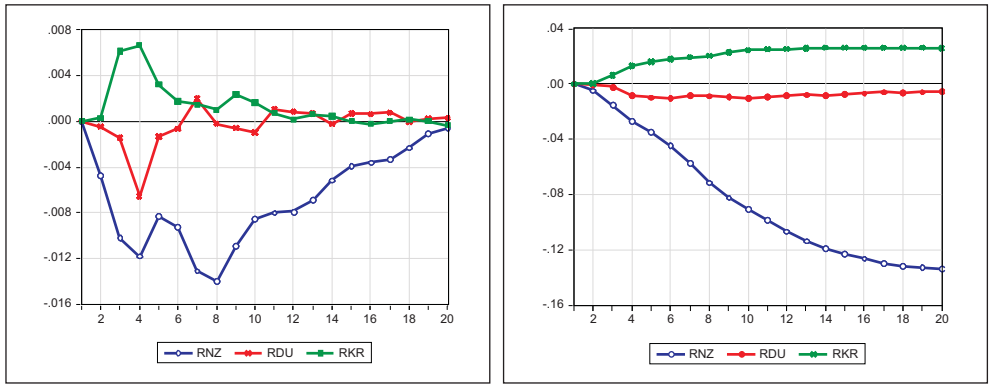
APPENDIX

Table 3: Dynamics of categories of consolidated central government budget expenditures in period 2005-2010

	2005		2006		2007		2008		2009		2010	
	-mil kn	%	-mil kn	%	-mil kn	%	-mil kn	%	-mil kn	%	-mil kn	%
Expenditures	92330.6	34.6	98737.4	33.9	93945.6	29.5	118686.0	34.4	120987.5	36.1	122584.0	36.6
Compensation of employees	24306.2	9.1	25514.5	8.8	25011.1	7.9	30230.3	8.8	31574.9	9.4	31371.6	9.4
Wages and salaries	20665.9	7.8	21701.3	7.5	21290.0	6.7	25696.0	7.4	20807.0	6.2	26628.3	8.0
Social contributions	3640.3	1.4	3813.2	1.3	3721.1	1.2	4534.3	1.3	4773.7	1.4	4743.3	1.4
Use of goods of services	7087.3	2.7	9192.7	3.2	7507.9	2.4	11468.4	3.3	10287.0	3.1	10306.6	3.1
Interest	5004.3	1.9	5398.7	1.9	5081.9	1.6	4900.8	1.4	5509.7	1.6	6551.8	2.0
Susidies	5252.9	2.0	5684.6	2.0	5517.8	1.7	6898.8	2.0	6799.7	2.0	6627.1	2.0
Grants	2806.0	1.1	2837.0	1.0	2576.5	0.8	4067.6	1.2	4117.5	1.2	3937.4	1.2
Social benefits	41929.6	15.7	44188.8	15.2	42668.3	13.4	52593.9	15.2	56148.5	16.8	56906.7	17.0
Other expenditures	5944.4	2.2	5921.1	2.0	5582.1	1.8	8526.1	2.5	6550.1	2.0	6882.8	2.1
Capital expenditures	6657.1	2.5	5307.5	1.8	5307.6	1.7	4228.2	1.2	3167.4	0.9	2679.3	0.8
BDP	266651.5	100.0	291044.0	100.0	318307.8	100.0	345014.7	100.0	335189.2	100.0	334563.5	100.0

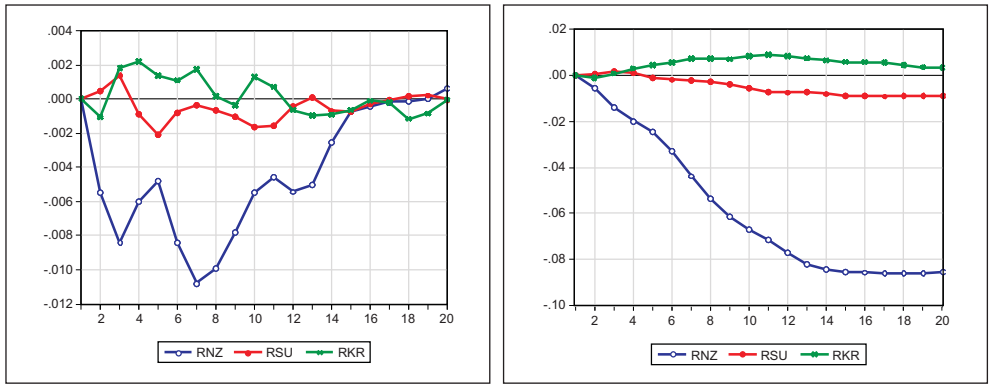
Source: Authors

Figure 2: Impact of selected variables on the GDP growth in short and long term (subsidies excluded)



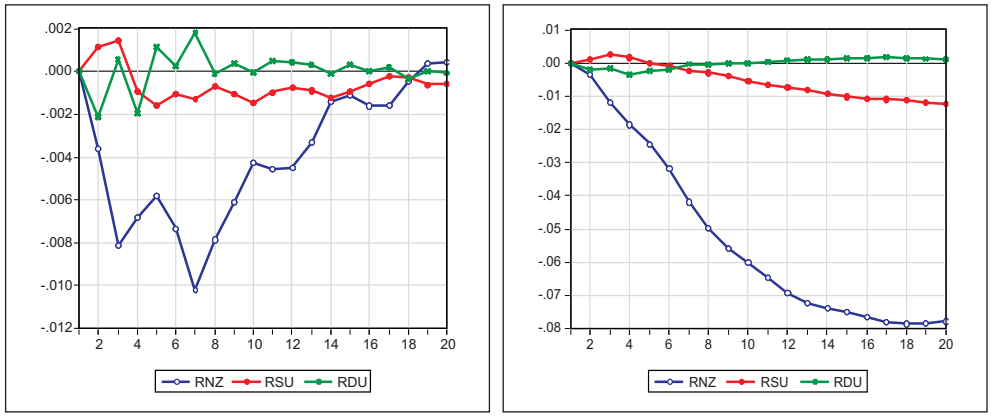
Source: Authors

Figure 3: Impact of selected variables on the GDP growth in short and long term (use of goods and services excluded)



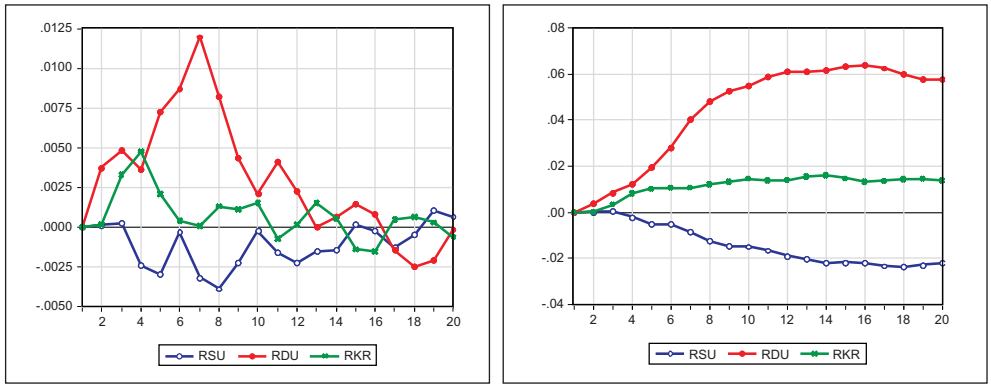
Source: Authors

Figure 4: Impact of selected variables on the GDP growth in short and long term (capital expenditures excluded)



Source: Authors

Figure 5: Impact of selected variables on the GDP growth in short and long term (compensation of employees excluded)



Source: Authors

Table 9: VAR stability tests

Model 1		Model 2		Model 3		Model 4	
Root	Modul	Root	Modul	Root	Modul	Root	Modul
0.224081 – 0.861534i	0.890198	-0.337334 – 0.844215i	0.909117	0.250506 – 0.879525i	0.914504	0.181456 – 0.935951i	0.953378
0.224081 + 0.861534i	0.890198	-0.337334 + 0.844215i	0.909117	0.250506 + 0.879525i	0.914504	0.181456 + 0.935951i	0.953378
-0.882611	0.882611	0.868988 – 0.249887i	0.904203	0.544618 – 0.711697i	0.896170	-0.343529 – 0.870559i	0.935887
0.864337 – 0.115524i	0.872023	0.868988 + 0.249887i	0.904203	0.544618 + 0.711697i	0.896170	-0.343529 + 0.870559i	0.935887
0.864337 + 0.115524i	0.872023	0.888601	0.888601	0.891497	0.891497	-0.807129 – 0.429269i	0.914182
0.492568 – 0.701790i	0.857398	-0.763321 – 0.427984i	0.875117	-0.873760	0.873760	-0.807129 + 0.429269i	0.914182
0.492568 + 0.701790i	0.857398	-0.763321 + 0.427984i	0.875117	-0.757783 – 0.387568i	0.851143	0.621668 – 0.661018i	0.907422
-0.702907 – 0.319460i	0.772096	0.387230 – 0.780391i	0.871182	-0.757783 + 0.387568i	0.851143	0.621668 + 0.661018i	0.907422
-0.702907 + 0.319460i	0.772096	0.387230 + 0.780391i	0.871182	0.826192 – 0.172382i	0.843984	0.901107	0.901107
-0.185004 – 0.681514i	0.706179	0.194505 – 0.841698i	0.863880	0.826192 + 0.172382i	0.843984	0.862909 – 0.234020i	0.894079
-0.185004 + 0.681514i	0.706179	0.194505 + 0.841698i	0.863880	-0.385311 – 0.714855i	0.812085	0.862909 + 0.234020i	0.894079
0.495672 – 0.149056i	0.517599	-0.734933	0.734933	-0.385311 + 0.714855i	0.812085	0.159455 – 0.836589i	0.851649
0.495672 + 0.149056i	0.517599	0.296499 – 0.544514i	0.620006	0.254373 – 0.530341i	0.588190	0.159455 + 0.836589i	0.851649
-0.333217 – 0.376617i	0.502866	0.296499 + 0.544514i	0.620006	0.254373 + 0.530341i	0.588190	-0.694594 – 0.202127i	0.723406
-0.333217 + 0.376617i	0.502866	-0.169299 – 0.266081i	0.315375	-0.278522 – 0.080893i	0.290031	-0.694594 + 0.202127i	0.723406
0.115558	0.115558	-0.169299 + 0.266081i	0.315375	-0.278522 + 0.080893i	0.290031	-0.298968	0.298968
No root lies outside the unit circle							
VAR satisfies the stability condition							

Source: Authors

Table 10: Granger Causality/Block Exogeneity Wald Tests

Model1			Model 2			Model 3			Model 4		
Dependent variable: GDP			*Dependent variable: GDP*			*Dependent variable: GDP*			*Dependent variable: GDP*		
Excluded	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*
RNZ	2.499539	0.6447	*RNZ*	1.720504	0.7870	*RNZ*	1.802076	0.7721	*RSU*	1.002709	0.9094
RDU	2.895868	0.5754	*RSU*	0.710262	0.9501	*RSU*	0.822045	0.9355	*RDU*	2.432671	0.6567
RKR	3.216426	0.5223	*RKR*	0.805004	0.9378	*RDU*	0.677735	0.9540	*RKR*	2.684180	0.6120
All	9.880531	0.6264	*All*	5.978879	0.9171	*All*	5.754848	0.9279	*All*	7.083854	0.8520
Dependent variable: RNZ			*Dependent variable: RNZ*			*Dependent variable: RNZ*			*Dependent variable: RSU*		
Excluded	Chi-sq	Prob.	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*
BDP_SA	4.129241	0.3888	*BDP_SA*	3.251304	0.5167	*BDP_SA*	4.421393	0.3520	*BDP_SA*	12.95359	0.0115
RDU	2.032968	0.7297	*RSU*	1.524544	0.8223	*RSU*	1.353680	0.8522	*RDU*	3.672922	0.4521
RKR	0.183156	0.9961	*RKR*	0.372567	0.9847	*RDU*	2.091048	0.7190	*RKR*	19.18682	0.0007
All	11.55542	0.4820	*All*	10.44430	0.5770	*All*	14.87881	0.2481	*All*	37.05864	0.0002
Dependent variable: RDU			*Dependent variable: RSU*			*Dependent variable: RSU*			*Dependent variable: RDU*		
Excluded	Chi-sq	Prob.	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*
BDP_SA	7.137609	0.1288	*BDP_SA*	3.389757	0.4948	*BDP_SA*	1.439654	0.8373	*BDP_SA*	5.122807	0.2749
RNZ	6.893734	0.1416	*RNZ*	3.211899	0.5230	*RNZ*	7.091792	0.1311	*RSU*	4.240608	0.3744
RKR	2.527083	0.6398	*RKR*	16.09603	0.0029	*RDU*	6.060036	0.1947	*RKR*	0.810056	0.9371
All	16.36638	0.1750	*All*	35.00642	0.0005	*All*	16.38134	0.1744	*All*	11.76408	0.4648
Dependent variable: RKR			*Dependent variable: RKR*			*Dependent variable: RDU*			*Dependent variable: RKR*		
Excluded	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*	*Excluded*	*Chi-sq*	*Prob.*
BDP_SA	0.910557	0.9230	*BDP_SA*	1.171047	0.8828	*BDP_SA*	6.611840	0.1579	*BDP_SA*	6.178110	0.1862
RNZ	5.230389	0.2645	*RNZ*	1.891945	0.7556	*RNZ*	3.441799	0.4868	*RSU*	5.840474	0.2114
RDU	4.591709	0.3318	*RSU*	1.918367	0.7508	*RSU*	3.389696	0.4948	*RDU*	5.129836	0.2742
All	15.14198	0.2338	*All*	9.805754	0.6330	*All*	18.62900	0.0979	*All*	16.29051	0.1783

Source: Authors

Table 11: VAR Residual Portmanteau Tests for Autocorrelations

	Model 1		Model 2		Model 3		Model 4	
Lags	Q-Stat	Prob.	Q-Stat	Prob.	Q-Stat	Prob.	Q-Stat	Prob.
1	15.15389	NA*	27.25901	NA*	19.29783	NA*	22.22922	NA*
2	26.66187	NA*	44.61924	NA*	34.34898	NA*	39.63628	NA*
3	37.54259	NA*	60.53257	NA*	49.65148	NA*	55.20594	NA*
4	49.01125	NA*	79.25273	NA*	59.72121	NA*	64.36654	NA*
5	65.38196	0.0000	93.52669	0.0000	75.65587	0.0000	74.20629	0.0000
6	80.70857	0.0000	103.7457	0.0000	90.99203	0.0000	85.96998	0.0000
7	91.38928	0.0002	111.8315	0.0000	102.6291	0.0000	90.60446	0.0002
8	102.0056	0.0018	125.2299	0.0000	116.1152	0.0001	101.4943	0.0020
9	110.2119	0.0142	131.5764	0.0002	126.1429	0.0008	108.0477	0.0201
10	118.6994	0.0580	139.4636	0.0025	134.7347	0.0056	114.8706	0.0919
11	126.4563	0.1657	146.9690	0.0149	145.2673	0.0189	122.8840	0.2269
12	139.5447	0.2290	160.1963	0.0284	153.0955	0.0646	130.5569	0.4206
H0: No residual autocorrelation; The test is valid only for lags larger than the VAR lag order								

Source: Authors

Table 12: VAR Residual Normality Tests

	Model 1			Model 2			Model 3			Model 4		
Component	Skewness	Chi-sq	Prob.	Skewness	Chi-sq	Prob.	Skewness	Chi-sq	Prob.	Skewness	Chi-sq	Prob.
1	-0.006056	0.000141	0.9905	0.066094	0.016746	0.8970	0.078245	0.023468	0.8782	0.052698	0.010645	0.9178
2	-0.049517	0.009399	0.9228	0.048660	0.009076	0.9241	0.058169	0.012970	0.9093	-0.103415	0.040996	0.8395
3	-0.115421	0.051068	0.8212	-0.018483	0.001310	0.9711	-0.048278	0.008935	0.9247	0.096352	0.035588	0.8504
4	-0.066806	0.017109	0.8959	-0.027493	0.002898	0.9571	0.043498	0.007253	0.9321	-0.054723	0.011479	0.9147
Joint		0.077716	0.9993		0.030029	0.9999		0.052627	0.9997		0.098709	0.9988
Component	Kurtosis	Chi-sq	Prob.	Kurtosis	Chi-sq	Prob.	Kurtosis	Chi-sq	Prob.	Kurtosis	Chi-sq	Prob.
1	0.146111	7.805321	0.0052	0.188223	7.576667	0.0059	0.175167	7.647193	0.0057	0.180224	7.619839	0.0058
2	0.139716	7.840340	0.0051	0.175366	7.646118	0.0057	0.225021	7.379656	0.0066	0.205010	7.486472	0.0062
3	0.232097	7.342069	0.0067	0.156043	7.751090	0.0054	0.215083	7.432604	0.0064	0.330329	6.830180	0.0090
4	0.153098	7.767149	0.0053	0.191029	7.561553	0.0060	0.168529	7.683175	0.0056	0.169124	7.679949	0.0056
Joint		30.75488	0.0000		30.53543	0.0000		30.14263	0.0000		29.61644	0.0000
Component	Jarque-Bera		Prob.	Jarque-Bera		Prob.	Jarque-Bera		Prob.	Jarque-Bera		Prob.
1	7.805462		0.0202	7.593413		0.0224	7.670662		0.0216	7.630485		0.0220
2	7.849739		0.0197	7.655195		0.0218	7.392626		0.0248	7.527468		0.0232
3	7.393137		0.0248	7.752399		0.0207	7.441539		0.0242	6.865768		0.0323
4	7.784258		0.0204	7.564451		0.0228	7.690429		0.0214	7.691428		0.0214
Joint	30.83260		0.0002	30.56546		0.0002	30.19526		0.0002	29.71515		0.0002
H0: residuals are multivariate normal; Ortogonalisation: Cholesky (Lutkepohl)												

Source: Authors

Table 13: Variance decomposition

	Model 1					Model 2				
Period	S.E.	GDP	RNZ	RDU	RKR	S.E.	GDP	RNZ	RSU	RKR
1	0.014118	100.0000	0.000000	0.000000	0.000000	0.016255	100.0000	0.000000	0.000000	0.000000
5	0.031422	52.00386	33.89249	4.777107	9.326548	0.025041	71.67203	25.42680	1.122181	1.778988
10	0.041775	34.71108	56.16566	3.023234	6.100018	0.032370	46.14267	51.07673	1.136190	1.644403
15	0.044418	31.13555	60.59876	2.815765	5.449920	0.033781	42.69782	54.16333	1.358543	1.780311
20	0.044799	30.68054	61.12761	2.823810	5.368034	0.033913	42.89516	53.79372	1.360538	1.950585
	Model 3					Model 4				
	S.E.	GDP	RNZ	RSU	RDU	S.E.	GDP	RSU	RDU	RKR
1	0.016409	100.0000	0.000000	0.000000	0.000000	0.015553	100.0000	0.000000	0.000000	0.000000
5	0.027670	77.05042	20.78740	0.874759	1.287419	0.030872	83.66698	1.557557	10.81298	3.962479
10	0.032736	57.01908	40.50393	1.225657	1.251335	0.047628	77.90832	2.017546	18.17207	1.902060
15	0.033749	54.28641	42.92527	1.555615	1.232702	0.051124	79.22460	2.221078	16.70423	1.850091
20	0.033886	54.05097	43.07173	1.640438	1.236860	0.051586	78.81268	2.314903	16.92668	1.945741

Source: Authors