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Management of Regional Consumption

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Abstract
Regions in the Slovak Republic are economically imbalanced, mainly in terms of employment and unemployment rates, in local budgets, in disposable incomes or consumption. The aim of this paper is to demonstrate a possible way to decrease disparity in consumption between regions using different individual income tax rates instead of the uniform, true flat tax rate of 19 percent only. To solve this problem, we have used the idea of van Hagen model (1998) to create an optimal tax rate for each region, by optimizing the variance of consumption. Having compared our results, we found out that varying tax rates for individual regions could be one of the internal sources for solving economic activity in these regions. Such an approach would provide possibility to decrease the existing regional disparities and to achieve balanced living standards in the different regions of Slovakia.

Keywords
Individual income tax rate, consumption equalisation, fiscal policy, internal risk-sharing.

Introduction

Development of world economy has been unstable during the past years. It was caused partly by the depression on the one hand and by imbalanced development of regions or individual states of the world on the other. The reasons of high deficits of state budgets and permanent debts of individual states come from disharmony of their living standards with the efficiency of their economies. The gap between rich and poor countries, between regions and standards of living of their inhabitants is widening constantly.

One of the basic tools used to enhance the growth of the population's living standard of is to increase the manufacturing potential. The manufacturing potential correlates with the growth of consumption and the growth of disposable incomes. Moreover, disposable incomes are affected by the tax system in each country.

Many countries have targeted their domestic economic policy to solve the problem of imbalanced development of their regions by means of direct state subsidies and by the established practice of differences in levels of taxation of the population in the regions. This is mentioned in articles Ingram (1959), Bayoumi and Masson (1998), von Hagen (1998), Mélitz and Zumer (1998) and Obstfeld and Peri (1998). The USA is a typical example of individual states whose tax rates vary (for instance, personal income tax, sales tax, estate duty, etc.). Different measures of taxation of natural persons are also found in the cantons of Switzerland and in other economies of the world, too. The idea of enhancing the taxation methods of citizens is supported by various works published in Slovakia, such as Horváthová (2009), Ivaničová (2011), Neupauerová (2012), Sedmihradská (2012) and Radvanský (2013).

Our article presents a simple way of calculating an optimal rate of income tax for economically active population of eight regions in Slovakia based on the work of von Hagen (1998). The aim of calculating such optimal tax rate is to create balanced incomes and consumption of the population in the region. For that reason we have only calculated the optimal income tax from dependent activity (direct tax is 19 %, which is currently the same for all regions). Other types of taxes are not analysed because of lack of available information from the regions.

1. Development of Slovak economy during the years 2004, 2009 and 2012

In order to create a projection about the development of Slovak economy during the years 2004 (accession to European Union in May), 2009 (joining the Economic and Monetary Union in January) and 2012, at this point we shall cite the data about the development of chosen indicators: the Gross Domestic Product (current prices, mil. EUR), average monthly salary of employees (EUR), rate of unemployment defined by LFS (%), and final consumption of households (mil. EUR).

Table 1 Chosen macroeconomic indicators

Year	2004	2009	Rise/Fall**	2012*	Rise/Fall***
GDP (mil. EUR)	45161	62794	39 %	71096	13 %
Average monthly wage of employees (EUR)	525	744	42 %	805	8 %
Rate of unemployment (%)	18,1	12,1	- 6 %	14,0	1,9 %
Final consumption of households (mil. EUR)	25455	37637	48 %	40307	7 %

Source: Statistical Office of the Slovak Republic, *preliminary data, **5-year period, *** 3-year period

When we evaluate the development of Slovak Republic after its entry into the European Union, we could say that during the years 2005-2009 there was a strong revival of the economy judging, for example, by the increase in wages (app 8,3% per annum) or by the growth of consumption (app. 9,6 % per annum). These factors activated the expansion of production and the growth of the rate of employment. However, following the crises during the years 2010-2012 there was a strong deceleration of the wage increase (app. only 2,67 % per annum) and for the consumption (app. only 2,33 % per annum). These facts caused a fall in demand, rising unemployment rate and slowing down the expansion of production (growth of GDP was app. 4.3 % per year). Since the growth of GDP depends on the growth of consumption, the positive balance of economy in our country is demonstrated only by the export of automobile production of Volkswagen, Peugeot and KIA companies.

We assume that there is a possibility to increase consumption by means of management of assessed taxes in individual regions. To prove that, we will perform the analysis of Slovak economy during the years 1997-2009 in eight regions of Slovakia, classified by means of NUTS3. The year 2010 is not included because the methodology of data structure and database calculation has been changed.

The economic potential of individual regions in the Slovak economy could be sufficiently described by means of labour productivity defined as the ratio of produced average monthly GDP to the average gross monthly earnings in EUR. Figure 1 shows that the labour productivity is the highest in Bratislava region. It is much higher than the labour productivity in the Slovak economy as a whole. The lowest labour productivity is in Presov region.

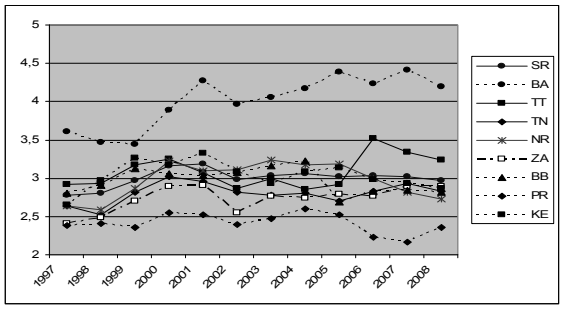

Figure 1 Ratio of produced average monthly GDP to average monthly wage
Source: Authors based on Statistical Office of the Slovak Republic

We can state that the unstable development of economic potential and related disparity of individual regions in Slovakia is coupled with permanent deficiency of financial resources. Inadequate infrastructure of regions used to slow down the flows of foreign capital. There is also insufficient support for small and medium – sized entrepreneurships.

On the one hand, inadequate salary administration (wages are very low, the smallest in the European Monetary Union), coupled with inadequate difference between the minimum wage and the social benefit, do not motivate people to seek employment. On other hand, high rate of unemployment causes a lower income to the state budget from taxes.

Low earnings, high unemployment and low consumption of the population do not support an increase in economic activity in regions. There are no new job positions generated either, and many small and medium – sized enterprises are liquidated. Therefore, there are some questions on how to manage the decrease of disparity in the production potential of economically weak regions. Is it possible to increase consumption of the regional

population? What is the way to increase standard of living of regions? We shall try to answer these questions in section 3 of this paper.

2. Regional measure of taxation given by von Hagen

Let economy be subdivided into n regions ($i = 1,2,..,n$). Let us assume that a representative consumer in each region earns income y_{it} in time t, which is random variable with expected mean y_{i0} and constant variance. For simplicity, the model does not consider savings. Let the consumption of the representative consumer c_{it} in each region be $c_{it} = y_{it}$. If consumers are risk averse, then the government may enhance the financial situation of the population using the fiscal policy of distributing the risk among regions in such a way that will define various measures of taxation.

The government would use three types of tools:

1. Taxation independent of state τ_{i0} like regional taxation of property, road tax, etc...
2. Taxation dependent on state $\tau_i(y_i)$, which is the same for all regions.
3. Subsidies $g_i(y_i)$ dependent on state, stated to supported consumption in the region.

If it is assumed, that there exists only taxation and subsidies dependent on state, fiscal policy does not have resources to evenly distribute risk among regions. Optimal distribution of consumption risk in the region is possible to obtain by means of selection of such tax τ (personal income tax) which will minimize variance of consumption c_{it}.

In the study of von Hagen (1998), the optimal value of taxation for region i is defined as:

$$\tau_i = \frac{w_i(w_i - \rho_i)}{1 + w_i(w_i - 2\rho_i)}, \qquad (1)$$

where

$$w_i = \sqrt{\frac{\mathrm{var}(y_{it})}{\mathrm{var}(y_t)}}, \qquad (2)$$

ρ_i is the coefficient of correlation of average gross income for inhabitants in the region i with average gross income of the total national population,

$$\rho_i = \frac{\mathrm{cov}(y_{it} y_t)}{\sqrt{\mathrm{var}\, y_{it}}\sqrt{\mathrm{var}\, y_t}}, \ \rho \in (-1, 1> \qquad (3)$$

On the basis of model (1)-(3), it is possible to ascertain: optimal measure of taxation τ_i for region i depends on ρ_i – correlation of the region i and on w_i - ratio calculated as standard deviation of incomes of the region i (in the numerator) and the standard deviation of regional average incomes (in the denominator). If all shocks accrued in regions are not correlated and equally distributed, then optimal value for equalization of all incomes is

$$c_{it} = y_{it} + (y_t - y_0). \qquad (4)$$

In general, (4) is invalid. For regions with high risk, where $w_i > 1$, the optimal value of taxation increases with the correlation ρ_i. For $\rho_i < \frac{2w_i}{(1 + w_i^2)}$, the optimal value of taxation increases because the relative measure of variability w_i has increased. It means that regions with higher risk need higher insurance. It is possible to state that regions with a variety of factors of risk require different measures of taxation.

For all reasons provided so far, it was assumed, that there is a possibility to find out a rate of taxation levied by the state, which could be optimal for all regions. To apply the described model (1) - (3) to the Slovak economy, we have modified some assumptions in the following way:

- The income of the inhabitants of the given region is determined as wage fund in region *i* = average gross monthly earnings of employees in region *i* multiplied by the number of economically active persons (labour force) in region *i*.
- Taxation independent from the state (τ_{i0}) is determined by municipalities of each region (different taxation of property, road taxation, taxation of household animals,

etc.). Because this taxation is different for each region and remains in the region, we did not include it into the analysis.

- Taxation dependent on state $\tau_i(y_i)$ was calculated in two ways: first, we calculated the adjusted average monthly salary (adjusted from transfer to social and health insurance[1] companies) which was taxed by the:

1. optimal measure of taxation given by (1)-(3),
2. flat rate taxation 19 %.

- Subsidies dependent on state $g_i(y_i)$, given for supporting consumption in the region, were not included**.**

3. Results of net income analysis for the regions of Slovakia

We would like to present how the consumption volume of private persons could be increased by means of using optimal measure of taxation for net average monthly earnings (gross average monthly earnings adjusted from the payments of social and health insurance) in regions.

To conduct this analysis, we used the theoretical ideas from Section 2 of this article. As it was mentioned, the analysis was done on data from the years 1997 and 2009 published in the Regional Statistical Year Book. The annual wage fund for every region and also for the entire state was calculated as gross average monthly salary multiplied by the number of active inhabitants of the given region, but pensioners were excluded. The population's personal savings were not taken into account, according to the assumptions of the model.

The formula (2) and (3) was used to calculate w_i and ρ_i respectively, for seven regions of Slovakia i = 1,2,..., 7. The Bratislava region was not included because of very high average monthly salary, higher than average monthly salary in Slovakia. Various measures of taxation $\tau_i, i = 1,2,...,7$ were calculated by formula (1). The results for each region are summarised in Table 2.

[1] During analysed period there were several changes in tariff rates to social and health funds. These changes were not taken into the account.

Table 2 Optimal measure of taxation of τ_i together with w_i for each region

	TT	TN	NR	ZA	BB	PR	KE
w_i	0.115	0.101	0.119	0.110	0.086	0.096	0.117
τ_i	0.130	0.112	0.134	0.123	0.094	0.103	0.132

Source: The authors' own calculation

Some relations among values of w_i and optimal measure of taxation τ_i are available in Table 2. The smallest optimal taxation (9.4 %) would be implemented in the region of Banska Bystrica. The average rate of unemployment in this region was the highest, amounting to 20.95%, and the average wage-fund the smallest during the analysed period, even though the average monthly salary was 30 EUR higher than the average monthly salary in the region Presov. Region Presov had the lowest average monthly salary during the analysed period. Table 3 shows the results of regional average net monthly earnings calculated in two ways: 1) with optimal taxation τ_i and 2) with taxation of 19 % together with their growth in percentage.

Table 3 Growth of net monthly disposable earnings (in %) in 2009

Region	TT	TN	NR	ZA	BB	PR	KE
Average net monthly earnings after optimal taxation τ_i	596.43	566.27	563.05	559.06	562.41	543.28	620.81
Average net monthly earnings after taxation $\tau_i = 0{,}19$	545.43	509.75	504.29	514.09	490.86	472.49	552.98
Growth of net monthly disposable earnings (%)	9.3	11.1	11.6	8.7	14.58	14.98	12.27

Source: Statistical Office of the Slovak Republic and the authors' own calculation.

It is clear from Table 3 that net earnings of employees taxed by the different taxation rates are higher than by means of true flat rate of taxation of 19 %.

The average growth of net monthly disposable earnings in all regions was approximately 11,8% in 2009, in comparison to the total net disposable income.

Average monthly net earnings calculated on the basis of optimal taxation could be higher in the region Presov (about 14,98 %) and also in the

region Banska Bystrica (about 14,58 %). As we know, both these regions are classified in Slovakia as very poor, with the lowest average gross monthly earnings and the lowest values of produced GDP per capita, coupled with the highest rate of unemployment.

Based on a very simple assumption, we would propose that the value of net earnings determines the value of consumption, that various rates of taxation for individual regions would allow the population to increase their consumption, and thus it would also increase domestic demand.

The increase in demand would result in the rise of economic potential of the regions, increase its employment rates, and also the income from taxation to the state budget in the long run.

The living standard of inhabitants in Slovakia would increase as well; and this is the goal of good governance in each country, not only in Slovakia.

Conclusion

This article proposes the way how to balance the unequal consumption across individual regions. It is provided based on several assumptions:

1. The analysis was done for direct income tax (income taxation of private persons from dependent activity only).
2. Consumption is equal to income.
3. Based on abstracts of analyses comprising retail savings, it can be presumed that other types of taxes and subsidies flow to the regions as well (which cannot be confirmed due to lack of available of data).

Despite such simplicity of presented model, we can conclude that different taxation rates for the population of different regions could be used as an internal tool for supporting economic activity in the region, decreasing regional disparity and regularising their standards of living. We believe that additional increase in direct income tax for the population of Slovakia is an enormous obstacle to further economic development of the Slovak Republic. SM

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