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An overview of the personal income tax system particularly the effects of tax allowances

Theses of Doctoral (PhD) dissertation

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1. Objectives, hypotheses

The research plan focuses on studying the income tax of individuals, especially the role of tax breaks. The author has paid particular attention to the changes of the personal income tax system comparing the Hungarian model with international tendencies in his 20-year long tax consulting practice and university teaching activity.

Personal income tax revenue is one of the most important sources of revenues in the developed countries. The fiscal autonomy of the Member States for this tax type has been the strongest. There is no positive harmonization in respect of personal income tax, recommendations and guidelines include only some restraints.

The personal income tax systems of European countries are quiet varied. The general tax reduction of the 80s was followed by a new decrease of taxes in the new century. However the measures of Crisis management had involves tax-increase in several countries. In Western European countries personal income taxation is characteristically progressive; the range of the income brackets and the number and degree of tax rates however vary widely. In several countries, there is the option of individual payment of personal income tax and the family tax payment, too. In the Central Eastern European region more and more countries have followed the first Baltic States in respect of flat rate income taxation, including Hungary since 2011.

The issue has become relevant due to the statutory amendments effective of 2011 restructuring the net income position of individuals more radically than ever before. The study covers the preceding decade when tax burdens varied from year to year and were influenced by the number and degree of tax rates, the relevant tax bracket ranges and tax reliefs. During this period the scope of tax reliefs gradually narrowed, conditions became more and more strict, therefore for most taxpayers could be achieved less burden that the general tax rate only by tax credits. Since the 2012 elimination of tax credits the average burden on wages in lower income categories has increased, while the family tax base correction has provided unprecedented benefits for parents with underage children. Therefore the author focuses on the family tax benefit in her studying and the role of family tax benefit in Hungary in comparison with the role of family allowance.

In most European countries family support through taxation is a crucial element of tax policy. In the light of the demographic indicators governments take a variety of measures to
stop or make changes declining birth rates. Central intervention is essential; however its effects are varied from country to country. On the other hand, redistribution of incomes raises further issues, particularly if progressivity of the tax system increases or just the opposite, like in Hungary, decreases.

**On the basis of these, the author formulated the following hypotheses**

1. Between 2004 and 2010 higher tax revenues would have been flowed into the budget without tax allowances if it had been using linear tax rate less than 20%. While retaining the family allowance system of 2004 with the progressive tax system and tax cuts also the 20% linear tax rate could have realised the same budget revenues.

2. Using tax credit to cut tax payments, the possibility of further tax allowances depended on the level of incomes and the number of dependant persons.

3. Private persons find it important to support families through tax benefits and family allowances system. The two methods are typically considered the same, regardless the level of income, age and number of dependants.

4. Changes in the tax system have no significant effect on the long-term commitment of individuals involving their decisions on parenting, buying new homes, saving or on further education. Family tax benefit does not constitute an adequate incentive to have more children.

5. The transformation of personal income tax system was deemed appropriate by private persons. However, the acceptance of a linear income tax in practice depends on the rate of incomes. Basically, the new type of family tax benefit is approved, on individual and social levels as well, regardless of income level, age or number of dependants.
Following the review of personal income tax systems, and examinations for the justification of the hypotheses, a further objective occurred: to develop an independent model regarding personal income tax system. To determine the main features of the model, the author took into account both positive and negative effects of the personal income tax system valid until 2010, research results of the relevant literature, furthermore, emerging problems under the conditions of the system valid from 2011 on, the potential benefits and drawbacks relating the introduction of the new family tax benefit and the linear tax system. The analysis can not be separated from economic and social changes. The available tax revenue on declared and planned personal incomes according to the parameters of this model will be compared by the means of a sensitivity study with the realized and planned tax revenue during a period of 10 years.

6. Between 2004 and 2013, on average of a 10-year long period, with a linear tax rate of 20%, it is possible to achieve the planned tax revenue in the background of given legal conditions even with applying a family tax cut equal to the two thirds of minimum wage (in case of three or more children the family tax cut equal to one and a half times of minimum wage).
2. The research content, method and justification

Taxation is primarily an economic issue, but - just because of the tax allowances – it involves a number of social problems as well. In order to examine the evolution of personal income tax burden, and particularly the impacts of tax benefits, the author carried out secondary and primary research. The two fields complement each other well, since examining only the national average the individual personal characteristics relating to given groups among all the data remain hidden. After summarizing of research objectives, in the detailed research plan the author highlighted the national and international literature to be processed, and determined the field of analysis area and data sources. The review of literature primarily focuses on theoretical relationships, but the secondary research details the tax revenue system of other European countries, too (in the first place in Austria and Slovakia, and especially in France, where family tax cut system has been considered as a significant example for nearly half a century). The author studied details of micro-simulation models measuring the effects of tax changes (e.g. Benczur et al., 2011, Benedek - Kiss 2011, Kiss - Mosberger, 2011).

The author's work evaluates changes of the Hungarian personal income tax system comparing tax burdens of international trends. There is a special emphasis on family tax benefits, which have priority since 2011.

Data Sources

The time horizon of the available test data is essentially fixed. A significant part of secondary data sources were yearly tax statistics and press conference materials available on the website of the National Tax and Customs Office (NAV). Other information necessary for the analysis originated from the database of the Central Statistical Office, but she made reference many results which were published in the specialized literature previously. Lack of data (sometimes partial) relating to the period of the last century, made the research difficult especially regarding the measurement of long-term impacts of tax benefits. A longer period of testing would have increased the reliability of the conclusions.

The examination and the comparison of the international tendencies and the practises of the European countries was based on the data of the homepages of the national ministries of finance, the data bases of Eurostat and OECD, moreover by the publications of
international analysts. In some cases the author found some differences among the Eurostat and OECD database, therefore in the calculations only one source was being used.

For the verification of the hypothesis the secondary databases had made completed by the author's primary research. The purpose was to have a picture about the taxes, tax allowances for not only for the whole society or for the average but for the personal taxpayer, too. The number of the tax returns during the testing period was growing until 2008 (4,65 million people), but it decreased in 2009 under 4,5 million people and although it has a growth in 2010 it could not reach 4,57 million. The primer research involved 451 people.

From the beginning of April 2012 a questionnaire was made to the quantitative research about the knowledge of the personal income tax allowances, focused on the family allowances and the survey asked the social-policy role of the tax discounts, moreover opinions about the linear vs. progressive taxation. Some of the questions of the survey was two-dimensional, with which the author was looking for the answer to what extent is a given method good for the people of whole society besides of the own preferences, and instead of the drawbacks.

The questionnaire was made with the help of Evasys program, in a traditional way (printed, hand-filling), and it was reachable also online. The program did not accept deficient questionnaires, although it was possible to choose the ‘I don’t know’ for each question.

It was difficult during the sampling process to choose the persons to answer, because of the terms and topics in the questionnaire have required higher economic knowledge than the general knowledge. During the personal sampling the most people with lower education level refused to participate in filling the questionnaire answering to the lack of information, and also obviously less of them filled the online version in. Accordingly, it was not a goal to reach the educational distribution of the people to answer the same rate in the country (because of the lack of knowledge means that the answers „I don’t know” would be more). In addition to random sampling was also given to the non-random sampling techniques, for example there are arbitrary sampling, and the snowball sampling method, too (Malhotra, 2002).

In the questionnaire the answers were clustered on the responder’s educational background, the age, sex, the type of profession, monthly earnings and the number of children.

1 http://evasys.nyme.hu/evasys/indexstud.php?typ=html&user_tan=PHDMV
The high rate of the respondents under 30 years is due to the fact that the questionnaire was also completed by students (mainly who studying economy). A special "education" category was also established for the students that their responses can be analysed separately. When it had not been necessary to analyse separately, in this case the students were put it together with those who had completed secondary education (after transcoding).

The number of the childless respondents is over-represented (35%) compared to the adult population, which is also due to the 68 students that 92% are childless. The relationship between two criteria indicates that 92% of respondents under 30 have no children, and 71.5% are under 30 years. 17% of those who has 3 or more children have completed the questionnaire, which is a few percent higher than the national average.

The level of education of 'large families' reflects the latest trends, as they have significantly higher the proportion with the lower-education also and the higher-education graduates among, while between secondary school graduates (students excluded) only 8% (!) have 3 or more children. Nearly three-quarters of the latter group have 1 or 2 children.

The aggregate value of respondents may be influenced according to their income status distribution that is why necessary to compare those by the data of national tax report. On the diagram inside arch it can be seen that the rate of the people who have the monthly income less than 100 thousand is slightly under-represented in the sample compared to the national figures. One of the reasons comes from the higher level of education (than the national average), the another is that the survey was prepared in North-Western Hungary where the national average incomes per person is higher than the average.

Rate of respondents based on their monthly income and the national data from tax returns (\%)  
Source: Primary Research and NAV
The survey also measured the respondents’ awareness of the personal income tax allowances valid in 2012. According to the age of the respondents the age group 31-45 is considered to be the most informed, more than 70% are at least familiar with the conditions of allowances which affects them, or maybe affects them. Nearly two-thirds of the people who have higher educational background said that. The lack of knowledge is higher among people with lower level of education as well as among job seekers. By the growth of the income also more people are familiar with allowances.

**Methods used in research**

After the review of national and international literature, during the data analysis of secondary sources, using indicators the author has carried out a variety of comparative analysis too. A significant part of analysis is exploratory study, with the purpose to explore regularities, trends and identify breakpoints of the data. An important tool for displaying statistical data is the graphical representations that illustrate proportions, so much easier to draw conclusions (Kerékgyártóné et al., 2001). This latter was used by the author to the presentation of the relationships after the data processing of primary research, because it has a useful attribution. The charts were made on the one hand using Chart Wizard menu item of Microsoft Excel and on the other hand using Graphs menu item of the Statistical Package for the Social Sciences software package (SPSS 16.0).

The sampling to primary research was related from early April 2012 until the end of June 2012. Processing the questionnaires is required great care, therefore, to provide a unified data management, the content of manually completed questionnaires is stated in the EvaSys system, and after that the author has imported the full data set into the SPSS system. Using the SPSS 16.0 software package the author could analyze complex issues too. The necessary transcoding to the data processing was occurred. In addition to the simpler analysis and multivariate methods were used. The choice among structural analysis methods is basically determined by the measuring level of the variables (Sajtos - Mitev, 2008).
In the analysis of dependency relationship between two (or more) criteria, we can distinguish dependent and independent variables, which mean that the latter has an effect on the dependent variable.

The variables of the questionnaire are non-metric – measured on nominal or ordinal scale - therefore is the crosstab-analysis the right method to examine the relationships. The method of analysis is the Test of Independence. The null hypothesis (H0) means that there is no correlation between the two variables, the counter-hypothesis (H1) means the context of the criteria then they will determine each other to some extent. If we accept the null hypothesis (based on chi-square test), it is required to make further studies to determine the strength of the relationship. The type of indicator used to stochastic connection detect depends on whether the variables was measured on nominal or ordinal scale. The necessary conditions in crosstab-analysis have been met, so the method can be used to draw conclusions.

The available secondary data to the hypothesis H4 allow measurement of the relationship between metric variables. Using correlation analysis we can test the strength of the relationship between the two selected variables. The calculated value of Pearson's correlation coefficient is $-1 < r <+1$, its absolute value shows the intensity of the linear relationship (in case of stronger connection the value close to 1), while its negative or positive sign shows the direction of the relationship.

The author conducted regression analysis for the metric variables, after the linear relationship between dependent and independent variables has been verified using the t-test. In an additional measurement, which is connected to the attest of Hypothesis 4, we can observe a strong positive relationship between family support spending to GDP and total fertility rates. To analyze the fertility rates professional literature typically uses the data of the
following year (Gábos, 2005) that’s why the author used the year $t + 1$ to the calculations (however there are methods also two-year or longer period of analysis). The regression function describes the relationship between the variables:

$$Y = \beta_0 + \beta_1 x_1$$

Searching international comparisons, time series data were available not for all test points on appropriate time period. In these cases, therefore, primarily static data analysis was possible. Countries in the database by Eurostat and the OECD are grouped into clusters by the analyzed variables. The scatterplot diagram is useful to illustrate the clusters.

After the review of the professional literature, the verification of hypothesis and studying the related problems the author made her own model, which has shown an alternative of the domestic personal income tax. The starting point for the calculation was the database of NAV and KSH, but in case of some parameters - because of the former are not sufficiently detailed - the author relied on researches published on professional literature publications. The model was supplemented with sensitivity test to compare her results to the declared and proposed tax incomes from 2004 to 2013.
3. Research results, new and novel results

The research work based on a comprehensive study of the national and international literature, which have their own additional secondary data processing and analysis and have added a primary research to integrate knowledge.

The literature reviews, summarizing of the views the author concluded that the European countries have very diverse personal income tax system: the tax rate, the progression and also allowances are many kinds. The tax harmonization for personal income tax among EU Member States is difficult. The important reasons is that this tax can hardly separate in a country's economic, social, cultural, and social environment. Common features can be highlighted as the tax cuts (a different rate), as well as tax allowances for families (different ways and amount).

On the basis of studies matching hypothesis the author formulated the following thesis:

1. If the total incomes had been the same in 2004-2010 than using 19 percent tax rate the budget would have realized the same tax revenue, without tax allowances. The calculations based on the secondary data have shown that the family allowance 2004-2010 is valid under conditions of a 7-year period also would have been sufficient for 19% tax rate, but only 20% linear tax rate could be achieved more revenues in every years. If the family tax allowances conditions had been remaining unchanged than it also would have been enough 20% tax rate to realize higher tax revenues than the actual data over this period.

2. On the base of tax returns was made from secondary database and primary research has also found that beside tax credit for lower income categories less further tax allowances was possible than higher earners (but this is the smaller group). The income growth of several types of discounts can reduce the calculated tax and higher earners involved relatively higher part of tax allowances. Sampled by analyzing the responses it can be concluded that the tax credit HUF 100-200 thousand earners and other tax benefits mostly for a monthly income of HUF 200-300 thousand earners have been reduced the calculated tax. The tax credit is in addition to the family tax allowance and tax cut on life insurance premiums was
the most popular. The latter option was more intensive for childless people and higher-income families who have child.

3. The primary research has shown that the role of child raising allowances is a very important question. More than four-fifths of respondents believe that raising children is not only the parents' responsibility. Their opinions about child benefits don't depend on the level of their incomes. The income limit is applied under the version of the higher-income households are less corresponds to emphasize; however, it has only a little difference between personal and society aspect. They prefer significantly more the personal income tax allowance irrespective of income levels if it is added to the family benefits. The tax credit for child-bearing age is most preferred. The opinions about tax allowance for dependent persons in relation to number of children or without children have the same. It has a priority that method growing amount of tax allowances with the number of children, however, it is less preferred society aspect than the individual level.

4. Following the literature synthesis and analysis of secondary data was found that benefits through the tax system may have an influential role on the fertility rate; however it was not detected by the examinations on sample. This is especially true in our country for the past twenty years, the amount and ratio of tax credits and family allowance was changed continuously, the direction and magnitude of several times in this period. But determining effect of government expenditure to GDP can be measured also domestically and internationally. The primary research hypothesis H4 is only partially substantiated. 60% of the respondents said that the changing of the tax system has not any effect on their mind to bear a child or not (an additional 14% of "maybe slightly"). The other three longer-term decisions have a stronger connection than the previous one. It can be quantifiable: while about education the most affected age group is also just about the same proportion said that has no any effect and said it has. Decision to house purchases is the same rate in all groups but the effect of tax law changes the strongest for savings decisions.
5. It can be concluded on the responses of the sample that the valid personal income tax system in 2012 (linear, some tax allowances) has no as strong agree on individual and also for society as progressive tax system with more tax allowances. The respondents whose monthly income is less than 200 thousand, more than 60% answered that "not a good solution" and 40% of respondents with more incomes said the same. The progressivity of the tax system is considered more important in social terms than the number of tax benefits. The current assessment of the family tax allowances for more than half of the respondents gave 'partially correct' answer, but a high proportion of those who do not keep a good solution (28.6%). Mostly the over HUF 300 thousand income earners, with three or more children, and 31 to 45 year olds are agreed with that. It is better for the whole society and has less difference between the groups.

6. After reviewing the personal income tax system the author has also produced its own model, which is based on a linear 19 to 20% tax rate applying sensitivity analysis. Calculations showed that if the child tax allowances had been two-thirds of the minimum wage and 20% linear tax rate than the tax revenues would have been the same amount by the Law conditions in 10 years. If 19% tax rate had been in 10 years about 5% lower tax revenues than the tax liability would have realized.
4. Conclusions and proposals

The structure of the tax burden rearranged in European countries in the last twenty years, the labour income tax deductions related to the characteristics tendency prevailed till the end of the millennium. Collection of sufficient tax revenues is required to make stronger the role of consumption-related taxes. In international practice the revenues from tax on sales and excise are increasing and more and more countries are applied to environmental problems related to taxes. Expansion of the tax revenue could be increased in the short term with the introduction of green taxes. This tax also can make stronger the environmental behaviour and the protection of the environment (especially in case high tax burden).

The share of direct taxes in tax revenues was decreased but in the role of personal income in the average of the European countries was not changed significantly.

The EU Member States insist on the personal income of most (tax) sovereignty, so this tax in respect of Harmonization of negative talk. Accordingly, the national taxation is varied, however by a deeper analysis can be highlighted some common features. The governments reduced tax burden; in case progressive taxation usually has the highest tax rate decreased or introduction of a linear tax in previous tax rate lower than the average tax rate of previous year. The Member States are progressive tax systems, however, in this countries the level of personal income tax burden are very different.

The type of taxpayer families can be significant differences because the governments support the parents through the tax system in most European countries. However, amounts are several and methods have many ways: from the "simpler" tax allowances to family quotient using various solutions. The family support system is realized in a special way in case the personal income tax system provides options to pay tax individual or family together. Also there are some several methods of family tax system. Their common feature is that the tax liability based on the number of family members and their aggregate incomes to reduce the progressivity of tax payment. The family tax system has several advantages, but the most important drawback is that much more complex regulation and registration required. This is the strongest argument against it. In particular there are many changes in the patterns of coexistence especially conservative family type is found not so important.

Comparison of the personal income tax burden has significance primarily on individual taxpayers but for enterprises and employers the tax wedge is more dominant. The labour tax and contribution burden in our country is very high by international comparison in
European countries, only in Germany and in Belgium were higher. This is higher than OECD average is about 10%, that is why is important to reduce tax wedge to increase competitiveness and employment in Hungary. Because of the high rate of tax evasion, the tax on labour is high and the potential tax base is getting less. The tax-optimization opportunities should be limited, for example reducing the gap between the tax on labour and capital income. There is a free movement of factors of production between countries and the border crossing has an influence on tax burden, too. Therefore the actual tax revenues can be more or less than the planned to strengthen the intention of the government to increase the share of indirect taxes and tax on property.

The Central and Eastern European countries introduced a linear personal income tax to simplify the tax system and reduce the tax burden, too. Hungary was connected with this trend from 2011. However, the foreign experience is not uniform. The tax reform had positive results as part of an overall restructuring of economic policy, near expansionary economic processes, especially when the labour costs were significantly reduced. The crisis has also raised some countries to return to progressive personal income tax system. It can be lining up several arguments for and against domestic introduction of linear tax system based on published results, but cannot leave out of consideration neither the socio-economic nor the cultural environment. Estimation of long-term effects of converting is a difficult task even if the financial stability.

The average tax burden on personal income declared during the period showed a decreasing trend in Hungary, and in 2009 the revenues from the personal income tax also fell within the total tax revenues. The 2011 legislative changes as a result this ratio continued to decline, according to the budget plan in 2012 is expected to remain below 14 percent. Thus the structure of the tax burden has changed, strengthening the tax on sales and consumption. The value added tax rate is 27% from 2012, which is currently the highest in Europe. The greatly increased excise taxes and new taxes (such as taxes on unhealthy products, industry specific taxes) have been introduced. The importance of property taxes is considerably lower than the European average, which is influenced by traditions and the lack of traditions. The property tax was repealed in 2010; however it was deployed in previous year.

I think, at the end of the millennium the Hungarian personal income tax system reached the statement of Földes (2001) - it looks like a Christmas tree and moving away from the "good tax system". It became apparent the need for simplification. The personal income tax system is overcrowded by tax allowances; it weakens the visibility and effectiveness of tax system. A shorter list of tax allowances can be economically justified, but some special
tax policy preference can leave in place. Such a major objective may be the long-term self-care to encourage because of the unfavourable demographic trends and to contribute to the costs of raising children. Before changing tax system, during the planning of introduction of a theoretical methods or the practice of other countries the current (and realistically) the expected benefits and drawbacks should be considered.

Any steps - such as the actual effect of the tax benefits - just predictable policy environment prevail. Become a responsible parenthood long-term "project", so the predictability for families is a very important question. The influential role of family tax benefit after the event, even several years after the introduction of the measure will appear. The family tax benefits for parents with children is an important pillar of support systems, however, do not forget that the positive effects only in a complex way, together with other influencing factors prevail. The author found on the basis of international research and her test on OECD database that it can quantifiable the effects of government support to GDP. The international analysis of fertility rates also became apparent that, while the negative effect of changes caused rapidly decreases in the birth rate, a growing support for families is slowly extending its favourable effects on parenting.

Fairness is emphasized between the basic principles of taxation by all view, however, combination of horizontal and vertical equity is almost impossible to achieve. The tax credit is over from 2012, that means the low income - even to cover basic needs - is became taxable. The redistribution towards families with children increased, opposite of the former system which had preferred low wage using tax credit.

So that a higher proportion of families with children enjoy the family tax allowances, but they net income position has not improved. The new personal income tax system brought positive changes to employee who has more children and higher income than average but in families where the parents have no job the declining real value of child benefit does not compensate. Serious issue is the fact that this new family tax allowances means "childless tax" function for persons without a child, despite the fact that in the actual social security system in their case of intergenerational care is not met. Encouraging bearing a child and the child-raising allowance is therefore a common interest; the well-educated young people with serious morality are the main pillars of a sustainable society.

A few years later on the base of author' work above has priority another area of research; a deeper analysis of stopping of the tax credit how it effects on labour and the declared income in Hungary, in particular, on incomes around tax credit bracket (marginal tax rate reduction), and the lowest incomes (as an alternative of black labour and unemployment
benefits). Could be the subject of the next study is that the introduction of linear tax means radical tax simplification in our country during the practice or not, and increase the willing to pay tax or not, help with whitening of the shadow economy or not, compared with international experience.

An empirical study on the family tax allowances recipients actually spectrum grouped on income deciles and the number of dependent children, as well as "unused" scale determined could provide guidance for any adjustments of the current system. It can be also an interesting primary research that is there any effect of family tax allowances in practice of each family type because this tax allowance promises much bigger benefit with the third child while, unfortunately, less and less the second (or even first) was born. In the last few years, the number of families having three children has not decreased, but both of number and proportion of the childless couples and parents with one child increased, especially who has a secondary qualification and lower incomes than average. However, the current analysis also showed that beside the material aspects has an important role the traditions, norms prevailing in the community, as well as individual values inside.
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