UNIVERSITY OF MISKOLC
FACULTY OF ECONOMICS

MIKLÓS FELLEGI

PRELIMINARY IMPACT ANALYSIS OF THE INTRODUCTION OF VALUE-BASED PROPERTY TAX

PHD DISSERTATION THEORIES

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NAME OF THE DOCTORAL SCHOOL:

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1. REVIEW OF THE RESEARCH TOPIC

„Difficulty lays not in forming new ideas,
But in getting free of the older ones."
John Maynard Keynes

Experiences accumulated during the last two decades concerning taxation, Hungary's recent accession to the European Union and the intention to enhance the country's competitiveness are the main reasons for reforming the present Hungarian tax structure. Any further increase in the tax wedge can not be considered as a possible solution as this would harm the competitiveness of the country. At the same time, considering the parallel need to maintain or even increase the state's expenditures, decreasing taxes can not be a realistic solution either. The system must be moved in the direction of structural changes, which means that the tax wedge of some taxpayers can increase leaving the aggregate tax revenue unchanged, or even increased, but can not be decreased. This seemingly paradox task can be solved by broadening the tax base on the one hand. Besides the simplification of the whole system of taxation, the rules of distinct tax schemes, benefits and tax administration are also needed. A further important aspect of the reform is the increase of transparency, and the efficiency of control and payments. The comprehensive modernisation of our tax system must give answers to the challenges of the international tax competition, the revenue needs of the budget and the more just distribution of the tax wedge by orienting the economic actors' decisions to a favoured direction at the same time.

Reforming the entire system of taxation should result in increasing the role of local taxation – and local revenues in a wider sense – letting the principle of subsidiary be realized in practice filled with real contain. This can only be imagined if the local governments are given instruments and money, not just tasks to solve, in order to bring them to real decision making situations. In more developed countries

major differences can be found compared to the Hungarian situation in terms of the distribution of the right to tax among the central, regional and local levels of authority. Based on the examples of these countries it should be thought over to enhance the right of local authorities – based on their own decisions – to tax and to form a new system of taxation on the local level as well. This dissertation aims to make a contribution to the preparation for making this decision with the help of the results from a model's calculations. Emphasis was put on the reform of the present unity-based local wealth taxation and its exchange for a new, value-based property tax.

When reforming a system it is of the highest importance to refrain from considering only a fragment of the structure – local taxes in the present situation – which they are an important part of. The main of the Dissertation is – besides making an effect-analysis of the introduction of a value-based property tax – to touch on the question which tax schemes should be thought of as local taxes and which should be left in central regulation. The circle of questions can be further deepened by the fact that tax schemes have to be analysed from tax regulation aspects as well, and decision must be made – considering the criteria of efficiency and purposefulness – whether tax administration, tax assessment tax collection, control, etc. should be centralised or regionalized. Making a conclusion of the above mentioned questions the most important of the opened question is what kind of tax structure would most serve Hungary's competitiveness, and secure its convergence to the criteria defined in the principles of taxation. This pops further questions concerning the importance of a tax system's efficiency and its effects on social solidarity. The analysis of this very exciting problem would take us far from the framework and questions of this Dissertation though.

2. RESEARCH BACKGROUND AND METHODOLOGY

A several years long research period concerning the questions of financial aspects of central and local governments' overcame the final choose of the theme of this Dissertation. Questions of the budget reform having been on the agenda for several years meant a constant professional challenge both in my researches and in my teaching activities. Going deeper to the matter my attention was focused on the ever increasing unsolved problems of our taxation system. Public finance and community decisions theories I got to know more and more aspects of forming an optimal tax system. In my further researches I focused on wealth taxes of the three most important tax schemes, income taxes, consumption taxes and wealth taxes.

Property tax is present in the Hungarian tax system not with the proper weight – mostly born by the enterprises, based on unity (of territory) in the form of building and land tax. In the present system gives the opportunity to free income from tax by transferring it to wealth assets. The solution to the problem seems to be handy: properties should be taxed as the most "easy to see" elements of wealth. Though the way from setting the "diagnose" to actual "therapy" is very long. In order to answer the questions of the research the methods of effect analysis were used which are suitable for differentiating between the important and less important factors of the problem in questions.

Effect analysis in a wider sense is part of our evolutionary development. Consciously or unconsciously, the living has always been fighting for survival. Individual interest has been changed for community interest in the communities of people. The more successful group made better estimations and were able to behave more efficiently[1] when realizing their interests. The scarcity of resources present in most situations – as a driving force – effected the development of economics to use

[1] This is called an assertive way of behavior.

more and more sophisticated methods[2] and accomplish them to forecast and analyse budgetary and other economic effects.

Narrowing the scheme, according to the OECD's definition effect analysis is an analysing approach if estimated costs results, consequences and unexpected side-effects of regulatory instruments, based on information. It can also be used to measure the cost results and consequences of regulation already in force. (Sigma Paper: No. 31, OECD 2001). One of the most important tasks of effect analysis is to enhance decision among possible alternatives.

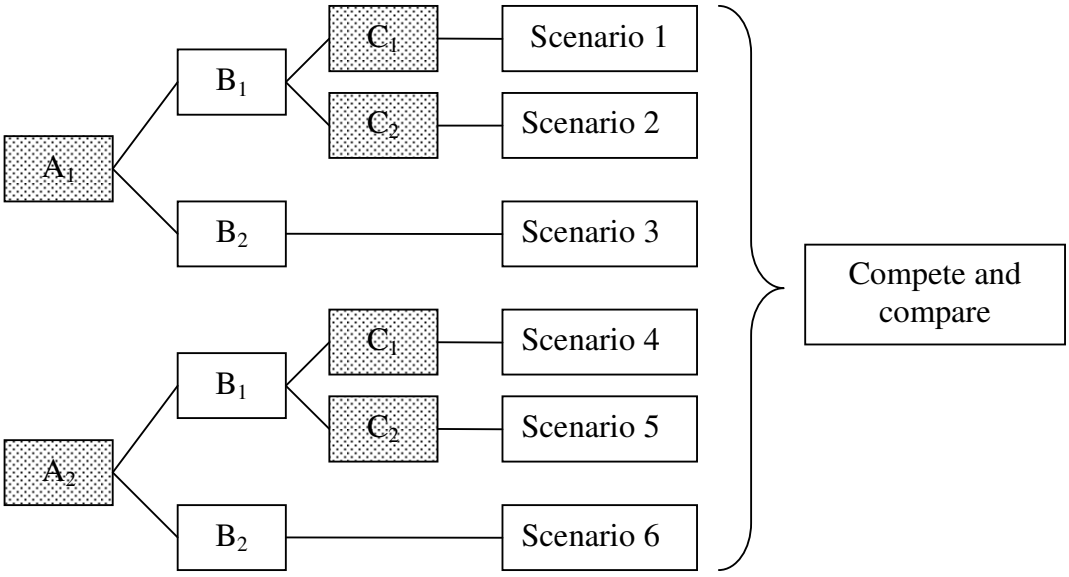
Several possibilities to use effect analysis are introduced in the Dissertation, from the fields of economy, society, law, environment, health and technology. In case of a tax scheme planned to be introduced – like the value-based property tax – reasons of effects are difficult to identify, and can not be related to distinct elements of the regulation, showing complex contexts to each-other too. This was the reason for searching for such an effect analysis method which enables the description of a multi-variable complex model, dividing the problem to its elements, making the final results comparable. Scenario-analysis fully meets these criteria. In the empirical chapters of the Dissertation the tax burden for the distinct cases of tax keys and tax benefits combinations for different values of properties were determined by the use of this method. Small differences in scenarios can be well shown in the tree structure. It can only be decided knowing the result which solution meets best the intentions of the regulators.

Not only the figures of different scenarios, but their planning also happens in the tree structure, the branches of which show different variables and the competing scenarios can be found at the ends of the branches.

Different results can be compared in the aspects of different objectives and after the optimal scenario was picked, the elements of the chosen form of regulation can be gathered moving backwards on the branches of the tree structure.

[2] Or was borrowed from other fields of science (from psychiatry, mathematics, physics, and engineering) and integrated to economics.

Figure 1: Tree of the scenario analysis



Source: Kovácsy, 2005. 108. p.

Besides a detailed introduction to the methodology used pro and contra arguments were gather considering the introduction of a value-based property tax and the importance of local taxation generally in the chapter on taxation theories. I justify using foreign examples the importance of this tax scheme and its efficient operation in the tax systems of developed countries. After introducing the specialties of the present Hungarian local tax system it is mentioned that the existence of a property certificate system is an important requirement to meet before introducing a value-based property tax system. Until this can be accomplished, based on the Dutch example, proposals are made for the temporary period's regulation.

In the empirical chapters which follow the methodological and tax theoretical chapters the essence of the previous parts are matched by making up a model which is capable of measuring the effects of all aspects and can help to decide whether value-based property tax can be used to fill in the space of the present local taxes entirely or fully. Based on this analysis this new version of property taxation would

not be introduced as an additional tax scheme but instead of some elements of the present system. Further research was needed to determine who will be the winners and losers of this new tax scheme. During the calculations made with the model the scale of tax to be paid in case of distinct values of properties were determined, and matched by the circle of those who qualify for benefits, giving the percent values of benefits too, and the calculations for the reduced tax burdens. The data standing at my disposal were analysed by the SPSS software package.

3. AIM OF THE RESEARCH

The research aims to analyse the effects of the value based property tax to be introduced in 2009, to find the winners and losers of these tax changes and the reform of the local taxation generally. Property tax is part of the present system of taxation in Hungary as well, under the names of building tax or land tax. Its importance can be neglected though even at the level of local authorities tax revenues, giving only 1,5% of local governments' revenues on the country's average. The main question of my Dissertation was whether the modelled value-based property tax can be able to fill in the space of the present local taxes or a fragment of them. The answer which can be given based on the calculations can be regarded as positive from several aspects. On the one hand, it can be justified from the tax-theoretical aspect that value-based property tax is a better match for the principles of equity and social just than the unity-based similar tax, while on the other hand it can be a solution to internal problems of the tax system by broadening the tax base and decreasing the tax wedges of enterprises, letting their competitiveness be improved through this, and increasing the tax revenues of local governments at the same time. Thirdly, by forming a mathematically easily useable and flexibly changeable model the scale of changes in the structure of the tax wedge and the wedges of distinct tax payers became measurable. Data standing at our disposal made it possible to prepare a country level estimation of potential scale of revenue to be expected from this type of taxation, and the extent of tax wedge by the same nominal tax revenue given distinct combination of benefits and tax keys by the help of the model.

When making the calculation with the econometric model I divided the properties to two groups, one group contained properties owned by the population while the other the enterprises' properties. On the one hand, these decisions must have been made for methodological reasons, as I had a different database standing at my disposal for inhabited properties and for enterprises properties. On the other hand the emphasised aim of the effect analysis besides answering the questions of

winners and losers of the new system to be introduced was to make us able to define the scale of costs and benefits too. Property tax, if other aspects of the tax system are not considered[3], would distribute a large fragment of the tax wedge to private persons owning property while winners would be the enterprises, based on the calculation of the model. The scale of this redistribution of the tax wedge depends on the benefits included in the system and the tax key used.

Calculations accomplished with the use of the model were based on four possible tax keys: 0,25%, 0,5%, 0,75%, and 1%. As a first step it was analysed what level of revenue the local governments can expect at distinct tax keys. The second question to analysed, related to the first one was determine the possibility of substituting the present forms of taxation by this new, value-based property tax, given the level of revenues to be expected from distinct tax keys' introduction. Tax payers' aspect of the question is – calculated for distinct tax keys again – the determination of tax wedge evolving from the new system of taxation for private persons and for enterprises. The last question was the effective tax wedge's calculation after considering the modelled benefits too.

Based on the calculations accomplished with the model in the Dissertation it can be concluded that value-based property tax fulfils the requirements to broaden the tax base and to decrease the tax wedge of enterprises at the same time. The increase in the tax burden of the population can be regarded as a critical point of this system though. Considering the ability to bear taxes and budget aspect as well, based on the calculations accomplished in the Dissertation it can be proposed to maintain the present system of industry tax and to introduce a value-based property tax with a 0,25% tax key. Parallel to this building and land tax would be seized in its present form and communal tax could be neglected as well.

Besides the aimed consequences other effects will also be generated by the introduction of a value-based property tax according to the model. Black economy could be reduced because the property tax can be used to decrease the tax base of

[3] Without considering the effects of tax benefits, social subsidies or other reduction of the tax wedge, evolving for example from possible decreases of other tax keys.

personal income tax and company income tax. The same effect can be attributed to the fact that billed costs of development; redecoration and modernisation of the property will decrease the tax base of the property tax itself. This latter opportunity is major importance from the aspect of enhancing the settlement's stock of properties so increasing the potential tax revenue of the local authority over the long run.

The case of credit financed properties is a further problem to solve and a source of potential loss of revenue. In the Dissertation a proposal was made to consider the possible decrease of tax key in case the property is financed by credit. A so called "ownership fragment" can be determined by the time period the credit must be paid, the capital and interest payments due, and the value of the property which could be the base of calculating the tax. It can be left for the regulators to decide whether they oblige the banks owning mortgage right over the properties to pay the missing part of tax or account the loss of revenue. There were no suitable data to make the exact calculations for this question standing at disposal.

4. INTRODUCTION OF THE MODEL

In the course of setting the model of value-based property taxation the minimal precondition was not to allow local governments' revenues to decrease. The basis of comparison was the population- and settlement statistics for 2006 and taxation data were also used both for settlement and aggregate analysis. As value-based property tax will be introduced in 2009 based on a decisions made in November 2007, the freshest sources of data were endeavoured to be used.

In the model properties are divided to two groups, one group contains the private properties of population serving housing purposes, while the other contains the properties of enterprises. The property tax unified value based, but for research purposes it seemed to be important to make this distinction, as this enables us t gain full picture of the distribution of tax wedge among stakeholders. It is also of high importance to change the unbalanced nature of taxation's structure and besides enterprises population should also bear some burdens[4] of local taxation serving the improvement of local services' quality and quantity. Based on the model this change can be followed punctually.

In the course of determining tax exemption and benefits it was of major importance to choose such forms of exemptions and benefits which are narrow and easily controllable, but focus on the aspects of equity too. A further important aspect was in the decision making process to consider individual circumstances only to an extent which will not turn property tax to poll-tax's direction. Matching this, only properties of the state, local government and churches would qualify for exemptions. Following the logic of the present system of tax regulation[5] it is considered as a benefit to enable those who pay personal or company income tax to decrease their tax base with the paid property tax. As pensioners can not use this possibility they could receive a 50% benefit from their tax base on the properties

[4] When determining the tax keys it was an objective to keep in mind the ability to bear burdens of taxation too. One of the most important measures for a tax scheme's efficiency is the ratio of realized to potential revenue.

[5] Paid industry tax can be fully accounted for reduction of company income tax.

they own[6]. Calculations were made for the realistic cases but the method can be extended and be easily used for individual cases too.

To give incentive for the owners to increase the values of their properties[7], further benefits could be given for investments increasing the value of the property from the tax base of the personal or company income taxes. This would also serve the whitening of the economy in the sector, as owners of properties would be encouraged to ask bills and to pay their income or company taxes. Another possibility is to enable the reduction of property tax's base. The positive side-effects of the first version would come into force in this case too, and the relationship between the subject of tax and the benefit would be more direct in this case. When analysing the problem from revenues' aspect local governments would win over the long run even if they should account for some temporary reduction in their tax revenues, as the values of properties in their territories would increase permanently. Increasing property values by unchanged tax keys would secure and ever growing level of local public services which enables further increase in the value of properties.

It is very important to determine tax base in order to calculate potential tax revenues. Estimation of the properties' value was accomplished based on the property- and settlement statistics' data and the value-categories used in the course of setting luxury tax. In order to determine distinct property-owners expected wedges calculations were made for properties in the value of 3, 6, 10, 12, 24, and 36 million Ft as examples. Knowing the last known year's (2006) paid building and land tax, and the ratio of these taxes the aggregate territory of properties owned by enterprises was determined. Using this result, and the price's 50% set for housing properties the aggregate value of enterprises properties were estimated.[8]

[6] In the course of calculations the exact details of benefits are given in the distinct cases.
[7] This is an elemental interest of all settlements.
[8] As there were no data standing at disposal enabling more punctual calculations the assumption was made to over-estimate the fragment of enterprises owning large, manufacturing properties and under-estimate the share of small, uptown, shop-like properties. In the aggregation of settlements the share of these two main branches of properties are balanced. In case of the present, territory-based the situation is just the opposite of

A further characteristic of the model is the base of taxation is the market value, better matching Hungarian traditions than rental fees of properties[9]. When determining the tax to be paid four possible tax keys were used, 0,25%, 0,5%, 0,75% and 1%. According to assumptions even the property tax with the smallest key can be able to fill in the space of the present local taxes, with the exemption of the industry tax, while the highest of the tax keys secures and equivalent revenue to the present level for local governments. In case of using a tax key lower than 0,25% because of the very often met low value properties would question the efficiency of controlling the tax's payment. The tax larger than 1% would cause tax evasion because of the high overall tax burden of Hungary[10] causing serious problems to taxation morals.

The calculation made for four tax keys does not mean that this tax should be progressive, it only aims to help decision makers, and the most punctual way of reaching preferences should be secured by this method. The model aims to determine the possible scales of tax revenues and burdens of tax payers which could evolve using these keys. Based on tax theoretical reasons it is proposed to introduce value-based property tax as a linear tax. Calculations' results enable choosing the optimal way of harmonising the revenue aspects of the budget and the burden bearing abilities of tax payers.

One of the most critical aspects of accomplishment is the estimation of properties' values. Market value can realistically be given only for properties which can be traded. Hungary's structure of settlements and the relatively low fragment of trading properties it is easy to see that determining market value can be sensible question in several cases. Correction methods based on engineering parameters can also bring about several factors of risk. A further critical aspect of introducing the tax is its social acceptance. This latter can harm the efficiency of tax enforcement,

this. Owners of a large manufacturing building pay more tax than the owners of smaller but more valuable shops.

[9] In case of office buildings it can be advantageous to use rental fee based property taxation.

[10] This is usually given as public burdens' share in GDP. Hungarian tax wedge is 38,5%, while EU-15's average is 39,9%, and the average tax burden of those countries who accessed the EU with us is 34,7% (Eurostat, 2005.). As a result of further tax and social security contribution's increase in 2006 and 2007 this probably increased.

which can further be worsened by lack of social regulation which would be needed to make in some cases.

When thinking of all these aspects it was endeavoured to make up such a simple form of the model which enables to accomplish calculations easily but the punctuality of calculations will not be harmed at the same time to such an extent which distorts objective evaluation. A further aim was to enable the flexible improvement of the model by integrating other element matching tax theoretical, budgetary etc. purposes, according to the intentions of the regulators.

5. NEW AND NOVEL OBSERVATIONS OF THE RESEARCH

The main results of the research and the Dissertation will be introduced in the form of theses, grouped around two fields. The first group contains **founding theses** which relate to the methodology used. The second group contains theses related to the calculations accomplished with the model's use. In the Dissertation the main question to be answered was whether value based property could be a suitable tax scheme to reform the system of local taxation, whether it could substitute partially or entirely the present taxes. Adequate answer to these questions was gained through the following three, seemingly simple logical process which is made up of only three elements:

INPUT $\Rightarrow$ LOGICAL GENERATOR $\Rightarrow$ OUTPUT

As a first step I had to solve the problem of obtaining reliable input data from the information concerning local tax revenues, population and property register. This question is of major importance as even perfect systems; seemingly free of any internal contradictions can lead to false consequences if the premises are not rights. Before turning to the results gained from the model calculations analysis must be started with theses concerning the way inputs were obtained.

The next step is to "feed" the inputs gained to the logical generator the task of which is to reconstruct inputs in a controllable way. This actually is the model itself, which will give us output concerning the tax wedge's scale in case of distinct property values, tax keys and benefits. The results of this phase make up the calculated values of the model analysis.

The third and final step is analysis of the calculated results' impacts – both on tax payers' and on budget sides – outputs must be transformed to data useable for the decision makers of economic policy. Only if the model is able to operate

successfully in all three phases can the theses concerning the main objectives of the Dissertation and of the method used be considered to be proved.

4. 1. FOUNDING THESES

OBJECTIVE:

T1: Value based property tax is a suitable tax scheme to reform the system of local taxation and can be used to substitute the present elements of local taxation partially or entirely.

Most of the critics for taxation relate to the questions of the fairness and equity of the system. There is no absolute measure for this aspect of the tax system though. One possible attitude to **equity** is the **principle of utility**. This evolved from the idea of the tax being paid by the individual a payment for the services used by him. In a just system of taxation contributions of individual taxpayers should be in harmony with the quantity of public goods they consume. A larger extent of local taxes could secure a wider supply of public services, while a lower level of local taxation can only allow local governments to supply less public good. Generally we can conclude that this principle can be realised in local taxation mainly. Local taxation and tax schemes used can make up a relationship between the contribution's extent and the quality and quantity and public goods consumed. In some cases the advantages of public services can not be seen in the increase of the population's welfare but in the increase of some tax subjects' value as well. For example the growth of public safety, the improvement of transportation and infrastructural circumstances can increase the prices of properties in the given region. This is why it is important to give a leading role to property tax in local taxation's system. If the property tax is unity based, the principle of utility can not be realised, as the contributions of tax payers would not be harmonised with the quality of public services they consume in the given region, which on the other hand will increase the value of the tax's subject (the property's price).

The other way to think about **equity** is the **principle of the ability to pay**. This principle states that each and every member of the population should contribute to the given public spending program according to his/her ability. In this case the criterion of equity appears in itself, and is not related to the expenditure. .Horizontal equity principle means that members of the population whose ability to pay is similar have to pay similar tax wedge. According to vertical equity principle Members of the population who are able to pay more contribution have to pay more taxes. In order to secure the practical accomplishment of this principle the measurement of the ability to pay must be defined. The tax base can either be income, consumption or wealth. Based on these characteristics we can state that value based property tax meets the criterion of the ability to pay too.

The statement defined in the second part of the thesis can be proved by the results of the model calculations. Whether the introduction of a value based property tax can substitute of the elements of the present local tax system entirely or partially depends on the tax keys and benefits mainly. Results concerning these questions will be introduced in the theses related to the model calculations.

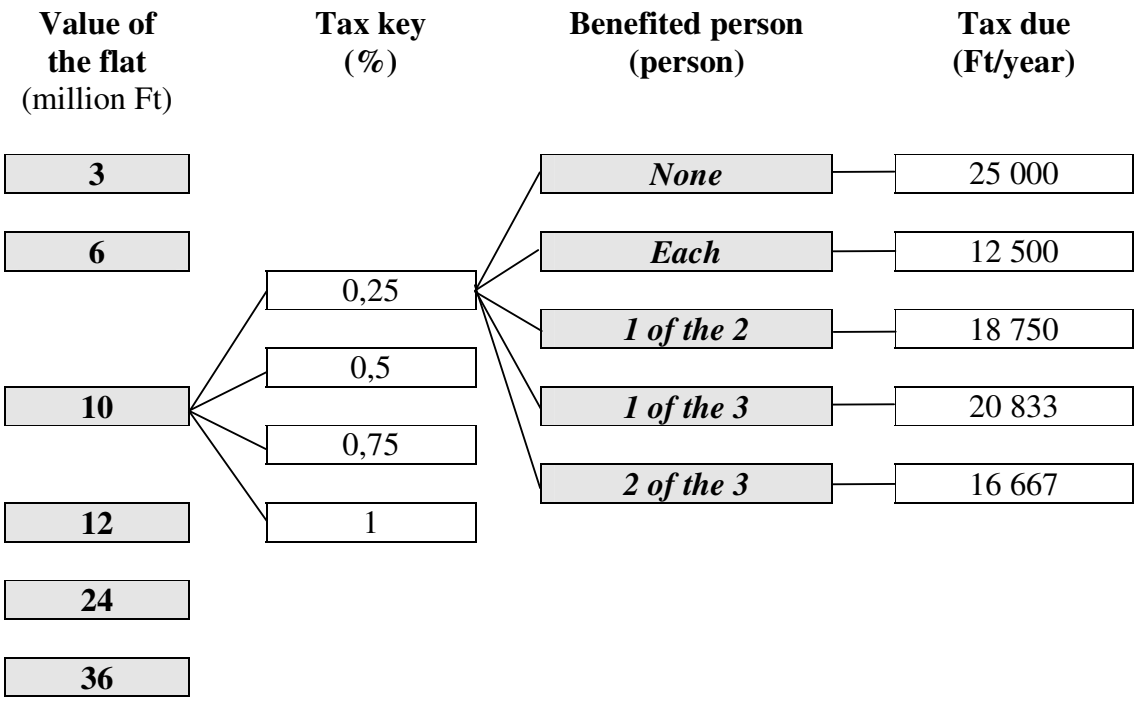
METHODOLOGY USED:

T2: Such a new model was worked out by the use of the scenario analysis technique – the method used in the course of the impact analysis – which will automatically generate numerable changes evolving from changes in the parameters built in the model.

In order to increase transparency of property values, tax keys and benefits a scenario analysis tree was accomplished in the Dissertation. In the figure included here only five of the calculated 120 scenarios can be seen (which can be read in full details in the III. Annex of the Dissertation in table), concerning the average values of properties and the tax keys and benefits preferred by the author. On the figure a 10 million Ft worth property's case of a married couple can be seen for example. Assuming that ownership is equally distributed between them, if one of them is a

pensioner the property tax they have to pay without benefits would be 25 000 Ft, but with benefit it will be 18 750 Ft. This evolves from that assumption of the model which lets the pensioner of the couple to have a 50% discount on the property he/she owns[11]. The case is shown on the next schedule:

Figure 2: Value based property tax's scenario analysis tree



Source: own construction

The automatism defined in the thesis can easily be followed on the figure. The present model's dependent variables which are shown in the three columns of the table, – the flat's value, tax key and benefit – can automatically generate the tax due by changing either the number of the parameters in the columns and the number of columns themselves.

[11] The benefited cases which are detailed in Annex III in a table are made even more transparent by the graphs of the Annex IV, which shows the tax wedge for all property values both on yearly and on monthly basis.

4. 2. THESES CONCERNING THE MODEL CALCULATIONS

PREPARING INPUTS:

T3: The overall value of Hungary's property wealth is approximately 49 189 Billion Ft worth.
A) In case of housing properties it is 43 446 billion Ft.
B) In case of entrepreneurial properties it is approximately 5 743 billion Ft.

It is necessary to determine settlements' property wealth in order to accomplish model calculations. This will serve as the base for value base property tax's calculation. Calculation of the estimated aggregate revenue from the value based property to expected were accomplished by the combined use of aggregated local tax revenues and distinct settlements' property data, distributed by properties owned by private persons and enterprises. The process of calculation will be introduced through the example of the town Miskolc.

The determination of **housing properties'** estimated value was accomplished the following way. Settlements were divided to value-zones when the luxury tax came into force and local governments accepted an average price per m^2. The town's properties are divided to 5 categories in the County's Registry Office. The following table contains the date:

Table 1: The register of Miskolc town's properties distributed by value

Market value (million Ft)	6	8	10	20	30
Number of properties (thousand units)	30	20	12	10	3
Value of properties (billion FT)	180	160	120	200	90

Source: own construction based on the County Registry Office's proposal's Annex for the implementation of the luxury tax law

Analysing the data it can be concluded that approximately 75 000 housing properties can be found in Miskolc, with an estimated value of 750 billion Ft. By simply dividing these data the average specific value per property will be 10 million Ft. Making further calculations with the town's average 200 000 Ft/m^2 price for properties the average property is 50 m^2 large. For further calculations another data is still needed, which is the average number of inhabitants in a flat. In order to calculate this, the population of the town must be divided by the number of properties in the town. So the average number of persons living in one flat is 2.34.

Building tax paid by enterprises was the basis to estimate the value of properties owned by enterprises. In the town of Miskolc 700 Ft/m^2 of property tax was due in the year in question. This value must be divided by the aggregate value of building tax paid by entrepreneurs. So the aggregate floor space of properties owned by companies can be obtained which was 1.270 billion Ft/700 Ft/m^2 = 1 814 286 m^2. Another step must be taken to estimate as these properties are even less registered by their real values as housing estates were. To mention two extreme cases as examples, enterprises can own such large, plant-like properties which are cheap by the m^2, but they can be small uptown shops of high value as well. The specific m^2 prices of these real estates are probably different from that of housing estates. As more punctual data are missing and we would like to maintain the simplicity of the model 50% of flats' prices were used. In Miskolc, based on the earlier calculations we obtain 100 000 Ft/m^2 floor space for this. The value of properties owned by enterprises can be calculated by multiplying the territory of properties by the price we have just determined. This will be used as tax base in the calculations. The value will be approximately 181 billion Ft.[12]

If calculation is made for country aggregate Hungary's average housing estate's value can be regarded to be 1 million Ft. The average floor space in Hungary is 67 m^2 as a result of smaller flats in towns an on the average larger flats in villages. By dividing the two numbers we can conclude that approximately 150 000 Ft/m^2 price

[12] The SPSS Software calculates with the punctual numbers all time of course. Tables and graphs are edited according to the punctual numbers in all cases.

can be used when determining the property value. The average 2.34 person/flat divided by 10 117 042, the number of Hungarian population we can calculate that approximately 4.323 million housing properties can be found in the country. Multiplying this value by the average floor space per flat and the specific price it can be determined that the estimated value of Hungarian property wealth is approximately 43 446 billion Ft. Enterprises' property value can be added to this which was determined by the method described above, using aggregate data. Enterprises paid 53.6 billion Ft property tax on the country level in the chosen base year, in 2006. This value must be divided by the 700 Ft/m^2 specific values, in order to obtain the full floor space of enterprises' properties. This is 76.57 million m^2. Multiplying this by 50 % of housing properties average price, 75 thousand Ft, aggregated value of enterprises property wealth will be approximately 5 743 billion Ft. The sum of the two values will be 49 189 billion Ft, this is the aggregated value of Hungary's property wealth.

NUMERICAL RESULTS OF THE CALCULATIONS:

T4: Value based property tax in case of a tax key of 1% can substitute for the whole present system of local taxation in Hungary.

As this statement relates to the country's average, settlements showing very high per capita values of local tax revenue can be exempted from this. For example in Tiszaújváros (one of the examined settlements), even in case of introducing the 1% tax key property taxation can not substitute for the entire present revenue of local taxation. The explanation for this is the outstandingly high per capita value of industry tax which is more than four rimes higher than the country's average.

In 2006 the 3 145 local governments' tax revenue was 448.9 billion Ft. In order to substitute for this a tax key of at least 1% should be introduced, based on the estimated 49 189 billion Ft worth of property wealth. In case of this all elements of the present local tax system could be withdrawn, including industry tax which would lead to a drastic restructuring of the tax wedge. If we divide this value of the

1% tax key, 434.46 billion Ft of the tax revenue would be paid by the 43 446 billion worth of housing property, while enterprises tax wedge would be 57.43 billion Ft, instead of the 448.9 billion Ft which almost entirely was paid by enterprises. The results of calculations lead to forming the following statement:

T5: Analysing the problem from taxpayers' aspect, in case of the introduction of the tax with 1% key:
A) Enterprises' tax wedge would be seriously decreased, enhancing their competitiveness.
B) Unbearable tax wedge would fall on the population which would make doubtful whether tax collection could be efficient.

Local taxes paid by the enterprises would decrease form 448.9 billion Ft paid in 2006 to 57.43 billion Ft. In percentage terms this means 87% reduction. Population's tax wedge on the other hand would be 434.46 billion Ft.

T6: In case of 0,25%, 0,5%, 075% and 1% tax keys an average Hungarian property's tax wedge would be 25, 50 75 and 100 thousand Ft.

Hinting at the calculations on the country's average, Hungarian population's property wealth is approximately 43 446 billion Ft worth. Based on the estimated number of properties[13] a good estimation for the average housing property's value is 10 million Ft. The following two schedules show a 10 million worth property's tax wedge in case of the analysed tax keys on yearly and on monthly basis.

[13] Which is approximately 4.3 million units.

Figure 3/a: Yearly value of property tax for a 10 million Ft worth property

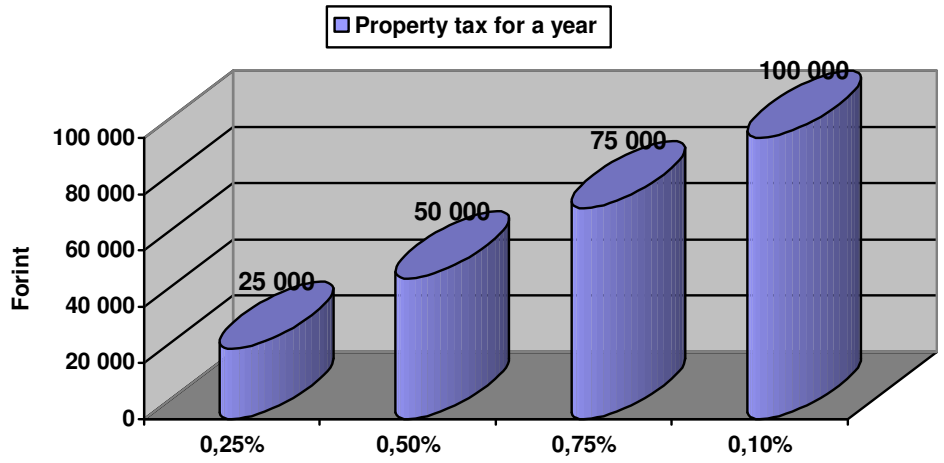
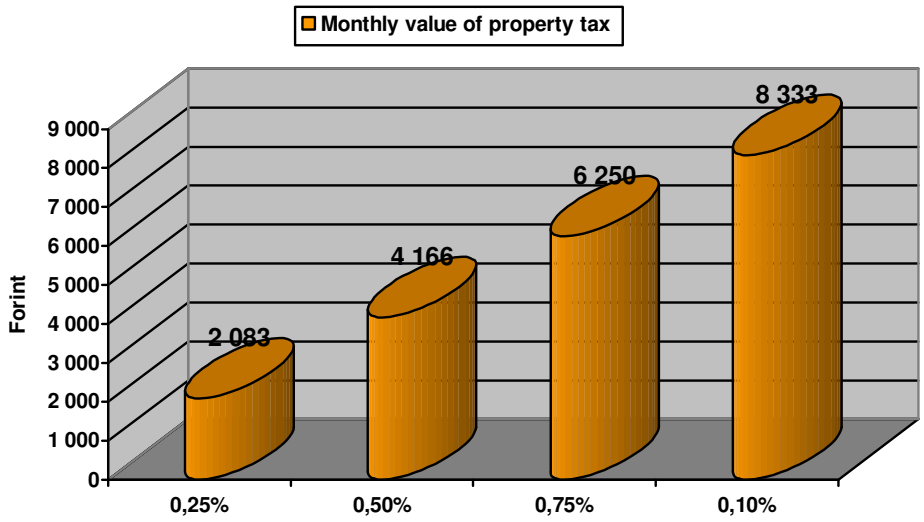


Figure 3/b: Monthly value of property tax for a 10 million Ft worth property



Source: own construction

T7: Value based property tax can substitute for all local taxes except for industry tax in case of introducing it with 0,25% tax key on country average.

Hungary's property wealth is worth approximately 49 189 billion Ft. In case tax was collected by a 0.25% tax key, tax due would be approximately 123 billion Ft. The aggregated amount of building and land tax paid in 2006 was 53.6 billion Ft.

T8: In case value based property tax was invented with a 0.25% tax key on country average:
A) Local governments' revenue from property tax would be more than doubled.
B) While enterprises' tax wedge would be reduced to approximately one quarter of the present one.

The amount of present property tax would be overcome by value based taxation paid by the population alone – 108.6 billion Ft/53.6 billion Ft – approximately twofold. The fragment of property tax paid by enterprises must be added to this, which based on the 5 743 billion worth property wealth of enterprises, calculated by the 0.25% tax key will be 14.4 billion Ft. This value is only one quarter of the present tax wedge (26.8%). Not talking on percentage terms, this means that almost 40 billion Ft could be left in the enterprises hands.

Based on the theses explained above and on further calculations of the Dissertation it can be concluded that enterprises' tax wedge would be decreased on a large scale in any case any of the model's scenarios were introduced, while local governments' revenues would also increase in all cases, even though the extent would be different. Parallel to this population's tax wedge would increase seriously. The next problem is to find that optimal solution which would mean a bearable increase in the tax wedge of the population. So we arrived to one of the most sensitive questions of property taxation: what extent can the wedge of taxpayers (Hungarian population's) be increased. This is especially difficult for the layer of society without income, if they are to pay tax on their property which does not raise any income for them. This is why the impact analysis of the model calculation are important, based on which the scenario of the optimal combination of tax keys and benefits can be chose, which will be able to satisfy the principle of equity

maximally, harmonised with budgetary aspects, – based on Colbert's famous statement – „to pluck out the highest number of feathers possible, on the expense of the least cackle". Based on the theses of tax theory and of the results of model calculations, the optimal tax wedge would be around the tax key of 0.25%. This option could secure the satisfaction of the equity principle, and meet the requirements to broaden the tax base too, while contributing to the reduction of enterprises' tax wedge and parallel to all these even the inhabitants were not to pay an unbearable high tax[14], and the tax revenue of local governments could be increased at the same time.

It is not the task of this Dissertation to go into the details of the following question but let's mention shortly that even if the highest level of carefulness is shown, the introduced system can not operate without problems – especially in case of small settlements with an ageing population and regions suffering a high level of unemployment – in case the government will not use efficient and aim-oriented social policy instruments parallel to changing the tax regime. A possible way of solving this problem can be interpret property tax as a micro-regional or regional tax, distributing some of the tax revenue among those settlements which has not enough property tax bases. Of course richer settlements' interest must also be considered and their development potential can not be hurt by this. This serves the interest of the neighbouring settlements too, as the development of them can be distributed among the others if the development is strong enough.

T9: Based on the model giving a 50% benefit to pensioners who own housing properties will decrease the potential revenue on the average 15%. This type of revenue will not influence property tax revenue of enterprises as the benefit does not consider them.

The parallel use of – ownership fragment based – 50% benefit according to the model, given to pensioners who do not realize work income, and social policy benefits given to that layer of the society which is need can make the tax wedge

[14] See figures 3a and 3b.

bearable, which means that the criterion of tax collection's efficiency will not be hurt.

Model calculations accomplished before concern the potential tax revenue to be collected in case of introducing distinct tax keys. The loss of revenue evolving because of the use of distinct benefits must be thought of as reducing factors. The next model calculation can help us in this aspect. 3 100 000 persons of Hungary's 10 117 042 inhabitants are retired. If the share of the two numbers is calculated, it can be concluded that approximately 30% of the population are retied. Let's suppose the least favourable situation for the budget, when pensioners own 100% of their properties, which means that properties do not have owners who are not retired. In this case, according to the model, owners must be given the maximal, 50% benefit when paying property tax. Assuming that the distribution of flat's inhabitants is proportionate; we can expect that in case of 30% of properties 50% benefit must be given, while other 70% of properties tax will be paid after the entire value. The effect of this is a 15% reduction of property tax revenue in case of housing properties. This means that only 85% of the population's property tax revenue, calculated by the model can be considered as potential revenue. This benefit does not influence property tax paid by the enterprises.

Starting from base data of 2006, as a result of model calculations accomplished it can be concluded that value based property tax can be a proper way of reforming the present system of local taxation. It is a question of regulators' intention, – which assumes the knowledge of tax wedge distribution after restructuring the tax system and the relationship among maintained elements of the present system and new elements to be introduced – what weight should be put on value based property tax among local tax schemes. The decision among the four tax keys and proposed benefits analysed before is also determined by the above mentioned aspects and regulators' intentions.

6. POSSIBLE APPLICATIONS OF THE RESEARCH FINDINGS

The primary results of the Dissertation, formed in theses above can be used in the course of the planned reform of the Hungarian tax system. It can be a major help in **restructuring the system of local taxation** in the first place. Having the numerical results of the research at our disposal, the quantitative value of revenue to be expected from the introduction of a value based property tax can be estimated, and the possible tax wedge of taxpayers as functions of combinations of distinct tax keys and benefits can be assessed as well.

Special attention was paid to identifying and mapping the quantifiable and only qualitatively measurable impacts of the tax scheme for those who will enjoy its advantages and for those who will have to bear the wedge. The analysis included the problems which can come to the surface either when introducing the system or when accomplishing it in practice. In case of these situations possible solutions were formed to deal with the problems. In the most critical issues special attention was directed at the necessity of social policy instruments to be implemented parallel to the introduction of the value based property tax.

The results of the Dissertation can also be used in **education**. The largest opportunity is seen in making use of the method introduced in the methodological chapter of the Dissertation, on the fields of economics and law. But the main body of the Dissertation can be implemented in the subjects though by the Department (finance and taxation).

Besides the already achieved results there are **opportunities in continuing the research** too. The methods used and the tax theoretical chapter's experiences can be used to analyse any element of the tax system – by making smaller changes in the methods, but keeping the logic- and even the whole Hungarian tax system can be analysed this way. Besides complex utilisation, the method can be used to measure the impacts of introducing a new tax scheme for settlements or groups of settlements as well.

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