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Use of microsimulation models for political decesion making

ABSTRACT

Socioeconomic systems are complex, extremely sensitive and of great social and economic importance. Microsimulation is a method able to handle complex socioeconomic systems by creating and studying a model that makes intensive use of the statistical data of the observed objects. These objects are the so-called micro units of the socioeconomic system; the person, the family or the household. Microsimulation models use simulation techniques in order to study the behavior of micro level units in time.

Microsimulation is generally accepted by decision-makers and widely used in Australia, Canada, Europe and the USA to prepare political decisions. In the European Union, more and more signs indicate an increasing demand for instruments of microeconomic analysis and prediction, coupled with a tendency of more willingness to budgetary spending for microsimulation. However, not only highly developed economies, but economies in transition also face many problems, especially in demography, pension systems, health care and taxation, for which microsimulation could be a very useful tool by doing a model-based study of related problems and possible solutions.

In this contribution first a short overview about the basic terms and recent microsimulation model developments is presented. Next, the feasibility of introducing capital income taxation in Hungary will be analyzed and discussed based on a microsimulation model. The current economic environment and the specific Hungarian economic characteristics are shortly described, followed by the economic justifications, the basic data collection and analysis, the microsimulation model, the model results and validation. Finally, the impact of different taxation policies on various social layers of the population and the macroeconomic consequences will be discussed and briefly analyzed.

Keywords:

- Socioeconomic modeling,
- Microsimulation,
- Capital income taxation,
- Taxation policy in Hungary.

Simulation models are models of real or hypothetical systems, which are developed in order to gain new information about system characteristics or behavior. The models reflect all important features of the system studied and all relevant relationships of the system with its environment. Because of the complexity of both the system and the model, digital computers are used to calculate the requested results.

A general *simulation model* can be described as follows *(see Figure 1)*

For the current purposes a few working definitions are introduced as follows. A *system* is given as a potential source of data. An *experiment* in this sense is the process of extracting data from a system by forcing it through its input to provide some output. Experimenting with the system might be impossible, dangerous or costly; therefore experiments are processed on models rather than the system itself. A *model* for a system and experiment(s) are used to answer questions about the system. *Modeling* means the process of acquiring and organizing knowledge about a given system, while *simulation* is an experiment performed on a computer model.

System elements are represented as *entities* or objects in the simulation model. They have distinguished properties or characteristics, which are also called *attributes or state variables.* The set of state variables determines the *state of a system* at a specific point in time. While time is passing by, the value of the state variables (sometimes even the set of state variables) are changing. Events are activities that change the state of the system (the value of particular state variables). *System behavior (trajectory)* is the changing of system states over time. *Simulation* in this sense is the numerical computation of system behavior.

Modeling and numerical computation of simulation results are loaded with errors. *Validation* checks the modeling process and the final result of it, the conceptual model, whether it is able to represent the system under investigation in a satisfactory way. *Verification* checks the computer model, especially whether the computer model is executed and the results calculated correctly. The model is never a perfect representation of the system and the numerical computation might also consist of rounding and/or method dependent errors. It is the responsibility of the modeler to make a final decision about the model and the acceptance/rejection of the model results.

Figure 1

SIMULATION MODEL

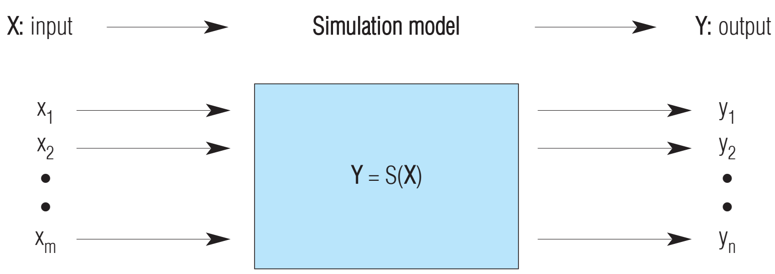
$$Y = S(\mathbf{X}), \qquad (1)$$

where

$\mathbf{X} = (x_1, x_2,..., x_m,)$ denotes m input variables,

$\mathbf{Y} = (y_1, y_2,..., y_n,)$ denotes n output variables, and

S = denotes the transformation made by the simulation model.



MICROSIMULATION

Socioeconomic systems are complex, extremely sensitive to changes and of great importance. Politics is the set of complex relations of (groups of) individuals living in a society and is also understood as the art and science of government. Governments are concerned with creating and/or maintaining governmental policy. Governmental *policy* is not just the prudence and wisdom in the management of society's affairs, but also the finding of a definite course and method of action selected from alternatives under given conditions in order to make appropriate *decisions*. It is a basic requirement of the society that these educated and smart governmental decisions be based rather on a scientific approach than on a blind experiment with the population, therefore modeling and simulation of socioeconomic systems is not just a technical opportunity but also a moral "must". Study of socioeconomic systems is a demanding challenge; simplified scientific approaches do not have the necessary accuracy and hence result in misjudgment and decisions with long-term negative effects and fatal consequences for the society.

Socioeconomic models can be used to study the effects of governmental policy changes; to study costs and (re)distributional aspects, to identify "winners" and "losers", without endangering the welfare of the society. Mathematical modeling and computer simulation are appropriate scientific approaches to analyze and help to solve socioeconomic problems; *micro-analytic simulation models,* also called microsimulation models, can be developed and studied instead of experimenting with the society.

Microsimulation is a method able to handle the high complexity of the socioeconomic problems by creating and studying a model that makes intensive use of the statistical data of the observed objects. These objects are the so-called micro-units of the socioeconomic system; the *person*, the *family* or the *household*. The microsimulation models use simulation techniques in order to study the behavior of micro level units (see also Orcutt et al. 1961).

Microsimulation models have the following main elements: simulation data, simulation model, simulation parameters and simulation results. The *initial model data, intermediate and/or final simulation result data,* are stored for further analysis. The *simulation model* consists of algorithms, which describe the *behavior of micro-units* and represent their environment. Simulating the micro-units' state and behavior (the changes of state over time) and the change of micro-units as a result of policy changes is often called "aging the data". *Static aging* refers to the adjustment by re-weighting the used sample based on some aggregate control variable (e.g., the composition of the sample by gender), while dynamic aging refers to adjusting each micro-unit attributes (e.g., income) by recalculating them at each time period, one period at a time. Special care is taken to do the data analysis and the estimation of simulation *model parameters,* which are stored together with the simulation model *(See Figure 2)*.

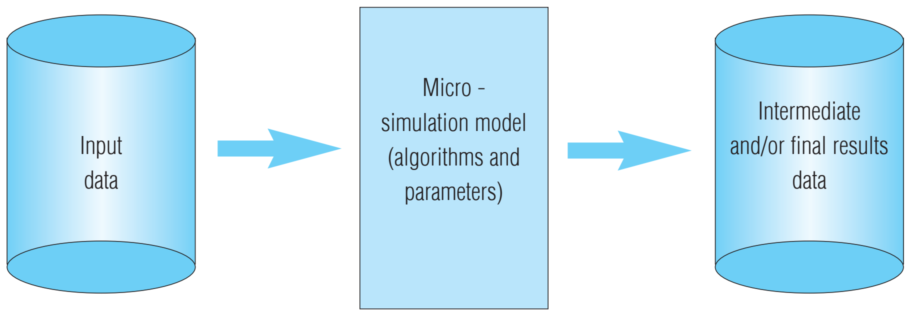
Given the model responses of micro-units at unit level, the microsimulation models can estimate aggregate effects and aggregate changes by grouping, creating distributions, tabulating or summing up unit-level individual model results in order to make statements about the various characteristics of the population as a whole.

The microsimulation model is working in an *experimental framework* in order to study the effects of policy changes on all micro-units, on the microsimulation model behavior itself. The model calculations are executed by a digital computer.

Initial data of microsimulation models are collected from *cross-sectional surveys, and/or longitudinal surveys.* Cross-sectional surveys

Figure 2

MICROSIMULATION MODEL



collect data about a sample population for a single period of time (e.g., a survey of tourists' expenditures), while longitudinal surveys collect data about the same sample population (also called panel) for several periods of time (e.g., a household statistical survey). Microsimulation models could also use a *time-series of cross-sectional surveys,* which collect data at periodic intervals (e.g., micro-census). Special techniques have been developed to improve data quality and use additional data sources available (e.g., imputing, merging, synthetic data). Model verification and validation also use different sophisticated statistical methods and techniques (see e.g., Rubin 2004, or Little and Rubin 2002, or Schofield and Polette 1998, or O'Donoghue 2001).

Microsimulation models are a subset of socioeconomic models and have specific characteristics. They are typically:

- *Large:* based on large samples and related detailed datasets.
- *Quantitative:* based on mathematical and statistical models and constructs in contrast to qualitative models, which are based on normative approaches.
- *Static:* not having the intention to model a time sequence of changes, but rather the immediate (or short term) effects of policy changes ("the morning after") in contrast to dynamic models, where all micro-unit attributes are recalculated at each time interval over a longer period of time in order to describe the dynamic transitions.
- *Non-behavioral:* not allowing any changes of micro-units' behavior in response to policy changes (in the absence of data related to behavioral pattern and pattern changes) in contrast to behavioral, which allow the models to reflect micro-units' behavioral patterns and policy change impacts on behavioral patterns.
- *Deterministic:* or rule-based, not allowing conditional probabilities, in contrast to stochastic, which allow modeling of events based on conditional probabilities.
- *Non-spatial:* just modeling the impacts and the effected population in contrast to a spatial approach that also takes into consideration the geographical/regional aspects of the impacts.

As a result of recent efforts, new models are emerging, which are stochastic, have behavioral elements, and use a regional model view.

Generally, two major microsimulation model classes were developed in order to build realistic models: *data-driven models and agent-based (behavior-driven) models.* Despite the different modeling approaches, both model classes handle model data and methods in a similar way; in both cases, significant amount of data must be analyzed and processed.

One of the most important technical problems of microsimulation model implementation is the integration and usage of different data sources available for microsimulation models. Historically, three different approaches were developed:

- File processing approach (e.g., Heike et al. 1994)
- Database-oriented approach (e.g., Sauerbier 2002)
- Agent-oriented approach (e.g., Pryor et al. 1996)

These approaches use mainframe or PC technology and as such, are not portable and architecture neutral. In the 90-ies, new network-oriented technologies were developed in order to support applications (like model-based analysis) using heterogeneous hardware and/or software platforms. Nowadays, the development of networked multi-platform microsimulation applications is not just necessary but also technically possible (see Molnar 2005).

Modeling and simulation of socioeconomic systems is a challenging task because of the complexity and non-technical nature of socioeconomic systems studied, and because of the fact that the modeling of such systems is highly influenced by the social positions or expectations of individuals' (and the modelers), eventually also by their financial or political interest. Difficulties in interpreting, understanding and accepting model results are also related to the reasons listed as modeling difficulties. It is imperative also to emphasize the importance of the data quality of microsimulation models, because it also determines to a great extent the quality of the model results, and even the quality of the model itself. Both, modeler and user must respect the limitation and enjoy the benefits of these models and the underlining methodology.

The advantages and disadvantages of microsimulation models can be summarized as follows:

Advantages:

- Micro-unit based behavioral analysis provides a more detailed and flexible model.
- Detailed data provides more possibilities for data analysis.
- Detailed model and detailed data provides detailed computational results; distributional analysis, aggregations at different levels retaining the opportunity to analyze the important interactions is possible, which the aggregated methodologies tend to hide.
- A rich variety of data, different model scenarios can be processed, providing both short term and longitudinal analysis of the impacts of policy changes.

Disadvantages:

- While describing and analyzing micro-units (like household, family or individuals), models do handle firms and government as "environment", the behavior of which is not included and described in the models.
- Microsimulation models represent "one side" of the economy, therefore might not necessarily deliver correct macroeconomic results.
- The dependence on micro-data results in large data bases, expensive data analysis, high computational costs, and long development time. This inflexibility in development of the models might result in rapid outdating of model and results.

Microsimulation is generally accepted by decision makers and widely used in Australia, Canada, Europe and the USA to prepare political decisions (see O'Donoghue 2001). Not just highly developed economies, but economies in transition also face many problems especially in demography, pension systems, health care, and taxation. Microsimulation can be a very useful tool to a model-based study of related problems and possible solutions. Unfortunately, while the current immediate impacts of political decisions are routinely analyzed using microsimulation models, future long-term impacts, structural changes and behavioral response to policy changes are not yet analyzed as widely with these models by policy makers.

Exploiting the basic approach of microsimulation, the method can be applied also for transportation problems. Transportation, especially urban transportation problems have been studied in the past few years more frequently by using the activity-based approach (McNally 1999), which takes into account that individuals' travel behavior is a complex socioeconomic phenomenon. Time-dependent and also often space-dependent (geographical) analysis and modeling of this phenomenon can contribute to a better understanding of the overall problem. Models built upon this approach often use agent-oriented techniques to realize the simulation model (e.g., Rindt et al. 2002).

MICROSIMULATION MODELS FOR TAX SIMULATION: EUROMOD

They are several approaches to the microsimulation of tax systems or tax policies published recently. *Haan and Steiner* 2004 and also *Creedy* and *Kalb* 2005 analyze existing tax systems. Some of the publications listed aim to simulate fiscal reform policies (e.g., Burman 2005, Trautman 1999) or the tax system simplification impacts (e.g., Gale and Rohaly 2002, or Shaviro 2004, or Edwards 2005), others investigate political programs (e.g., Gale at al. 2004, Beach at al. 2004).

From our point of view, the most important publications are closely related to the *Targeted Socio-Economic Research (TSER)* program of the European Commission (CT97-3060), the aim of which was to build *EUROMOD*, a tax-benefit microsimulation model covering all 15 then-member states of the European Union (see Sutherland 2001). The program runs currently in FP6 Research Infrastructures Action as a Design Study. The main aim of the project is to expand EUROMOD to include the 10 new member states and make it easier to use.

EUROMOD uses micro-data at individual level; the main source of which has been determined by each member country. Different types of data sources are used, starting with national panel studies to the more unified European Community Household Panel (ECHP). Even though EUROMOD does not consider itself responsible for data quality, it contributes to data quality improvement by giving professional advice regarding definitions, determination of common variables used, exclusion from samples, non-response biases, furthermore uses imputing to include household expenditure and an indicator for risk of social exclusion into the database.

The model design and implementation of EUROMOD focuses on common structural characteristics and data requirements, therefore the tax-benefit system has been conceptualized and operationalized as follows: the tax-benefit system is made up of individual policies, which are collections of tax-benefit instruments. There is a *policy spine,* which determines the list of policies and their execution order. Calculations are performed by the tax-benefit *modules*. The implementation has been focusing on stand-alone PC configuration using C/C++, MS Excel and Access. Output statistics are standardized but tools are provided to create different, flexible and parameterized user defined outputs (e.g., tabulations, summary statistics).

Because of the main output of EUROMOD is a measure of Household Disposable Income (HDI), several components for output calculations must be distinguished based on availability and importance. Some data elements are covered by the model and therefore can be used for calculations, some might be modified (in part simulated), and some are fully simulated. The calculation scheme of the main output is as follows: wage and salary income + self-employment income + property income + other cash market income and occupational pension income + cash benefit payments - direct taxes and social insurance contribution.

Based on available documentation, the following tax-benefit instruments are *simulated* in all countries:

- Income taxes (both, national and local),
- Social insurance contributions (paid by employees, employers and the self-employed),
- Family benefits,
- Housing benefits,
- Social assistance benefits and other income-related benefits.

The following instruments are *not simulated* in all countries; however, there is a possibility to include them into the national models:

- Capital and property taxes,
- Real estate taxes,
- Pensions and survivor benefits,
- Contributory benefits,
- Disability benefits.

EUROMOD has been intensively tested and validated. For validation a baseline validation exercise (e.g., ranking countries in terms of poverty and inequality), among others, has been successfully executed. EUROMOD has been used intensively in the past years and several microsimulation applications were developed (see Sutherland 2001).

EUROMOD is a great tool and can be used for analysis and planning tax-benefit systems and policies. Unfortunately, at the current level of development a few major disadvantages could be observed, which limit the use of the tool:

- As the authors also mention, the static model does not incorporate the effects of behavioral changes or the long-term effect of changes.
- The model can use only those variables that are present in the underlying database.
- Accessing and updating databases seems to be difficult; there are no network-oriented software solutions, there is no version concept applied and there is no concept to regulate the data granularity problems.
- Because the database differs from country to country, the comparability of results is not without difficulties.

CAPITAL INCOME AND ITS TAXATION IN HUNGARY

Based on increasing efforts to harmonize the economy with the other member states of the EU and to exploit the positive effect of tax system changes, the possible results of capital income taxation have been investigated using microsimulation. This research extends the EUROMOD project aims and provides new, promising directions for the Hungarian researchers working in this field (Belyo and Molnar 2005).

In Hungary, the introduction of a uniform capital income tax rate would be desirable, but taking into account the complexity of the present taxation and the difficulties of income and revenue estimations, the task is challenging. The possible effects of a capital income tax could differ significantly with different consumption patterns. Thus, it is important to first understand the savings and consumption patterns and their dynamics and to base the new tax in the framework of the presently functioning system.

The forms of private savings of the population based on National Bank of Hungary (NBH) statistics are as follows *(see Table 1)*.

Comparing the major characteristics of the economic environment and private savings

Table 1

GROSS SAVINGS STATISTICS BETWEEN 2002 AND 2004

Saving forms	2002 billion HUF	2002 (%)	2003 billion HUF	2003 (%)	2004 billion HUF	2004 (%)	Compositions (%)
1. Cash and bank deposits	5 177	110	5 921	114	6 451	109	41
2. Securities (excl. #4)	1 002	107	1 104	110	1 302	118	9
3. Credits and loans	0.5	167	N/A		N/At		N/A
4. Stocks, shares	4 391	115	4 871	111	5 437	112	34
5. Insurance	1 498	129	1 924	128	2 519	131	14
6. Other claims	166	125	207	125	283	137	2

Source: MNB

behavior, the following salient features can be observed:

❶ The growth of savings related to capital income (mainly forms 1–4) during the last four years was close to exponential. At the end of 2004, the net savings of the population related to capital income have been estimated as HUF 11,888.5 billion. Insurance related net savings (5) were estimated at HUF 2,394 billion. 50–60% of the savings is related to forms 1 and 5.

❷ During the past 5 years, the ratio of consumption in the GDP has been growing continuously, while the society has been undergoing radical restructuring and a significant part of the population has been unable to generate savings, rather incurred debts. The trend of increasing consumption is in contrast with the "old" EU member states, where during the past 15 years the household consumption ratio, as a sign of well balanced economic development, has remained basically unchanged.

❸ Because a significant part of the population was unable to save, a lion's share of the savings originated in high income households. Generally, with increasing age, people use more frequently cash and bank deposits (savings form 1); so do members of lower middle class families. Members of the upper middle class and people between 50 and 65 find forms 2 and 4 more favorable. Savings forms, related to title 5 are popular for blue collar workers, people with lower than average income and recent graduates. The behavioral patterns related to the savings dynamics are based on an ECOSTAT survey: half of the people are actively changing their portfolios; well educated individuals under 50 years of age are especially committed.

❹ Major parts of savings consist of cash and bank savings, in contrast to most EU member states, where stocks and shares have a far greater proportion. At the same time, people are migrating towards real estate and other portfolio investments with greater returns or profit rates. However, some savings forms cannot be fully estimated, because no specific information is available for them (this is the case for deposits or real estate investments held abroad).

❺ The dynamics of savings do not depend strongly on the interest rate (negative correlation) or the income of the population, but can be partially explained by the inflation rate (preemptive spending). This indifference to interest rates has happened in spite of the emergence in the past 5 years of a competitive financial system resulting in relatively higher interest rates than could have otherwise been expected (the average interest rates in 2004 are presented in *Table 2*).

❻ A widely accepted international practice is to tax capital income indirectly, by using different forms of asset/property taxes. The current Hungarian income taxation system levies a tax on real estate rental fees and on realized profits from increased stock exchange investments. According to the Hungarian State Tax and Financial Control Office (APEH), in 2003 an estimated 421,000 individuals paid HUF 90 billion tax, of which 20% has been paid as individual entrepreneurship tax, 10% stock/bonds value increase-related tax, 29% share-related revenue tax, and 20% real estate rental fee related revenue tax.

CAPITAL INCOME TAXATION SIMULATION

Data preparation

The microsimulation model of capital income taxation in Hungary has been developed as a static simulation model, which is based on corrected statistical data of 2002.

The basic data were selected using the Household Statistical Survey (HSS) of 2002. The survey consisted of household budget data of 10,000 households. The sample was random, representative, layered by type of settlement, and country-wide. However, the income and spending data of the HSS2002 are not able to fully reproduce (match) the macro level statistical data. Because of the central role of the HSS2002 survey in calculations of other economic data, e.g., income elasticity, this data set was selected for further corrections. These corrections aimed to accomplish two series of changes:

❶ Changes of income related data: Asset and capital related data were corrected by 1,358 billion HUF, 48% of which were salary based and 59% were entrepreneurial income. The changes were based on the 2002 individuals' "tariffs survey" (TS), which has been conducted by the Hungarian Central Statistical Office (HCSO). Data corrections on HSS2002 were determined based on the TS data using the statistical matching method. After the corrections, the net income increased by 23.6% and as a consequence of the changes, the original data set matched the relevant macro data.

❷ Changes of consumption related data: 75% of the generated income data was imputed as consumption, the remaining 25% was imputed as savings. The number of changes has been marginal (13 corrections), but their statistical importance significant.

The corrected data of 2002 of HSS2002 (C2002HSS) has been aged and aggregated as a second step of data preparation. The aging aimed to produce an initial synthetic data set for 2005 using published macro data (e.g., salary data, pension data) and certain statistics

Table 2

AVERAGE INTEREST RATES OF DIFFERENT SAVINGS FORMS IN 2004

Saving forms		Profit (%)
1.	Cash and bank deposits	8,5
2.	Securities (excl. #4)	12,2
3.	Credits and loans	N/A
4a.	Stocks,	54
4b.	Share,	10,8
5.	Insurance	10,2
6.	Other claims	N/A

provided by the HCSO and the NBH (e.g., the distribution of incomes and assets). The aggregation aimed to generate household level data using the individual data of C2002HSS. As a result of this step, a synthetic data set for the capital income taxation microsimulation model has been created. Different cross sections and comparisons with macro level data of years 2003–2005 show that the resulting synthetic data are satisfying for further use in the microsimulation study.

The process of data preparation is showed on *Figure 3,* below.

Microsimulation model

The static microsimulation model executes the simulation for the year 2006, which can be considered as a one year aging on the synthetic statistical data set of 2005. The simulation model uses the same type of macro data as the aging procedure (e.g., salary, inflation, and pension). Starting with the households of the synthetic data set, the model generates the savings and calculates the appropriate taxes. For generating savings, further studies of ECOSTAT and TARKI about savings behavior (e.g., household portfolio management) were taken in consideration. Data used for portfolio composition is presented in *Table 3.*

For validation of the simulation model and the quality check of synthetic data, tax revenue calculations were used for the time period between 2003 and 2005. The results demonstrated the ability of the model to calculate tax revenues in an acceptable range compared to the measured and/or predicted government tax data.

Microsimulation model experiments

Based on the ECOSTAT survey and to study the expected impacts of capital income taxation, different scenarios and cases were created and analyzed. Two scenarios, each of them with two cases were analyzed. The data of basic scenarios are presented in *Table 4*, the cases differed only in the behavior of the first and second quintile; there is no behavior change. Experiments were made based on the following different capital income tax rates: 5%, 10%, 15%, 20%, and 25%.

The experiments aimed at giving a clear picture about the range of revenue generated by

Figure 3

MICRO-DATA PREPARATION

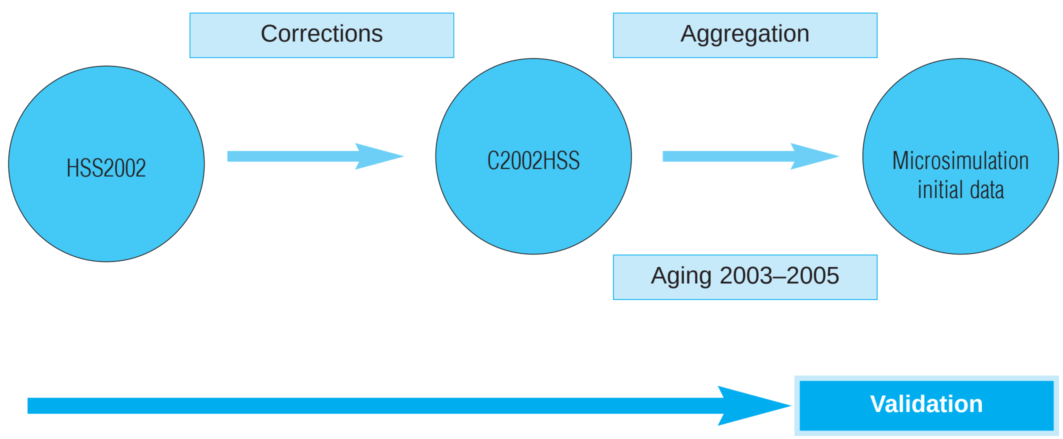


Table 3

PORTFOLIO COMPOSITION AND SAVINGS CHARACTERISTICS PRESENTED BY INCOME QUINTILE

Income quintiles	Bank deposits (%)	Stock and goverment securities (%)	Insurance (%)	Share (%)	Ratio of savers in the quintile (%)	Savings in the quintile(%)
1. quintile	70	0	20	10	20.4	1.2
2. quintile	65	5	20	10	22.5	3.5
3. quintile	65	5	10	20	39.1	9.4
4. quintile	53	7	15	25	50.4	20.3
5. quintile	33	12	15	40	69.4	65.6

the capital income taxation and the impact of the new taxes on the population at different income levels. It has also been a goal to recognize tax avoidance problems and their economic impacts (e.g., changing the portfolio may increase the pressure on the real estate market).

Results of the microsimulation model study

The most important results of the microsimulation study:

❶ Because of the complexity of the current tax system and the difficulties in forecasting, the expected revenue generated by uniform capital income taxation may vary significantly. The tax revenue generated by the capital income taxation is calculated between 23.1 and 86.8 billion HUF. In the best case scenario, the capital income taxation revenue will amount to 0.4% of the GDP.

❷ The introduction of capital income taxation would not affect the population dramatically: the income decreases less than 1% in each quintile. People with higher income would pay more taxes, but the most impact is to be expected for the oldest and the youngest. The retired and inactive population would be more affected. Looking at the families, the most impact is to be expected in families without children.

❸ Based on the static microsimulation model, the long-term behavioral changes cannot be studied. Nevertheless, in case of radical behavior changes of the population, the negative effects could be significant. Cash savings and bank deposits could decrease considerably, while the demand for government securities and stocks would decrease. The danger of a radically increasing consumption and the "exports of savings" cannot be excluded.

CONCLUSIONS AND FINAL REMARKS

Microsimulation is a popular and valuable instrument for governments to study the social impact of their decisions, especially impacts that cannot be observed using other methods. It provides the tools for detailed study of impacts of political decisions; tax policy changes can be also studied before introduced. There is a clear need to support governmental decision processes with this methodology, consequently there is a significant demand to make the methodology and related technology more available and user friendly. In Hungary, there is a need to develop a methodology, which reflects the changed international position of the country and the influence of globalization

Table 4

DATA OF MICROSIMULATION MODEL EXPERIMENTS

First scenario	Second scenario
10% ignorant	10% ignorants
12% more spending	12% more spending
25% starting a business	25% starting a business
53% changing portfolio to:	53% changing portfolio to:
• 75% real estate	• 75% real estate
• 10% valuables and insurance	• 7% insurance
	• 3% valuables
• 15% looking for higher revenue	• 15% looking for higher revenue

TAX SENSIBILITY THRESHOLD	
Capital income tax	% of changes
5	29
10	59
15	84
20	91
25	100

on the political decisions. EUROMOD and other EU-conform decision support tools can contribute to a better decision making. A series of our future efforts will aim to improve the quality of statistical data (starting with the data collection phase) and the technical support of data analysis and model validation. We believe that further methodological and technological improvements can eliminate the basic disadvantages of the currently used static microsimulation models. We will concentrate our future efforts on the development of dynamic microsimulation models for tax policy related decision making in Hungary.

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PPP regulation is lacking

Public Private Partnership, or PPP for short, and the necessity, possibilities, and the content of its application has been a popular subject in public economy discourse recently. This characteristically third way method (the concept was suggested by *Anthony Giddens* in his book (The Third Way) is considered by some as the miracle tool while others think of it as the incarnation of irresponsibility relaxing fiscal regulations, and bringing long-term misery.

European experience has favourable and unfavourable examples alike, although one should note that PPP arrangements presently underway have only reached implementation phase at best, and one cannot predict the outcome of the decade-long projects. Some have good experience, and diversify their PPP portfolio, while in other cases modifications or lowering of profile results.

The rate of domestic interest is explained by the supposed or actual circumstances of PPP arrangements to date (cf. the adventurous history of the M5 motorway), i.e. the contradictions between the urge to launch development projects fuelled by high-flying political ambitions, and the present state of the central budget. Interest is reflected by an increasing number of papers published on the subject including the writings of former Minister of Finance *Mihály Varga* in *Pénzügyi Szemle* (Public Finance Quarterly) in 2005 and *Gusztáv Báger*, Director General of the Institute of Development and Methodology at the State Audit Office, in 2006. The former investigated the issue from the point of view of social and economy utility, the latter from the point of view of transparency, accountability, and controllability.

In my present contribution I would like to deal with two issues touched upon in both papers but not elaborated in detail: the legal framework of the Hungarian 'nameless' arrangement (translator's note: the author refers to the fact that PPP has no Hungarian translation yet), and the necessity of creating domestic legislative standards.

The essence of Public Private Partnership funding arrangements first seen in Anglo-Saxon countries is that capital intensive investments of the public sector are realised by involving the private sector. The extent, the method, and the consequences of such cooperation are essentially associated – at least to my best judgement – to the level of development and strength of a given society and its economy, stability in political and common law terms of the country in question, and the role that the government of that country attributes to the state in both theory and practice.

Motorway construction projects in certain southern European EU countries are implemented in a PPP arrangement in which one third of the funding comes from the state budget, one third is granted by the EU (they sat it out), and one third private investment. The last third – i.e. one third of the full expenditure – is supposed to be recouped from toll revenues, and in some cases revenues from related services that constitute the actual risk for the investor. In Hungary the full return on the investment – blown up significantly by the banking costs of private investment funded from loans – is guaranteed by commitment cost paid from the central budget, involving no real exposure.

In the light of the above: we need national legislation, too, which takes account of the limits of financial load that the central budget can cope with, and also of EU legislation as far as public finance requirements are concerned, but one which is based on Hungarian features in regulating the possibilities, and limitations of PPP projects, their preparation, launching, implementation, and audit.

Independent, dedicated regulation has been so far presumably delayed by the fact that Hungarian law, even today, does not actually prohibit the application of that method. Act XXXVIII of 1992 on the State budget, and Act LXV of 1990 on Local governments enable various entities under the public finance system to become participants of such arrangements. Independent regulation on concession, and standards applicable to financial leasing sometimes enable distinction between the two, however, these cases are unpredictable, relative, and jeopardise both enforcement, and judicial practice by allowing uncertainty.

That is why creating national regulation is a truly urgent task.

This is the reason why in debates on PPP in recent years some ministries placed the creation of independent regulation on their agenda and made even promises to that end. However, none of these have so far been delivered. Guessing possible reasons for that delay would be largely based on imagination, would exceed the dimensions available for my contribution, and encroach upon the reader's perseverance.

I will therefore suggest arguments for independent legal regulation.

The World Bank's summary states that in 9 out of the 11 countries where PPP is being applied there is either established, properly formulated legislation or a draft is under preparation. Out of the six new EU countries that apply PPP to any extent in some way national regulatory work has been undertaken or is currently underway in four. (The summary report classifies Hungary as 'work commenced'). Among candidate countries Bulgaria and Romania apply the arrangement in question, and have begun relevant legislative work. It is to be noted that Turkey, member of the same group, does have dedicated national level regulation, but does not use PPP.

When preparing PPP legislation, the following must be borne in mind based on international and national experience, in addition to the usual regulatory objectives:

- Social needs assessment and accurate economy computations to serve as a basis for the preparatory work to applying the arrangement
- Medium-term and long-term implications of the arrangement
- Social and economy limitations of its application (how much of the services now in public competence are planned to be handed over and in what manner, limitation of the financial load and earmarking on all times' state budget, the effect it has on the costs of implementation and operation, etc.)

It might seem obvious, but I recommend integrating the 2.5 thousand year-old category of exposure in the regulation, and taking it into account all along with special regard to the fact that unburdening the state budget, and the viability of PPP require a real private partner, and a real private partner requires taking actual risk.

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