

Szent István University
Gödöllő

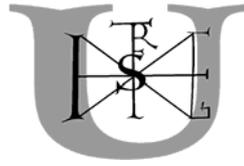
Management and Business Administration Ph.D. School

**The main relations of the macro-economical regulatory system
influencing the innovation activities of the Hungarian small and
medium-sized enterprises with the focus on taxation**

Ph.D. Thesis

KLÁRA HUSTINÉ BÉRES

GÖDÖLLŐ
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Ph.D. School

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1. ANTECEDENTS AND THE GOALS OF THE RESEARCH

1.1. Antecedents and the relevancy of the topic

After the political and economic transition the number, the importance and the role of the national economy of small and medium-sized enterprises (SMEs) have significantly increased. Based on the data of the Hungarian Central Statistical Office (KSH) as of 2010 the SMEs provided employment for more than 70% of the employees in the competitive sector, almost half of the added value of the national economy derived from them as well as one third of the export. They still are an important source for creating employment opportunities and business developments. The performances of the SMEs have a strong influence on the output of the whole economy and its competitiveness. These enterprises are the most sensitive to the changes of business environment and to the increase of the administrative burdens and they give the fastest reactions to the favourable potential opportunities as well. They are an important driving factor of innovation and employment.

The European Council held a meeting in 2000 in Lisbon where they launched the “Lisbon Strategy”. The goal of the Strategy is to make the European Union ‘the most dynamic and competitive knowledge-based economy in the world’. The competitiveness of the Union highly depends on the smaller enterprises for their economic importance. They make up a significant portion of all the enterprises of the member countries and provide a remarkable portion of the employment opportunities as well.

Key to development: knowledge and innovation. According to the classical statement innovation is the engine of economic development and growth. However, in order to make a better use of all the possibilities given by innovation a more innovation-friendly business environment needs to be created within the single market. This is such a challenge that requires each member state to make steps forward the common goal. Currently the conditions and skills of each state are very different for a general regulation to be able to function.

The practical entrepreneurial experience and theoretical knowledge I have gained during my life confirmed me that innovation has a key role in promoting competitiveness, as well as the efficient operation of the production factors in today’s society. Innovation is mainly an entrepreneurial task. Innovative companies are ahead of those that are not spending money on innovation even in such an economy struggling with crisis. There is a great number of companies who use the crisis as an excuse to gather innovation strength in order to be able to make a big jump once the crisis is over. For this reason it is of high importance that the government keeps on using motivational tools to increase innovation activities at the micro level. I am **confident** to say that **Hungary** has to find **its own tasks** in this complex that serve national interests as well as the interests of the European Union.

Making provisions in the interest of SMEs are in the scope of the national authority. One of the main areas of these provisions is **enterprise tax revenue**.

The Hungarian **taxation** system has been changed many times in the past twenty years. The classical system of taxation was born when the tax reform of 1987/88 was introduced. There have been many continuous changes in the taxation system that reflected the actual economical and social aims. These changes included the introduction of new tax types as well as the cancellation and modification of the existing ones. These changes significantly influenced some areas of the enterprises’ operations.

1.2. Goals and hypotheses of the research

1.2.1. Goals

Based on my scientific intentions the **main purpose** of the study is to reveal correlations through statistical analyses that clearly show how tax allowances fulfilled the intentions of the government to create a more favourable business environment to joint businesses that stimulate innovation. In order to reach this goal I have set **sub-goals** that are connected to each other. Setting sub-aims was not an easy job since in this area everything is connected to everything.

During my research I set my **sub-goals** based on the following:

- Outlook of the related Hungarian and international professional literature and its critical assessment with special attention to **three areas**:
 - understanding the concept of innovation and its development in the light of the professional sources;
 - understanding the criteria of small and medium-sized enterprises in Hungary and abroad;
 - analysis of the influencing factors of government tools (mainly taxation) on the innovation activities of enterprises.
- Linked to the above: the introduction of the effect of administrative **regulatory environment** on the enterprises based on national and international sources.
- Analysis of the Hungarian SMEs based on a big primary data file and the comparison of the results with that of the professional literature.
- Gathering and systematizing the elements of the Corporate Tax Law that stimulate the innovation activities of enterprises and could help the financing of the enterprises' research, development and innovation (R+D+I) activities with the improvement and increase of possible resources.

In the Hungarian professional literature the analyses of the R+D+I activities of the SMEs are based on the secondary data files of the Tax and Financial Control Administration (NAV, previously APEH). The aim of my research study is to analyse the R+D+I activities of the Hungarian SMEs with special focus on the medium-sized enterprises. The analysis is based on the primary data file of tax allowances related to the enterprises' innovation activities.
- Complex econometrical analysis based on the available primary data file. My aim is to convert and systematize the data file and create new derived data.
- For the analysis of the systematized data file the proper **statistical methods** are to be chosen.
- **Relation** analysis between the defining characteristics of the enterprises (foreign ownership ratio, business activity, regional location, and form of the enterprise) and the utilization of tax allowances related to innovation.
- Analysis of the effects of the defining characteristics of the enterprises (foreign ownership ratio, business activity, regional location, form of the enterprise –as **independent variables**) on the earnings before taxes, on the tax base, on the tax, on the tax allowances related to innovation as well as on some financial indicators of the enterprises (as **dependent variables**).
- Through **cluster analysis** the medium-sized enterprises are grouped based on their basic characteristics and each group is analysed.

- As a result of all these:
 - **On one side:** the conclusions give an answer to the basic question of how the innovation activities of the analysed enterprises are influenced by the certain elements of state regulation,
 - **On the other side:** the conclusions give a basis to making suggestions that could further develop state regulation (with special focus on taxation) in the light of the fact that the innovation activity of SMEs is an influencing factor in the development of the national economy.

My **aim and study does not cover** the analysis of the whole regulatory environment of the SMEs including the positive supporting system of enterprises, the different financing methods, the entrepreneurial knowledge, the relationship system of human resources, and the characteristics of entrepreneurial infrastructure.

1.2.2. Hypotheses

As one of the elements of the regulatory environment the taxation practice could be a proper tool for the stimulation of the **R+D+I** innovation activities. Based on this belief I have concluded the following five hypotheses (H1-H5).

H1: The Hungarian regulation of the tax revenue of corporate enterprises doesn't seem to stimulate the innovation activities of the small and medium-sized enterprises.

H2: The Hungarian regulation of the tax revenue of corporate enterprises doesn't give any competitive edge to the SME-s.

H3: The regional location, business activity, form of operation and ownership structure of the Hungarian SMEs (mainly the medium-sized enterprises) have an influence on the innovation activities of the enterprises.

H4: Innovation related tax allowances are mainly utilized by enterprises with foreign ownership.

H5: The decrease of the corporate tax rate, the simplification of the framework system of tax allowances, the correcting elements and the decrease of allowances could help decrease the tax burdens of the enterprises without decreasing the tax revenues of the state budget.

It took a strict and focused study method to fulfil all the aims and verify the above stated hypotheses. The below shown **process model** was created in order to help me fulfil these goals as well as to give a structure and backbone to my thesis. (Figure 1)

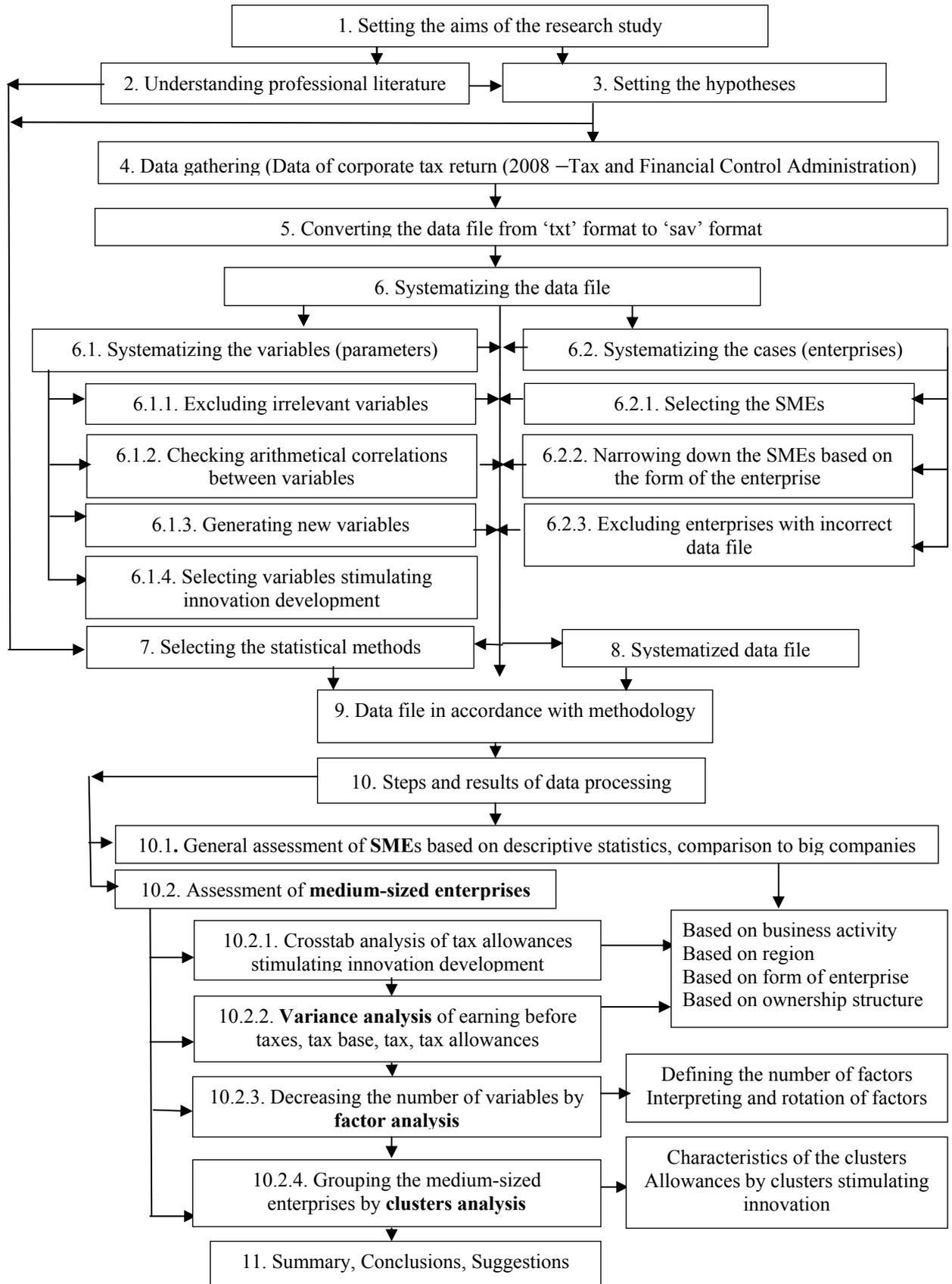


Figure 1: Process model reflecting the structure of the research study

2. MATERIALS AND METHODOLOGY

2.1. Professional literature

Since my research deals with a complex topic, understanding and evaluating the background of each sub-areas of the **professional literature** were of high importance. My main focuses were the following:

- characteristics of the small and medium sized enterprises, their role in the economy, the parameters of business environment influencing their operation,
- the importance and role of innovation in the forming of competitiveness of small and medium-sized enterprises,
- the influencing factors of the tools of government – mainly taxation – on the operation and innovation activities of the small and medium-sized enterprises.

Both national and international sources were used forming the scientific base of my research study and giving guidance to my independent research.

2.2. The data file

Based on my professional knowledge and the results of the overview of professional literature in line with my original aims I worked with the data file of the corporate tax of 2008 provided by APEH. By scanning, systematizing, grouping and filtering this data file I analysed the Hungarian SME sector including the innovation activities of its enterprises. The data file was processed in the SPSS (Statistical Package for Social Sciences) program. The data file in 'txt' format provided by APEH consisted of 601 different variables marked with codes for 348 623 companies. In order to have the data file ready for further analysis, the following steps had to be made:

- Converting the data file from 'txt' to 'sav' format in line with the SPSS program.
- **Systematizing** the data file:
 - Excluding the irrelevant variables,
 - Checking arithmetical correlations between variables,
 - Selecting variables related to innovation activities,
 - Generating new variables,
 - Transformation of the measurement scale of each variable (from gold scale to ordinal scale).

2.3. Selection of the applicable statistical methods

One of the main goals of my research was to analyse how the basic characteristics (regional location, form of enterprise, business activity and ownership structure) of the enterprises affect their taxation parameters and innovation activities. In order to reach this goal the following methodology was used:

- **Crosstab analysis**

I used this methodology to find those variables in the data file that have any dependency between each other. My data file had both categorical and categorized metric variables.

- **Variance analysis**

This methodology was applied to analyse how the basic characteristics (independent variables) of the enterprises affect the earnings before taxes, the tax base, the tax allowances related to innovation and some financial indicators of the enterprises (dependent variables).

- **Factor analysis**

This methodology was used to decrease the number of variables. As a result of the analysis, new variables (factors) were created for further, more complex analyses.

- **Cluster analysis**

Among the non hierarchical methods I used the **K-means** algorithm. This methodology was applied to group the medium-sized enterprises.

2.4. Analysis of the applicability of the systematized data file in line with the selected statistical methodology

- I applied the **crosstab** methodology to measure the statistical significance of dependency between the variables using the **Pearson chi-squared test**. **Cramer's V** was used for measuring the strength of correlation between the variables.
- Before applying the methodology of variance analysis, I used the test of normality (**Kolmogorov-Smirnov test**). I used the **Levene test** to check if the variances of the dependent variables are the same at the different levels of the independent variables. Since the number of the analysed data was high I used the **ANOVA test** (F test) for my analysis. I used **Post-hoc test** to reveal the significant differences between the averages. (In case the variances of the analysed variables were homogeneous **Scheffé's test** was used, if they were not, then **Tamhane's test** was used.)
- I applied the methodology of the R-type factor analysis to contract the number of variables. As part of the descriptive statistical analysis for **single variables** of the cases (enterprises) I filtered out the outliers by a boxplot. During the application of this methodology, I used the data of 4,408 **medium-sized enterprises**. After these numerous steps decreasing the number of variables, I got **7 variables** in my database. I used a **correlational matrix** to check if the expected multicollinearity exists between the variables. In order to further test the applicability of the data file I used an anti-image matrix, the Bartlett test and the KMO calculation. Since the variables were known and the single variance and the error variance were only a small percentage of the total variance, the aim was to get the highest explained variance with the least number of factors for which I used the **principal component analysis**.
- The **clusters were defined** by a non-hierarchical method by changing the number of clusters. I selected this non-hierarchical method (K-means) because of the following reasons:
 - The number of sampling units were high (4,408 medium-sized enterprises),
 - The results of this method are less dependent on outliers or irrelevant variables.

3. RESULTS

3.1. Results of the analyses

In this research study I intended to show how the innovation activities of the small and medium-sized enterprises are affected by the elements of the Hungarian regulatory system with a focus on the rules of taxation and its effects. Since the topic was very complex I divided the summary of my study into **three sub-topics**.

These are:

- a) Understanding and assessing the related **professional literature**, understanding the different concepts, and making some comments related to these;
- b) Questions to prepare the processing and using of the **data file**;
- c) **Results and conclusions** reached by using the appropriate mathematical-statistical methods.

I have reached the following conclusions by the application of the selected **four examination methods**:

- **The correlation between the different tax allowances and the characteristics of the medium-sized enterprises:**
 - There is a **weak correlation** between the utilization of tax allowances related to innovation and the quota of **foreign** ownership and the **regional** location of the companies.
 - There is **no significant correlation** between the **business activities** of the enterprises and the utilization of tax allowances related to innovation.
 - There is a **weak correlation** between the **form of the enterprise** and the utilization of tax allowances. (Based on those six tax allowance types out of the fourteen that show any correlation to the form of the enterprise.)
- The changes in the earnings before taxes, in the tax base, and in the tax burden of the **different groups** of the medium-sized enterprises:
 - The amount of the **earnings before taxes** is affected in a different way by the form of the enterprises, by the business activities, by the regional location and by the quota of foreign ownership.
 - The highest amount of earnings before taxes was reached by the shareholder groups, the companies operating in Central Hungary, companies with a foreign ownership quota of more than 75% and those operating in the information or communication sectors.
 - Enterprises with no legal entities had more correcting elements increasing the tax burdens than that of decreasing that resulted in a higher tax burden. The administrative burdens of the enterprises were increased by all the work related to the calculations of the correcting elements of the earnings before taxes.
 - Analysing the correcting elements by business activities of the companies, there was no significant difference between the average of the increasing and decreasing factors – except for the other services sector.
 - Companies operating in the Central Hungary region had the highest difference between the earnings before taxes and the tax base of the companies.
 - Companies with a foreign ownership quota of more than 75% had a 130% difference between the earnings before taxes and the tax base. The negative correcting elements were dominant in this group as a result of which the average tax base became negative. The correcting elements gave advantages mainly to companies with a significant foreign ownership.

- **Tax paid:** The highest average tax was paid by the shareholder groups, by companies operating in Central Hungary, by companies with a foreign ownership quota of more than 75% and by those with a business focus on other services.

Table 1: The amount of the average tax paid depending on the quota of foreign ownership

Foreign ownership	N	Average tax paid (in thousand HUF)
0 %	1,950	8,761
0.1-25%	2,152	15,311
25.1-50%	301	15,319
50.1-75%	52	17,667
75.1-100%	25	136,519

Source: Own calculation based on the data file provided by APEH

- The higher the quota of foreign ownership was the higher the **average tax** of a certain group was. There was a discrepancy between the fact that the companies with a foreign ownership quota of more than 75% had a negative tax base and that this group paid the highest amount of average tax. The explanation to this is that this group had to pay taxes based on the expected tax base (minimum revenue). If there hadn't been any correcting elements and the company had had to pay taxes based on the earning before taxes, the expected tax would have doubled the burdens of this group. Enterprises belonging to this group are the obvious beneficiaries of the correcting elements. (Table 1)
- The result of the calculation of tax burden showed that if the tax base of the companies had been the earning before taxes (without any correcting elements) and if they hadn't been able to utilize tax allowances, these companies would have had to pay an average tax of 14% of their revenues.
- With a tax rate of 16% and 10% of 2008 and with no corrective elements and tax allowances, the medium-sized enterprises would have paid 223,932 million HUD tax, an average of 49,8 million HUF per company. As compared to this due to the correcting elements 75% less, namely 57,32 million HUF came in to the state budget. An average of 12.7 million HUF had to be paid as tax per enterprise in 2008. **The joint businesses saved a significant amount of tax money, but had to spend heavily on administrative burdens.** Earnings before taxes had to be corrected by the decreasing and increasing elements. In order to be able to do this one had to know the complex framework of the application of the correcting elements. If tax allowances were utilized a company had to fulfil the required conditions for several years. **The state budget lost significant tax revenue, while had to pay a huge amount of administrative and financing costs.** It is difficult to verify the validity of tax allowances; the process would require a bigger team of more prepared professionals.
- Taking the earning before taxes as a basis with a tax rate of 10%, 5% and 4% I have defined the amount of tax payable. With a tax rate of 10% set to all companies the revenue of the state budget would significantly increase. The enterprises would of course need to pay higher taxes, but their administrative tasks would be simplified. If the state budget would aim to get the same amount of tax revenue as it did in 2008 with the correcting elements and tax allowances, then they would need to **set a tax rate of 4%** to every company. In this case the fiscal side wouldn't get hurt, while the administrative burdens would be significantly reduced making the lives of both the taxpayers and the tax authorities easier. (Table 2)

Table 2: Amount of tax revenue calculated based on different tax rates and tax bases (in thousand HUF)

Title	N	Total tax payable	Tax payable per enterprise
Tax calculated based on revenues before taxes (tax rate of 10-16%)	4,491	223,932,026	49,862
Tax calculated based on tax base including allowances (tax rate of 10-16%)	4,491	57,320,798	12,764
Tax calculated based on revenues before taxes (tax rate of 10%)	4,491	140,883,671	31,370
Tax calculated based on revenues before taxes (tax rate of 5%)	4,491	70,441,835	15,685
Tax calculated based on revenues before taxes (tax rate of 4%)	4,491	56,353,468	12,548

Source: Own calculation based on the data file provided by APEH

- I have calculated the **actual** average tax burden as the quotient of the tax paid and tax base, as well as that of the tax paid and earnings before taxes. The ratio of tax payable as compared to the earnings before taxes (actual tax burden) was 2.82% (it was 8.1 million HUF per enterprise) for those medium-sized enterprises where earnings before taxation was higher than the minimum revenue. Tax burden was 14% for those medium-sized enterprises who pay taxes based on the minimum revenue (this was 34,6 million HUF per enterprise). This group had high revenue as well as significant costs and expenditures in the examined year resulting in low earnings before taxes. Taxation based on the minimum revenue is definitely disadvantageous for companies with higher costs.
- I compared the **values of the effective and nominal tax rates**. The **nominal tax rate** is the quotient of the calculated tax based on the tax base and the earnings before taxes. The **effective tax rate** is the quotient of the tax payable and the earnings before taxes. There is a very slight difference between the two tax rates indicating a low level of tax allowances utilized. Tax allowance is a way of reducing taxes only in theory. Most companies don't take advantage of them in practice. The average values of the two tax rates are equal in case of smaller companies (i.e. with no legal entities). Enterprises with a foreign ownership quota have the highest difference between the two rates (the difference between the two rates is 0.36% in case of companies with a foreign ownership quota of more than 75% while it is only 0.11% for companies with no foreign ownership.)
- **Regional** analysis of the tax rates shows that the effective tax rate is the lowest (2.34%) in Central Hungary, while it ranks as the second lowest in Western Transdanubia (2.47%) and as the third lowest in North-Hungary (2.5%) and in the North-Eastern part of Hungary (2.51%). The average effective tax rate is the highest in South Transdanubia (2.57%). In North-Hungary the nominal tax rate is fairly high (2.61%).
- The **effective average tax rate is the lowest** (2.28%) for enterprises with a foreign ownership quota of 0.1-0.25%, while it is the **highest** (3.34%) for enterprises with a foreign ownership quota of more than 75%. This group tends to take advantage of tax allowances the most since the difference between their two tax rates are almost nine times as much as that of the enterprises with Hungarian ownership only. (In case of enterprises with a national ownership of 100% the difference between the effective and nominal tax rates are 0.04% while it is 0.36 in case of enterprises with a foreign ownership quota of more than 75%.) Enterprises with Hungarian ownership only didn't tend to take advantage of tax allowances. 47% of the enterprises with a foreign ownership quota of more than

75% didn't pay taxes, while 24% of them paid a tax rate of 6-10%. The effective tax burden was **lower** for companies with a **foreign** ownership than for national companies. These data confirm that companies with no foreign ownership didn't want to or couldn't take advantage of the tax allowances. This could be explained by a couple of reasons including the complexity of the tax regulation system, the lack of highly skilled professionals and the conditions to utilize the tax allowances.

- **By summarizing the results of the analysis on tax allowances related to innovation** we can say that in 2008 the highest tax allowances were utilized by public companies operating in Central Hungary in the other services, information or communication sectors with a foreign ownership quota of more than 75%. As a comparison to this, the lowest tax allowances were utilized by companies with no legal entities, with a foreign ownership quota of 20-25% operating in North-Hungary in the hospitality sector.

- **Factors for packed variables**

I could pack the main factors of the enterprises into **three factors**. These consist of the **tax factor**, **liability-earnings factor** and the **capital factor** (Table 3). By creating the factors, 14.5% of the information content of the original variables was lost since the value of the cumulated variance was 86.5%.

Table 3: The rotated component matrix

Variables	Factors		
	Tax factor	Liability- and earnings factor	Capital factor
Tax base	.971	.112	9,375E-02
Earnings before taxes	.965	.141	.137
Total liabilities	9,903E-02	.890	3,515E-02
Balance sheet profit	.119	.873	.199
Capital with foreign ownership	-3,924E-02	-7,223E-02	.873
Issued capital	.313	.432	.753
Owners' equity	.337	.513	.710

Comment: Applied methodology: Principal component analysis, varimax rotation in 4 steps.

Source: Own calculation based on the data file provided by APEH

- **Main characteristics of the clusters of the medium-sized enterprises**

Based on the factor analysis resulting in three factors the enterprises were grouped into **five clusters**. Among the five clusters, the second one includes the majority of the enterprises (3,919 enterprises) that is 88.9% of the total number of enterprises. The minority of the enterprises belongs to the first cluster, namely 13 enterprises can be found here. I compared each cluster and their enterprises based on their main economical indicators (Table 4).

Table 4: Characteristics of the clusters (average value in thousand HUF)

Title	1th cluster	2nd cluster	3rd cluster	4th cluster	5th cluster
Earnings before taxes	915,497	178,660	2,698,670	420,492	684,280
Average earnings before taxes: 520,758					
Tax base	1,010,671	159,409	2,726,037	274,468	633,176
Average tax base: 537,601					
Total liabilities	338,096	48,062	188,789	134,238	1,202,621
Average total liabilities: 293,168					
Balance sheet profit	907,012	89,077	274,952	293,897	1,726,368
Average balance sheet profit: 409 823					
Capital with foreign ownership	70	2	4	20	3
Average capital with foreign ownership: 12%					
Issued capital	10,711,167	914,926	3,575,394	5,734,365	4,687,375
Average issued capital: 1 863 342					
Owner's equity	15,999,019	1,298,272	5,267,268	7,480,396	7,771,030
Average owner's equity capital: 2,710,778					

Source: Own calculation based on the data file provided by APEH

1st cluster: Enterprises with a solid capital and a significant quota of foreign ownership. The utilization of innovation related tax allowances is significant. Tax allowance per enterprise is 864 million HUF.

2nd cluster: 89% of the enterprises belong here. These are Hungarian owned enterprises with average parameters (earnings before taxes, tax base etc.). The utilization of tax allowances is not significant, for more than half of the group it is below 30 million HUF.

3rd cluster: Hungarian owned enterprises with a solid capital. Tax allowance per enterprise is significant, it is 362 million HUF.

4th cluster: Enterprises with a solid capital, smaller income and high quota of foreign ownership. Tax allowance per person is 278 million HUF.

5th cluster: Hungarian indebted enterprises. Innovation related tax allowance is significant; it is 399 million HUF per enterprise.

(Table 5)

Table 5: Total amount of tax allowances related to innovation by clusters (in thousand HUF)

Cluster	N	%	Maximum	Total	Average	Variance
1 st cluster	13	0,29	3,531,932	11,235,777	864,291	1,162,497
2 nd cluster	3,919	88,91	3,312,885	243,302,035	62,083	118,843
3 rd cluster	115	2,61	3,038,878	41,710,761	362,702	537,074
4 th cluster	217	4,92	5,257,855	60,504,597	278,823	596,555
5 th cluster	144	3,27	4,326,922	57,401,990	398,625	479,132
Total	4,408	100	5,257,855	414,155,160	93,955	240,507

Source: Own calculation based on the data file provided by APEH

Grouping the enterprises by clusters gives an opportunity to further develop the regulatory system.

In line with my hypotheses I laid down the following statements:

H1: My results verified with that the national regulation of tax revenue of joint businesses doesn't stimulate the innovation activities of small and medium-sized enterprises. These enterprises utilized only a small amount of tax allowances related to innovation provided by tax regulation. Therefore there is no obvious correlation between the innovation performance of SMEs and tax regulations and allowances. This **verified my first hypothesis**.

H2: I verified that the national regulation of tax revenue of joint businesses gives a competitive edge to the bigger companies. Mainly these companies took advantage of the tax base correcting elements and the effective tax rate was the smallest for this group. Based on this statement my **second hypothesis got verified**.

H3: My analyses verified that there is a weak correlation between the innovation activities (as dependent variables) of medium-sized enterprises and the regional location, business activity, form of the enterprises and ownership structure (as independent variables). Considering the weak correlation, my **third hypothesis got partly verified**.

H4: My analyses proved that tax allowances related to innovation activities are mainly utilized by the medium –sized enterprises with a foreign ownership. (I have to add that this correlation between the utilization of tax allowances and the size of the foreign ownership quota is not directly proportional. The correlation between the allowances and foreign ownership shows direct proportion only in those cases when the ownership is between 0.1%-50%.) Based on this statement my **fourth hypothesis got verified**.

H5: My analyses verified that by decreasing the corporate tax rate, simplification the framework of tax allowances, decreasing the correcting elements and tax allowances the state budget wouldn't decrease, but could even be increased. Based on my calculations, taking the result data of the medium sized enterprises as of 2008, by drastically decreasing the applied tax rates of 16% and 10% to 4% and with no correcting elements and tax allowances the state budget's revenue would have been almost the same. This statement **verified my fifth hypotheses**.

3.2. New scientific results

1. With the application of the modern mathematical statistical methods I scientifically verified that there is **no** significant correlation between the business activities of the medium –sized enterprises and the utilization of tax allowances. However there is a **weak** correlation between the utilization of innovation related tax allowances and the quota of foreign ownership and the regional location of the enterprises.

2. Taking the earnings before taxes as a basis and calculating with simplified administrative burdens, **the revenue of the state budget** would:

- Significantly increase with the application of a tax rate of 10% instead of 16% as it was in 2008,
- Not change with the application of correcting elements and without tax allowances with a tax rate of 4% assuming taxpayers behave in accordance with legislation.

3. The results of my research showed that in tax year 2008:

- The medium-sized enterprises of shareholder groups with a foreign ownership quota of 0.1%-1.25% had to pay **the smallest effective tax burden** (tax payable/earnings before taxes) in Central-Hungary,
- The average amount of innovation related tax allowances was the highest among public companies operating in Central Hungary with a business focus on other services, information or communication activities and with a foreign ownership quota of more than 75%.

4. I divided the basic characteristics of the medium-sized enterprises into **three factors** (the **tax factor**, **liability and earnings factor** and the **capital factor**) based on factor analysis.

Applying the method of cluster analysis, based on these three factors the enterprises could further be divided into **five sub-clusters**.

1st cluster (0.29%): Enterprises with a strong capital and a significant quota of foreign ownership. Innovation related tax allowance is high.

2nd cluster (88.91%): These enterprises' parameters are below average and they are Hungarian owned. Innovation related tax allowance is below average.

3rd cluster (2.61%): Hungarian owned enterprises with a solid capital. Innovation related tax allowance is above average.

4th cluster (4.92%): Enterprises with a solid capital, smaller income and a high quota of foreign ownership. Innovation related tax allowance is above average.

5th cluster (3.27%): Hungarian indebted enterprises. Innovation related tax allowance is above average.

Among each factor the economical factors behind three factors significantly differ.

4. CONCLUSIONS, SUGGESTIONS

Based on the results of the research study my most important conclusions and suggestions are the following:

- **I agree** that the tools of state regulation can influence the innovation activity of the SMEs, particularly by taxation. However, the complex tax reduction system of R+D+I applied in the Hungarian economy needs to be revised. New principles would need to be adopted, correspondence between each component should be ensured. The system of conditions would need to be simplified and tailored to the characteristics of the SMEs. The components of successfully applied regulations in some OECD countries could be used when revising the system. Some of the tax reducing elements of the tax system of 2008 has been taken out of the new corporate tax system of 2012 and the government didn't substitute them with new elements. The most significant positive changes could be reached through tax allowances to start-up innovative companies. The concept would need some clarification in order to see who the target companies are and what kind of conditions apply.
- A simpler and a more transparent regulatory framework would be of great use as well as the further reductions of administrative burdens and the reformation of the regulatory system in order to be transparent.
- The revision and modification of the **motivating** factors considering corporate needs would be necessary. When defining allowances, the differences between activities would need to be considered as well. The criteria of tax allowances in the area of the key sectors of macro economy in the aspect of promoting innovation would need to be eased.
- When defining tax **allowances** the differences between regions need to be considered, especially the improvement of opportunities of regions with a high unemployment rate would need to be treated with high priority. The current regulation contains such components, however the result of my research shows that the motivation factors of these components are far from being effective. The Central Hungary region is in a more favourable situation compared to the rest of the country.
- One of the obstacles the enterprises have to face when trying to have resort to **R+D tax allowances** is the uncertainty around the classification and qualification of R+D activities (there has been some positive changes in this area since 2012 though). In order to properly classify enterprises, we would need to consider if the practice of classifying an enterprise autonomous, a partnership or a joint venture is right or not. Despite of its good intention, this practice is rather confusing than helpful.
- The nature of business activity would need to be considered in the category elements of **SMEs** (the total revenue, balance sheet total).
- The complex framework of tax allowances significantly increases the administration costs of the enterprises. It negatively affects a group of enterprises that are smaller in size thus can't afford to pay for the related services offered by the more expensive audit companies.
- The **form** and filling system of the tax return of 2008 was complicated. (The form consisted of 21 pages. Besides the identification factors of the enterprises the form consisted of 337 lines. The tax return guide consisted of 98 pages. As a contrast to that the tax return guide of 2011 consisted of 105 pages while the form still consisted of 337 lines. These data goes to show that the form hasn't been simplified; though it would have been necessary.) In case of smaller enterprises a simplified version of the tax return form would be highly verified.

- A number of **errors** occur due to incorrect filing of the tax returns causing problems when processing the data file. The electronic filing system would need some elements that could filter out or at least indicate most of these errors.
- Without any doubt the tax system of 2008 was dominated by the decreasing effect of the **correcting elements**. The sector of joint venture companies saved a significant amount of tax at the expense of high administrative costs. Earnings before taxes had to be corrected by the decreasing and increasing elements. In order to be able to do this a company had to know the complex framework of the application of the correcting elements. If tax allowances were utilized a company had to fulfil the required conditions for several years. The state budget lost significant tax revenue, whilst had to pay a huge amount of administrative and financing costs. It is difficult to verify the validity of tax allowances, the process would require a bigger team of more prepared professionals. These correcting elements provide advantages mainly to enterprises with a significant foreign ownership ratio. This group is the obvious beneficiary of the correcting elements.
- With the tax reform of 1988 the tax regulation developed into the direction of uniting the corporate tax regulation of enterprises. The processes of the past decades made it clear that besides unification customized regulations are necessary as well as the creation of a regulatory framework that takes account of the characteristics of the SMEs. The related recommendations and regulations of the EU would need to be taken into consideration as well.
- The **reduction** of corporate tax rate as well as the correction elements would need to be considered.
- Taxation by the **expected revenue** (minimum revenue) is definitely disadvantageous for enterprises operating with higher costs. Based on the percentage effective tax burden the highest amounts of taxes were effectively paid by institutions without legal entities. (The public companies had the lowest effective tax burden). The tax burden basically hit those in lack of resources.
- **To utilize tax allowances** is probably the most important for the small enterprises in order to stay in business and increase their sources for development. The analysed regulatory system has failed to fulfil this task. The corporate tax regulation (rates, allowances, correction elements) did not create a competitive edge for the smaller enterprises.
- The **utilization of tax allowances** (those that can be deducted from the calculated tax) is not significant either. In theory they work well, however in practice most of the companies do not take advantage of these allowances. It is an interesting fact that the utilization of tax allowances was not significant in the key areas (professional scientific and technical activities) that could make a difference in a country's innovation activities. Enterprises operating in these areas belonged to the zone of higher tax rates.
- The effective tax burden is the **smallest** in Central Hungary, however decentralization would needed to be incentivised for a number of reasons.
- **Enterprises without foreign ownership** could nor or did not want to utilize tax allowances. This behaviour may be explained by the complexity of the framework, the lack of highly skilled tax professionals, the administrative burdens related to the allowances etc.

5. LIST OF RELATED PUBLICATIONS

Scientific book, book detail:

1. **Klára Béres (2008)**: Elements of the incentive to stimulate innovation. pp. 135-145.
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