Methodology for supporting decision-making in the local economy development

Doctoral (PhD) theses

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TABLE OF CONTENTS

1 BACKGROUND OF THE WORK, DESIGNATED OBJECTIVES

The national settlement development after the change of regime has been severely affected by a lack of resources. Although the significant political forces welcomed the notion of autonomy without exception (Hajdú 1996), unfortunately, the approach was also uniform to provide settlements the resources necessary for a real local government only restrictively, in fact, year by year more and more scarcely. Local governments that often struggle with financial problems, therefore, paid little attention to think strategically about settlement development. Consequently - based on my experience - the national municipal decision-making is characterized less by a long-term sustainable development but rather by some kind of drifting. This means that the specific actions were often shaped rather by the available resources than the real needs. The overriding reasons and poor management collectively lead to the indebtedness of the municipal sector, thus making the state assumption of debt stock necessary. Simultaneously to debt consolidation, the governmental need was once again formulated about settlements participating more actively in local economy development, therefore, debt assumption was done on condition of creating a local economy development program (LED), however, the settlements concerned did not receive professional point of references for creating these.

This requirement necessitated a new approach in the management of settlements. The starting point is that settlements are not only good or less good natural and economic resources but innovational and investment areas as well. In this approach, the issue of systematically developing the local economy is becoming especially more important - regardless of settlement size. Settlements can develop if they have a sufficient number of inhabitants with sufficient satisfaction levels. That is, as Ludescher G. (2010) defines it, successful settlements are constituted not only by a successful economy but by a successful community as well. The key to population retention is maintaining and developing the quality of life.

With my research I developed a toolset for local governments that can help – in a strategic approach - in systematically processing problems that have been piling up since the change of regime. I strongly believe that in the face of reduced opportunities, a huge part of settlements have a chance to improve the local economy, and thereby the quality of life by taking effective measures.

1.1 The objectives of this paper and hypotheses

The overall objective of my research (O_0) is to develop a methodology that supports the local government's efforts aimed at developing the economy with the set of instruments of evidence-based decision-making. As a first step, the objective is to define precisely the areas to be developed, and to identify the possible growth points. The foremost step of developing the strategy is thus assessment, because the prerequisite of successful planning is a sound knowledge of the local economic, social and environmental relations (Goda, Tóth 2013). Accordingly, my first direct objective (O_1) is to define the action space and action opportunities by examining the relation of environmental factors and internal resources. I want to assign an analytical tool to this objective that discovers - with an indicator system - the network of the internal factors of the settlement economy and the external environment affecting it. When considering the options of local economy development, it is a key aspect to assess the local economy in situ with interaction with its surroundings. This implies a more complete coverage of the active environmental factors and the simultaneous representation of the economy's internal dynamics.

The second objective (O_2) is to discover and show the connection between the available tools and the environmental factors, and thereby enabling decision-makers to orientate based on evidences when drawing up local economy development actions. The tool has to make a quantified relation between the possible actions and the environmental factors made available by the actions. It is essential to show, which actions affect which environmental factors, as well as to which factor can they help to adjust. I assume (H_1) that the economy development tools of local governments are not equal in their effectiveness when interacting with the different environmental factors.

My third objective (O_3) is to discover the relationship between the tools and the related internal resources, thereby ensuring an objective base for planning the resources necessary for implementing economy development actions. According to my preliminary assumption (H_2), the relations between the available resources and the local governmental tools are not of the same strength, therefore, the analysis of these during the planning is justified.

My next assumption, deduced from H_1 and H_2 (H_3) is that the areas affected by the same environmental factors of the local economy development can be developed to different extents with local governmental tools. However, I also assume (H_4) that development according to a predefined target system of the specific settlement can be achieved by a systematic application of appropriately selected tools, thus each and every area identified can be developed.

The factors of economy are related to each other; they constitute a living fabric. My objective (O_4) is to discover the hidden relations of the local economy. According to my assumption (H_5), knowing the system of relations allows the indirect influence of economic factors that are more difficult to shape. Hungarian settlements show differences in several characteristics. Being a fact experienced, that they present differences in their economic development and in their development potentials, I assume (H_6) that they can by grouped into types based on the characteristics of local economy.

A significant advantage of a well-developed system can be that the use of limited resources can be made effective with the economy development methodology that is based on the precise knowledge of facts, sets realistic targets, and builds on the use of direct and indirect tools.

Easing the definition of intervention points, as well as increasing the transparency of planning can make the measures, which do not produce a direct result but are important and more long-term, more attractive and easier defended by local politicians. With the use of the results, I would like to help resolve the dilemma between the results that can be quickly displayed and the long-term but perspective advantages, as well as provide factual arguments for supporting adequate economic policy decisions.

My objective (O_5) is for the methodology to provide structured and clear-cut information for creating the development centers of gravity and for planning the economy development actions as well by systematically implementing the suitably established and interconnected system elements.

In conclusion, my research objectives (O_{0-5}) and my hypotheses (H_{1-6}) were the following:

O_0: Establishing a methodology that builds on the tool system of evidence-based decision-making and supports local economy development.

O_1: Defining the action space and action opportunities.

O_2: Discovering the relation between the available tools and the environmental factors.

O_3: Discovering the relationship between the tools and the related resources.

O_4: Discovering the hidden relations of the local economy.

O_5: My objective is for the methodology to provide a structured and clear-cut information for creating the development centers of gravity and for planning the economy development actions as well by systematically implementing system elements.

H_1: I assume that the economy development tools of local governments are not equal in their effectiveness when interacting with the different environmental factors.

H_2: According to my assumption, the relations between the available resources and the local governmental tools are not of the same strength.

H_3: I assume that the different areas of local economy development can be influenced to a different extent with local governmental tools.

H4: I assume that every area identified can be developed.

H5: According to my assumption, knowing the system of relations allows the indirect influence of economic factors that are more difficult to shape.

H6: I assume that settlements can by grouped into types based on the characteristics of local economy.

2 MATERIAL AND METHOD

Several methodologies have been developed in the past decades to support the planning of local economy development. The complexity of the procedures established is different; there are those that provide help only for one or more steps of the planning, and those that aim to support the whole process. The different approaches vary widely also regarding their practical use: there are theoretical methodologies that reveal logical relations, and there are also methodologies that can be used with ease throughout a specific research. One part of the approaches used is too specific; they are limited to the specific settlement and they can be reused for different development programs only with difficulties, whereas other approaches offer tools that can be used widely. The objectivity of the methodologies is also diverse: there are a lot of approaches that use quantitative tools irregularly to support qualitative statements.

Built on my experience gained during years in the government sector, I established the so-called Regional ScoreCard System (RSC System), with which I set the ambitious objective of developing a methodological toolset that combines the advantages of well-known methods while eliminating the weaknesses as much as possible. To be specific, I defined the following requirement system regarding the methodology:

- It could be used across a broad range of settlements and regions
- It shall contain an objective analytical and decision-supporting system
- It shall be complex enough so that it shall cover every or at least most of the areas of settlement economy, while remaining transparent
- Each element shall connect to each other logically
- Compared to the complexity of the task, it shall be implemented with ease
- It shall take domestic conditions into consideration
- It shall lead to settlement-specific and practicable results
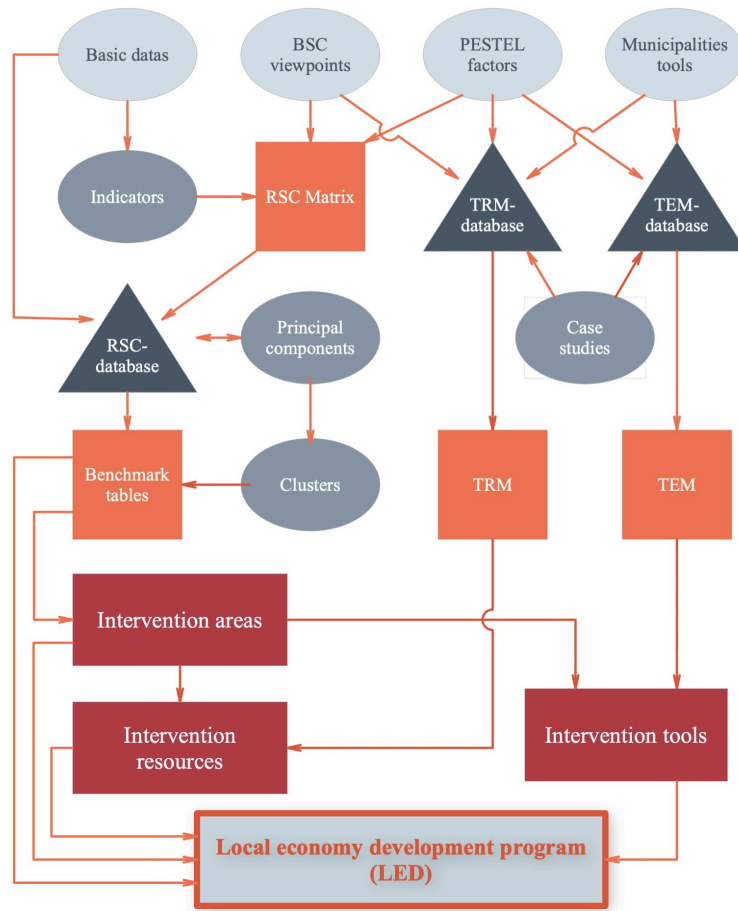
3 RESULTS

3.1 Building the Regional Scorecard (RSC)

In order to achieve the objectives, I used, remodeled, and linked several commonly used, well established tools to a stricter framework (PESTEL, Balanced Scorecard [BSC], indicator-creation, benchmarking, multi-variant analyses, etc.).

However, it was necessary to develop more custom analytical and decision supporting methods, partly to connect methodological elements quantitatively, partly to acquire supplementary information needed for the work, and partly to create the tight logical connection between the different work stages (governmental set of instruments, tool-effect matrix, resource matrix, effectiveness matrix, screening prioritization tools, etc.).

The logical relationship of the specific elements in the methodology developed is illustrated by 11. In the figure, the data requirements of different subsystems, the established databases and the different tool-developing analyses and their correlations are separated. With some simplification, but the tools and the method of their implementation can be seen at the creation of the local economy development program.

The three matrices that constitute the base of the system (the *RSC-, Resource-* and *Tool-Effect Matrix*) illustrate the relations between the three criteria (*BSC, PESTEL, Governmental tools*) in different combinations. The Tool Resource matrix (TRM) and the Tool-Effect Matrix (TEM) are

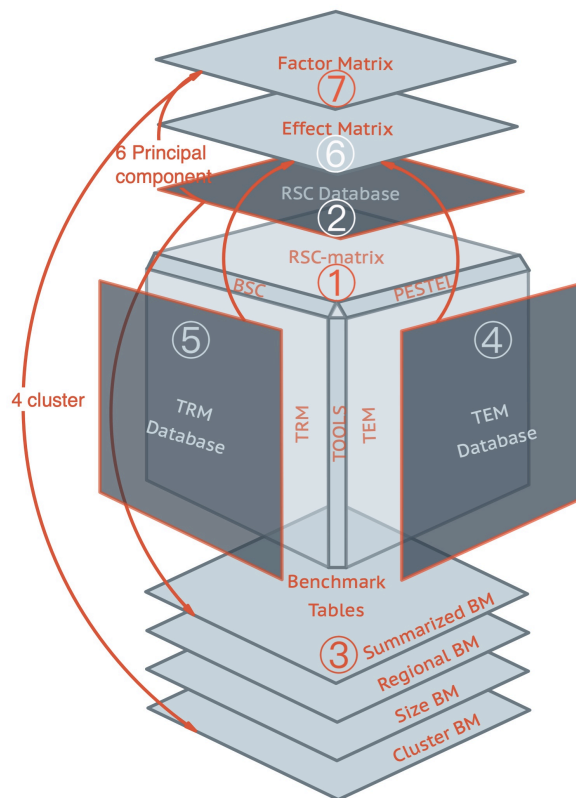

11: Elements of the Regional ScoreCard System

Source: Custom information, 2018

not tools specific to settlements; I formed them from databases (*TRM* and *TEM databases*), which were created from case studies that were processed based on the appropriate relations.

In the center of the methodology is the denominator of the RSC-system, the RSC Matrix. There is one indicator in each field of the matrix, which characterizes the relations of the factors affecting the settlement economy (PESTEL) and the available resources. The RSC Matrix is thus an element of the system which takes on values that characterize a settlement. However, the values obtained can be interpreted only by comparing benchmarks (*Benchmark-matrices*) that are made of values from sufficient number of settlements (*RSC database*); this comparison forms an element of the *local economy development program (LED)*, highlighting the possible *intervention areas*, and through these determining the *intervention tools* and *resources* recommended for their development.

Nevertheless, the logical network in itself does not help in establishing the methodology, nor in understanding the time horizons of the implementation. The tool system and the relations of the RSC system are illustrated more plastically by **2** 2. Beyond what has been already written regarding the logical structure, the process of the research and the relations between the system elements can be seen in the figure.

2 2: The tools of the RSC System and their relations
Source: Custom information, 2018

The element marked with "1" is the indicator table of the RSC Matrix, which has been established according to the two dimensions selected (BSC, PESTEL). In the next phase of the research, the database necessary for further analysis was established (marked with "2" on the figure). I made benchmark tables (summarized, regional and based on settlement size) from the database to be used later as an instrument for settlement and regional comparative analyses ("3").

I examined the relations between the set of instruments of local governments and the dimensions of the indicator matrix as a new dimension. The assessment was done by analyzing approximately 70 settlement development projects: the question in each case was, what internal characteristics were they linked to (BSC aspects), and to what environmental factor (PESTEL) did they help to adapt. The Tool-Effect Matrix (TEM, "4".) and the Tool-Resource matrix (TRM, "5".) created by summarizing these databases are useful as instruments for action planning, however, they are indispensable starting points for the Effect Matrix marked by "6". The latter one shows the strength of the direct effect that can be exercised with the tools of the local government on the economic regions marked by the specific indicators, enabling the filtering of target areas. The question arose naturally: are there factors and hidden connections between the indicators that enable an indirect effect on areas that can be influenced less? The research delivered positive results; the six factors identified and the five independent indicators are illustrated in the factor matrix ("7").

The four clusters identified by the main components organize the settlements examined into new groups with an RSC approach, and they also enable creating secondary benchmark tables that are based on clusters ("8").

As a result of structured planning, the "local economy development program", which contains specific actions, is made by using the analytical and filtering tools appropriately. In the following sections I present the specific elements of the methodology and their proposed method of use in details.

3.2. The analytical matrix

The RSC Matrix (analytical matrix) is a tool developed specifically to analyze the economy of settlements. It examines the relation between the external and internal factors that define the settlement's operation by combining the well-established methodologies used successfully in the economic world.

The framework of the analytical model is made by the areas that were defined by the PESTEL methodology described earlier - which introduces the external factors affecting the settlement - and the BSC aspects that discover the internal, organizational characteristics and resources. The indicator system connects these two criteria.

The analytical matrix is the cornerstone of the RSC Matrix. We can get a quick overview about the economic status of the settlements to be assessed by the indicators of the RSC matrix. The comparative analysis of the data of several settlements is essential to know the current status, to which an appropriate foundation is provided by a database containing already more than 130 records.

Embedding the PESTEL criteria set into the methodology

When adapting the model, I analyzed six factors of the basic model regarding how capable they are of describing the surroundings in which the local governments make their strategical decisions. During this task it became crystal clear that the political, economic, social, environmental and legal aspects are as much fundamental for a settlement as they are for an enterprise, even if these impacts apply differently. However, when considering technological changes, bigger differences can be experienced: while in the case of an enterprise the available technology is fundamental, what's more, crucial (especially for IT enterprises which can become successful or vanish in a couple of years), the general infrastructural background is much more defining in the life of a settlement, which also covers technological features. At this stage I used this extended definition, although I did not deem it necessary to modify the name of the aspect.

Internal factors: Embedding the BSC aspects into the system

I used a different, yet already reviewed tool to examine the internal, organizational factors. The Balanced Scorecard is a strategical framework that is - similarly to the SWOT-analysis or the PESTEL model - particularly popular in the business world. It is complex enough, while flexible and can be used with ease. This flexibility enabled it to play a role in assessing the situation of the local economy and in defining realistic development goals as part of the methodology established. The aspects of the model needed some adjustments for the local governments, because the focus of enterprises and settlement goals differ from each other.

I extended the **financial aspect** and was renamed Financial-economic aspect, as it does not only analyze the financial situation but also the economic situation of the settlement.

The **customer** viewpoint is somewhat similar in the case of enterprises and settlements, because the service provider and the party using the service can be identified, however, it is important to not only measure the service provider effectiveness of the local government, but rather the general public opinion and perception of the residents regarding their own quality of life, so I deemed the Quality of life definition to be more expressive. In view of the fact that I studied the economy development opportunities of the whole settlement, this originally external resource (customer satisfaction) became an internal one (quality of life). Accordingly, the BSC aspects appear as internal resources in the RSC matrix.

The aspect of **operational processes** had to be transformed substantially. An enterprise is much more flexible regarding its internal processes than a local government, because the different laws defining the internal functioning of the local governments allow less space. In the limited legal framework, only its own functioning and the distribution of the resources available for the

development of the settlement can be made more effective, therefore, this factor was named Organizational Effectiveness.

The **aspect of learning-development** can be interpreted better in case of a specific organization than in case of a settlement that can be defined less from the aspect of learning, so this category was extended. During the analyses, I tried to get a better idea about the innovation practices and traditions of the settlement.

The analytical indicator matrix

The connection between these two criteria defined above (modified PESTEL and BSC criteria) is made by the RSC Matrix (analytical matrix). The matrix provides a comprehensive picture about the situation of the settlement's economy by connecting the external and internal factors, thereby discovering the necessary and possible intervention spots. Following the logic of the matrix, it contains information about the influence extent of the environment on the economic status of the settlement, but also about what kind of influence effect and/or adaptability does the settlement have regarding the specific environmental factors.

The RSC Matrix is constituted of four rows according to the four aspects of the Balanced Scorecard (Quality of life, Organizational effectiveness, Economy and finances, Innovation). The columns of the matrices are defined by the six factors of the PESTEL model (political, economic, social, technological, environmental and legal) (11).

1: Indicators of the RSC Matrix

Factors (→) Aspects (↓)	Political	Economic	Social	Infrastructural	Environmental	Legal
Quality of life	AQP	AQEC	AQS	AQI	AQEN	AQL
Organizational effectiveness	AOEP	AOEEC	AOES	AOEI	AOEEN	AOEL
Economy and finances	AEP	AEEC	AES	AEI	AEEN	AEL
Innovation	AINP	AINEC	AINS	AINI	AINEN	AINL

Source: Custom information (2015)

Each field in the intersection of columns and rows contains an indicator. It would be possible to define more indicators for each field - preserving thus the logic of the system - but my objective was to get a comprehensive overview of the local conditions as simply as possible. Accordingly, the objective of the indicator system is to provide some kind of summary information about the status of specific areas, drawing attention to the areas to be developed or to the strengths of the local economy. The thorough examination of the "hot spots" identified is for the most part justified, however, based on my experience, the orienting capability of the matrix is adequate and relevant.

The naming of the indicators is technically composed of three letters. The first letter, "A" refers to the "Analytical" attribute and the function of the matrix: RSC-matrix (Analytical matrix). The second letter marks one of the four aspects of the modified BSC methodology; quality of life is marked by "Q"; "OE" is used for Organizational effectiveness, "EC" is used for economy and finances, and "IN" for the indicators of innovation. The third letter of the name indicates one of the environmental factors of the PESTEL methodology (**11**).

When drawing up the indicators, it was an important aspect that they shall have already such information value which can provide a basis for discovering areas that can be developed and also for comparing the settlements, while at the same time characterizing the relations of the local economic life graphically, thus enabling the generalizing abstraction from actual data. The specific indicators comply with the SMART criteria described above. Each indicator is a value characterizing and specific to the given relation, which can be calculated from well-defined data.

It was also important - being well aware of the slow data supply of local governments - to work with data that can be accessed as simply as possible and their time of creation should also be determined easily. According to the practice I created, 50 baseline data was needed to calculate the 24 indicators, and only for 10 of these data was a local data supply needed. Most of the indicators are composed of 2-5 data, and each of these should be gathered from precisely defined sources (local data supply from the local government or from public registers). Defining these sources requires special attention. I experienced in several cases that data coming from different sources but theoretically identical showed significant differences. I used an electronic form to simplify data collection as much as possible. I put the data gathered by each settlement into an Excel file called "data processor matrix", which calculates the values of the indicators. After this, the data is built into an RSC database as one record for each settlement. In the following section I describe the specific indicators.

Introducing the indicators used

For convenience, I describe the indicators in a grouping corresponding to the BSC aspects.

Quality of life indicators

AQP - Political "well-being"

The indicator is to model the lobbying power (in a good sense) through the ratio of the support of the governmental mayoral candidate and the support of the nominating organization. The stronger political relationship enables to raise funds to a somewhat different extent from the average, and thereby to improve the local quality of life. The indicator measures the connection between the political factor and the quality of life by dividing the support ratio of the governmental mayoral candidate and the nominating body of the government party, creating a percentage. It shows how the support of the governmental mayor candidate relates to the popularity of its nominating organization. In those settlements where the settlement leader is not given by the governmental party, it provides an image about the internal political relations of the board: the political "well-being" indicator of a specific settlement refers also to the cooperation within the assembly and to the willingness to act together. The power of the governmental mayoral candidate is assessed on a settlement level, whereas the popularity of the nominating organization is assessed on a constituency level.

AQEC - Net yearly income per inhabitant

The indicator quantifying the relation of the Economic factor and the quality of life shows the net yearly income per inhabitant of a settlement. The indicator refers to the local population's standard of living, and to its change if the related data of the settlement is processed chronologically. This value can be accessed directly from the TEIR database, and because it speaks volumes in itself, I did not create a distinct indicator of it. If we compare the value of the settlements area by area, then during the evaluation of the quality of life, it is worth taking into consideration, how the real value of wages and salaries differ by regions.

AQS - Unemployment rate

The indicator for the Social factors' effect on quality of life provides the percentage of the settlement's unemployed compared to the population number of working age people (aged 15-64) of the settlement. The indicator also refers to the supply and demand. Depending on whether the unemployment rate is too high or too low, we can do additional researches. The data necessary for

calculating the indicator can be accessed in the settlement database of the Public Employment Service (NFSZ).

AQI - Number of public services accessible in 30 minutes by public transport

The Infrastructural environment's effect on quality of life is illustrated by the number of public services that can be accessed within the settlement or in 30 minutes in the catchment area of the settlement. The public services that are relatively easy to access influence the population's quality of life directly. When establishing the value of the indicator, I considered the number of public service obligations (currently 28) defined by law, the distance between the settlements and the public transport opportunities. The necessary data is provided by the local governments through the uniform electronic request form.

AQEN - Size of greenery per inhabitant

I defined the relation between the environment and the quality of life with the size of greenery per inhabitant. The size of greenery of the settlement correlates with the local environmental culture and partially with the recreational opportunities of the population. A higher ratio of greenery contributes to the well-being of people and influences the image of the settlement positively. It can be said that the greeneries of a settlement, and their quality as well, play a particularly important social, health and aesthetic role. The data necessary for calculating the indicator can be accessed via the TEIR IVS application.

AQL - Proportion of new and modified regulations compared to the total number of regulations

The indicator characterizes the effect of the quality of life on the Legal factor through the permanence of the local regulatory environment. The assembly of local governments regulates the local public affairs and the functioning of the municipal organs by issuing municipal decrees and regulations, or by modifying these, with which it affects directly or indirectly the life of the settlement's population. The municipal regulation is a law that significantly influences local life, and from the aspect of the population's quality of life it is vital that this factor must be predictable. The index-number is provided by the quotient of the number of new regulations and regulatory amendments of the preceding year, and the number of operative regulations of the same period.

Organizational effectiveness

AOEP - The ratio of unfinished investments and renovations of the local government compared to the original estimate of the budget. When calculating the indicator that describes the effectiveness of the local governments' functioning in connection with the political environment I consider the gap between the sum that was originally envisaged for investment and development expenses in the financial regulation with the sum that was actually used for development.

The data necessary for the calculations can be accessed from the regulation of the local government's final accounts for the current year, which can be accessed via local data supply or from the webpage of the National Legislation Database. We can get a closer look about how effectively local municipalities implement the tasks planned in the budget with the percentage value obtained via this method. Precise and accurate planning is one of the keystones of dynamic development, and the indicator can give a base for this. However, inaccuracy can be traced back in most of the cases to the unpredictability of the national tender system - and thereby the political environment -, thus it shows a strong correlation with the index-numbers referring to the tendering activity.

AOEEC - The change of the local taxing power compared to the increase of GDP

The indicator characterizes the effectiveness of the settlement's economy. The indicator compares the change in the settlement's taxing power ability with the degree of the GDP change, that is, it compares the performance of the local economy with the performance of the national economy. Information about the economic indicators of the settlement can be accessed by local data supply, whereas the national economy indicator can be requested from the database of the HCSO.

One crucial challenge for settlement municipalities is how attractive can they make their settlements for enterprises and entrepreneurs. If the management of the settlement - building on the favorable characteristics- tries to ensure ideal conditions for the establishment and functioning of corporations, as well as help the successful operation of local enterprises, then it facilitates the increase of income of the local economy and indirectly the settlement itself.

AOES - Long-term unemployment rate amongst the unemployed

The long-term unemployment rate is a significant economic factor. It is in the interests of local governments to ensure the opportunity for the working age population to get income that guarantees livelihood, because higher employment can mean not only the decrease of social expenditures but also the increase of tax revenue. The indicator reflects the effectiveness of the municipal effect on social environment through the rate of long-term unemployed. Indirectly, it also refers to the dynamics of the local labor market. The reduced accessibility or the limited number of workplaces, the absence of adequate vocational and further education opportunities, the demotivation of people and several other factors can lead to a higher long-term unemployment rate.

AOEI - The average age of IT-tools used by the local government

These days it is an especially important aspect what kind of set of instruments are available for decision-makers and civil servants of settlement municipalities to work effectively. The time requirements of specific office administration workflows can be decreased significantly by a modern IT support, thereby more tasks can be done in the same amount of time. I defined the IT support's effect on organizational effectiveness with the average age of IT-tools. Information about the size and age of IT-tools can be acquired by local data supply.

AOEEN - The sum of environmental investments per thousand inhabitants

Both from the viewpoint of environment protection and the population, it is an important matter, how much care is given by the settlements to moderate local harmful emissions and take measures that reduce environmental impact. Using renewable resources reduces expenditures on the long run while eases the dependency of the settlement on the external suppliers. The environmental protection investments influence thus significantly the social contentment and the sustainable economic development of the settlement.

I described the relationship of the natural environment and the organizational effectiveness in proportion to the population with the tendering resources used by local governments for realizing environmental protection investments. I based the calculation of the indicator on the data of the TEIR (local population) database and on the successful Environment and Energy Operational Program tenders - which are supported by the government of Hungary - as well as the tenders won by the local governments.

AOEL - Proportion of available strategical documents compared to mandatory strategical documents

The indicator assesses the effective work of the municipality's assembly through the number of operative strategic documents. The indicator shows the percentage of obligatory strategic documents the specific settlement has. When creating strategic documents, comprehensive researches and situation analyses are made about the specific settlement by taking the demographic, economic and environmental conditions, as well as other relevant factors into consideration. The assembly receives a comprehensive image about the settlement's current situation and about its areas to be developed with the help of the strategic documents, while it defines the objectives that show a predictable direction for the whole of the settlement. Therefore, settlements having at least those strategic documents that are prescribed by the law have a special priority regarding the effective and sustainable development of the settlement.

Economy and finances

AECP - The proportion of the sum of settlement development resources per inhabitant and the sum of national development resources per inhabitant.

The tender sources facilitating the development, and the economic and financial operation of the settlement have been for a long time fundamental on all three levels: national, regional and settlement. The assembly of the local government, the heads of institutions and the local enterprises all play a role in determining how much a settlement can finance its own development and investments from tender sources. The value of the indicator shows to what extent the settlements receive development resources within that specific seven-year long EU development cycle. The value of the development resources won in the specific development cycle is displayed in the denominator of the quotient per inhabitant of the country; the numerator contains the sum of tender sources gained in the same cycle per inhabitant of the settlement. Data about the development resources can be accessed via the Unified Monitoring Information System. Information about the population of the settlement and the country can be found in the databases of TEIR and HCSO.

AECEC - Gross Value Added (GVA) per enterprise

The indicator measures the connection between the economic-financial performance of the settlement and the economic settings with the gross value added per registered enterprise in the settlement.

The indicator defines how successful are the companies registered in the settlement.

AECS - Proportion of tax payer working age population

One of the fundamental aspects regarding the functioning of a settlement's economy is to what extent does the municipality has to support its population in order to ensure basic living conditions. Therefore, the percentage of the population having taxed income is a characteristic data about the social burdens of the settlement. On the one hand, a self-sustaining population relieves to some extent the government of the settlement in social expenditures, and on the other hand it generates income via taxes to the operation of the settlement's municipality and to the development of the settlement. Accordingly, the indicator measures the effect of the social factor on the local economy with the percentage of the quotient calculated from the working-age population and the taxpayers.

The data about the taxpaying population can be requested from the TEIR database, whereas the data regarding working-age population can be accessed in the settlement database of the Public Employment Service (NFSZ).

AECI - Number of middle-sized and large enterprises per 1000 inhabitants weighted by FEI index. The indicator measures what correlation exists between the number of middle-sized and large enterprises on the settlement per 1000 inhabitants with the local infrastructural level of development.

When examining the relation between economy and infrastructure, I considered the number of locally operating middle-sized and large enterprises an important characteristics.

The infrastructure present locally is a fundamental matter concerning the settlement's attractiveness toward enterprises. I defined this value with the Financial Economic Infrastructure (FEI) index. Bigger enterprises earn more income than their smaller rivals, therefore, they pay more business tax to the settlement where they pursue their activities.

22 contains the aspects of the Financial Economic Infrastructure (FEI) index.

The aspects of the FEI take the values 0, 1 and 2 based on what range they are in, then the FEI index is created as the sum of the 0, 1 or 2 values of the different aspects. The data regarding the number of enterprises and population data can be accessed in the TEIR database.

22: Calculating the FEI-index

Title	Data source	V	V	V
Distance from the capital	Google Maps	>1.5 hours	<1.5 hours	Agglome ration
Motorway, highway-exit	Google Maps	>30 km	<30 km	direct
Proportion of paved roads	Quotient of municipal and national paved roads, plazas (km), and municipal and national roads and plazas (km).	0-74.99%	75.00-89.99%	90-100%
Public utilities difference	TEIR/TMER	0-74.99%	75.00-89.99%	90-100%
Wired internet	Proportion of broadband subscriptions bigger than 30Mbps.	none	<50%	>=50%
Economic area/industrial park	Defined in the local building rules (G5) of the settlement government and in the industrial park address list	none	One of them	Both
Acquired value: sum of points gained by rows (0-12 points)		0	1	2

Source: Custom information (2015)

The aspects of the FEI take the values 0, 1 and 2 based on what range they are in, then the FEI index is created as the sum of the 0, 1 or 2 values of the different aspects. The data regarding the number of enterprises and population data can be accessed in the TEIR database.

AECEN - The product of the number of overnight stays per thousand inhabitants and the ratio of the protected areas of the settlement. The environmental factors affect the economic and financial situation of the settlement through the touristic attractiveness of the settlement's environmental conditions. When calculating the indicator, the environment's touristic attractiveness is represented by the protected areas of the settlement, whose ratio is assessed compared to the total area of the settlement, and multiplied with the number of overnight stays per thousand inhabitants. The index connects the environmental conditions of the settlement with the current touristic performance.

AECL - The proportion of the levied local business tax (LBT) and the taxing force ability of the settlement.

One of the most considerable tax revenue sources of local municipalities is the local business tax. Local enterprises have to pay it at the rate specified by the regulation of the local government. Its rate can be defined at the most as 2% of the corrected net turnover of the enterprise. The scale of the taxing force is the maximum business tax value that can be levied in theory, which coincides for the local government with the income potential of LBT. In this sense, the index represents the extent of the local government levying LBT on the local enterprises. Data about the extent of the LBT levied can be found in the final accounts regulation of the local government, whereas data regarding the taxing force ability can be gathered from local data supply.

Innovation

AINP - The proportion of municipal council candidates and the number of municipal council seats

The indicator presenting the intention of joining the settlement decision-making refers to the political relations of the local innovation potential. The activity of the settlement's population in the election period determines significantly the composition of the elected assembly elected and the debate culture of local public life. Residents of settlements elect those people delegates during the municipal elections about whom they think that they are deserving that position. The more people go for a seat in the assembly during the elections, the bigger is the performance pressure on the elected members; if we invert the statement: without a healthy competition the assembly members are less inclined to work effectively. When evaluating the results, we have to take into consideration the population number of the settlement, thus at this point the comparison is valid for settlements with similar sizes. Data for calculating the formula can be accessed on the webpage of the National Election Office.

AINEC - Change in the number of registered enterprises per 1000 inhabitants

The indicator measures the effect of the economic factor on the innovation capacity of the settlement with the changes in the number of enterprises registered in the settlement.

The indicator refers basically to the entrepreneurial mindset of the settlement, as well as it hints about the existence of ideal conditions to start and adequately operate an enterprise that are ensured by the settlement's economic and infrastructural situation, and about the municipal regulations concerning commercial companies. The change in the number of enterprises is calculated per thousand residents, therefore, settlements belonging to different settlement size categories can be compared to each other.

The data of variables can be requested through the TEIR Helyzet Tér Kép (Location Space Image) application.

AINS - Number of NGOs by 1000 people

NGOs play a significant role in the life of settlements. They can participate in carrying out specific municipals tasks and satisfying other real social needs. They contribute with their activities to improving the quality of life of local people. NGOs offer a mirror for the leaders elected, and they can influence the life of the settlement by defining collective needs.

AINI - Number of broadband internet access per 100 people

In the information society these days, the free flow of information and the free access to information is indispensable in the everyday life of people for self-sufficiency and competitiveness. In the last decade, the role of using the internet has been significantly revalued, as with it people have the opportunity to learn, work, manage issues from home or on their mobile devices; therefore, it can be stated without exaggeration that broadband internet is an essential tool for a developed society. It presents the effect on infrastructural innovation with the number of broadband internet access on the specific settlement.

The data necessary can be accessed from TEIR.

AINEC - Proportion of transferred selective waste compared to the total number of transferred solid waste

The indicator measures the innovative adaptation to environmental challenges with the proportion of selective waste collection on the settlement.

At present, environment pollution and emission generated by different human activities significantly burdens our environment, and it is important for the settlements to pay adequate attention for creating opportunities for an environmentally aware conduct. One of the manifestations of this awareness is organizing the selective collection of waste.

It is important to note that when interpreting the primary meaning of this indicator, the opportunities provided by the size of the settlement must be taken into consideration, as well as how the waste management operators co-working with the settlement enable the transfer of waste

selectively, and to what extent does the population's practice of waste collection reflect environmental awareness.

The data of the variables can be accessed via the meta database of TEIR.

AINL - The proportion of development resources gained by local enterprises compared to national average

The indicator measures the innovativeness of the settlement's local enterprises through the utilization of tender development sources. When building the RSC database for the indicator's variables I took the sources of successful Economic Development Operational Program tenders as starting points. From now on, I intend to use for this indicator the data of operative programs that support the current development cycle's micro-, small- and medium-sized enterprises. The legal environment directly influences the fact that on what conditions can micro-, small- and middle-sized enterprises get development resources through the government's tendering system. The demand side is defined by the knowledge of enterprises and the difficulties of entering the tendering system, as well as the regulations regarding the use of tender sources, which are from time to time overregulated. The settlement and national average rate of the tender sources used is thus a valid indicator for marking the innovativeness of the local MSME sector. The indicator shows to what extent the enterprises of a specific settlement financed their developments from tender sources compared to the national trend.

3.2. Testing the methodology in a specific regional research: building the database and designating the research locations

The national database - which contains previous settlement surveys - based on the indicator system above was used to define the economic status of settlements, and which enables comparing the settlements based on different aspects (benchmarking). An indicator matrix is created for each settlement based on unique data collection, whose values themselves can enable some kind of analysis of the situation but they can provide a significantly more comprehensive image if compared to the benchmark values created from the whole database. Data has been collected in two turns: during the secondary data collection I filled the settlement forms with information available in public databases (TEIR, Public Employment Service, etc.), whereas during the primary data collection I requested settlement data supply. 24 indicators were constituted of 50 data, and for these cases information was needed directly from the local government in 10-12 cases.
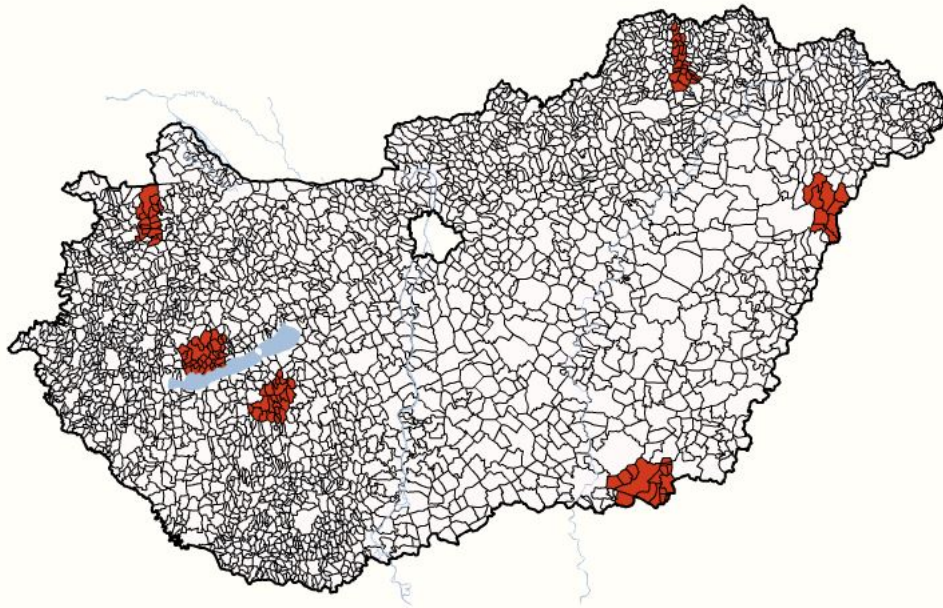
Recording the data was done by an electronic form based on MS Excel. After filling the left column of the matrix, the indicators are calculated by the software in the table located in the top right corner of data recording matrix, from which the numerical values of the indicators - creating separate records - are automatically placed to another worksheet in a format corresponding to database editing. The assessment, and if needed, the filtering of outstanding values is done in this worksheet. I exported the database, still in Excel, to SPSS for statistical analyses, with which benchmark matrices, the main component analysis and cluster analysis have been made later.

Finally, I exported the database - which was extended with factors and cluster codes in SPSS - into Excel, which is better suited for more simple analyses, thereby getting the RSC database containing extended data.

I had to decide what pattern I should use for building the database. The adequate number of elements and regional representativeness was by all means a significant aspect due to the benchmarking planned. However, collecting data would have been made disproportionately more difficult in case of an excessively scattered pattern. The special situation of the central region was a serious issue: the capital is seen as a significantly distorting factor; what is more, the shape and sector of resources that can be involved in settlement development differ sharply from the convergence regions. Based on all of these, I decided that in the first stage I will concentrate on convergence regions, and I will collect data about the settlements of districts by regions. When

selecting the district, it was an aspect that they should have very diverse regional conditions, but there shouldn't be excessive differences in their sizes, so I excluded those districts from the first round of data recording where the seat of the district was a city with country rights or a provincial capital.

3₃: Districts of the primary data collection
Source: The map was made with Geo Market. Edited by: Szabó Dorottya (2018)

In the later stages, this basic database was extended with every settlement examined. The following 6 districts were selected in the first round: the district of Kapuvár (Győr-Moson-Sopron county, Western Transdanubia region), the district of Tapolca (Veszprém county, Central Transdanubia region), the district of Makó (Csongrád county, South Great Plains region), the district of Nyíradony (Hajdú-Bihar county, North Great Plains region), the district of Szikszó (Borsod-Abaúj-Zemplén county, North Hungary), the district of Tab (Somogy county, South Transdanubia).

Altogether data from 126 settlements has been collected in the six districts - calculating with an average of 50 data per settlement - that meant collecting and recording more than 6300 data. I have extended the database with information about each settlement examined since the recording of the basic data bank.

3.2.1 Primary benchmark matrices

I created three types of comparative indicator tables from the RSC database. The national contains the medium of the data of every examined settlement; the regional examines the medium of the index by regions; whereas the benchmark tables based on settlement size contain the values according to the settlement size categories. Based on their size, I divided the settlements into four groups: settlements with 500 residents at the most are the first group; settlements with 501-1000 residents constitute the second one; settlements with 1001-5000 residents are the third group, and every settlement above this population number constitutes the fourth group. Altogether, I created thus one national, six convergence regional and four settlement size comparison tables, from which I use three relevant matrices when examining settlements.

The benchmark data provide several assessment and analytical directions. We have the opportunity to perform comparative examinations on settlement, regional and national level, and we can analyze the settlement's economic character based on settlement size. It is true that when examining bigger regions, where settlement groups or districts are compared to each other, the number of sample units must be increased, however, usually enough data was available for researches on settlement level. It must be noted that due to imperfect data supply, some

benchmarks need supplements, therefore, in case of assessments in these regions it is advised to start the research by complementing and extending the database, or by narrowing the scope of validity with comparative analyses. Nevertheless, the latter one leads to the image about the local economy being incomplete, so I deem this solution acceptable only in surveys that are rather for orientation and that form the foundation of deeper researches in the future.

3.2.2. The necessity of cluster-based secondary benchmarking

During the creation of benchmark tables, the question arose, whether the economic characteristics of settlements - based on the current methodology - correlate with the settlement size or rather with the regional situation. I examined two indicator groups to answer this question. The first group (AXI) contains the indicators for infrastructural relations. The X in the naming refers to the changing aspects of the BSC, whereas the "I" refers to the infrastructural environmental factors. The second group contains the AXEC type indicators, named through a similar logic.

Regarding the assessed indicators, it can be stated that they provide valuable information about the settlement economies adapting to the macroeconomic environment. The values of two indicators (AECI, AINI) increased unambiguously with the size of the settlement.

All of the benchmarks made out of the indicators depend on the geographical location, but a trend between the development of Eastern-Western part or north-south gradient could be found only for the AQEC, AOEEC, AECEC, and the AOEI, AQI indicators.

It can be stated that regarding the five indicators mentioned (AQEC, AOEEC, AECEC, AOEI, AQI), the settlements between 501 and 1000 heads performed somewhat above the expected value, whereas the settlement category of 1001-5000 heads performed somewhat lower than the expected value. I could not identify a geographical nor a settlement size dependency for the AINEC benchmark.

The indicator groups examined showed thus a miscellaneous dependence on the two grouping aspects assessed. The result brought up a new approach: the opportunity (and need as well) of grouping settlements into types (clustering) based on the economy development opportunities; I present the result of this later.

3.2.3. The Tool Resource Matrix (TRM)

The Tool Resource Matrix (**33**) shows the connection between the local government's set of instruments and the internal characteristics (resources that can be involved) grouped according to BSC aspects. It helps the management of the settlement to order the appropriate resources for effectively using the tools selected.

Dimensions of the Tool Resource Matrix

The two dimensions of the TRM are provided by the BSC aspects and the municipal set of instruments (**33**). Detailed information on the BSC aspects can be found above. A new dimension, "tools" shows up at the TRM.

Local governments possess a set of instruments of several different characteristics, which can strengthen or even weaken the effect of each other. In my view, if they are used systematically, the settlement's economic development might be achieved in accordance with the pre-recorded target system. During my research, I identified six distinct municipal roles, and six related toolsets. These are the following: political, owner, norm setter, authoritative, market and communicator roles. Every role has different tools, therefore, the scope of related tools also differs. In many cases the inappropriate use of specific roles causes disturbance. Different roles would often need different attitudes that should be done by the same participants, which is a difficult task humanly and professionally as well.

33: **Structure of the Tool Resource Matrix (TRM)**

Tools→ Aspects ↓	Political	Commu-nicator	Norm setter	Authorita-tive	Owner	Market
Quality of life	QP	QC	QN	QA	QO	QM
Organizational effectiveness	OEP	OEC	OEN	OEA	OEO	OEM
Economy-finance	EP	EC	EN	EA	EO	EM
Innovation	INP	INC	INN	INA	INO	INM

Source: Custom information (2016)

The first role is the **Political**, whose tools can be, among others, strategical planning (for example, Integrated Urban Development Strategy [IUDS], settlement development and asset management strategies, equal opportunity plan, sectoral strategies, etc.), agreements with other settlements (for example, town-twinning, association agreements, organizing trans-national communities [CBC]), lobbying role as a tool for involving capital, as well as contacting local communities.

A crucial role for local governments is the **Communicator** role. It communicates towards the population, the actual external and the prospective partners (guests, investors). It plays an important role in influencing settlement marketing or settlement attitude with its special tools.

The **Norm setter** function can be derived from the public authority function of local governments. Local governments can, or in some cases, have to make laws. The statutes about local taxes, livestock production or local constructions, among others, are made using this right. It is thus reasonable that these and many other local laws can have a direct effect on the functioning, and in the optimistic case, the development of local economy, therefore, we can state that this is also an effective tool in the hands of the local politics.

The scope of **Authoritative** tools contain specific pricing authority questions and several local supervision functions, because they act in specific cases and usually indirectly as local authority, while implementing the interests of the local community and checking the compliance of rules.

The **Owner** role results naturally from the foregoing; managing the wealth of the community also involves managing public affairs. Such a task is managing the movable and immovable property owned by the local government, handling corporate shares, and maintaining and developing real estates.

Including the **market** role in the list might be surprising but a feature of the domestic municipal system is that the local government supplies and orders, sells and buys at the same time, therefore, it is an active member of the local market. It can be a customer, a supplier or a competitor to the local enterprises. However, it is an active participant of the labor market as well. The local government is the biggest employer in most of the settlements, therefore, it has significant influence by extending (or reducing) the available jobs of the settlement. The public employment programs of the last years considerably influenced the labor force and the local goods market.

It can be stated that the combined use of the set of instruments described above can have a major effect on the functioning of the local economy. Nevertheless, it can be also seen that the uninspired or inconsistent use of means may weaken each other's effect or even completely cancel them.

Relation analysis and results

I processed several case studies during the data recording. During the analysis, I built mainly on publicly and easily accessible collections. Such publications have been made in the last years - in cooperation with other partner organizations - by VÁTI (2010), TÖOSZ (2015) and several other work and research groups.

I considered as a fundamental requirement for the case studies to describe at least one specific economy development measure with such details that enables the identification of the set of instrument(s) applied and the internal resources involved. During the first stage, I added approximately sixty case studies and data gathered from these to the database, which has, in my view, provided enough basis for defining the strength of the relations characterized by the fields of the TRM.

Therefore, when creating the matrix, first of all the case studies are examined, regarding what available tool the local government used; then the internal resources interacting with the tools are defined. During the processing, I recorded every data from each economy development best practice identified into a unified datasheet, which contains the fundamental data of the settlement (name, county, region), the literary source, title and short description of the best practice; as well as the TRM set up for the specific case, in which I marked the municipality roles used during the action examined and in which resource interaction they used it. If the tools of a role had an effect on more areas, I marked the relation in every field affected, whereas if one specific toolset affected the same resources in a number of ways, I included the number of identified actions in the related field.

I summed up the values of the identical fields of each datasheet in a summary matrix, then by adding the summarized data into a table corresponding to the relationships of the TRM, I received the actual TRM, which displays the strengths of interactions between the local government tools and the specific environmental factors. I supplemented the Tool Resource Matrix with a heat map to make the relationships more expressive.

The heat map makes the relations graphical between the local government tools and the internal factors with a multi-colored scaling. Bright red means a strong relation; graying colors mean weaker and weaker relations.

4: **The results of the TRM depicted on a heat map**

Tools→ Aspects ↓	Political	Com-munica-tor	Norm setter	Autho-ritative	Owner	Emplo-yer	∑Inter-nal fac-tors	Appli-cation rate
Quality of life	38	45	1	4	21	21	130	38%
Organizational effectiveness	16	8	5	0	13	2	44	13%
Economy-finance	31	34	4	4	32	21	126	37%
Innovation	13	21	2	2	5	0	43	13%
Altogether	98	108	12	10	71	44	343	100%

Source: Edited based on own research results: Földesová (2016)

When examining the use of internal factors, we can see that the role of the categories of Quality of life and Economy-finance stands out (38% and 37% of all occurrences), based on which we can

declare that one prerequisite of successful local government actions is securing social support that builds on the local quality of life and the necessary financial resources at the same time. However, it is surprising that the organizational effectiveness and the innovation factor appears with a relatively low percentage, namely 13-13%. But then again, this relatively modest ratio can be traced back to the defining nature of the economic and quality of life aspects mentioned earlier.

Medium-strong relations can be seen in relatively significant numbers (value of 13-21%), marked with light purple. It can be seen that local governments used the authoritative and norm setter tools in relatively few cases, although these had the lowest resource requirements.

The management of the settlement gets sufficient help through the Resource matrix when planning economy development actions to select the most effective resources for supporting the selected set of instruments.

3.2.4. The Tool Effect Matrix

It is necessary to recall some of the thoughts that were described earlier in order to show the location and content of the Tool Effect Matrix (TEM) in the methodology. The economy development of local governments is not a value in itself; its objective is to improve the local quality of life. This objective can be achieved by settlements by interacting with their environment. Such an interaction can be adaptation, or changing the environment as much as possible. I examine the environmental factors affecting settlements in the RSC methodology according to the areas of the PESTEL analysis, with which the snapshot of the economy can be assessed with the RSC Matrix (**11**). Those areas can be defined by comparing the benchmark matrices with the settlement data of the RSC matrix that can be developed realistically at least to the level of the benchmark, and those also that show outstanding values in case of a specific settlement. The environmental dimension of the indicators of the selected development areas, thereby the area of environmental interactions of the desired economy development is shown by the aspect of PESTEL. By setting up the TEM, I was seeking the answer for the following question: with which tools of their diverse roles can local municipalities influence the most effectively the areas of the environment, or adapt to their environmental conditions. In my thesis I used the definition of "Tools" to describe the specific dimension, which is more comprehensible in my view.

Dimensions of the Tool Effect Matrix

Among the constantly changing conditions those settlements can be successful, which are able to adapt to their surroundings. This adaptation is the influence of the effect on environmental factors and the settlement.

Accordingly, one dimension of the TEM is the PESTEL system used at the RSC Matrix, which creates thus a logical connection between the analysis (RSC matrix, **11**) and the tools of action planning. The second dimension contains the set of instruments ensuring the environmental adaptation of settlements (5 5).

The specific fields can have different values in the intersections, depending on the results of the research.

Relation analysis and results

As a next step in the research, I analyzed the relationship between the roles identified and the environmental factors with the analysis of the successful municipal economy development projects and programs. Similarly to the Tool Resource Matrix, the Tool Effect Matrix is built on data gained by processing settlement case studies. When examining relations, I analyzed the same case study set in order to ensure the homogeneity of the source databases of the TRM and TEM. I gained additional information about the characteristics of successful economy development actions by the research. The TRM provides help in knowing the character of resources needed for effective actions, whereas with the TEM I received an image about the effectiveness of tools that can be

used for adapting to environmental factors passively and actively. The TEM not only identifies relations but provides an overview about their strengths as well.

5 5: The structure of the Tool Effect Matrix (TEM)

Area of effect→ Tools↓	Political	Economic	Social	Infrastruc-tural	Environ-mental	Legal
Political	PP	PEC	PS	PI	PEN	PL
Communicator	CP	CEC	CS	CI	CEN	CL
Norm setter	NP	NEC	NS	NI	NEN	NL
Authoritative	OEP	OEEC	OES	OEI	OEN	OEL
Owner	OP	OEC	OS	OI	OEN	OL
Market	MP	MEC	MS	MI	MEN	ML

Source: Custom information

The data of actions analyzed as described at TRM were gathered into one database, then the data was summarized. As a result of the work, on the one hand a case collection was created that contains the best practices and could be used as a sample for planning settlement development actions; on the other hand the Tool Effect Matrix (TEM) showing the efficiency of the local government's tools was made by summarizing the numerical results.

The created matrix provides a quantitative image about the relations between the tools and the external factors examined. To make the efficiency of the set of instruments more graphic, I created a version of the TEM supplemented with a heat map (66). The most prominent interaction areas between the set of instruments and the environment can be identified with the heat map (marked with warmer colors). Warmer colors mean higher, colder colors mean lower values.

The highlighted fields in the table contain the occurrence of each indicator reflected to every case study. The lowest summary row shows how big the influence of the local government can be on specific external factors, whereas the summary columns on the right provide information about the efficiency of the specific tools in developing the economy.

If we examine the areas to be influenced, it can be seen that local governments can have an effect most efficiently on the economic and social relations to a significantly lesser extent but the influence is still firm on the fields of infrastructure and environment.

The picture is more nuanced when examining unique interactions. By examining this, relatively usable tools can be identified even in areas that can be less influenced. An example can be influencing the political environment or the topic of adapting to it. The strength of the political-political and the communicator-political relations shows the most well-suited tools for adapting to the political environment.

The other end of the scale is provided by relations with 0 value (brightest colors), that is, a correlation could not be created between, for example, the employer function and the legal environment or between the authoritative tool and the political environment. This does not mean that effective actions cannot be planned, but in the past these relations were not concerned.

66: The results of the TEM depicted on a heat map

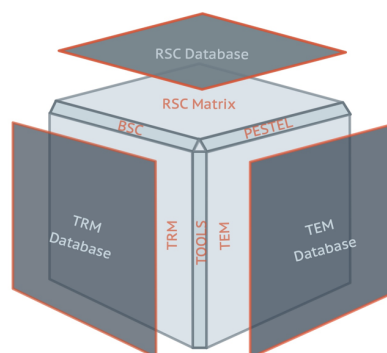| Area of effect→ Tools↓	Political	Economic	Social	Infra-structural	Environmental	Legal	Σ (Tools)	Application rate
Political	15	40	45	17	12	0	129	30%
Communicator	3	46	50	15	18	0	132	30%
Norm setter	0	8	8	6	1	0	23	4%
Authoritative	0	4	4	1	0	1	10	2%
Owner	0	32	32	19	8	3	94	22%
Market	0	23	24	3	1	0	51	12%
Altogether	18	153	163	61	40	4	439	100%

Source: Edited based on own research results: Földesová (2016)

The leaders of the settlement can get thus proper help about selecting tools on the decision areas that can influence specific external factors the most with the analyses of the database built on the TEM.

3.2.5. Tools of effective action planning

The basic instrument of the methodology described earlier is the RSC Matrix (which is an analytical table by function) that is capable in itself to support the decision preparation processes.

Based on my field experience, I came to the conclusion that although the assessment of the RSC Matrix, the TEM and the TRM helps decision-making, it can be even more expedient if these assessment frames are incorporated into a system. The complex methodology obtained this way is not only suitable for checking the economic status of a settlement but it can help settlement municipalities to give adequate answers to problems that arise during the analysis of the situation. **4** 4 illustrates how the Tool Effect matrix connects to the RSC Matrix along the environmental factors, and to the Resource matrix along the set of instruments. The latter connects to the RSC database via the dimensions of the BSC aspects (**4** 4).

4 4: **Relations of the RSC matrix**

When planning the possible actions of economy development, it is a fundamental question, how much local governments can affect areas modelled by the RSC Matrix.

Identifying possible areas of direct intervention

During the development of the methodology I was aiming for quantifiability and well measurability. According to my method, the influencability of specific areas can be calculated from the data of the Tool Effect Matrix and the Resource matrix. We can define the extent of the effect on the different areas with the sum of the product of the TEM's and TRM's values.

Demonstrating with an actual example, in order to calculate the influencability of the RSC indicator defining the Political-quality of life relation, I multiplied the values of TEM tools affecting the political environmental factors with the corresponding value that belongs to the TRM's quality of life dimension, and then I added these six products. The Effect matrix - illustrating influencability - was created by repeating this procedure for each field (7 7).
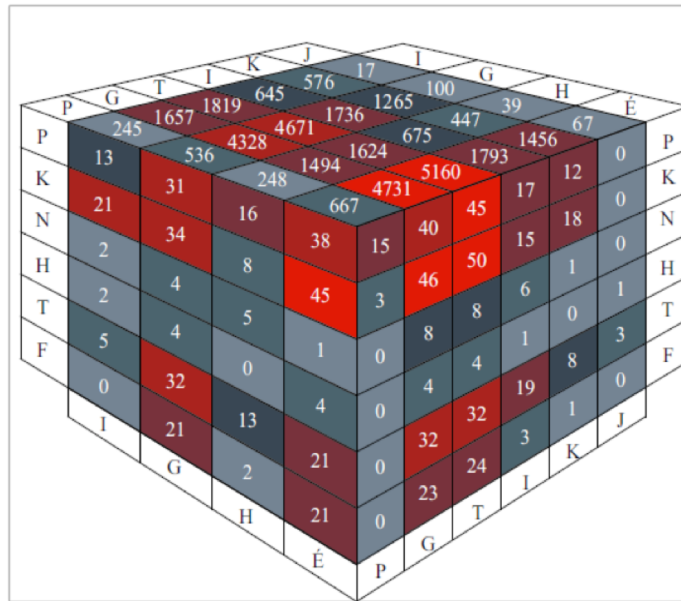
When developing a specific economy development policy, the Effect matrix shows in respect of the development points selected, how successful can be the direct development of this specific area. In the next stage of my research, I made the interrelationship of heat maps visible by connecting the three heat maps created at their same dimension edges (**5** 5).

7 7: Effect matrix - The influencability of specific areas of the RSC Matrix

Effects/Internal factors	Political	Econo- mic	Social	Infra- struc- tural	Envi- ron- mental protect- tion	Legal	Σ Internal factor [n]	Appli- cation rate [%]
Quality of life	705	4769	5160	1793	1456	67	13950	39%
Organizational effectiveness	264	1510	1624	675	447	39	4559	13%
Economy- finance	567	4359	4671	1736	1265	100	12698	35%
Innovation	258	1670	1819	645	576	17	4985	14%
Σ (environmental factors) [n]	1794	12308	13274	4849	3744	223	36192	100%
Application rate [%]	5%	34%	37%	13%	10%	1%	100%	

Source: Edited based on own research results: Földesová (2016)

Interpreting Figure 5 on the top sheet (Effect matrix), the warming colors indicate which points are worth/realistic influencing. Illustrating it via an example: the local government has made the decision at the first decision-making that they want to affect the development of the local economy positively on the relation between the Social external factor and the Economic-financial internal resource (characterized by the ASEC indicator).

5 5: Relationship of heat maps
Source: Edited based on own research results: Földesová (2016)

The selected indicator, according to the Effect matrix, can be influenced easily, and takes the value of 4328. Based on the right-hand TEM, political (40), communicational (46), owner (32) and market/employer tools (23) are recommended for this; it is worth thinking about the use of mainly financial and quality of life affecting resources.

The local economy's factors that can be influenced easier or with more difficulties can be clearly identified in the heat map illustrating the influencability of economic factors. In the following stage of my research I analyzed what relations can be unveiled between the different indicators and whether we can identify indicator groups whose elements are not entirely independent of each other. The practical significance of this analysis is that the identified correlations might enable the indirect development of areas which cannot be influenced as much, by using interventions aimed at areas characterized by the related indicators. I chose the analysis of the main component of indicators as the method of my research. I identified six main components by reducing data (

8 8**Hiba! A hivatkozási forrás nem található.**.

 Five indicators (AQEN, AECEN, AIEN, AECL, AIL) could not be involved in the main component creation.

Possibility of indirectly developing areas that can be influenced with difficulties

The **F₁ main component** contains indicators mainly about development management. AOEEN characterizes the investments regarding environment protection; the AECP provides information about the settlement's ability to exercise resources; AOEP characterizes the operational efficiency of the management through the accuracy of the financial planning of the local government. When assessing the dimensions of the component indicators, we can see that two indexes are the index numbers for adjusting to the political environment, and two contain the aspect of organizational effectiveness. The factors thus: Efficiency of environment management (AOEEN); Ability to create resources (AECP); Efficiency of resource utilization (AOEP).

The **F₂ main component** includes the local livelihood opportunities. Accordingly, two indicators refer to the quality of life, and three contain the relation to social environment.

Main component F₃ contains three indicators related to infrastructure (AQI, AOEI, and AII), therefore, this component became the factor's denominator feature. It covers a wide range of spectrum: from the accessibility of public services through the quality of the IT tools of the local

government, that ensures the supporting environment of the economy, to the broadband internet access available in the settlement.

The **F₄ main component** was named entrepreneurial activity. The component indicators, if examined from the dimension viewpoint, provide information about the relationship of innovativeness, the economic-financial internal characteristics (AECEC, AECI), the economic (AECEC, AIEC), and the infrastructural (AECI) environment. The primary meaning of the indicators gives an image about the local entrepreneurship: the number of new and middle-sized enterprises, as well as the added value generated by enterprises show the functioning of the local real sphere from multiple views.

The **F₅ affiliated indicator group** embraces some areas of settlement management. The two efficiency and two legal dimensions relate to the security and flexibility of the regulator environment.

Main component F₆ contains the indicators characteristic of the local social activity. Political activity, lobbying power, the stability of the local management and civilian courage is combined in this factor.

8 **8**: **Characteristics of the F₁-F₃ main components**

Variables of the main components	Communa-lities	Retained information (%)	Min./Max
F₁: Development management			
AOEEC - size of expenses spent on environmental investments projected to 1000 heads	0.399	36.983	-5.218
AECP - the proportion of development resources won by the settlement per thousand people of the settlement and the national development resources per thousand people of the country	0.258		
AOEP - The ratio of unfinished investment and renovation expenses of the local government compared to the original estimate of the budget	0.453		4.6129
F2: Livelihood opportunities			
AQEC - Net yearly income per inhabitant (thousand Fts)	0.827	62.167	-2.957
AQS - Unemployment rate	0.681		
AOES - Long-term unemployment rate amongst the unemployed (%)	0.249		1.992
AECS - The quotient of the taxpaying population number and the working age population number	0.730		
F₃: Infrastructure			

Variables of the main components	Communa-lities	Retained information (%)	Min./Max
AQI - Number of public services accessible in 30 minutes by public transport	0.553	47.078	-2.727
AOEI - The average age of IT-tools	0.444		
AII - number of broadband internet accesses on the settlement projected to 100 heads.	0.416		2.748
F₄: Entrepreneurial activity			
AECEC - Gross Value Added (GVA) per enterprise	0.521	36.142	-4.482
AECIN - Number of middle-sized enterprises per 1000 inhabitants weighted by FEI index	0.282		
AIEC - The number of newly registered enterprises per thousand inhabitants.	0.281		6.241
F₅: Settlement management			
AQL - The number of new regulations and regulation amendments in proportion to all regulations.	0.642	47.041	-1,930
AOEEC - The change of the local taxing power compared to the increase of GDP	0.386		
AOEL - The number of operative and valid strategical documents in proportion to mandatory documents	0.383		5.883
F₆: Social activity			
AIP - The proportion of municipal council candidates and the number of municipal council seats (%)	0.374	41.094	-3.498
AQP - Support ratio of the mayor candidate of the government party and the nominating body of the government party	0.608		
AIS - Number of non-governmental organizations per 100 inhabitants	0.251		2.698

Source: Custom information (2018) (N=132)

Returning to the original question, that is, how to find a method to shape areas that can be hardly influenced, the question is: have we received an answer by analyzing the main components. I compare thus the values of the Effect matrix with the position of the factors (9 9). It can be seen that three factors got into main component F_1: one that is hard to influence, and two that can be influenced somewhat easier, but still only modestly; here we can hope for a real added option only by the synergy of factor-forming indicators.

In groups $F_{2,4}$ the situation is just the opposite: local governments have good tools for developing practically every relation. Therefore, the factor effect is not relevant again, although because of a contrary reason.

The situation is different in the case of main components $F_{3,5,6}$ .In these groups both areas that cannot be developed easily are connected to one that can be influenced somewhat easier, which, if needed, can enable the indirect development of the two weaker relations.

9 9: Position of factor-forming indicators on the analysis chart

Effects/Internal factors	Political	Economic	Social	Infra-structural	Environ-mental	Legal
Quality of life	AQP 705	AQEC 4769	AQS 5160	AQI 1793	AQEN 1456	AQL 67
Organizational effectiveness	AOEP 264	AOEEC 1510	AOES 1624	AOEI 675	AOEEN 447	AOEL 39
Economy-finance	AEP 567	AEEC 4359	AES 4671	AEI 1736	AEEN 1265	AEL 100
Innovation	AINP 258	AINEC 1670	AINS 1819	AINI 645	AINEN 576	AINL 17

Source: Custom information, 2018

To summarize, it can be said that by analyzing the main components, I found adequate tools for indirectly developing six areas that can be influenced only slightly. I could not find direct development tools for three factor-forming areas; another three areas can be influenced only slightly and they don't participate in the main component forming. The developed tool can be regarded effective, if we consider that we found some kind of development approach to 50% of 12 areas that have an influencability value below 1000, thereby the settlement management choosing the RSC Matrix can have influence on 75% of the 24 examined relations. Considering that we speak about the development of the real economy with public authority tools, this ratio can be regarded adequate.

3.2.6. Settlement typology with an RSC approach and its opportunities

I showed at the analysis of the primary benchmark data that one part of the economic indicators correlates with settlement size, whereas other indicators change based on regional location. However, there are some features that show a prominent correspondence to none of the aspects listed. One can question whether a special settlement typology can be created based on and corresponding to the approach of RSC methodology, and whether the comparison of settlements - based on the new approach - provides additional information for developing the local economy. I used the cluster analysis method for the research. For the calculation, I applied the main components created by the indicators of the 132 settlements examined.

I identified four clusters (1010). Settlements belonging to category "1" have good infrastructural conditions, and vivid settlement development takes place with serious fundraising, which is based on prominent settlement management. The quality of life is somewhat better than the average, however, the entrepreneurship is rather average yet. Social activity is strikingly modest, as if the locals would turn their awakening initiative for the time being towards economic activities. I gave this cluster the name "Emerging" based on the good/improving conditions and strong control. 8% (11 pc) of the settlements assessed got into this group. The cities of Tapolca, Balatonfűzfő, Makó,

Csongrád, Szikszó and as a surprise, some smaller settlements (Alsóvadász, Halmaj) belong to this group.

The second cluster is similar in size, but has a significantly different character. The livelihood characteristics, similarly to the first cluster, can be deemed favorable, and we can see a somewhat weaker but still an imaginative settlement management. However, the efficiency of settlement management became much weaker and perhaps partly as a result of this, the underdevelopment is grave regarding the infrastructural conditions. It is interesting that here is social activity the biggest, whereas entrepreneurship is the weakest among every cluster. I found the "Endangered" attribute the most fitting for this cluster (for example, Nyírábrány, Hövej, Kövegy).

1010: Forming settlement clusters based on main components

	Cluster			
	1. Emerging N=11	2. Endangered N=10	3. Opportunists N=101	4. Fortunate N=10
Development management	0.782	-1.956	0.120	-0.114
Livelihood opportunities	0.215	0.215	-0.137	0.931
Infrastructure	1.593	-0.232	-0.171	0.209
Entrepreneurial activity	0.029	-0.274	-0.203	2.294
Settlement management	0.975	0.354	-0.144	0.033
Social activity	-1.582	0.433	0.090	0.395

Source: Custom information, 2018

The majority of the settlements examined belongs to cluster 3 (101 pc, 76%). Modest development, and livelihood opportunities below the total settlement average characterize this group. Underdeveloped infrastructure, insignificant entrepreneurship and average social activity can be read from the numbers. Settlement management seems the weakest in this group. By and large, stagnation or slow deterioration can be seen in these settlements. The development directions are usually defined not by a vision or strategy based on consensus, but by the emerging opportunities. Therefore, I named this cluster Opportunists.

The fourth cluster is the not too populous group (N=10, 8%) of settlements enjoying prosperity. The outstanding livelihood is based on a strong and broadening entrepreneur stratum and the best infrastructural conditions among the clusters. Relative welfare allows a more spirited social life, however, in this medium, settlement management and development works are neglected somewhat. It is interesting that we can find rather smaller settlements in the cluster which explains the few but successful enterprises and the not too many workplaces - but when taking the settlement size into consideration, it is significant - , just like it explains the modest ratio of liable sources, because the current rural development policy does not favor smaller settlements. The cluster received the name "Fortunates". (Typical representatives: Kékkút, Kapoly, Kára (sic.), Veszkény)

Further on, it will be worth calculating the benchmark matrixes of the clusters identified, because this way we get newer comparison opportunities by which we can get a better idea about defining development objectives.

4   CONCLUSIONS, RECOMMENDATIONS

I present the result of the research with the realization of the objectives and the validation of the hypotheses.

4.1   Results of the objective assessment

O_1: Defining the action space and action objectives by examining the relation of environmental factors and internal resources. When assembling the indicator system, it was an important aspect to get a comprehensive picture about the interactions between the settlement and its environment as much as possible. Accordingly, I chose criteria sets to characterize the two dimensions whose adequacy has long been proven by positive experience (PESTEL, BSC). The connection between the two dimensions was created by the indicator table of the RSC Matrix (**11**). Based on experience, the indicators are good representatives of the local economy's areas, and the matrix ensures the completeness of the relations examined. Thereby, I have managed to achieve this objective.

O_2: Discovering and presenting the connection between the available tools and the environmental factors. I began this work stage by thematically grouping the extensive set of instruments of the local governments. I identified six distinct roles and six set of instruments related to them; afterwards I assessed the relation of the specific tools and the environmental factors by analyzing successful economy development actions. The results provide a differentiated image about the possibilities and limits regarding the use of municipal tools in local economy development (**66**).

O_3: Discovering the relationship between the tools and the related resources. For this purpose, I examined the relation of local resources that can be used for economy development and the set of instruments of the local government by processing case studies. The TRM illustrates the needed result plastically (**4**).

O_4: Discovering the hidden relations of the local economy. During the research, I examined the relations between the RSC indicators with the method of the main component analysis. As a result of data reduction, 19 indicators from 24 were gathered into six factors (

8 8). Knowing the relations between the indicators enables indirectly influencing specific economic areas. Overall, 5 indicators remained that did not show any relation to any other indicator, therefore, in my view I achieved this objective as well, even if not perfectly.

O_5: The methodology should provide structured and clear-cut information for creating the development centers of gravity and for planning the economy development actions as well by systematically implementing and integrating elaborate system elements. We get a comprehensive overview about the strengths of the local economy and its areas to be developed with the comparative analysis of the benchmark tables and the values of the RSC Matrix; the Effect matrix and the results of the main component analysis provide adequate orientation for selecting the intervention areas to be influenced the most effectively. The TEM and the TRM supports the planning of adequate measures, and the case study collection created in context with it can play an inspiring role in the planning process. Based on the methodological elements listed and their connections, as well as on the experience of the pilot project introduced, I reckon that I have also achieved this objective.

O_0: Developing a methodology that supports the local government's efforts aimed at developing economy with the tool system of evidence-based decision-making. The O_{1-5} results enabled creating a complex enough but practicable quantitative methodological system that offers decision

makers the tools for evidence-based decision-making starting from the analysis of the situation until the creation of action plans.

4.2 Results of the hypothesis assessment

H₁: Economy development tools of local governments are not equally effective when interacting with the different environmental factors. By assembling the Tool Effect Matrix (TEM), I examined which environmental factors - dividing environmental factors based on the PESTEL logic - are the most effective when in interaction with the identified municipal set of instruments. The results of the examination showed (**66**) that the diverse tools show a spectacular difference in their effect patterns. Based on the results of the assessment, I regard the hypothesis proven.

H₂: The relations between the available resources and the local governmental tools are not of the same strength. I examined the relation between the relevant internal factors (divided by the aspects of the Balanced Scorecard) and the municipal set of instruments with the Resource Matrix (TRM). The result of the examination showed a similarly differentiated image as the TEM. The results of the TRM proved the hypothesis (**4**).

H₃: The different areas of local economy development can be influenced to a different extent. The Effect matrix calculated from the TEM and the TRM (7 7) shows that the areas marked by the indicators of the RSC matrix can be influenced to a different extent. Approximately 50% of economic areas can be influenced directly. Half of the remaining areas can be influenced indirectly by developing the areas of the same factor. The results proved the hypothesis.

H₄: Every identified area to be developed can be developed by implementing the appropriately selected tools systematically. Based on the data of the Effect matrix (7 7 7) there is no area that cannot be affected by the local government. However, I identified several areas that can be influenced extremely poorly. Therefore, I can view the hypothesis only partially proven.

H₅: Knowing the system of relations allows the indirect influence of economic factors that are more difficult to shape. As a result of the main component analysis, I found a complementary tool for direct development for six of the 12 areas that can be influenced with difficulties, that is, for 50% (9 9). I found completeness exaggerated from the beginning, I reckon the hypothesis proven.

H₆: Settlements can by grouped into typologies based on the characteristics of local economy. I made a cluster analysis using the factors identified and the RSC indicators that do not create factors; as a result, I could identify four distinct settlement types (1010). The result proves the hypothesis.

4.3 Recommendations

R₁: I deem it necessary to create a benchmark matrix based on the clusters identified. The comparison based on the new aspect can further nuance the selection process of development areas.

R₂: The methodology in its current state does not mention the structuring of the actions defined. I deem it worthy to think about what attributes could be used to characterize the specific actions. For example, such an attribute can be the implementation's cost, human resource demand and externalities; the urgency of the action, the risk of leeway, the time requirement of implementation and several other aspects. Organizing these and visualizing the measures based on multiple criteria and in a customer-friendly way is still a task ahead of me.

R₃: The methodology concerns at length about analyzing and defining the elements of the action plan, while designing clearly the position of content elements and assembling the unified table of contents and document outline necessary for creating homogeneous analyses.

R₄: At the moment, the database of the methodology reference contains only convergence regional settlements. A useful improvement opportunity is to extend the database with the settlements of the Central Hungarian region.

R₅: After obtaining an adequate number of implementation experience, the creation of analytical matrices and the process of proposals can be supported with a uniquely developed software. The dangers of automation must be paid attention to, and enough room must be given for expert intervention in every work phase.

R₆: It is worth developing the RSC-based monitoring of economy development, whose goal is to objectively keep track of the realization of the Local Economy Development Program. Of course, the exact, numerical definition of target values is necessary for this. An in-depth and adequately received feedback enables the timely execution of corrections that are necessary from time to time.

4.4   New and novel scientific results

My new and novel results are methodological adaptations, analytical and evaluation technics for optimizing decision-making objectives.

- A novel adaptation is the indicator matrix (RSC matrix) that models the relation between the external factors affecting the settlement and the internal factors characterizing the settlement with quantitative tools.
- The logical system of the reference database needed for additional analyses can be regarded novel, which enabled comparative work based on many aspects.
- The regional analysis based on settlement size and deduced from the database provided benchmark data in an innovative way, with which relevant aspects can be designated for the economy development of settlements.
- I regard the experience fact deduced from the comparative analysis of benchmark tables that were made according to regional and settlement size: part of the indicators characterizing a settlement are depending on region and settlement size.
- I identified six characteristic municipal roles with a novel methodological adaptation, based on the regulation features of the municipal sphere; to each role I matched the set of instruments that can be attached by the legislator, which enabled the assessment of the relation between the set of instruments and the environmental factors, as well as the resources of the settlement. I summarized the relations in the Tool Effect Matrix (TEM) and the Resource Matrix (TRM). The two matrices can support the planning of economy development actions.
- By linking the three tools, that is, the RSC matrix, the TEM and the TRM, corresponding to my initial concept, a set of instruments with consistent logic was created that can be used effectively in the regional and settlement economy development.
- The realization of the need of grouping settlements into types - mentioned earlier - was done by using the factors. The settlement cluster system consisting of four RSC approach is novel, which enabled the opportunity to perform additional analyses.
- The Effect matrix is used in a novel way regarding its methodology; it helps in revealing the influencability of economic areas characterized by different indicators. The matrix created and the heat map built on the values of the specific fields gives a plastic image about the extent of the direct influencability by local governments. I proved several direct development opportunities by the main component analysis of the RSC indicators.

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5 LIST OF PUBLICATIONS RELATED TO MY RESEARCH SUBJECT

Revised article/book in a foreign language

1. MOLNÁR, M., LENDVAY, E. (2016): Possibilities to identify action points in economic development of local management. In: Journal of Management (2016 Nr 1(28)) Klaipeda University Press, Klaipeda pp. 111. (ISSN 1648-7974)
2. LENDVAY, E. Instrumentele dezvoltării economice ale autorităţilor publice locale din Ungaria. (Economy-developing tools of the Municipals in Hungary). In: Revista Transilvană de Ştiinţe Administrative, 2(39)/2016, pp 113-122 (ISSN-L 2247-8329, ISSN 1454-1378) http://rtsa.ro/rtsa/index.php/rtsa/article/view/535/532
3. LENDVAY, E. (2016): The Context-sensitive economic development at the local governments in Hungary, Selye e-studies, 7/2016, pp-4-12 (2016) (ISSN 1338-1598)

Revised article/book in Hungarian

4. MOLNÁR, M., LENDVAY, E. (2012): A helyi társadalmat és gazdaságot meghatározó sikertényezők vizsgálata Tiszaladányban. In: Acta Regionis Rurum 6. (2012) Szent István Egyetem Gazdaság- és Társadalomtudományi Kar, Gödöllő, 116-122. pp. (ISSN 1789-5588)
5. LENDVAY, E. (2017): Komplex szemlélet a helyi gazdaságfejlesztésben – Comitatus (2017. Tavasz), Comitatus Társadalomkutató Egyesület, Veszprém, 68-77. pp. (ISSN 1215-315X)
6. LENDVAY, E. (2010): Értékközpontú településirányítás – A politikai, gazdasági mozgástér visszanyerésének lehetősége. Önkormányzati Pénzügy (2010. február) Complex Kiadó Kft., Budapest, 21-24. pp. (ISSN 2060-6117)

Conference publication in a foreign language:

7. LENDVAY, E. (2013): The possibilities in the economic development of the local governments. In: Lengyel I. - Vas. Zs. (2013) (eds.): Regional Growth, Competitiveness and Development. University of Szeged, Faculty of Economics and Business Administration, Doctoral School in Economics, Szeged, pp. 26-36. (ISBN: 978-963-306-222-7) http://www.eco.u-szeged.hu/kutatas-tudomany/workshop/workshop
8. LENDVAY, E. (2014) Adaptability as strategy of local development In: Csata A. – Fejér-Király G. – György O. – Kassay J. – Nagy B. – Tánczos L. J. (2015) (eds.): Gobal challenges, local answers - Challenges in the Carpathian Basin. Editura Risoprint Publishing House, Cluj-Napoca, pp. 59-54. (ISBN 978-973-53-1565-8)

Conference publication in Hungarian:

9. LENDVAY, E., NAGYNÉ MOLNÁR M. (2013): Önkormányzati szerepek és eszközök a helyi gazdaságfejlesztésben. In: Lukovich Miklós - Savanya Péter (Szerk.) (2013): Új hangsúlyok a területi fejlődésben. JATE-Press, SZTE Gazdaságtudományi Kar, Szeged, 209-224. pp.
(ISBN: 978-963-306-247-0) http://www.eco.u-szeged.hu/download.php?docID=27386
10. LENDVAY, E. (2013) Önkormányzati szerepek és eszközök a helyi gazdaságfejlesztésben. (Municipalroles and tools in the local economy development) In: Rechnitzer J. – Somlyódyné Pfeidl E. – Kovács G. (Szerk.) (2013): A hely szelleme – a területi fejlesztések lokális dimenziói. Széchenyi István Egyetem Regionális- és Gazdaságtudományi Doktori Iskolája, Győr, 353-363. pp. (ISBN: 978-615-5391-10-1)
11. LENDVAY E., NAGYNÉ MOLNÁR M. (2014): A környezethez való alkalmazkodás, és eszközei a helyi gazdaságfejlesztésben. The tools of adapting in the local economic development In: Takácsné György Katalin (Szerk.) (2014): "Az átalakuló, alkalmazkodó

mezőgazdaság és vidék" – XIV. Nemzetközi Tudományos Napok, KRF, Gyöngyös, 967-975. pp. (ISBN 978-963-9941-76-2)

12. LENDVAY E. (2016): Beavatkozási pontok azonosításának lehetőségei a települési gazdaságfejlesztésben Option of defining intervention points in local (economic) development. In: Takácsné György Katalin (Szerk.) (2016): "Innovációs kihívások és lehetőségek 2014-2020 között" – XV. Nemzetközi Tudományos Napok, KRF, Gyöngyös, 1043-1050. pp. (ISBN 978-963-9941-92-2)