Institutional Determinants of Higher Education Students' International Mobility within the Erasmus Programme Countries

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SUMMARY

One of the major EU policy objectives is to enhance the international mobility of students. The Leuven Communiqué published in 2009 set an objective of increasing the ratio of European Higher Education Area (EHEA) higher education graduates participating in a study or a training period abroad to at least 20% by 2020. However, currently the majority of European Union Member States perform significantly below the target in this respect. Also, since a low number of students are interested in mobility programmes, the funds of the Erasmus-type student mobility programs remain unused. This study focuses on highlighting the factors that represent barriers to student participation in mobility programs. After conducting a literature review on international student mobility and presenting major statistics describing outbound mobility, this study investigates factors related to institutional components of the higher education system that affect the international mobility of Erasmus young people. Among the explanatory factors related to Erasmus-type student mobility, cultural factors including Hofstede's indulgence and uncertainty avoidance seem to have the greatest influence on student mobility intentions in Europe. The findings revealed that better planned Erasmus processes (pre-, during and post-mobility activities such as departure, course choice, staying in a host country, etc.) and better communicated career opportunities and labour market values of the mobility could considerably contribute to an increase in the number of outbound students. One of the main lessons learned from the conducted analyses is that Europe's rich cultural diversity needs to be considered in the course of promoting the Erasmus Programme in Europe. In addition to adopting common communication, promotion and direction strategies, programmes need to be elaborated that take national specificities into account.

Keywords: Erasmus, higher education, student mobility, culture, institutions
Journal of Economic Literature (JEL) codes: F22, I23, J61, M14
DOI: http://dx.doi.org/10.18096/TMP.2018.02.01

INTRODUCTION

The Bologna Declaration (1999) targeting the creation of the European Higher Education Area (EHEA) set out six main goals, one of the key pillars of which was to facilitate the mobility of students, teachers and researchers and to recognise qualifications and periods of study. The Bologna Declaration was originally signed by 29 European countries and a further 19 counties joined the Bologna Process in eight Ministerial Conferences later. (The tenth Ministerial Conference of EHEA was held in Paris in May 2018). Point 18 of the Leuven Communiqué (2009, p. 4), which is the outcome document of the sixth Bologna Ministerial Conference in Leuven, states that in 2020 at least 20% of those graduating in the European Higher Education Area should have had a study or training period abroad. This objective was further developed in the 'Education and Training 2020' work programme (a part of the Europe 2020 strategy), which stipulated that students participating in mobility abroad should have a minimum of 15 ECTS credits or the mobility should last a minimum of three months (Agostini & Capano 2013, p.153). The mobility period abroad is not capped. Thus, studies abroad with the aim of obtaining a degree also contribute to meeting the objectives set by the Leuven Communiqué as just much as Erasmus-type studies or practical workplace

experiences. This study aims at investigating the Erasmus-type mobility.

In order to meet the set objectives, the budget for Erasmus programme was considerably increased in the EU budgetary cycle of 2014-2020. The budget for Erasmus was about €2 billion in 2014, whereas in 2020 it will amount to almost €3.5 billion (EC 2015, p.11). Hungary considers objectives formulated in the Leuven Communiqué as priorities. According to the objective set by the Ministry of Human Capabilities of Hungary, 20% of those graduating from higher education institutions should have spent a study or training period abroad by 2023 (Palkovics 2016). The Campus Mundi Programme also contributes to achieving the above objectives and HUF 9.2 billion is allocated from the EU funds to enhance the internationalisation of higher education in the period between 2016 and 2021. This amount includes HUF 5.7 billion allocated for scholarships in order to promote non-degree mobility studies and traineeships abroad (Tempus Public Foundation 2018).

A very specific situation has emerged. Although the resources for mobility scholarships are guaranteed, students' mobility intentions have not increased. In order to utilise the increasing resources, over 6,000 Hungarian university students should spend study or training periods abroad on the Erasmus scholarship in 2020. However, the outbound mobility rate has been around 4,000 students for ten years. The Erasmus quota available for Hungary considerably exceeds the number of those actually aspiring to travel abroad on Erasmus (Tempus Public Foundation 2015, p. 5).

The Hungarian higher education is facing major challenges in boosting student mobility to the required level. The topic of this research study is closely related to this problem, since this study aims at identifying the institutional factors that have a hindering or facilitating effect on promoting students' partial mobility studies abroad in European countries. If the system of effect factors can be identified, then realistic possibilities can be explored for influencing these factors in the short term and meeting the set mobility objectives. First, this study provides a review of the available literature on the factors influencing student mobility. Then the cultural dimensions and their effects are addressed. Also, international student mobility in Europe is presented. Finally, the hypotheses that are tested and summarised in the last part of this study are formulated. The database used for testing the hypotheses was compiled from the secondary sources (Eurostat, European Social Survey, etc.) where a cross-sectional analysis of EU-28 and Erasmus programme countries was performed.

FACTORS AFFECTING MOBILITY

Factors affecting mobility may be both facilitating and hindering. As for their effect mechanism, they may exert their effects at personal, institutional and national levels.

Factors hindering student mobility are mostly lack of adequate information (Vossensteyn et al. 2010; Bartha et al. 2017) or lack of financial resources (Eurobarometer 2009; Bryla & Ciabiada 2014). Although the level of grant has considerably increased over the past years, financial constraints continue to be leading barriers to mobility. Another potential barrier to mobility is deficiencies in foreign language skills (Vossensteyn et al. 2010; Hauschildt et al. 2015; Bartha et al. 2017) and lack of motivation (Wächter & Maiworm 2008; Vossensteyn et al. 2010; Hauschildt et al. 2015). Apart from these factors interpreted at an individual level, there are also hindering factors related to particular higher institutions or even to the higher education system of a particular country. Teichler et al. (2011) investigated the student mobility of thirty-two countries participating in the Erasmus programme and reported that the regulatory frameworks of particular countries significantly affect students' mobility patterns. They are as follows: the availability of mobility windows, geographical and language preferences, the process of credit recognition and the standard of services. The recognition of credits awarded abroad is a general problem (Bracht et al. 2006; Souto-Otero et al. 2013; Bartha et al. 2017). A similar concern is that curricula are not harmonised and students on partial study mobility face major challenges when they attempt to find courses provided by host institutions that can be recognised by their home institutions (Kehm 2005).

Teichler et al. (2011) highlight three major facilitating factors: financial facilitators (available in different forms provided by scholarship programmes), curricular-related facilitators (mobility windows, double and joint degree programmes and the language level of education) and personal facilitators (the standard of provided services). The latter are also emphasised by Kelo, Rogers and Rumbley (2010), potential benefits including perspectives in the labour market revealed by several surveys (for example, EC 2014). After conducting a survey among Brazilian students and lecturers, Oliveira and Freitas (2016) classified facilitating factors into three groups: personal, education and career-related motivators. According to Engel (2010), Erasmus students from Central and Eastern European countries seem to profit more from participating in the programme than their peers from Western Europe. A facilitating factor can be the participation experience itself. The conducted surveys (for example, Gallup 2011) support the evidence that participants who have already been on mobility abroad tend to apply for the programme again. Golob and Makarovic (2018) highlighted the importance of students' international networks built in the course of the programme and their facilitating effects.

Azmat et al. (2013) describe pull and push factors in their model. Pull factors include attractive forces, knowledge level, cost level, geographical closeness of the country and the institution, and the level of the organisational support. The standard of education in the

home country/institution, demographic factors, income factors and family background belong to push factors.

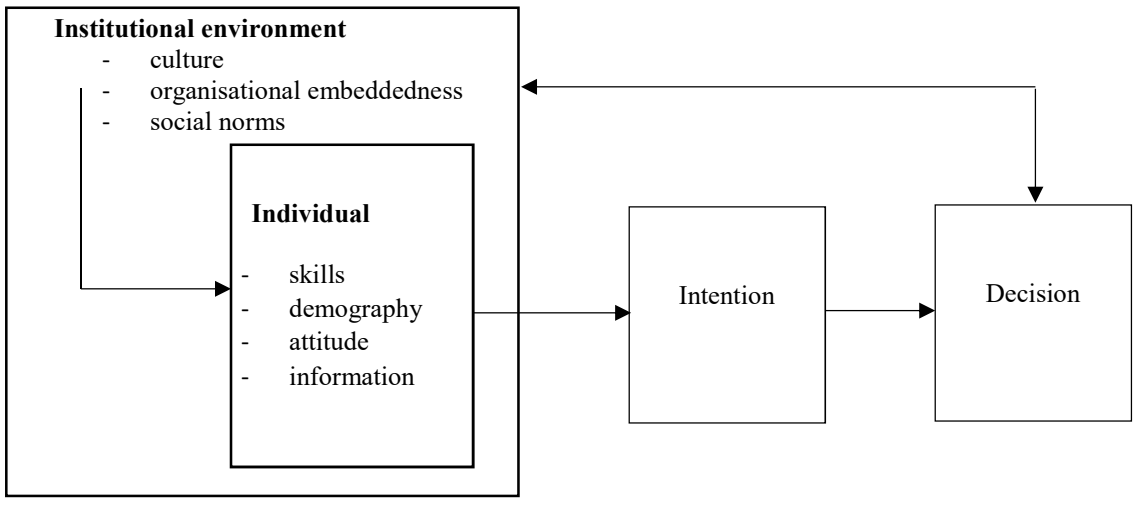
These facilitating and hindering factors can be perceived in a particular institutional environment. The existing formal and informal rules can motivate individuals on the one hand, but on the other hand may place barriers and restrain them from formulating their intentions and making decisions. The opinion of the immediate environment (family members, friends, reference points) is also of determining importance. Impact factors of mobility aspirations and decisions are personal skills (communication skills, language skills), demographic specificities (gender, age, field of study, family background), personal attitudes (to the international environment and mobility) and the information obtained (possibilities).

This study uses aggregated data (data are not broken down to individual level) and investigates the relationships between the institutional environment and the decision-making process.

CULTURE AS AN IMPACT FACTOR

The conducted empirical surveys reveal that one of the main hindering factors of mobility is fear of an unknown environment, of the unknown and fear of making changes (for example, Klahr & Ratti 2000; Sanchez et al. 2006). Since we are of the opinion that the cultural factor depends on cultural values, this study addresses the influence of this factor on student mobility activities. The measurement of culture frequently used in a business context is linked to the Hofstede cultural dimension and the Globe project. This study applies the Hofstede dimensions used for international comparisons because their values are relevant to all countries under investigation and are available for public use. Hofstede dimensions are defined as follows (Hofstede Insights 2018):

1. Power distance expresses the degree to which the less powerful individuals in lower hierarchical positions accept and expect unequal power distribution.
2. Individualism versus collectivism expresses whether the identity is based on an individual or whether the identity is defined by a group to which an individual belongs.
3. Masculinity versus femininity expresses the degree to which gender roles are separated from each other and the degree to which social cohabitation is based on material success, heroism, achievement, and competitiveness; feminine societies on the other hand are characterised by striving for consensus.
4. Uncertainty avoidance expresses the degree to which unknown situations, unpredictable and unorthodox development of events threaten and make society members uncertain; in societies with high uncertainty avoidance, traditions and customs play a crucial role, which results in low openness to change;
5. Long-term versus short-term orientation expresses the degree to which societies prefer to maintain a forward-looking, innovative and pragmatic approach rather than an approach built on traditions and old convictions; this dimension is often presented as a normative approach versus a pragmatic approach;
6. Indulgence versus restraint: in indulgent societies more emphasis is placed on the relatively free enjoyment of life; whereas in restrained societies emphasis is placed on the suppression of instincts and strict social norms.



Source: own elaboration

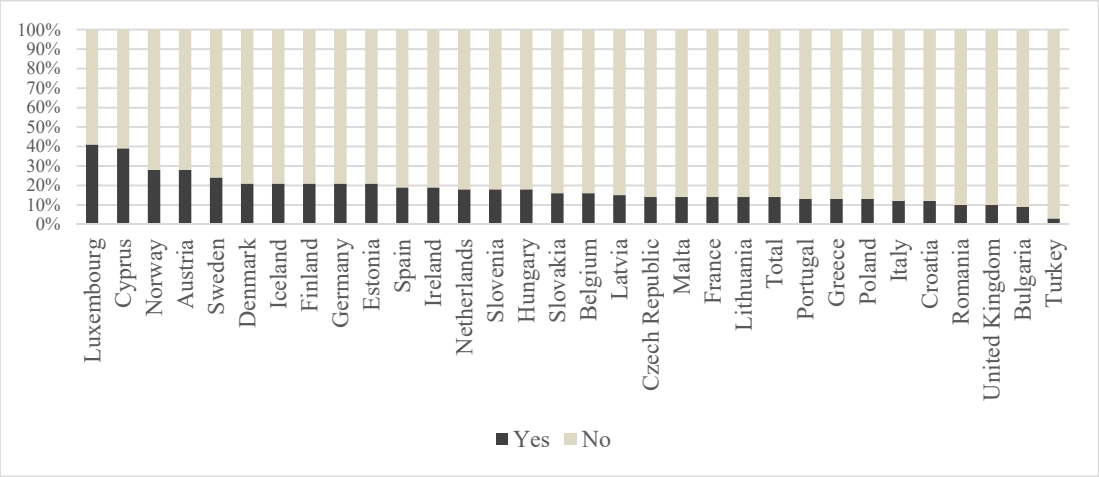
Figure 1. Decision model of student mobility abroad

Other cultural elements (partners, European institutions, confidence in European values, and community activities) that are indirectly measured by the Hofstede dimensions may also affect mobility. The findings of the European Social Survey are used for testing the effects of these elements (ESS 2016).

INTERNATIONAL STUDY AND TRAINING MOBILITY

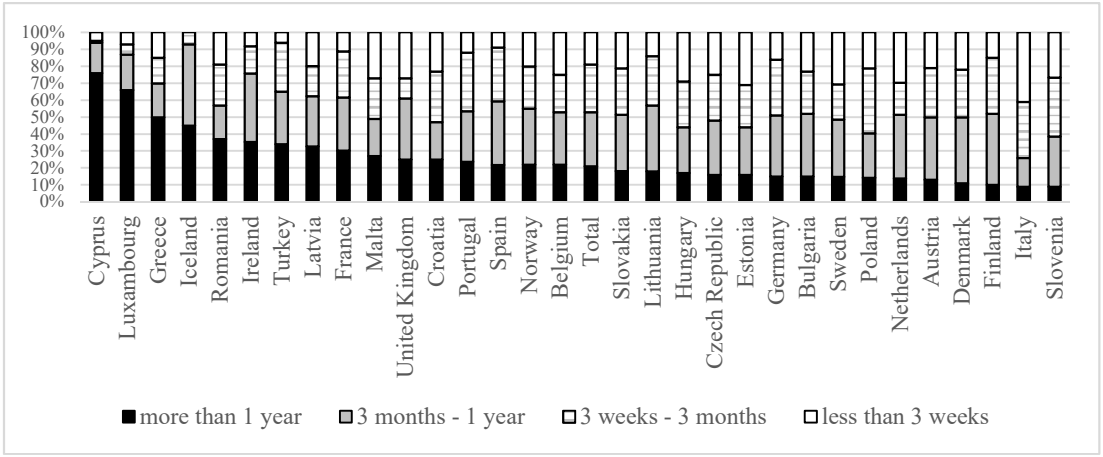
The Youth on the Move (Gallup 2011) study conducted by the Gallup Organisation provides data for mapping international student mobility. The study interviewed over 30,000 young people aged 15-35 about their intentions regarding mobility for internship or study. Although the survey was conducted in the early 2010, a similar extensive and comprehensive data collection on all Erasmus programs has not been conducted since then. According to the survey, one in seven of the sampled young people had participated in mobility abroad for education or training purposes. The study revealed significant national differences. The lowest proportion of the sampled students reporting that they participated in mobility abroad for education purposes (Figure 2) was found in Turkey (3%), followed by Bulgaria (10%). The highest mobility was observed in Cyprus and Luxembourg (above 40%).

The length of the stay abroad also varied across the surveyed countries, as shown in Figure 3. Respondents from Cyprus (76%) and from Luxembourg (66%) stayed abroad for more than one year. As for the mobility abroad lasting more than three months, responses given by the young people from Iceland showed high statistical figures, with 48% of the respondents with mobility experience reported staying abroad for more than one year and another 48% reporting that their studying mobility abroad had lasted between three months and a year. The proportion of young people staying abroad for less than three weeks was the highest in Italy (41%). Italian respondents who spent more than one year abroad amounted only to 9% of all Italian mobility participants.



Source: Gallup 2011

Figure 2. Have you stayed abroad for learning or training purposes?



Source: Gallup 2011

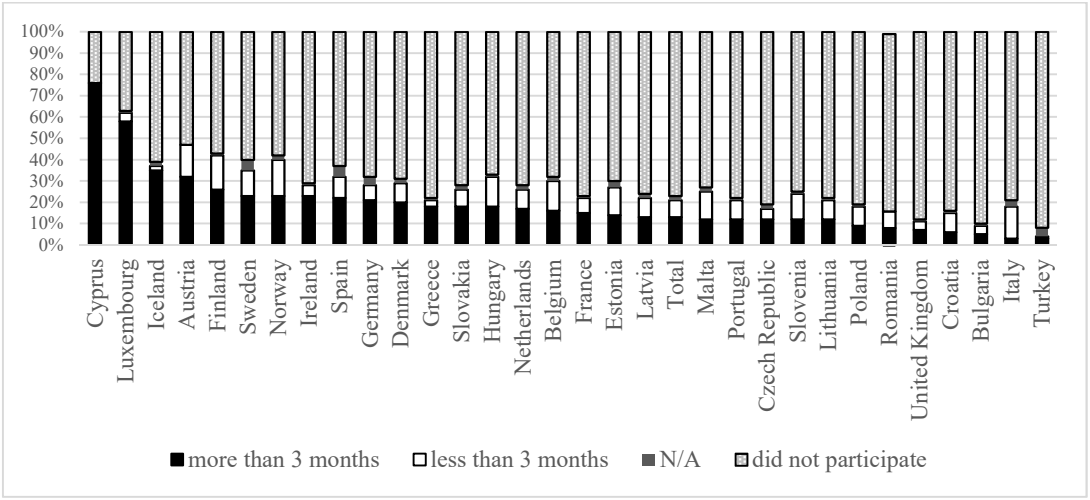
Figure 3. How long did your mobility last?

According to the Gallup survey, the mobility of students studying in higher education institutions is the highest, since 23% of them participated in programmes for study or traineeship purposes. Figure 4 shows participation by country: the proportions of students who had not chosen a foreign institution was the highest in Turkey, since 92% of young people did not spend any time abroad at all and only 3% of them stayed abroad for more than three months. The highest mobility data were observed in Cyprus, where only 24% of respondents did not join international mobility and 76% stayed abroad for a period longer than three months. In several countries the proportion of mobile students who stayed abroad for a short period is higher than the average, for example, Norway (17%), Finland (16%), Austria and Italy (both 15%).

ERASMUS + MOBILITY

According to the Gallup survey, a large proportion of respondents financed their stay abroad through private funds in England, Austria, Luxembourg, Germany, Spain, Greece and Cyprus (home country). This proportion amounted to more than 70%. The proportion of EU-funded mobility programmes was the highest in Lithuania and Finland (over 30%) (Gallup 2011, p. 35).

Figure 5 shows national differences in student mobility in the framework of the Erasmus+ mobility programme across countries. As in the case of mobility for studying and training purposes, a significant proportion of students who had participated in the Erasmus+ programmwere observed in Luxembourg and Iceland and the lowest proportion was seen in Turkey. Although the highest overall student mobility was experienced in Cyprus (see Figure 3), only a small proportion of stays abroad were Erasmus funded.



Source: Gallup 2011

Figure 4. Study or training mobility of respondents with a higher education degree

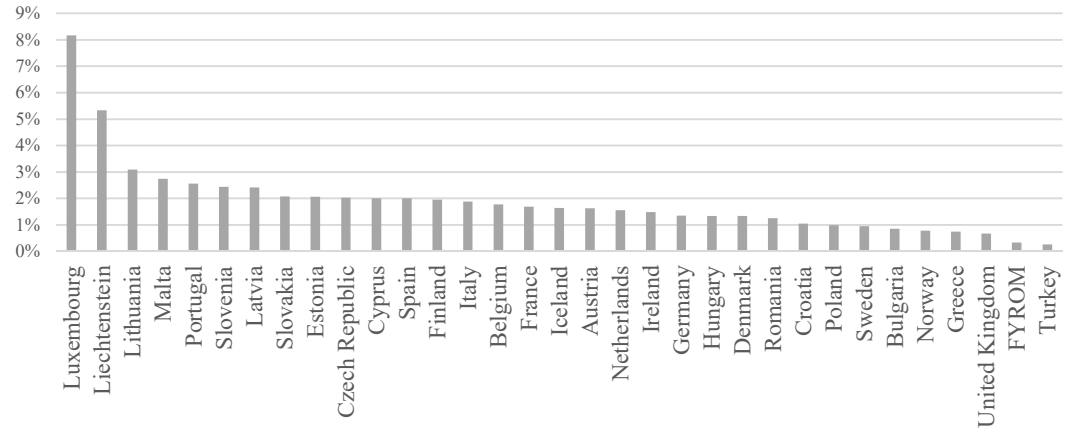


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Figure 5. Erasmus mobility in proportion to all students in 2016

METHODOLOGY

Factors affecting Erasmus-type motilities are very diverse. This study focuses on elements that are linked to the institutional components of the higher education system. Based on the findings in the literature, the following hypotheses were formulated:

H1: Cultural specificities affect the extent of student mobility. The rate of Erasmus partial mobility is higher in countries where:

a. the power distance is lower (because students may be more proactive);
b. individualistic values are stronger (because it may be easier for students to leave their environment behind);
c. feminine values are more characteristic (because these values help promote environmental integration);
d. uncertainty avoidance is low (because uncertainty in mobility is one of the key barriers, according to the available literature);
e. long-term orientation is stronger (because international mobility requires a novel and unorthodox approach and may have long-term beneficial effects);
f. indulgence values prevail (because they contribute to Erasmus experiences).

H2. The quality of higher education is in a positive relationship with student mobility. The rate of Erasmus partial mobility is higher in countries where

a. the student/teacher ratio is lower in higher education (because of more possibilities and time spent on personal consultations that ease uncertainty);
b. higher institutions offer higher-quality education (because these institutions attract better and more mobile students and offer better services, which make mobility easier);

H3. The rate of Erasmus partial mobility is higher in countries where the rate of speakers of major European languages (English, German and French) is higher (because courses are mostly offered in these languages);

H4. The level of trust beliefs affects student mobility. The rate of Erasmus partial mobility is higher in countries where

a. the trust in people is higher (because young people are more willing to leave their comfort zone if they feel that they can rely on others for help);
b. the trust in European institutions is higher (because Erasmus is a European exchange programme and students usually move within the EU. Thus, young people who have a higher trust in European institutions may tend to be more open to mobility).

H5. The rate of Erasmus partial mobility is higher in countries where community members are more involved in community life (because Erasmus mobility results in meeting new people and building new communities).

The data for testing hypotheses were obtained from the following databases:

- EU Open Data Portal: https://data.europa.eu/euodp/en/data/dataset/erasmus-plus-2016-annual-report-statistical-annex. This portal is operated by the Publication Office of the European Union, collects data provided by EU institutions and provides access to open data published by EU institutions.
- Eurostat: http://ec.europa.eu/eurostat
- Elsevier-QS University Rankings: https://www.topuniversities.com/. QS ranks universities by academic disciplines based on the responses from academic staff and students and on citation data from international databases.
- European Social Survey database: http://www.europeansocialsurvey.org/. The design of the European Social Survey began in 1995. It provides detailed data that are used for exploring social values and processes of participating countries. The European Social Survey Organisation is funded by all participating countries, the European Union and EU institutions.

The variables in the analysis were as follows:

- Dependent variable: the proportion of students participating in mobility studies within the total number of higher education students. This was quantified in the following way: The number of students participating in the Erasmus studies abroad in 2016 was divided by the number of students studying in higher education in 2015.
- Independent variables:
  1. Power Distance Index (Hofstede): the value is plotted on a scale from 0 to 100. A high value indicates a high power distance;
  2. Individualism/Collectivism Index (Hofstede): the value is plotted on a scale from 0 to 100. A high value indicates the dominance of individualist values;
  3. Masculine/Feminine Index (Hofstede): the value is plotted on a scale from 0 to 100. A high value indicates the dominance of masculine values;
  4. Uncertainty Avoidance Index: the value is plotted on a scale from 0 to 100. A high value indicates high avoidance of uncertainty;
  5. Long/Short Term Orientation Index (Hofstede): the value is plotted on a scale from 0 to 100. A high value indicates the dominance of pragmatic values;
  6. Indulgence/restraint Index (Hofstede): the value is plotted on a scale from 0 to 100. A high value indicates the willingness of people to realise their impulses and desires with regard to enjoying life;
  7. The teacher-student ratio in higher education: (Eurostat data), the number of students attending a higher education institution in 2015 divided by the number of teachers in higher education institution;
  8. Public expenditure on higher education as a share of GDP (as an index of higher education quality): Eurostat data of 2016;

9. Number of universities in the Elsevier-QS ranking list (as an index of higher education quality): indicates the number of universities of a country listed in the ranking (based on teacher and student responses and research publication output in the Scopus database); The higher the value is, the better quality the education system is;
10. The ratio of foreign language speakers: A) it is the ratio of people reporting that they are able to understand English, German or French well enough to be able to follow the news on radio or television in the language (Eurobarometer 2012, p. 31);. B) the ratio of people within a society reporting that they are able to speak a language well enough to be able to use that foreign language for communication (Eurobarometer 2006, p. 9)
11. Trust in people: the extent to which people trust other people on a scale from 0 to 10, where 0 means people cannot be trusted at all (European Social Survey);
12. Trust in European institutions: the extent to which people trust European institutions on a scale from 0 to 10, where 0 means that people have no trust in institutions at all (European Social Survey);;
13. Community activity: the extent to which people are interested in politics on a scale from 0 to 10, where 0 means that people are not interested in politics at all (European Social Survey).

The unit of analysis in this study was particular countries. Most tests were performed in Erasmus Programme Countries (EU28, Iceland, Liechtenstein, Macedonia, Norway and Turkey). The data of the European Social Survey encompass fewer countries so the number of the investigated units was lower.

IBM SPSS software package was used for performing the regression tests.

FINDINGS

First, this study analysed the relationship between the cultural variables used in the analysis and the variable of the ratio of Erasmus students within the total number of higher education students. The relationship between cultural variables and the outbound rate is insignificant. However, a great majority of cultural variables (individualism, power distance, uncertainty avoidance and indulgence/restraint attitude) are closely related to the country's economic performance, which was calculated based on GDP per capita data measured in purchasing power parities. The relevant literature also investigates the relationship between cultural dimensions and country's economic performance (Hofstede 2001, Cox et al. 2011).

The variable measuring the ratio of outgoing Erasmus students ($r=0.606$, $p=0.000$) correlates with the country's economic performance. The mobility data in the Youth on the move study conducted by the Gallup Organisation (Gallup 2011) also reveal a positive relationship between study or training mobility and the country's economic performance: a higher proportion of young people from economically well performing countries participate in international mobility. This phenomenon can also be observed among higher education students.

Second, after controlling for the per capita GDP of the countries, the measurement of the relationship strength between the two variables was repeated. By eliminating the effect of economic performance from the analysis, significant relationships were observed in five variables. They were as follows: Power Distance Index, Uncertainty Avoidance Index, Long/Short Term Orientation Index, Individualism/Collectivism Index and Indulgence/Restraint Index (See Table 1).

Considering the positive relationship between the power distance and the ratio of outbound people, in countries with a high power distance the ratio of outbound

Table 1
Partial correlation coefficients of cultural variables used in the analysis

	N	*Partial correlation coefficient*	Significance level
Power Distance Index	30	0.399	0.032
Individualism/Collectivism Index	30	-0.343	0.068
Masculine/Feminine index	30	0.015	0.937
Uncertainty Avoidance Index	30	0.463	0.011
Long/Short Term Orientation Index	30	0.372	0.047
Indulgence/Restraint Index	30	-0.627	0.000

Source: own calculations

people is high. This relationship contradicts the assumption that countries with low power distance have individuals with more initiative and so their student mobility is higher.

The negative Individualism/Collectivism Index indicates that in societies where collectivism dominates the outbound rate is high. In a collectivist society families and groups play an important role in an individual's life; relationships are preferred to tasks; private life and work are closely linked. Thus, the assumption that an individualist society is more mobile must be rejected.

The Uncertainty Avoidance Index, with a positive coefficient, indicates that the higher the index value is, the more students participate in study and training mobility programs abroad. In societies where the Uncertainty Avoidance Index is high, a predictable environment is crucial for its members and the established norms and rules play an essential role in easing the feeling of uncertainty. Planning is important. Knowledge plays a crucial role. People are goal oriented (Hofstede, 2001). The obtained results reveal that these specificities also help in overcoming the challenging situations resulting from international mobility.

The positive direction of the relationship between long-term orientation and the outbound ratio indicates that in societies where people are future oriented and a long-term way of thinking dominates, student international mobility is high. The efforts made are a measure of success; individuals are able to adapt to changed conditions; determination is highly valued. The findings confirm the assumption made in this study.

The last significant cultural variable is the Indulgence/Restraint Index, which shows a relationship of a negative direction. The high value of this index indicates the dominance of indulgence and permissiveness, which is unlikely to promote international student mobility, according to our results. A low index demonstrates that controlled and rigid behaviour is expected and members of such a society tend to be sceptical and cynical (Hofstede Insights 2018). The findings reveal that the assumption of this study related to the indulgence/restraint value must be rejected.

After this, the relationship between institutional variables and the outbound ratio was investigated. A significant relationship between these variables was observed in two cases: the government expenditure on higher education as percentage of GDP (linear correlation coefficient=- 0.392, p=0.036) and the two variables measuring foreign languages skills. One of them measured the ratio of people who were able to understand English, German or French well enough to be able to follow the news on radio or television in the language. In this case the value of the linear correlation coefficient was r=0.553, p=0.005. The other variable measured the ratio of people within a society who were able to speak a language well enough to be able to use that foreign language for communication. In this case the value of the linear correlation coefficient is somewhat lower, r=0.425, p=0.027. In countries where a higher proportion of the population speaks a foreign language, students are more mobile.

The GDP per capita also affects the relationship between the measured variables. The relationship between the ratio of students who are able to communicate at least in one foreign language and the ratio of students who join international mobility remains after excluding the effect of economic performance (the value of the partial correlation coefficient is 0.343, p=0.087). As for government expenditure on higher education, the observed relationship between the two variables also remains significant (the value of the partial correlation coefficient is -0.583, p=0.001). The findings provided evidence only to H3 related to foreign language skills.

In order to investigate the effect of trust level on mobility, the European Social Survey database was used in this study. Two questions were involved in the analysis measuring the level of trust in people and European institutions. There was no significant relationship between the two variables in either of them. The variable taken from the database of the third European Social Survey and used for measuring community members' activities did not show a significant relationship with the mobility data of the surveyed counties.

Taking into consideration that the mobility value in Luxembourg is considerably higher than the values of the surveyed country, Luxembourg was considered an outlier, and removed from the sample. But if Luxembourg is removed, the relationships between the cultural variables and the mobility variable becomes insignificant, too. After this, the relationships between variables were visualised with the help of point cloud diagrams. It was found that the surveyed countries could be divided into at least two subgroups which show characteristic differences between variables under analysis. Some countries (Bulgaria, Croatia, Greece, Hungary, Poland Romania, Macedonia and Turkey) do not show the characteristics described in our findings. In other words the described relationships only apply to the rest of the surveyed countries. Next, after grouping countries into clusters, the analysis needs to be repeated by country groups.

SUMMARY

This study focused on investigating the reasons why higher education institutions in general may be failing to meet study mobility requirements, and how this can inform our understanding of the situation with Hungarian universities. One of the possible explanations for this problem in Hungary may be a constellation of institutional factors, especially values and cultural background, that acts as a strong restraining force in situations where students make decisions on participating in Erasmus-type mobility programs. The findings of this study did not confirm the assumption that the Hungarian institutional environment may prevent students from taking part in

mobility activities. Although several impact factors have a significant relationship with mobility ratio (if GDP value per capita is considered), the direction of the relationship contradicts most of the assumptions formulated in the hypotheses after the review of the relevant literature. On the other hand, the findings of this study may suggest that Hungarian cultural and institutional specificities facilitate rather than hinder student outbound mobility, which appears to contradict the observed practice, namely that Hungarian higher institutions find it increasingly challenging to boost outbound student mobility.

Here we evaluate the factors that were found to be significantly correlated with outgoing Erasmus mobility from two aspects. First, it is examined whether the direction of the relationship is similar to that assumed in the hypotheses. Second, it is examined if the correlations calculated in the model were observed in Hungary, in what direction it would shift the Hungarian outbound mobility data. This study identified significant relationships in seven potential impact factors, which are as follows:

1. Power distance is in a weakly positive relationship with mobility, which contradicts the assumptions made in this study, but the results calculated in the model coincide with the low mobility activities of Hungarian students because the Power Distance Index calculated by Hofstede for Hungary is 46, which can be considered to be low on a European level (the model of this study – based on the findings – would assign a lower mobility ratio to Hungary if the power distance were considered).
2. Individualism is in a weakly negative relationship, which also contradicts the assumptions made in this study. Since the Individualism/Collectivism Index score for Hungary is 80, which indicates that Hungary is an individualist society, the model of this study would assign a lower mobility ratio to Hungary if individualism was considered.
3. Uncertainty Avoidance is in medium-strength positive relationship, which also contradicts the assumptions made in this study. The Uncertainty Avoidance Index score for Hungary is high (82). Thus, the model of this study would assign a high mobility ratio if the uncertainty avoidance were considered.
4. Long-Term Orientation is in weakly positive relationship, which coincides with the original assumption of this study. Since the Index score for Hungary is higher than the average (58), the model of this study would assign a higher mobility ratio to Hungary based on long term orientation.
5. Indulgent attitude is in a slightly stronger than average negative relationship (this is the strongest one of all the investigated factors), which also contradicts the assumptions made in this study. Since this Index score for Hungary is low (31), the model of this study would assign a higher mobility ratio for Hungary if the indulgent/restraint attitude was considered.
6. The ratio of public expenditure on higher education is in weak negative relationship, which also contradicts the assumptions made in this study. Since the public expenditure on higher education is lower than the European average, the model of this study would assign a higher mobility ratio for Hungary if the indulgent/restraint attitude were considered.
7. Language skill is in a positive relationship, which seems to self-evident. A lower mobility ratio could be modelled for Hungary based on this factor, as the language skills of Hungarians are way below the European average.

Further analyses showed that if the only outlier (Luxembourg) is excluded from the analyses, the number of significant relationships decreases. The countries under investigation disintegrate into clusters and the relationships between the measured factors differ within particular clusters.

If despite the obtained measurement results we do not wish to reject the original concept, according to which mobility is influenced by institutional and cultural impact factors, it must be assumed that the effect of these impact factors must be measured at individual and institutional levels. First, it can be assumed that the values of mobility participants and non-participants differ, which cannot be addressed by analysing national data. Second, services as well as formal and informal regulations of particular higher education institutions may create a supporting institutional environment, which cannot be measured by using national indicators either. Directions for further research while preserving the original concept would be to measure cultural attitudes of students and compare those participating and not participating in international mobility, and to consider the regulations of higher institutions related to international mobility by collecting primary data.

The conducted analyses may suggest that in the course of promoting the Erasmus programs in Europe, cultural diversities of European countries need to be taken into account. Instead of adopting common communication, promotion and direction strategies, programs taking into account national specificities need to be elaborated. For instance, the Indulgence Index, which measures whether the free enjoyment of life or the suppression of instincts is a social norm, differs greatly across programme countries. Consequently, in cultures where this index value is high, the main emphasis should be laid on the valuable experiences to be gained from the Erasmus programs. In cultures where this index is low, the favourable career perspectives that participation in Erasmus programs has opened should be highlighted.

Similar diversity is experienced in the case of the uncertainty avoidance variable. In countries where the Uncertainty Avoidance scores high, a strong positive motivation force may be an elaboration of clear planning processes and the provision of ready solutions. In countries where the Uncertainty Avoidance Index is low, the provision of a wider range of choices may be a good facilitator.

Acknowledgement

This research was supported by the project nr. EFOP-3.6.2-16-2017-00007, titled Aspects on the development of intelligent, sustainable and inclusive society: social, technological, innovation networks in employment and digital economy. The project has been supported by the European Union, co-financed by the European Social Fund and the budget of Hungary.
This paper is an English summary of a Hungarian study published in Marketing és Menedzsment, Special Issue on mobility, LII, pp. 33-46.

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Bank Domestic Outstandings in Central-Eastern-European Countries between 2008 and 2018

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SUMMARY

The economic crisis that broke out in the most developed part of the world in 2008 seriously affected the Central-Eastern-European bank systems. This was no wonder, because these economies were closely linked to the developed countries. Firstly, the Central-Eastern-European banks were mostly owned by large Western-European banks, and the management of these subsidiaries became tougher due to the asset management problems of their mother banks. The current paper examines the deleveraging of bank systems of this area during the crisis and thereafter. A special northern-southern division can be observed among the Central-Eastern-European banking systems, where the border is unfortunately at the northern border of Hungary. During the crisis, the amount of bank outstandings was mostly determined by the economic growth, the starting state of loan-deposit ratio, as well as the uncertainty of sovereign Credit Defalut Spread. In the after-crisis period the change in outstandings is especially dependent on the non-performing loan ratio and the change in loan-deposit ratio. Hungary is an "off-line" country for all strong correlated variable pairs, so the decrease in domestic outstandings may have country-specific reasons in addition to the general theoretical variables.

Keywords: Deleverage, Central-European banking system, financial crisis
Journal of Economic Literature (JEL) codes: E51, G21
DOI: http://dx.doi.org/10.18096/TMP.2018.02.02

INTRODUCTION

The CEE economies were influenced to different degrees by the financial crisis that broke out in 2008. The local fragile bank systems were the very first victims of the crisis, since most of the local banks were owned by large Western-European financial institutions. The portfolio deterioration of the mother banks made the management of the local subsidiaries harder (Tressel, 2010). From 2011 the local banks were no longer supported by the financing sources of their owner, moreover some mother banks began to withdraw deposits from their Eastern-European branches to meet the consolidation requirements prescribed by their home countries. Secondly, most of the related countries suffered from the consequences of easy or predator lending, so the asset quality worsened severely. Thirdly, the sphere of potential debtors decreased due to the economic crisis that followed the financial crisis. The fourth potential reason fordecreased outstanding loans was the intervention of state economic policy. The majority of Central-Eastern-European states introduced sectorial taxes on financial institutions and strengthened the supervisory rules by the recommendation of Basel III. (Tressel, 2010)

Despite facing the same situation, the financial crisis affected the Central-Eastern-European countries in different manners. This study is devoted to exploring the explanatory factors of the banks' asset deleverage.

LITERATURE REVIEW

Deleveraging is related to capital leverage. Capital leverage refers to the structure of financing, namely the ratio between equity and liabilities. It has several measurements; in our case capital leverage means the total ratio of assets to shareholders' equity ratio (Burke, 2015).

Deleveraging means that the enterprises change their leverage in each phase of an economic cycle. During recovery and overheating, when the profitability is high, and the companies need loans to finance their investments, the leverage increases. During recession the profitability of companies decreases and their aim is to decrease their fixed revenues costs. Since interest is such a fixed expense,

the companies strive to repay their loans and decrease their leverage in order to minimise the interest expenses.

Kiss & Szilágyi write that, "We are talking about deleverage if due to the changing economic circumstances the actors of the economy judge that their leverage is exaggerated, and they make economic decisions to build down their debt by readjusting their asset structure, so deleverage is a synonym for debt repayment" (Kiss & Szilágyi 2014: 955). According to the authors the deleveraging process proceeds in the following pattern in the case of banks: The erupting financial crisis (huge amount of bad loans) increases the leverage of banks, since the losses can be written off from the equity. Since the capital increase has severe limitations during the circumstances of a crisis (no profit, high aversion to risky investments), the leverage can be restated only by decreasing the outstanding and loans.

On the micro level deleverage means that the enterprises are forced to decrease their expenses due to the fall in their incomes, thus they minimise their debt level to decrease the interest expenses. Secondly, their working capital needs are decreasing due to lower sales and their investment opportunities are worsening, which decreases both their long- and short-term loan demand.

On the macro level the banks withdraw their outstandings. The stock of non-performing loan increases, which decreases the equity of banks. The lowering equity level forces the banks to decrease lending to meet the capital adequacy directives. In addition, the risk-bearing ability of banks becomes lower because of the deteriorating asset quality, so they turn to less risky investments (like state securities) against the more risky banks. (De Bond, 2002).

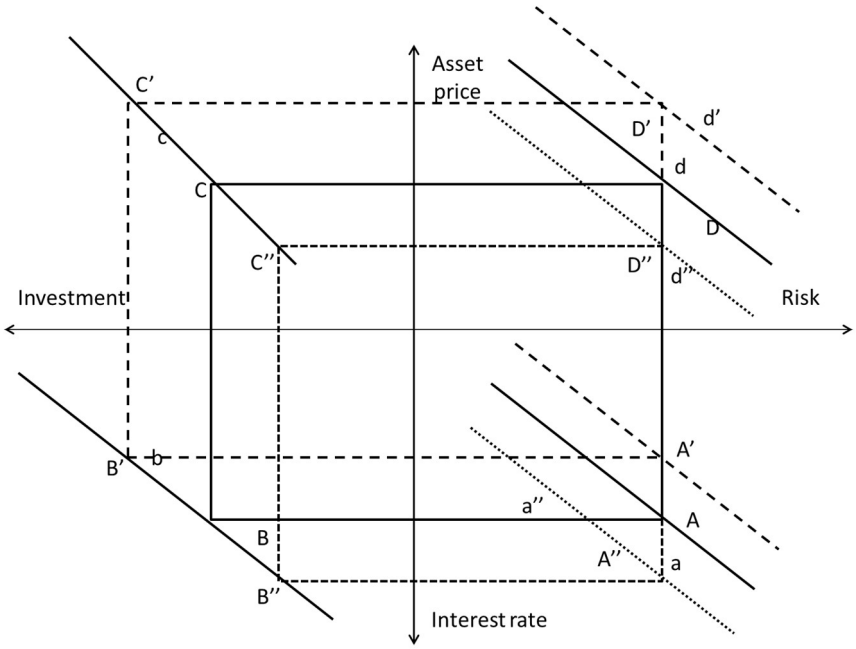
The above procyclical behaviour of banks was one of the most important lessons from the economic crisis that started in 2007 (Kovács 2014). Whereas the monetary authorities and the governments strived to increase the aggregate demand through deficit increase and lowering the prime rate, the behaviour of the financial sector deepened the crisis. The bank system began a credit crunch in answer to the worsening quality of outstanding and disappearing liquidity in financial markets, and by doing that it decreased the aggregate demand.

Before the financial crisis the behaviour of bank systems was just the opposite. The financial institutions increased the volume of outstandings, disregarding the bearing risk, which (especially in the real estate market) led to the creation of asset price bubbles (Kovács 2014).

Let us look at how the lending boom leads theoretically to create asset price bubbles and how the bursting of bubbles leads to withdrawal of banks' lending activity. The assumptions of this model (Acharya & Naqvi, 2011) are the following (see also Figure 1):

1. The riskier an investment idea, the higher the interest rate of the loan – line a.
2. The higher the lending rate, the lower quantity of investments made – line b.
3. The lower the quantity of investments, the lower the price of invested assets – line c.
4. The bigger the risk of an asset, the lower its price – line d.

Figure 1 provides an explanation. The solid line of this chart represents the equilibrium among the asset price (real estate price), the risk, the interest rate and the level of investments.



Source: Acahrya &Naqvi, 2011

Figure 1. Creation of asset bubbles

Now let us see how the asset bubbles are created. The banks underestimate the expected risk of their loans, and therefore line a shifts to rightward and upward, and the lending rate falls (from A to A′), and they give larger loans for investments, so the size of investment increases from B to B′. The increasing demand beats up the asset prices, so the risky assets become overvalued and the price-risk axis shifts from line d to line d′. The asset bubble is established, denoted by the dotted square.

The burst asset bubble leads the prices down from D′ to D″. The decreasing prices throw back the demand for investment from C′ to C″, the worsening loan portfolio leads to higher real loan rates from B′ to B″. The risk aversion of banks increases, so they finance the same risk for a higher lending rate (from A′ to A″).

Consequently the risk bearing attitude of banks is high during overheating while the real lending rates are low, which leads to increasing investments and increasing asset prices. During recession the process is precisely reversed. The higher risk version leads to decreasing prices, decreasing investments and high real rates.

The process is self-generating in both ways. Human psychology stands behind both, according to behavioural finance theory. During overheating exaggerated self-confidence rules, just as during recession panic explains human behaviour (De Bondt 2012).

A study by Takáts and Upper deals with the sensitivity of banks' loan stock toeconomic cycles (Takáts & Upper 2013). They examined 39 economic crises where the creation of the bubbles advanced the eruption of the crisis. They found that recovery from the crisis does not hinder the deleveraging (the decrease in lending). They found no correlation between the economic growth two years after the crisis and the change in loan stock/GDP ratio. They conclude that the economic recovery depends on the indebtedness of the country and the real rate of interest by their examination.

Deleveraging is natural in an economic recession. However, its size matters, and by considering this the literature differentiates between "good" and "bad" deleverage (Bologna et al. 2014). In good deleverage the bank just simply adjusts to the changing economic circumstances to avoid bankruptcy. Thus, as the loan requests of potential debtors decrease, the bank repays its lenders, especially its external, foreign sources, so its capital adequacy improves, although its profitability decreases. The bank makes its credit terms stringent to crowd out the risky debtors, but it remains available to solvent debtors.

We talk about bad deleverageif the fall in loan stock is the consequence of rising bad loan stock. In this case the fall of loan stock does not improve the capital adequacy, since the lowering equity base is caused by the loss from bad lending. Thus, the bank is forced to dramatically withdraw its outstandings to meet the regulatory directives, even if it has to refuse to lend to its good customers. This phenomenon is often calledcredit crunch. The credit crunch further deepens the recession and consequently further worsens the level of bad loans. An vicious circle can be established that can be solved only by the state (through consolidating the bank through purchasing the banks' bad loans). However if the state's solvency is also weak, only the international financial institutions can help.

THE CONSEQUENCES OF THE ECONOMIC CRISIS IN EUROPE

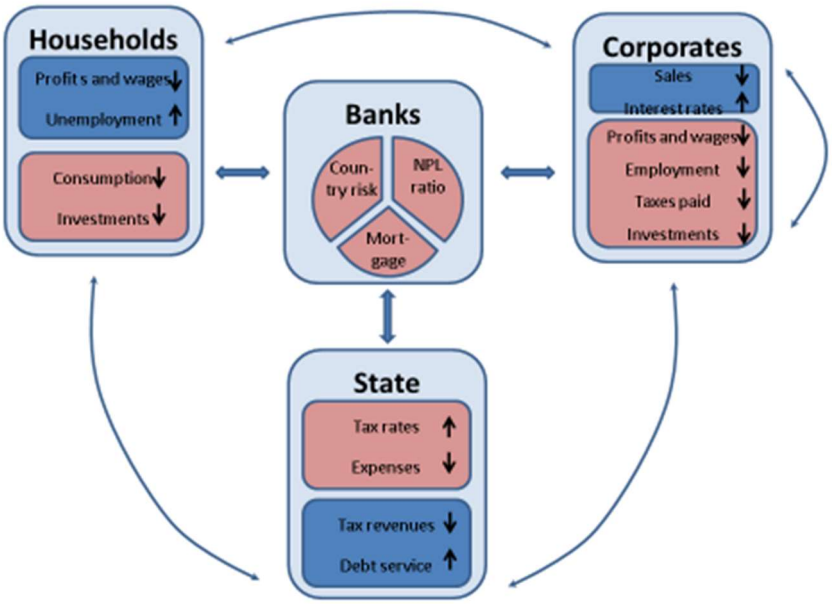
Paradoxically the credit crunch that originated in the USA caused the largest recession and deleverage in Europe. This has basically two reasons.

The first is that the European banks suffered meaningful losses in their direct and indirect American investments. The fertilisation effect was examined by an IMF study (Cerutti & Claessens 2014). It stated that the supply side factors (namely, the factors depending on banks) played a bigger role in deleverage than the decrease of loan demand. The banks strengthened their credit terms due to the fertilisation effect. If the bank or its mother bank had large losses in the American outstanding, then the bank held in (or was forced to hold in) its outstandings in the home market. The fertilisation effect was deepened by the bank's dependency on external sources, since the crisis froze the operation of interbank financial markets, thus causing a liquidity crisis for banks with a high loan/deposit ratio. (Angelides 2011)

This fertilisation effect was examined by the World Bank's experts in an analysis of the deleverage of Central-Eastern-European banks (Feyen et al. 2014). The larger the dependency of these banks on external sources, the bigger the deleverage to repay these external sources. The share of foreign equity played no explanatory role in deleveraging; it didn't matter whether the bank was in foreign or in domestic hands, the banks decreased the lending if the loans were financed from foreign sources.

A second factor was that in some countries problems emerged related to the sovereign debt (Southern-European countries, Hungary). Since they did not receive financing sources from the markets, they were forced to turn to international institutions, which linked their loan to meaningful austerity measures. Sothese states could not help their economies to recover, and the economic policy further deepened the crisis. Naturally the problems with sovereign debt had a disadvantageous relation to the financing cost of the domestic banks, thus the deleveraging was extremely serious in those countries where there were problems with the state debt (Vause et al. 2012).

The mechanism of the European economic crisis and deleverage is described in Figure 2 (Bornhorst & Arranz, 2013).



Source: Bornhorst &Arranz 2013

Figure 2. Linkage between deleverages

Figure 2 shows the vicious circle of recession. The bursting of the mortgage market bubble decreases the value of mortgage, which forces the bank to withdraw loans in every overdebted sector. The decrease in lending decreases residential investments and also decreases the income of companies producing commodities (especially the income of the contruction industry and automobile industry). These companies decline their production, which leads to cost reduction programs, laying off staff and lower levels of investment. This decreases the income of the households, which leads to a further decrease in the aggregate demand. The widespread recession is perceived by the banks, because their loan portfolio worsens further. The lending losses and the emerging risk force them to make their credit terms more severe, which negatively effects the declining residential and commercial investments. (Cerutti 2014)

The above situation becomes even more serious if the state was heavily indebted before the crisis. The recession decreases the state's revenue, and its expenses increase to soften the social effect of recession. However, a larger deficit is not an option due to the lack of finance. So the state increases taxes, decreases public spending and sells public property (privatisation) at a very low price (deep in recession). This further deepens the crisis.

The linkage between the sovereign debt rating of Central-Eastern-European countries and bank deleveraging appears in the study of Benczúr and Kónya (2015). They found that the larger the increase in sovereign debt Credit Defalut Spreads (later CDS), the larger the drop in foreign deposits during the crisis.

The domestic loan stock significantly decreased in the countries of European Union during the crisis (Schoenmaker & Peek 2014). This decline was especially meaningful in the peripheral countries (in Eastern and Southern Europe, as well as in Ireland). Examining the countries' banks, they stated that the outstandings decline was larger in the case of banks consolidated by the state than in the case of banks with normal capital adequacy. Deleveraging was especially the consequence of lowering equity level, which forced the bank to decrease its lending to meet the requirements of strengthening bank regulation.

Deleveraging was examined by one of the World Bank's studies from the aspect of tightening credit terms (Feyen et al. 2012). It concluded that the banks operating in emerging markets (especially in Eastern Europe) tightened their credit terms due to the crisis; however, the capital adequacy was the highest here (thanks to the mother banks' support) So the decrease in outstandings was not caused by the lack of capital but by other factors of the economic situation (recession, high level of non-performing loans, the cash-flow hunger of mother banks and the high loan-to-deposit ratio).

Finally a comprehensive study of VOXEDU listed the triggering factors for deleverage in the European Union (Feyen et al. 2013). The study differentiates three factor groups of European deleverage –financial, regulational and economic political factors. The study provides an overview of the effect of market conditions on financial factors. Tightening inter-bank market conditions, the worsening rating of debtors, problems of foreign currency nominated loans and withdrawal of foreign sources were listed. Similar conclusions can be found in (Gróf 2016)

The regulatory factors relate to the gradual introduction of the new Basel-III agreement. The capital adequacy requirements began to tighten and encouraged the banks to follow less procyclical behaviour. A new aspect is the recognition of liquidity risk and new liquidity indicators. These strive to encourage the banks to limit their outstanding in the medium term.

The study mentions among the economic political reasons that the economic recession was linked with austerity packages (tax raises, public expense cuts) in several countries facing high public debt. This deepens the recession and decreases the number of lendable private debtors. The recession limits the income-generating ability of banks and hinders the quick write-off of bad loans.

The banks have another alternative to invest their money: they can buy state securities. The collapse of domestic outstandings can be compensated by a portfolio rearrangement towards the less risky treasury bonds. (Gróf 201)

This paper examines the effect of the financial crisis on the overall outstanding debt (both private and state) in Central and Eastern Europe and examines the speed of general recovery after the crisis.

THE AIM OF RESEARCH AND THE APPLIED METHODOLOGY

The aim of current paper is to examine deleverage in the eastern part of the European Union (among the former socialist countries). Firstly we examine how the deleverage is related to the Central-Eastern-European (CEE) countries and how quick has the recovery been since 2013 according to the newest available statistics.

Secondly we distinguished which country's bank system was characterised by "good" or "bad" deleveraging. Due to the lack of data, the examination was carried out on the whole banking system of the countries based on the data of the World Bank, European Central Bank and the European Statistical Office, rather than on individual banks.

After separating the "bad" and "good" deleverage we surveyed whether there are any sign of domestic outstandings increasing after the deepest point of the crisis (since 2012) and how the influencing factors of deleverage behaved during that period.

The annual change in corporate and household loan was considered as the indicator of deleverage. This was the dependent variable. So the total outstanding of the bank sector was decreased by the amount of public lending and the amount of foreign lending. The reason for this is that the primary goal of public lending is not to earn profit, but to ensure the required liquidity and capital adequacy. That is why the public outstanding (which means mainly the purchase of government securities) does not react to the shape of economic cycle in the same way as the private outstanding.

Foreign loans – considering the fact that the examined region is poor in capital – are not typical outstanding of the region's banks, and here we cannot separate whether the foreign income holder is private or public, which wasn't crucial in this analysis.

Results in the literature suggest that it would be worthwhile to examine the role of four factors in the case of Central-and-Eastern-European bank systems. These are the following:

1. Fertilise effect from developed (WesternEuropean) bank systems
2. Non-performing loan stock
3. Current state of the economic cycle
4. Country risk

Four explaining variables were created to separate these four factors.

The fertilise effect is strong in a given state if the foreign liabilities have a significant stake in the total bank's liabilities. If the mother bank encounters trouble, it tries to get more cash inflow, so it tries to reclaim its foreign outstanding. In several cases the consolidation contracts made between the mother bank and its state also prescribe the liquidation of foreign investments. Due to the lack of proper data we approached the exposure of liabilities from the mother bank using the corporate and household loan-to-deposit ratio at the end of 2008. Before the crisis, the banks of the examined region had taken on significant foreign liabilities to finance the lending boom, and their loan to deposit ratio significantly increased.

H1: The higher the loan-to-deposit ratio, the larger the extent of the decrease in domestic outstandings during the crisis.

The decreasing quality of te loan portfolio was measured by the change in the non-performing loan percentage between 2008 and 2012. Generally the quality of loan portfolio was the worst in 2012 in the examined country group.

H2: The larger the quality decrease in the loan portfolio, the greater the fall in domestic outstandings.

The depth of the economic crisis may have a significant effect on the size of domestic outstandings, because the base of potential solvent customers was decreasing. In recession a well managed company keeps its working capital level low and makes no unnecessary investments, and so its financing needs decrease. The size of the economic crisis was measured by the difference between the 2008 and 2012 real GDP. I chose this long period because the economic crisis followed a "W" shape in most of the countries, with two recession depths (in 2009 and in 2012). The recovery started in 2013.

H3: The larger the fall in GDP, the larger the deleverage.

The uncertainty of country risk was measured by the standard deviation of sovereign debt of the related country between the end of 2007 and 2012.

H4: The higher the volatility of CDS spread, the larger the decrease in domestic outstandings.

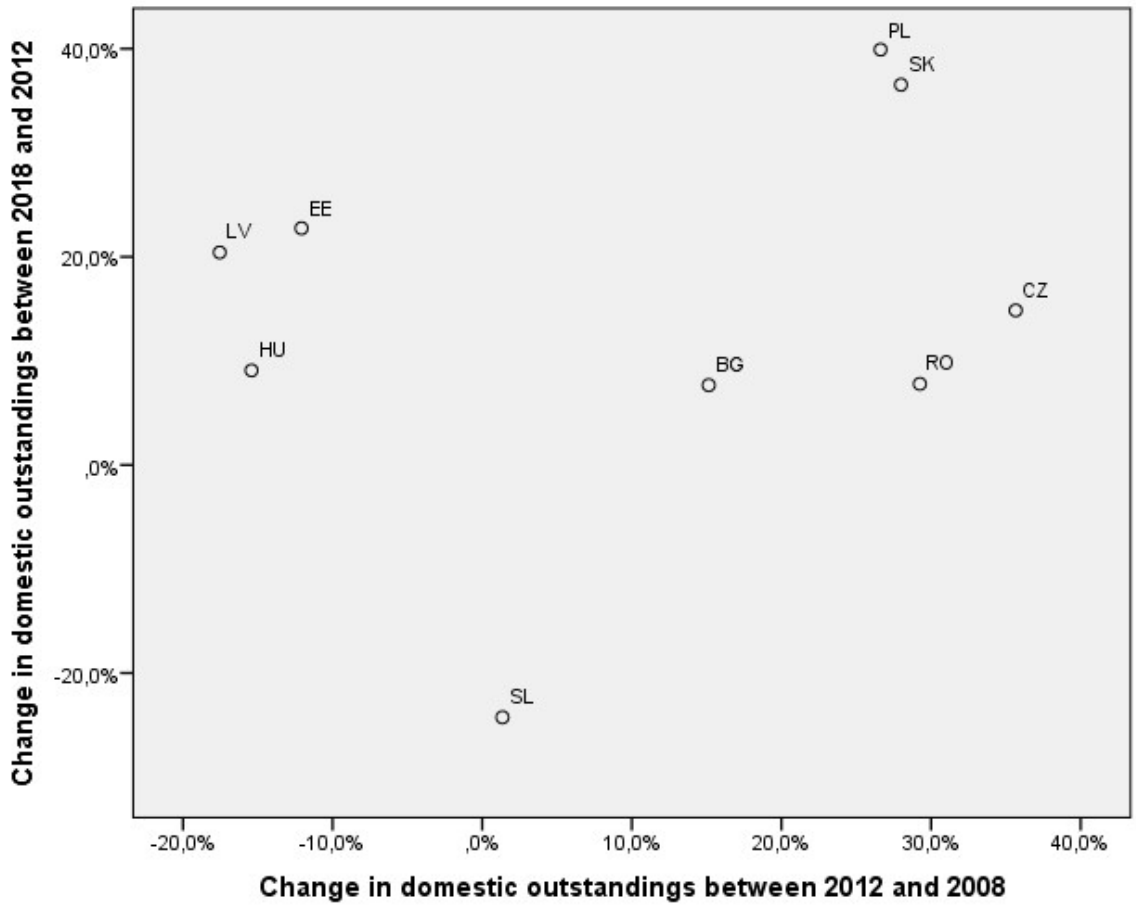
The examined countries can be found in the Eastern part of the European Union, among the group of member states that joined the EuropeanUnion in 2004 or later: Bulgaria, the three Baltic states - Lithuania, Estonia and Latvia, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia.

The data came from three sources. The GDP was downloaded from the Eurostat website, the non-performing loan ratio came from the World Bank's database and the source of loan and deposit stock was the database of the European Central Bank (ECB). The historical CDS spreads are available at the website of DataGrapple. In the case of Croatia and Latvia the ECB database contains no data, while in the case of Slovenia the CDS spreads are not available.

The statistical analysis was made by SPSS 22.0. Due to the lack of data there were 8-11 cases, so a scatter plot was used to expose the linkage between each of the independent variables and the dependent variable. The stronger is the linkage, the better the plots fit onto a line or curve. The research was made both the during- and the post-crisis periods.

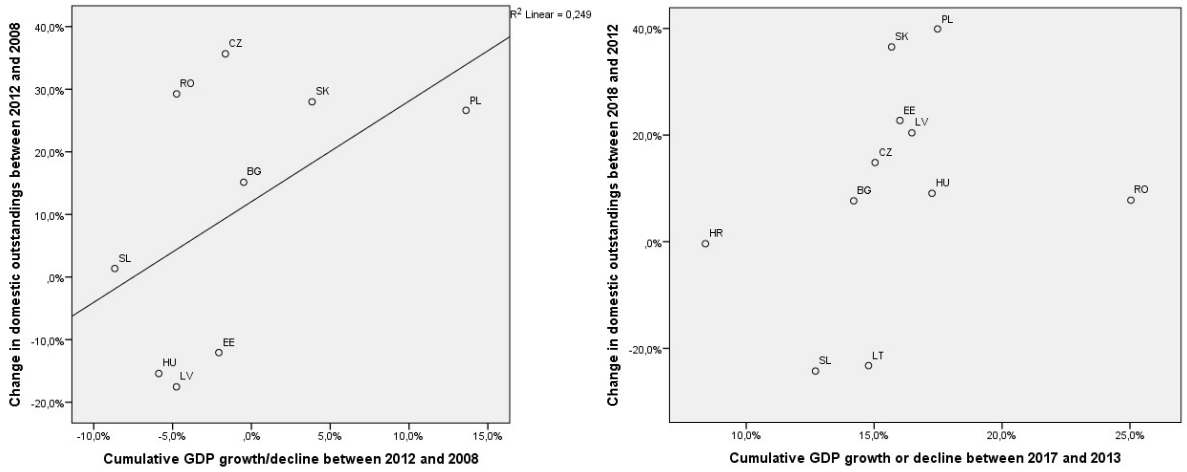
RESULTS OF THE RESEARCH

Firstlythe size of deleverage is ranked by using a scatter plot chart (Figure 3) where the horizontal axis demonstrates the change in domestic outstandings during the crisis and the vertical axis presents the post-crisis change in domestic outstandings. The farther a country from the lower left-hand corner of the chart, the smaller the degree of deleverage (if there even was a leverage.) The countries were ranked in descending order by their distance from the lower left-hand corner.



Source: ECB, own work

Figure 3. Change of domestic outstandings during and after the crisis



In crisis After crisis

Source: ECB, own work

Figure 4-5. Relationship between domestic outstandings and GDP

From the chart it can be seen that the largest fall in domestic loans was suffered by Slovenia both during and after the crisis. The decrease was not significant before the crisis, but the drop has increased since 2012. The Baltic countries and Hungary (upper left-hand corner) also suffered a sharp decline during the crisis, but the size of recovery reached the regional average. Romania, Bulgaria and the Czech Republic indicate very moderate increases in domestic lending in both periods in euro terms. In Slovakia and in Poland the size of domestic lending did not reflect the crisis; both periods brought a significant increase in domestic outstandings. Based on this result the following clusters were formed related to the deleveraging (based on the distance from the lower left-hand corner).

1. Poland, Slovakia – dynamic increase
2. Estonia, Latvia, Hungary – strong exposure to the crisis
3. Bulgaria, Romania – moderate increase
4. Slovenia – decaying outstanding

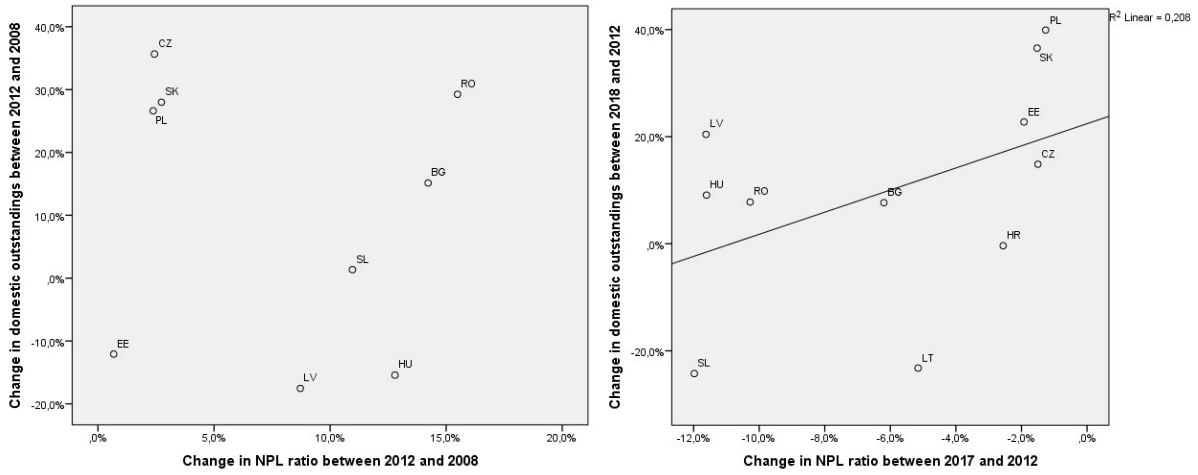
Lithuania and Croatia weren't ranked by available data and therefore are not represented in the figure.

In the Central-Eastern-European countries the linkage between the domestic outstandings and the GDP during and after the crisis is shown by Figures 4 and 5.

It can be seen in Figure 4 that during the crisis the deleverage is clearly explained by the change in GDP. The explanation power is 25%, measured by R2. The larger the fall in GDP, the more significant the drop in domestic outstandings. However, the Baltic States and Hungary suffered a bigger drop in lending than the GDP decline. In the "above the line" countries (Slovenia, Romania and the Czech Republic) the drop in domestic lending was not as large as the fall in GDP.

However, the GDP does not explain so clearly the situation after the crisis (Figure 5). Between 2013 and 2018 Romania and Hungary earned the biggest growth, but the expansion in lending was not impressive. The countries with expanding domestic loans did not display significantly better economic growth.

One explanation for this phenomenon can be "bad" deleveraging. If the bank system has too many bad loans, the increase in domestic outstandings may be postponed due to the high perceived risk.



In crisis After crisis

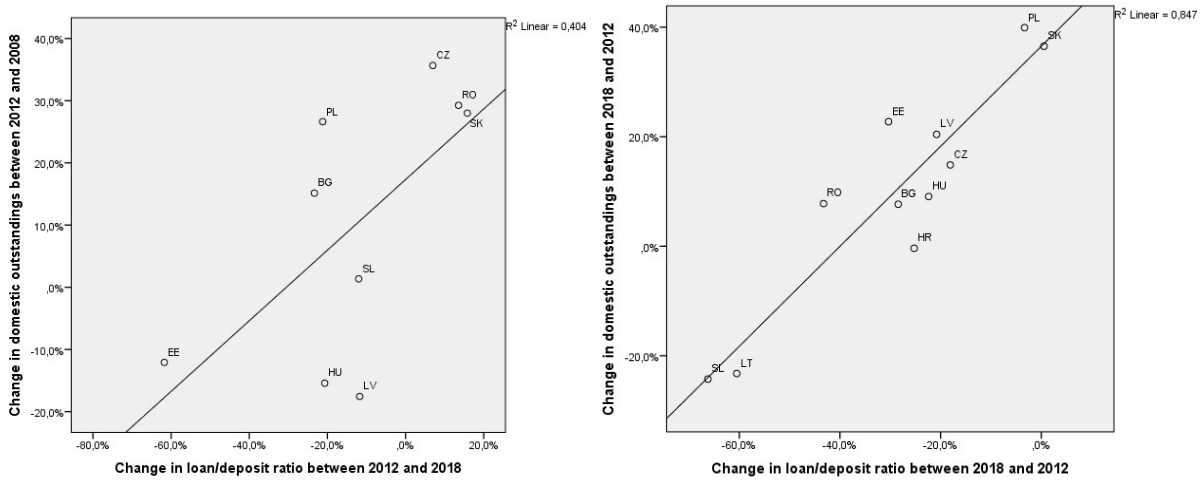
Source: ECB, World Bank, own work

Figure 6-7. Relationship of domestic outstandings and bad loans

The bad loan ratio shown in Figure 6 explains the deleverage against the GDP change better in the post-crisis period than during the crisis. After the crisis, the biggest drop in loan quality occurred in Slovenia, Lithuania and Hungary and the deleveraging was the most significant in these countries.

On the other side, Poland and Slovakia had no problem with the quality of assets; consequently, the banks' lending could rapidly expand. The increase was less intensive in the case of the Czech Republik and Estonia.

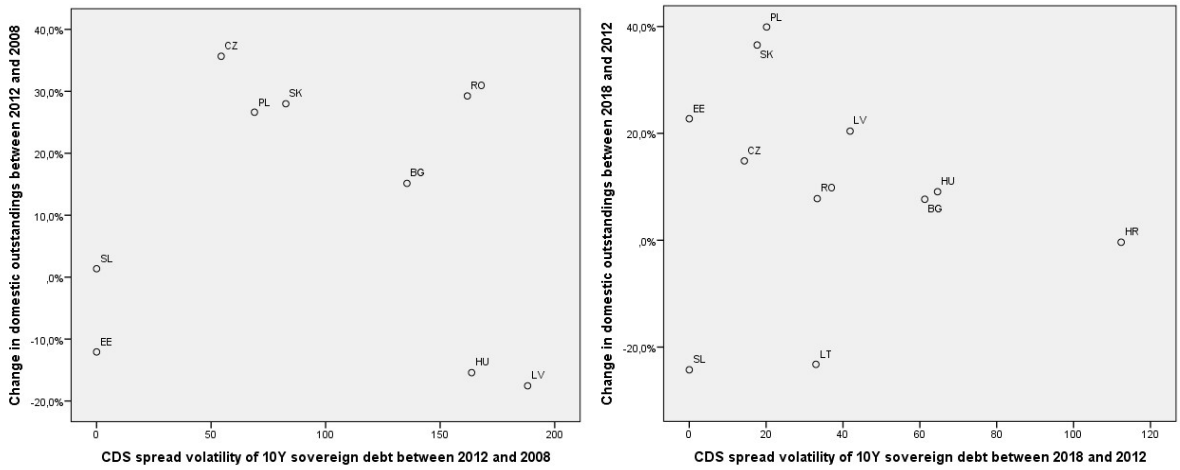
The differences may come from the various changes of loan-to-deposit ratio (Figure 7). After the crisis the banks strived to bring their loan-to-deposit ratio close to 1, since the inter-bank money market was frozen, and some regional banks could expect no help from their mother banks. The explanitory power of loan-to-deposit ratio remains after the crisis. During the crisis I used the opening balance of loan-to-deposit ratio (Figure 8), while in the post-crisis period I used the change of loan-to-deposit ratio (Figure 9). After the crisis, the lack of domestic deposits may have constrained the increase in private lending.



In crisis After crisis

Source: ECB, own work

Figure 8-9. Relationship between domestic outstandings and the loan-to-deposit ratio



In crisis After crisis

Source: ECB, DataGrapple, own work

Figure 10-11. Relationship between domestic outstandings and standard deviation of CDS spread

It can be seenin Figure 8 that the dependence on domestic deposits explains well the change in domestic lending. In 2008 the domestic outstandings significantly decreased in the net lending countries. Where the bank system had a significant domestic deposit base (the Visegrad countries except for Hungary) the amount of domestic outstandings increased against the crisis. Although Hungary is an "under-the-line" country, the loan stock decreased more than could be explained by the loan-to-deposit ratio.

After the crisis, the outstandings increase if the deposits increase and vice versa. If the deposits decrease, the lending decreases regardless of the state of economy. The linkage is much stronger than in the crisis period. Where the deposits grow, the banks utilise the situation and increase their lendings.

Finally. let us look at the effect of sovereign debt risk on the stock of CEE domestic outstandings. The sovereign risk is considered to be zero in the case of Estonia since its public indebtedness is extremely low; there is no listed CDS spread on Estonian public debt.

From Figure 9 it can be seen that the uncertainty of sovereign risk spread moderately affects the level of outstandings. The linkage is almost negligible. It appears that domestic outstandings are not sensitive to the volatility of macroeconomic risks.

It is important to note that there is a strong linkage between the non-performing loan ratio and the risk of sovereign debt ranking. A correlation matrix of the available independent variables revealed a not significant but medium-strong correlation (0.8) between these two variables during the crisis. In the post-crisis period, however, this linkage disappeared.

CONCLUSIONS

The following conclusions can be drawn from studying the figures and data:

1. The change in domestic outstanding was determined by the loan-to-deposit ratio, the GDP and the bad loan ratio in this order. The CDS spread has no explanatory power. However, the weight of the explanation variables are different in the crisis and the post-crisis period. The GDP has stronger explanatory power in the crisis, but the NPL and loan-to-deposit ratio are better in the post-crisis period.
2. Hungary was one of the two countries (near Slovencia), where the deleverage was the most serious. This may be the consequence of two factors. Firstly, the Hungarian bank system has got an accumulated drawback situation; all of the bank specific explaining factors (loan-to-deposit ratio, GDP growth, non-performing loan, and risk of sovereign debt) have poor figures during and after the crisis. The only exception was the post-crisis economic growth, where the performance of Hungary was fairly good between 2013 and 2015. The second reason may be that the Hungarian bank sector was burdened by several special levies (sectorial bank tax introduced firstly in the region with heavy tax rates, consolidation of foreign currency nominated mortgage loans, transaction tax, etc.) These levies limited the profit generating ability of Hungarian banks and also limited the quick write-off of accumulated bad loans.

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Presentation and Testing of the Creeping Trend with Harmonic Weights Method in the Light of Sovereign CDS Prices

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SUMMARY

The prediction of financial indicators is not easy, as the influencing factors may change from time to time. The sovereign credit default swap (CDS) spread is a complex measure which helps evaluate country risk, and there are a number of quantitative and qualitative criteria that may have an impact on the price development. The study aims to present and test a relatively new method. Forecasting based on the creeping trend with harmonic weights allows us to manage independent variables that are not constant in time. The study presents the method and illustrates its effectiveness through an empirical example, using the Hungarian and German five-year USD denominated quarterly CDS spreads.
Keywords: Credit Default Swap, forecast, creeping trend with harmonic weights, sovereign CDS
Journal of Economic Literature (JEL) codes: B4, C53, E47, F37
DOI: http://dx.doi.org/10.18096/TMP.2018.02.03

INTRODUCTION

Economic developments and their expected future tendencies have an important role in the decision-making process. The analysts try to analyse the time series data and based on their results they attempt to determine the trends. For this they can use several different methods and techniques. Precise forecasting in the credit derivatives market is just as important as in the case of any other economic process.

One of the most common credit derivatives is the Credit Default Swap (CDS). There are several types, applicable to companies and countries (the latter is called as sovereign CDS premium). CDS is essentially an agreement between two parties to exchange a third party's credit risk with a given interest rate over a given maturity. In practice, this works like insurance. The purchaser of CDS pays the seller a fee (spread) at a certain time, and in exchange for certain default events the seller takes the risks. Interest spread is determined in base points. The fee actually is the product of the interest margin in base points and the total nominal value of the insured asset. Interest spreads are usually paid quarterly (Varga 2008).

However, the CDS does not only have insurance functions; in many cases trades are carried out for speculative purposes. As the CDS is traded on OTC (over-the-counter, non-regulated) markets, it also offers anonymous transactions. The value of sovereign CDS is an important variable for a country because it affects external sources of funding. In addition, it is linked to many macroeconomic, financial, and political variables that make the sovereign CDS a good choice to test different forecasting models.

In time series analysis we can choose from several forecasting methods. The purpose of this paper is not to explore the processes behind the movement of sovereign CDS spreads, but to test a lesser known but effective forecasting method. The method of creeping trend with harmonic weights (Szilágyi et al. 2016) is suitable for the short-term forecasting of complex processes.

In addition to the introduction of the theoretical background, an empirical study was also performed. In the analysis the Hungarian and German five-year USD denominated CDS spreads were estimated using various macroeconomic and financial indicators. Quarterly data was used, enabling a sufficient number of samples to be available despite the relatively short time periods (2012–2016 and 2003–2016).

The study is structured as follows: in the second section the sovereign CDS-related literature is introduced. The third section presents method selected, the creeping trend with harmonic weights. The fourth section contains the empirical analysis. Finally, the fifth section provides the conclusions and a summary.

POSSIBLE CDS FORECASTING METHODS – LITERATURE REVIEW

In the last decades, different derivatives have gained popularity. Credit Default Swap (CDS) products are among the most popular group of credit derivatives. As the products are traded outside the stock exchange, the range of available information is limited, though the authorities attempted to regulate the trade more intensively by changing the rules after the 2008 crisis. Researchers are increasingly attracted by CDS price movements, so the number of publications is constantly growing. Within these, an increasing number of studies are about the examination of sovereign CDS spreads.

Duffie et al. (2003) examined Russian sovereign bonds denominated in USD. They tried to quantify the effects of different events, paying particular attention to the restructuring. In the paper, a pricing model based on a likelihood estimation was developed and they found that the yields are very different in time and respond to political events, changes in oil prices and foreign reserves.

Remolona et al. (2008) investigated emerging markets and measured the risk of countries using sovereign CDS spreads as indicators. The CDS spreads were divided into two parts: the expected losses from bankruptcy and the market risk premium expected by investors. It was concluded that change in the various fundamentals mainly affects the sovereign risk, while change in the risk aversion factor of investors influences the volatility.

During their analysis, Fontana and Scheicher (2010) focused on the Eurozone's sovereign CDS prices and government bonds. They used weekly data and tested ten different countries. They recognized that common factors played a major role during the financial crisis. In addition, from the beginning of the crisis the values of CDS spreads exceeded the value of bond payments, on average. One of the reasons for this could be the limited arbitrage opportunities. In addition, it was emphasized that there is a difference between countries in terms of price integration.

Longstaff et al. (2011) divided the sovereign risks by analysing CDS spreads. Two main components were developed: global and local economic factors. Perhaps surprisingly, they concluded that sovereign country risk is affected by global factors (in particular, various economic indicators of the United States) more strongly than by country-specific factors. This raises the question of how sovereign the risk of each country can be if global factors play a key role. This finding can be particularly important when selecting the variables for the analysis.

Dieckmann and Plank (2012) examined the evolution of CDS spreads in developed economies during the financial crisis in 2008. It was found that there is a great movement between countries and that the pre-crisis financial markets played a major role in the movement of country risk premiums. They recognized that the members of the European Union are more exposed to the risks, more vulnerable than the non-member countries.

Aizenman et al. (2013) focused on the role of fiscal space and economic fundamentals, using panel regression and Arellano-Bond dynamic panel estimation. Based on the pairwise comparison of different countries, they concluded that systematic estimation errors occurred in the sovereign CDS markets during the 2008-10 financial crisis.

According to the literature, in the analysis of CDS spreads it is certainly worth taking into account macroeconomic and financial indicators. In addition, where possible, exploration of relations between countries is also needed. However, there are many factors that are difficult to quantify and model. For example, the impact of policy changes, the role of declarations, developments in credit ratings, etc. Integration of these variables into the model poses a serious challenge to researchers.

CREEPING TREND WITH HARMONIC WEIGHTS

In the literature one can read about many predictive methods, some of which are simple techniques and others more complicated. The applicability of the methods depends on several factors, e.g. time period of forecasting, the quantity and quality of available data, the time, the budget, etc. (Szilágyi et al. 2016)

In many cases, the observed process or phenomena are influenced by different factors over time, so traditional models with the same variables cannot properly describe the changes. Recognizing these changes and the breakpoints is always a challenge for researchers. There are several possible approaches which can be used for find the breakpoints, such as ARMA models, Bayesian statistics, Markov chain (Pesaran et al. 2006), or CUSUM (cumulative sum) models or likelihood approaches (Aue & Horváth 2012). Since the primary purpose of the study is to present the creeping trend with harmonic weights method, the identification of breakpoints is not included.

Szilágyi et al. (2016) have developed a technique that combines the method of harmonic partial trends (Besenyei & Domán 2010; Hegedűsné Baranyai 2007) with multivariate regression analysis (OLS) (Wooldridge, 2016). This can be used to validate the relatively accepted view that values closer to the present are more relevant to the future than the "older" values. In addition, it also allows the researcher to use different, truly relevant independent variables during the different periods.

The variables included in the analysis are determined on the basis of the literature. Since the effect of some phenomena may intensify or weaken from time to time, it is desirable to include the widest range of variables in the analysis. The underlying, hidden links between the variables may also cause differences in the regression functions for each period.

The inclusion of qualitative variables in the analysis may also be necessary, but it is a very difficult task. For example, political decisions and declarations have a clear impact on the perception of a country's risk. However, quantifying political declarations is not easy. One possible case for involving quality variables is the use of dummy variables. However, this has a limit, since dummy variables are binary variables and the description of a complex phenomenon is difficult and complicated. In addition, since multiple variables have to be created for multiple possible values, the reliability of the regression results is also reduced.

Indices and indicators are often used to display quality factors. However, developing a good methodology in this case is a time-consuming and complicated task. However, for a comprehensive study, it is necessary to turn the quality aspects into the analysis in somehow. The creeping trend with harmonic weights is capable of taking into account the qualitative factors, since in the regression analysis we can use dummy and other indicator variables. Later there will be qualitative variables in the model, but in this paper the regression functions contain only quantitative factors.

The steps of the creeping trend with harmonic weights are the following: 1. Determination of the subsamples (number of time periods for each regression function); 2. Creation of optimal regression functions for each subsample; 3. Estimation for each year/quarter/month/week etc. based on the regression functions; 4. Determination of weights based on the adjusted R2 values; 5. Use of the harmonic sub-trends method (Besenyei & Domán 2010) and create the forecast; 6. Interpret and validate the results.

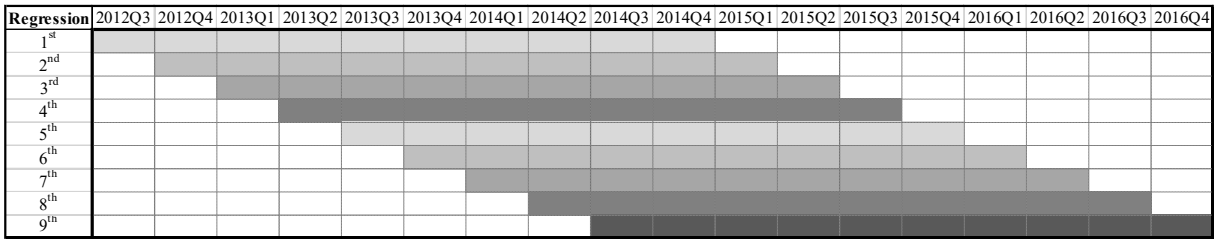
In the first step, it is necessary to determine the number of sub-samples. These subsamples will "slip" from time to time. The structure can be seen in Figure 1.

An optimal regression function is determined for each sub-sample. For this the most common method is OLS, but other functions can also be applied, taking into account the multivariable assumptions. Based on the regression functions, for the sub-samples we have an estimated value for each moment. Since it is a “moving” calculation, in each case, except for the first and the last period, several estimates are created.

These values are weighted and averaged using the weights determined by the adjusted multiple determination coefficients. For the determination of the weights first we have to obtain every R^2 value (in the example above we can see 9 different time periods, which means 9 different regression functions with 9 different R^2 values). For the first and the last dates weights are not needed, because there we have only one estimation value. The weighting technique is the following: in the second date (2012Q4) we have two regressions with two R^2 values, from which we will calculate two weights (one weight for each regression). For the first regression we divide the R^2 of the first regression by the sum of the R^2 values of the first and second regression. For the second regression we divide the R^2 of the second regression by the sum of the R^2 values of the first and second regression. The sum of the two calculated weights for the second date will be 1. For the third date (2013Q1) we have three regressions, so we need to determine three weights with the same technique, and the sum of these weights will be 1 again. We need to do this for every regression estimation of each date. We determine the estimated values based on the regressions for every case and calculate the average estimated value for every date, using the calculated weights.

In this way we get the estimated average values for which the weighting technique described by the harmonic partial method is used. For this, we need to determine the difference of the estimated values (d_t). For the first date we cannot determine the d_t, because there is no t-1 value there. The next step is the determination of h_t: $ht=h_{t-1}+(1/(n-t)))$, where the n is the total number of dates and t is the rank of the actual date (if we start ranking them from 0). After that we determine the w_t values ($w_t=h_t/(n-1)$). We need to multiple the dt values with the w_t values, add them and in the end we get the coefficients which we will use for the estimation. Consequently, the trend is more weighted by the recent values.

The great advantage of this method is that it is able to handle time-changing effects while also ensuring the greater role of recent values. The disadvantage is that it is computation intensive, and in case of large samples, more than one hundred regressions can be made, which is why it is time-consuming. As in the case of the other forecasting methods, it can be used reliably for short-term or medium-term forecasts, but is not suitable for long-term forecasts.



Source: Own compilation

Figure 1. Example of the structure of the sub-samples and sub-regressions

EMPIRICAL ANALYSIS

Forecasting sovereign CDS spreads is not an easy task. Several factors, including qualitative (difficult to quantify) variables have an impact on price developments. Conventional forecasting techniques are therefore ineffective. This paper uses the method of creeping trends with harmonic weights to predict the quarterly sovereign CDS spreads for Hungary and Germany, with the smallest prediction error. There are two reasons for choosing these two counties: the availability of data and the importance of the economic relations between them. Additionally, in order to test the method as fully as possible, two different sample sizes and regression element numbers were defined, which was possible for these two countries.

During the analyses SPSS software and Microsoft Excel software were used. The range of variables included in the analysis is not complete; the qualitative factors are not included in this study. Later, in further research the range of the included variables will be expanded. Graphical tests were performed to verify the results.

Dataset

The dependent variable was the five-year USD denominated sovereign CDS premium, using data from the Bloomberg database. For the fulfilment of the regression assumptions, the natural logarithm of the dependent variables was used for the analyses. The following independent variables were used for the two countries: unemployment rate (2010 = 100%), industrial output index (seasonally adjusted and unadjusted, 2010 = 100%), wage index (2010 = 100%), shares (end-of-period prices, 2010 = 100%, refers to the BUX Index/CDAX Index, base January 2, 1991/December 30, 1987), producer price index (all commodities, 2010 = 100%), consumer price index (2010 = 100%), average exchange rate (national currency/USD), nominal effective exchange rate (index), real effective exchange rate (index), export (national currency), import (national currency), GDP deflator (index), GDP (national currency), discount rate (annual percentage; end of period; basic rate at which NBH offers loans with maturity of more than one year to other MFIs), lending rate (average rate charged by other MFIs on loans with maturity of less than one year to nonfinancial corporations, weighted by volume of new credit extended during the last reporting month), treasury bill (annual percentage; weighted average yield on 90-day treasury bills sold at auctions), deposit interest rate (annual percentage), government bond (annual percentage; average daily secondary market yield on ten-year fixed-rate government bonds), loan interest rate (annual percentage), total reserve (excluding gold, USD). Each variable was quarterly in order to have a sufficient number of samples for the tests.

For the determination of partial trends the SPSS stepwise multivariable linear regression command was used.

For Hungary, the used time period was 2012 Q3–2016 Q4, as the data were available during this period. This represents a total of 18 quarters, of which 10 sub-samples were formed. The forecast was between 2017 Q1–2018 Q4. For Germany, a larger sample was available: the used time period was 2003 Q1–2016 Q4, which represents 56 periods. Here, the rationalization of the analysis and the control of the larger sample resulted in 30 sub-samples. The forecast also covered the 2017 Q1–2018 Q4 period.

Results, Interpretations

Hungary

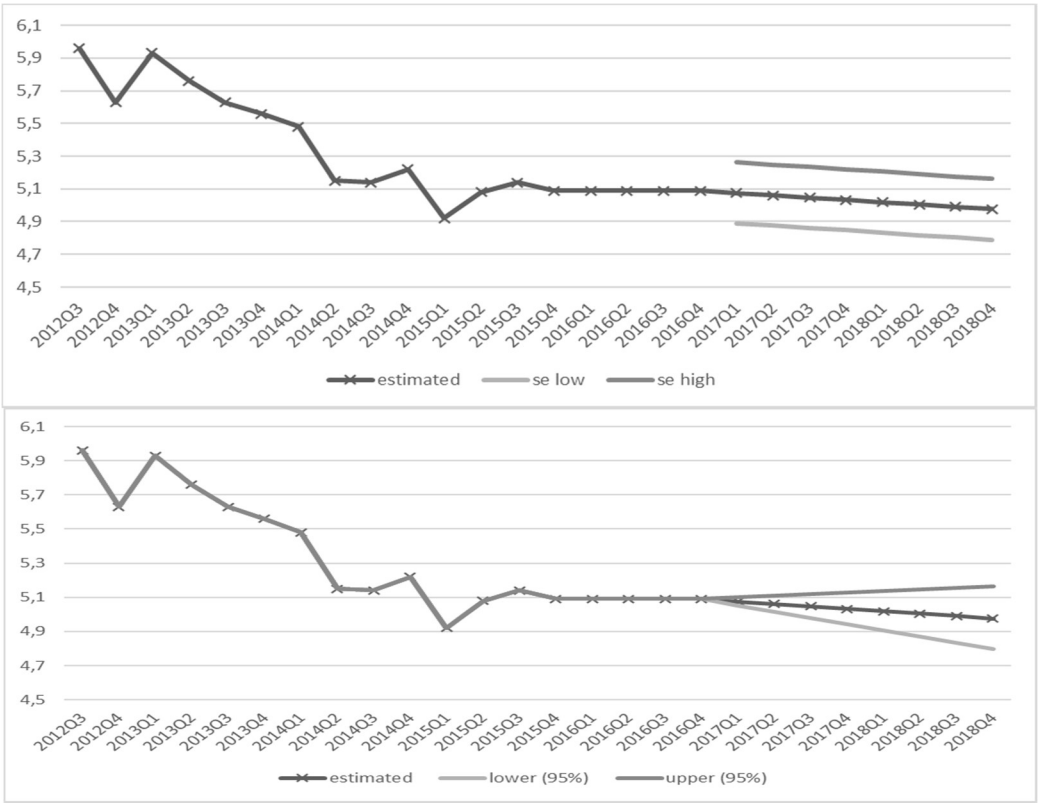
Based on the creeping trends with harmonic weights method, the optimal multivariate regression functions were determined in the first step. For Hungary, using 10-element samples, this has resulted in 9 different functions (moving every time with a period). Regression analysis requires the fulfilment of number of assumptions, most of which are related to residuals. In most cases, the fulfilment of these conditions was solved by the logarithmic transformation of the dependent variable, using the least squares method (OLS). Multicollinearity was eliminated by the backward elimination method and manual control, and disturbing autocorrelation was tested with Durbin-Watson statistics. The explanatory power of each regression function and the included variables are given in Table 1. In Appendixes 7.3, 7.4 and 7.5 one can see detailed information about the regression functions.

Table 1
Characteristics of regression functions, Hungary

No.	Periods	Adjusted R^2	Variables		
			Constant	Independent variables	
1	2012Q3-2014Q4	0.883	✓	import	
2	2012Q4-2015Q1	0.903	✓	industrial output index (seasonally adjusted)	
3	2013Q1-2015Q2	0.916	✓		
4	2013Q2-2015Q3	0.839	✓	loan interest rate	
5	2013Q3-2015Q4	0.884	✓	government bond	total reserve
6	2013Q4-2016Q1	0.724	✓		
7	2014Q1-2016Q2	0.618	✓		
8	2014Q2-2016Q3	0.250	✓		wage index
9	2014Q3-2016Q4	0.255	✓		

Source: own compilation

Estimation of the partial trends was based on different regressions, which resulted in several estimates for each quarter (excluding the first and last periods) that were weighted by the adjusted R^2 value of the regression functions. The values were used for the harmonic partial trends method, as a result of this the forecast has been completed. (In the prognostic point of view the latest, recent values/changes have a greater role in the determination of the present and future trends. By applying an appropriate weighting system, the examined periods' partial trends also were assigned different weights, thereby ensuring that data closer to the present gain more weight during the forecasting.) During the analysis, the 95-percent confidence interval and standard errors were also determined. The results obtained with the confidence interval as well as standard errors are shown in Figure 2.



Source: Own compilation

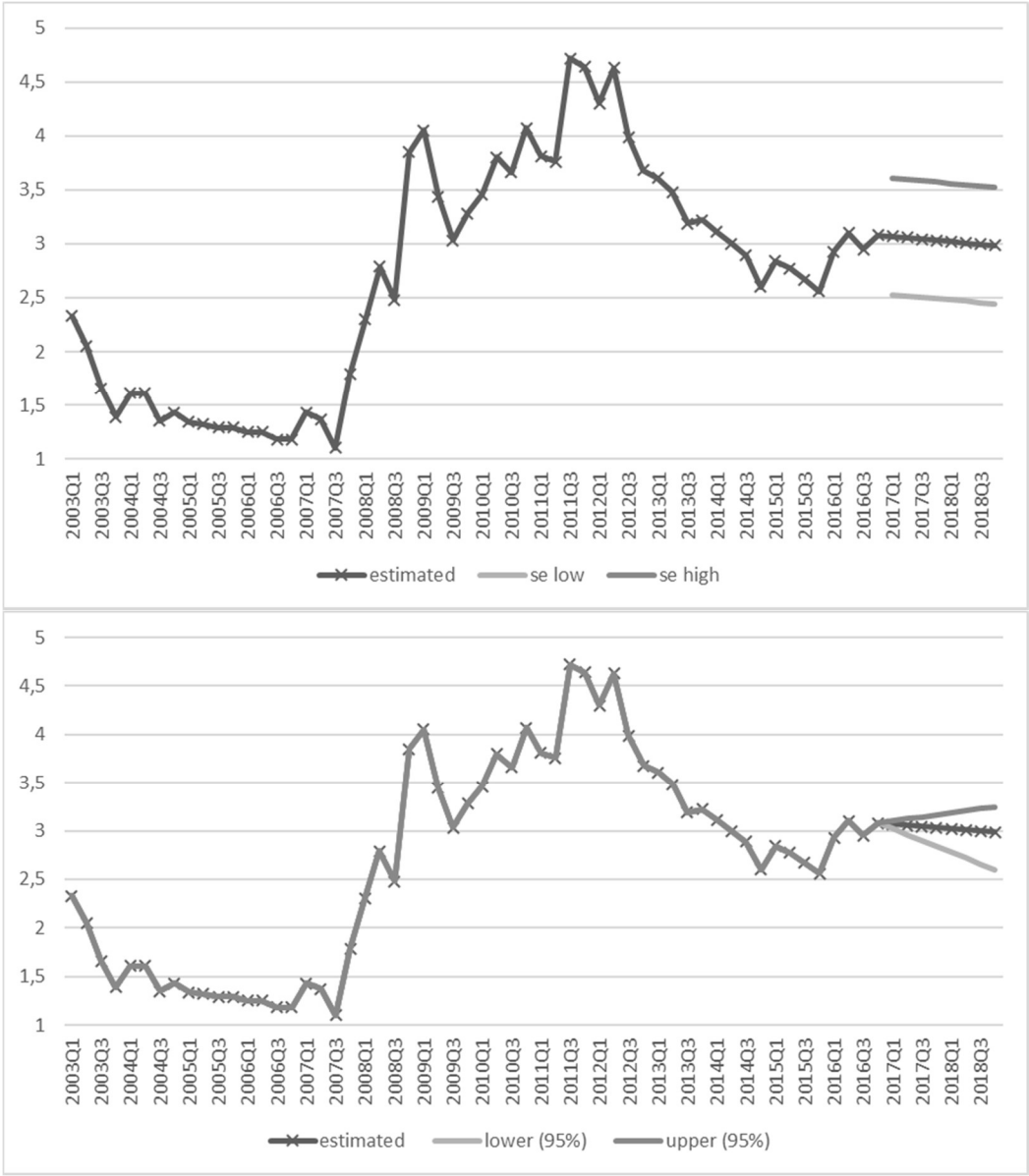
Figure 2. Forecast of the Hungarian sovereign lnCDS premium with standard error (upper) and 95% confidence interval (lower)

In Hungary, the forecast predicts a fall in sovereign CDS spreads. It is important to note that qualitative factors (e.g. credit rating, political news, announcements, etc.) are not included in the analysis. Building them into a model is the next research goal.

Germany

For Germany, the test procedure was the same as described above. Since there are 56 periods (2003Q1-2016Q4) available, the use of 10-element regressions would have been unreasonable, so 30-element samples were defined. This resulted in 27 different partial trends, which were also weighted with the adjusted multiple determinations coefficients. The basic data for the different regression functions are given in Appendixes 1 and 2.

For Germany, the confidence interval moves within a broader range, but it is predicted that there will be a fall in sovereign lnCDS spreads. The results are shown in Figure 3: in the lower part with a 95% confidence interval and in the upper half with the calculated standard errors.



Source: Own compilation

Figure 3. Prediction of German sovereign lnCDS premium with standard error (upper) and 95% confidence interval (lower)

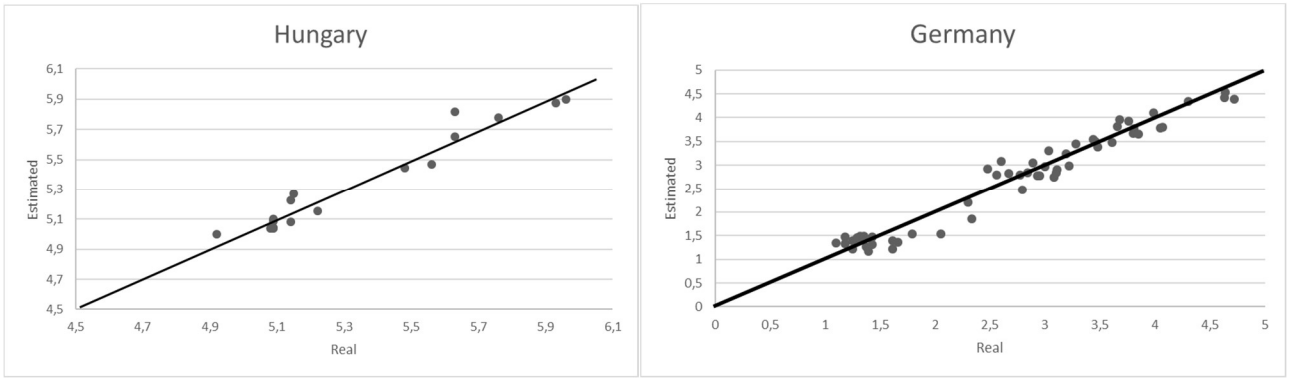
Validity Tests

As with any statistical test, it is important to check the results, test the estimation and explore the inaccuracies. Therefore, different graphical testing methods have been applied for both countries. Tests concentrate on the reliability of the forecasts, which means to what extent the signs and tendencies of future systematic errors are present in the ex-post errors of the forecast.

The first graphical test examines the relationship between the predicted and the actual values (graphs of the two countries are shown in Figure 4). When interpreting the diagram, the axis starting from the origin at an angle of 45° is the relevant one. In the case of a "fully accurate" forecast, the points are located on the axis but this is rare (or simply does not occur) in practice. For a reliable forecast, the set of points randomly scattered around the axis.

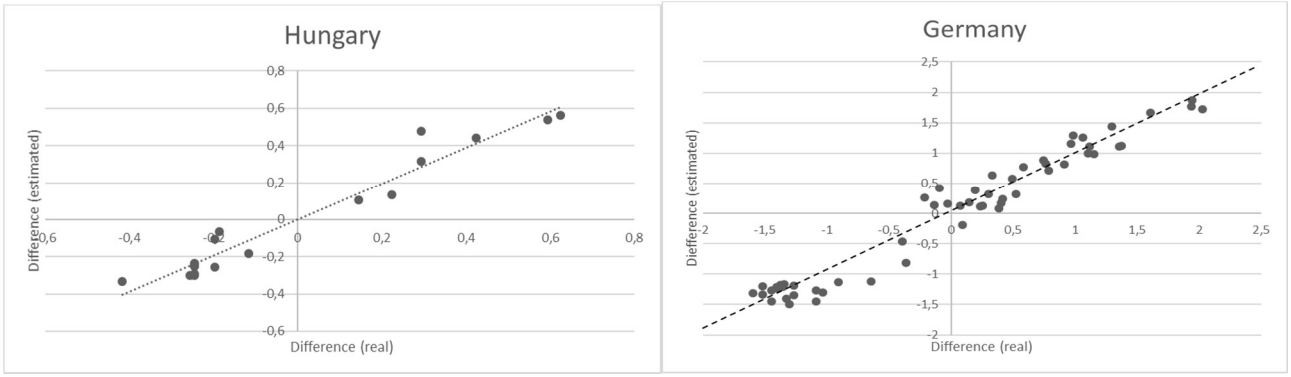
If we look at the Hungarian and German forecasts, we can state that in both cases the precondition for a random set of points around the axis is fulfilled, which means the level of reliability is acceptable.

The second graphical test uses deviations from the averages. Deviations from their own averages have been determined for both the estimated and predicted values. Similarly to the previous graphic test, in this case we can talk about reliable predictions and results if the values are randomly located around the diagonal. Figure 5 shows the results of the test, from which it can be clearly seen that the values are usually around the diagonal, meaning there is no significant systematic deviation in the estimated values. For Hungarian data, since there was a much smaller sample, the results were less spectacular, but this did not affect the interpretation.



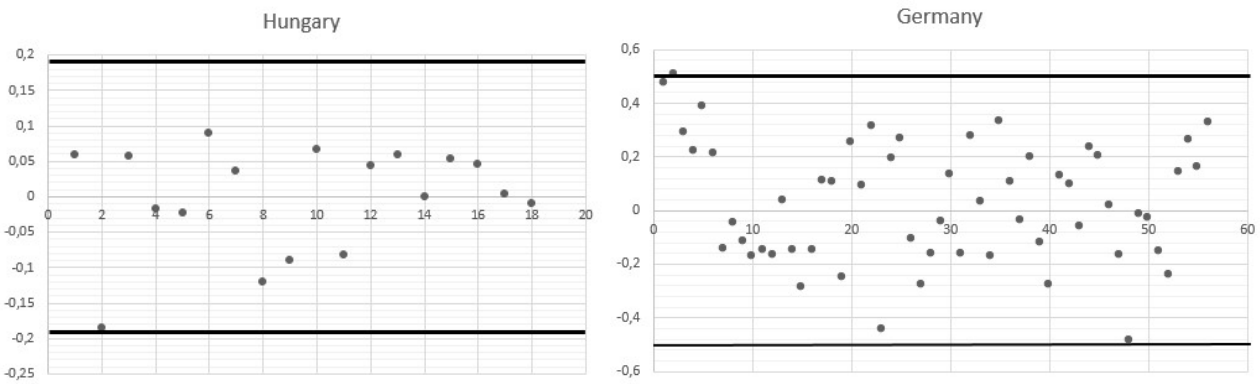
Source: Own compilation

Figure 4. Difference between real and estimated values



Source: Own compilation

Figure 5. The difference between deviations from the real and estimated average



Source: Own compilation

Figure 6. Envelope curves

In the third and final graphical test, the estimated values are shown as a function of time. The two linear lines represent the envelope curves whose values are determined by the standard errors. For both countries, it can be stated that the values are within the envelope curves, which means that the results are reliable. The graphs are shown in Figure 6.

In order to test the reliability of the method, I also looked at the estimation results out of the sample. Figure 7 shows estimates and true data, not just until 2016, but until the second quarter of 2018. Since I used the data until the end of 2016 to the creation of the forecasting function, the estimate for the next six quarters is out of sample estimation. The figure shows that the forecast is reliable in the short term, but as in the case of other forecasting methods, the deviation increases in the long term.

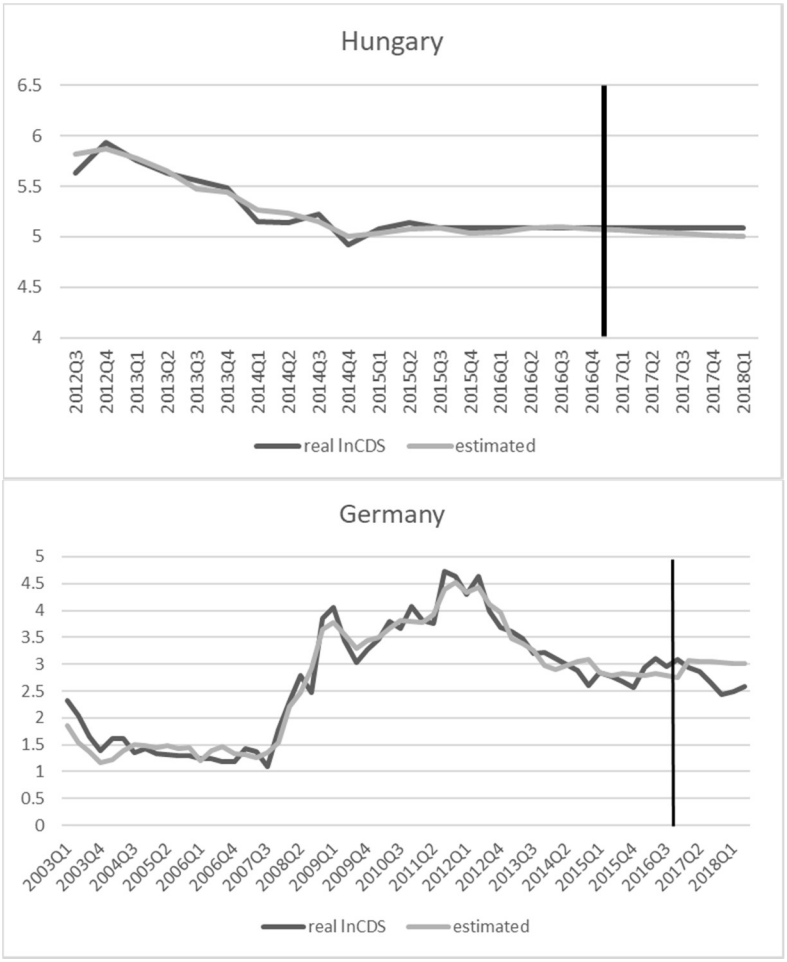
In the case of Germany we can see bigger differences between the actual and the forecasted results. The reason for this is that in the last few years of the model, the growth rate of the economy was far below what the model could not independently improve. It would be worthwhile to look at how the model responds when the sample is split up, so the financial crisis does not distort the results.

It is important not just to make graphic tests of forecasting, but to calculate analytical tests, too. Accordingly, I calculated various analytical indicators (MAD=Mean Absolute Deviation; MSE=Mean Squared Error, RMSE=Root Mean Squared Error, MAPE=Mean Absolute Percentage Error), the results of which are given in Table 2. (The calculation based on Wallström, 2009). It is worth noting that the indicators are less relevant alone, but in comparison with the results of other estimation procedures, they will say a lot. However, it can be stated that the deviations are low; the forecast does not include any lucrative deviations.

Table 2
Forecasting evaluation measures

Measure	Hungary	Germany
MAD	0.0578	0.1912
MSE	0.0053	0.0508
RMSE	0.0727	0.2254
MAPE	0.0108	0.0860

Source: Own compilation



Source: Own compilation

Figure 7. Out of sample results

CONCLUSIONS

The purpose of the study was to effectively predict the sovereign CDS spreads by using the creeping trend with harmonic weights method. On the basis of the regressions performed on the partial samples, the weighted estimation can be used to predict the sovereign CDS spreads, using Hungarian and German quarterly, 5-year USD denominated data. According to the graphical tests, the forecasts have an acceptable level of confidence. The method, though complex, is transparent and helps to carry out successful analyses.

Although the method of creeping trends with harmonic weights provides reliable results, it should not be ignored that the qualitative variables are not included in the analysis and that the sample size should be further increased. In the case of forecasts, as values closer to the present gain more weight, careful consideration is important, because recent extraordinary events (such as the 2008 financial crisis, migration crises, terrorist acts, natural disasters, etc.) can distort the results.

In all statistical analyses, it is important to perform the analysis using several methods, different frequency data and different variables to ensure comparability. Due to the framework of the study, comparative analysis does not cover a variety of times, countries and methods, so the results are not suitable for forming general conclusions.

Examination of causal relationships was not the purpose of this study, but it will be important in later phases of research. Understanding the processes behind the examined phenomenon is essential to select the right method and evaluate the results correctly.

Acknowledgement

I would like to thank the Pallas Athéné Domus Educationis Foundation for its support.

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Appendix 1. *Characteristics of regression functions, Germany*

No.	Periods	Adjusted R^2	Variables				
			Constant	Independent variables			
1	2003Q1-2010Q2	0.901	✓	consumer price index	shares		
2	2003Q2-2010Q3	0.919	✓				
3	2003Q3-2010Q4	0.931	✓			loan interest rate	
4	2003Q4-2011Q1	0.943	✓				
5	2004Q1-2011Q2	0.949	✓				
6	2004Q2-2011Q3	0.962	✓				
7	2004Q3-2011Q4	0.969	✓				
8	2004Q4-2012Q1	0.966	✓				
9	2005Q1-2012Q2	0.966	✓				
10	2005Q2-2012Q3	0.946	✓				
11	2005Q3-2012Q4	0.924	✓				
12	2005Q4-2013Q1	0.906	✓				
13	2006Q1-2013Q2	0.915	✓			unemployment rate	total reserve
14	2006Q2-2013Q3	0.911	✓				
15	2006Q3-2013Q4	0.932	✓	loan interest rate			
16	2006Q4-2014Q1	0.914	✓				
17	2007Q1-2014Q2	0.948	✓			producer price index	nominal effective exchange rate
18	2007Q2-2014Q3	0.939	✓				
19	2007Q3-2014Q4	0.920	✓				
20	2007Q4-2015Q1	0.891	✓				
21	2008Q1-2015Q2	0.864	✓				
22	2008Q2-2015Q3	0.752	✓				industrial output index (seasonally unadjusted)
23	2008Q3-2015Q4	0.715	✓				
24	2008Q4-2016Q1	0.731	✓		deposit interest rate	total reserve	
25	2009Q1-2016Q2	0.817	✓				industrial output index (seasonally unadjusted)
26	2009Q2-2016Q3	0.835	✓				real effective exchange rate
27	2009Q3-2016Q4	0.831	✓				

Source: Own compilation

Appendix 2. *Model summary of regression functions, Germany*

Period	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2003Q1-2010Q2	1	0.953	0.908	0.901	0.29896
2003Q2-2010Q3	2	0.961	0.924	0.919	0.28336
2003Q3-2010Q4	3	0.969	0.938	0.931	0.27687
2003Q4-2011Q1	4	0.974	0.949	0.943	0.26023
2004Q1-2011Q2	5	0.977	0.954	0.949	0.25295
2004Q2-2011Q3	6	0.983	0.966	0.962	0.23322
2004Q3-2011Q4	7	0.986	0.972	0.969	0.21884
2004Q4-2012Q1	8	0.985	0.970	0.966	0.23340
2005Q1-2012Q2	9	0.985	0.970	0.966	0.23744
2005Q2-2012Q3	10	0.975	0.950	0.946	0.29805
2005Q3-2012Q4	11	0.964	0.929	0.924	0.34968
2005Q4-2013Q1	12	0.955	0.912	0.906	0.37951
2006Q1-2013Q2	13	0.961	0.924	0.915	0.34847
2006Q2-2013Q3	14	0.959	0.920	0.911	0.34275
2006Q3-2013Q4	15	0.969	0.939	0.932	0.28432
2006Q4-2014Q1	16	0.960	0.922	0.914	0.30141
2007Q1-2014Q2	17	0.977	0.955	0.948	0.21628
2007Q2-2014Q3	18	0.972	0.946	0.939	0.21805
2007Q3-2014Q4	19	0.963	0.928	0.920	0.23161
2007Q4-2015Q1	20	0.950	0.902	0.891	0.23226
2008Q1-2015Q2	21	0.937	0.878	0.864	0.23684
2008Q2-2015Q3	22	0.882	0.778	0.752	0.30998
2008Q3-2015Q4	23	0.857	0.734	0.715	0.33821
2008Q4-2016Q1	24	0.871	0.759	0.731	0.31804
2009Q1-2016Q2	25	0.911	0.829	0.817	0.26299
2009Q2-2016Q3	26	0.920	0.847	0.835	0.24800
2009Q3-2016Q4	27	0.918	0.843	0.831	0.25246

Source: Own compilation

Appendix 3. *Model summary of regression functions, Hungary*

Period	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2012Q3-2014Q4	1	0.947	0.896	0.883	0.10304
2012Q4-2015Q1	2	0.956	0.914	0.903	0.10015
2013Q1-2015Q2	3	0.962	0.926	0.916	0.09626
2013Q2-2015Q3	4	0.926	0.857	0.839	0.11220
2013Q3-2015Q4	5	0.954	0.909	0.884	0.08045
2013Q4-2016Q1	6	0.869	0.755	0.724	0.10170
2014Q1-2016Q2	7	0.813	0.660	0.618	0.08823
2014Q2-2016Q3	8	0.577	0.333	0.250	0.06641
2014Q3-2016Q4	9	0.581	0.338	0.255	0.06450

Source: Own compilation

Appendix 4. *ANOVA tables of regression functions, Hungary*

Period	Model		Sum of Squares	df	Mean Square	F
2012Q3-2014Q4	1	Regression	0.735	1	0.735	69.195
		Residual	0.085	8	0.011	
		Total	0.82	9		
2012Q4-2015Q1	2	Regression	0.849	1	0.849	84.680
		Residual	0.080	8	0.010	
		Total	0.930	9		
2013Q1-2015Q2	3	Regression	0.922	1	0.922	99.505
		Residual	0.074	8	0.009	
		Total	0.996	9		
2013Q2-2015Q3	4	Regression	0.603	1	0.603	47.936
		Residual	0.101	8	0.013	
		Total	0.704	9		
2013Q3-2015Q4	5	Regression	0.455	2	0.227	35.136
		Residual	0.045	7	0.006	
		Total	0.500	9		
2013Q4-2016Q1	6	Regression	0.255	1	0.255	24.612
		Residual	0.083	8	0.010	
		Total	0.337	9		
2014Q1-2016Q2	7	Regression	0.121	1	0.121	15.560
		Residual	0.062	8	0.008	
		Total	0.183	9		
2014Q2-2016Q3	8	Regression	0.018	1	0.018	3.998
		Residual	0.035	8	0.004	
		Total	0.053	9		
2014Q3-2016Q4	9	Regression	0.017	1	0.017	4.085
		Residual	0.033	8	0.004	
		Total	0.050	9		

Source: Own compilation

Appendix 5. *Information about the coefficients of regression functions, Hungary*

Period	Model	Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
			B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
2012Q3-2014Q4	1	(Constant)	9.372	0.461		20.329	0.000	8.309	10.435		
		Import	-0.001	0.000	-0.947	-8.318	0.000	-0.001	0.000	1.000	1.000
2012Q4-2015Q1	2	(Constant)	11.343	0.642		17.668	0.000	9.862	12.823		
		Indprod_1	-0.054	0.006	-0.956	-9.202	0.000	-0.067	-0.040	1.000	1.000
2013Q1-2015Q2	3	(Constant)	11.291	0.593		19.049	0.000	9.924	12.658		
		Indprod_1	-0.053	0.005	-0.962	-9.975	0.000	-0.065	-0.041	1.000	1.000
2013Q2-2015Q3	4	(Constant)	4.403	0.135		32.536	0.000	4.091	4.715		
		Lendrate	0.204	0.029	0.926	6.924	0.000	0.136	0.272	1.000	1.000
2013Q3-2015Q4	5	(Constant)	4.870	0.216		22.553	0.000	4.359	5.381		
		Govbond	0.261	0.036	1.233	7.322	0.000	0.177	0.346	0.457	2.190
		Totres	-1.90E-02	0.000	-0.444	-2.639	0.033	0.000	0.000	0.457	2.190
2013Q4-2016Q1	6	(Constant)	4.487	0.144		31.078	0.000	4.154	4.820		
		Govbond	0.166	0.034	0.869	4.961	0.001	0.089	0.244	1.000	1.000
2014Q1-2016Q2	7	(Constant)	4.625	0.133		34.791	0.000	4.319	4.932		
		Govbond	0.130	0.033	0.813	3.945	0.004	0.054	0.206	1.000	1.000
2014Q2-2016Q3	8	(Constant)	5.617	0.260		21.602	0.000	5.017	6.216		
		Wagerate	-0.004	0.002	-0.577	-1.999	0.081	-0.008	0.001	1.000	1.000
2014Q3-2016Q4	9	(Constant)	5.600	0.252		22.212	0.000	5.019	6.182		
		Wagerate	-0.004	0.002	-0.581	-2.021	0.078	-0.008	0.001	1.000	1.000

Source: Own compilation

The Social Role of Intership Programmes in Reducing Migration from a County Seat

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SUMMARY

This article deals with the role of internship programmes in encouraging young graduates from higher education to stay in their home region and is based on the findings of a questionnaire survey conducted in 2017. The aim of our research was to get a close view of the intern's motivation and of their satisfaction; futhermore, whether they would like to work for the company and thanks to that stay in the region. Survey findings show that 56 percent of the respondents feel it is important to be employed close to their home, and 80 percent of the interns would like to work in a full-time position as soon as possible and aim to stay the company after the internship programme. These results would suggest that the internship programmemes of the multinational companies help to encourage young graduates to stay in their home region.
Keywords: internship programme, migration, social innovation
Journal of Economic Literature (JEL) codes: O35, E24, J01, R23
DOI: http://dx.doi.org/10.18096/TMP.2018.02.04

INTRODUCTION

According to the data and statistics, migration from a country and moving from one region to another within a country both play an important role in population changes. Hungary is heavily affected by this process because of its location in the middle of Europe. Several reasons (economic, social, political, etc.) can be found behind the migration processes, but as Siskáné Szilasi et al. (2018) write, some factors that strengthen the migration process are the broadening of motivational reasons, the expanding transportation opportunities, and the new infocommunication opportunities brought about by new technologies. Depending on the part of the country, the orientation and the dimensions of migration is different: the regions that have good opportunities for work with better living conditions are affected less. In Hungary, the population has been increasing in regions close to the northwestern border and in the capital, while the northeastern, eastern and southern regions have a decreasing number of inhabitants. Unfortunately, Miskolc is located in a region with declining population because of the lack of work places and low wages. In the last decades statistics have showed that the population of the city has decreased; nowadays this number is approximately 161,000, although it exceeded 211,000 in the 1980s.

The multinational companies of the region would like to work together with the University of Miskolc to increase the number of university graduates who would like to stay in the region through offering better conditions and wages in many fields. It is also important for Miskolc that young people find their expectations in the region, which also involves work places being located close to their hometowns (this statement is validated by our research).

This issue is important; many studies (Blaskó & Gödri 2016; Hegyi-Kéri & Horváth 2018) have highlighted that the younger and more educated group is more significantly affected by migration than the older and less educated ones, which can lead to a decline in the number of well-qualified employees. Because of the migration of younger, more educated employees the region has to deal with the negative effects of the "brain drain": if the knowledge loss due to migration is not compensated for, then the economy of the region and its competitiveness will suffer. Today our world is globalized, which means that opportunities are available all over the world. Assuming sufficient knowledge of other languages, anybody could find easily a job or a school in another part of the world thanks to the modern electronic world and Internet. In this situation the importance of good job offers and work places becomes evident. We assume that students who start to work during their studies are more likely to stay in the region.

The aim of our research was to get a close view of the interns' motivation for participating in an internship programme in a multinational company located in or near Miskolc and to examine their satisfaction with the work

and the company. We also asked whether or not they would like to work for the company (and thus stay in Miskolc). During our research, two surveys were carried out to get an inside view of the internship programme of the most significant multinational company in the region of Northern Hungary, placing questions about the respondent's long term plans, job hunting and the working habits of the students. In the region of North Hungary, several multinational companies offer internship programmes for students. During the selection of the multinational companies, we concentrated on their role in the county. The analysis aims to find the answers for the question of whether the multinational companies with internship programmes are strong enough to keep new graduates in the city. (The examined topic is clearly related also to issues of human resource management; however, this aspect of the topic was not dealt with in this article.)

The Conceptual Definition of Mobility, Migration and the Migration Potential

Nowadays the definitions of migration and mobility are often mixed up; this is the reason why we would like to clarify them. Mobility means 'ability of movement' (Kulcsár 2006), in which a person or group has the possibility to move in a favourable direction. There are two main types of mobility: geographical (spatial) and social mobility. Geographical mobility means the possibility of geographical motion, while social mobility means that the person (or group) has abilities that make it possible for him or her to move from a lower social class to a higher one. Both types of mobility are interpreted as one-way, upward mobility in the literature.

The migration is the action itself: motion that tends from one geographical area to another (shorter or longer distances), for different reasons, in a temporary or a permanent way (Kulcsár 2006). The motion can be considered as migration if it takes place across an administrative (executive) border; therefore, a change of residence within a settlement is not a migration. Commuting is different from migration, because it means travelling further without changing the place of residence (Hárs 2012).

The migration potential can be characterized as planning to leave the residence or the possibility for somebody to consider leaving his/her residence in the future. The intention to migrate is formed by the deliberation of the expected advantages and disadvantages of migration, the cognition of the migration related external expectations, as well as the assessment of the feasibility of migration (Marien 2018).

The Connection between Mobility, Migration and the Intention to Migrate, and their Possible Effects

The nature of mobility and migration is different among the unemployed, the educated, and people who live in bigger cities (Gödry & Feleky 2013). It is a fact that people with higher mobility tend to migrate more often, but the decision about whether they leave their former home or for how long depends on complex individual and institutional factors (Berényi 2018). The fact that someone is mobile does not necessarily mean that the given person is going to migrate. According to De Jong et al. (1985), a strong intention to move away is required for an individual to leave a former domicile. The research of Varga and Szilágyi (2018) showed that educational attainment has a significant influence on the intention to migrate on a national level: the higher the educational attainment is, the lower the migration potential becomes. Lipták et al. examined student mobility from the perspective of education and determined that any decision made by young people that makes that person leave home – in the first instance to be able to study – is the final stage of a long process influenced by the parents' preferences, school and the support of friends (Lipták et al. 2018).

The relationship of mobility, migration and the labour market has a comprehensive basis in the literature. This article is not intended to display all of these sources in detail; we only want to show some of the possible consequences of the migration of young white-collar workers. Before the 1990s it was believed that migration increases the rate of unemployment; however, later a growing body of research contradicted this; for example the research of Marr and Siklos (1994, 1999). According to them, a change in the migration ratio does not increase the unemployment. Siposné Nándori et al. (2018) found that the mobility of young people influences employment: both in centrum-receptive and periphery-sender countries the mobility of youngsters decreases the unemployment rate. Some researchers (Beine et al. 2008, Clemens 2011, Elsner 2015) reached the conclusion that some of the employees in regions afflicted by migration can actually profit from the shortage of labour caused by migration. There can be lack of workers in some given professions; therefore the local employees gain a better bargaining position, so they can negotiate higher wages for themselves. Halász (2018) underlines that sometimes the absence of professionals has such a strong effect that it cannot be eased by higher wages: at this time companies change their profile from labour-intensive production to a capital-intensive model.

Related to this subject we would like to present another effect: settlements, regions or countries with unfavourable conditions have to face the so-called "brain drain" effect, which is the migration of well-qualified, highly mobile young people working in white-collar jobs. According to Docquier and Rapoport (2012), this effect occurs as a central element of the migrating processes. Although

highly educated people are not the main potential migrating unit, nowadays the intention to leave the country is very common among the students at institutions of higher education. Should the country loose only 10% of its graduated people, it would indeed be a massive loss to a country, where human resources add up to one of the most significant part of the country's capital (Molnár et al. 2015). According to the latest research, currently 32.8% of the Hungarians over thirty years old have a higher education degree, while these numbers scale up to 47% among Hungarian emigrants – this is much higher than the proportion of young graduates in the European Union, which is 39%. (Siskáné Szilasi & Halász 2018). Due to increased student mobility, a growing number of young, future white-collar workers are gaining experience abroad, which makes easier for them to work in a foreign country after their graduation.

Population Tendencies in Hungary and Miskolc

According to the representatives of classical economics, migration could be explained by better working conditions and wage differences. Ravenstein explained that the non-beneficial geographical regions are repellent for the people so they are disposed to choose migration, while beneficial geographical regions are desirable; in this case inhabitants will stay in their habitation (Ravenstein 1885). In the Harris-Todaro model migration could be explained by the difference between the wages in the city and in the countryside. One of the most important statements of the model is that inhabitants of the less developed regions decide to move to a more developed region, which assists to decrease the development differences (Harris & Todaro 1970). Nowadays we can see that migration does not eliminate the differences in development of regions, at most the differences in wages of the more developed and less developed regions will decrease due to the fact that migrants from the less developed regions to the more developed ones are willing to take the same job for a lower wage.

According to the world system theory of Sassen (1988), postindustrial development brought about structural economical problems, which appear as a repulsing factor in the less developed regions, and this is the reason why the inhabitants migrate to more developed regions. According to the human capacity theory most likely young adults and the more highly educated people leave their regions earlier.

Population Tendencies in Hungary

After Hungary joined the European Union in 2004 there was a slight emigration wave because of the stabilization of the labour market, an especially low unemployment rate (around 6%) in the first decade of the 2000s, a progressive employment policy, a 3–5% increase in the GDP, and an increase in wages (Siskáné Szilasi et al. 2018). There are only estimated data for the number of people who left Hungary, because there are significant differences between the national and international statistics, but it appears that the number of the people who left the country is around 300,000 to 600,000 people. One decade ago, most of the people emigrating were male, the rate of the people under 30 was less than the number of the people between the age of 30–40, and the unemployed, the Roma and the inhabitants of the West and South-West regions of Hungary left Hungary at higher rates (Siskáné Szilasi et al. 2017). Studies related to this topic in recent years show that the dominance of men could be negligible in recent years compared to the trends in the early 2000s (Blaskó & Gödri 2016). Siskáné Szilasi et al. published corresponding results, showing that the percentage of women who decide to go abroad is the same as men, but a higher percent of the women intend to return to Hungary, either in a relatively short time or eventually. The young generation has a stronger migration motivation, most typically between the ages of 20–29. The fact that even the generation around their early twenties is willing to go abroad is bad news in terms of social and demographical trends (Siskáné Szilasi et al. 2017).

Many national and international studies focus on the migration of young people, especially university and college students. According to a study in the University of Pécs two thirds of the respondents planned international emigration in some form or other (Rohr, 2012) while the research carried out in 2010 by the Identity Research Workgroup of National Minorities in Zenta showed that a quarter of the Hungarian university students in the Vojvodina region of Serbia would like to go abroad (Siskáné Szilasi & Halász 2018). The Hungarian Demographic Research Institute (NKI) made a survey with around 1,500 respondents and found a cumulative migration potential of 33% amoung the young generation (between the ages of 18–40) (NKI 2013). The report of the Research Group of Active Young People in Hungary in 2015 stated that in 2013 33% of the fresh graduates planned to emigrate, while this rate was 37% in 2015 (Szabó 2015). In the data collection of TÁRKI Omnibus, in April 2015 39% of the 18–29 age group wanted to spend a few weeks or months abroad, while around 40% were thinking of a few years and 25% more than a few years abroad (TÁRKI 2015). According to the research of the Hungarian Central Statistical Office (KSH) Hungarian Demographic Research Institute, 35% of the generation between 18 and 40 years of age are willing to go abroad, and 11.5% of the total population of Hungary were likely to implement their migration plans (Gödri 2016).

Along with the strengthening emigration trend in Hungary in the last 5–6 years, the internal migration amoung the regions of Hungary is also significant, which is the result of different economic factors (wages, employment). According to Bába (2008), internal migration has mainly economic reasons, in which labour

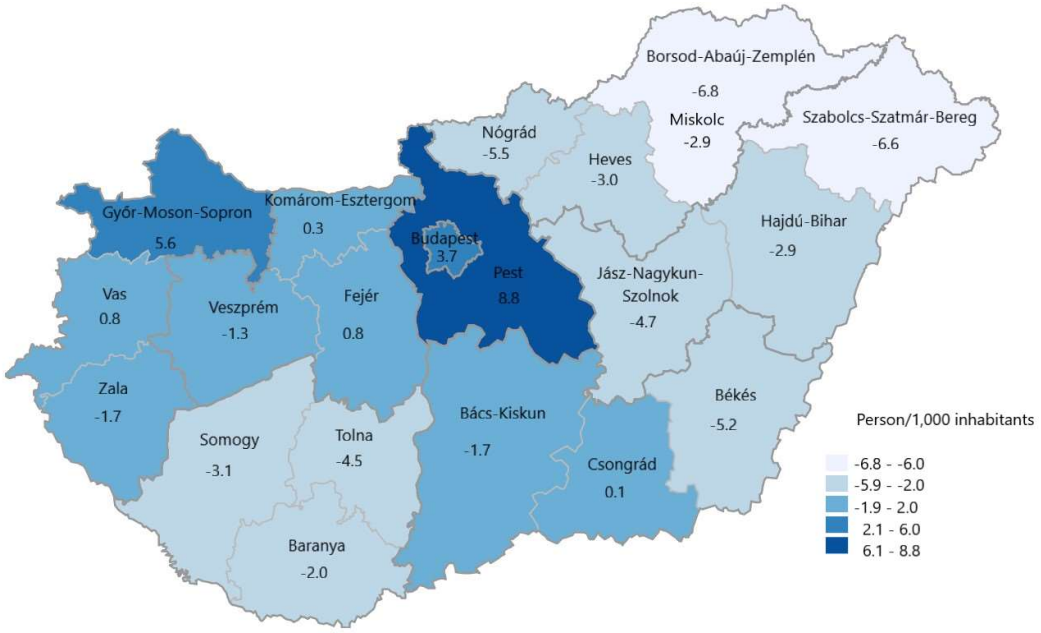
market factors play a prominent role. In addition, internal migration processes are influenced by the real estate market and government actions (Siskáné Szilasi et al. 2018). The biggest geographical realignment of the population was in 2007; in the last 5–6 years the region of West Hungary and the central regions gained population, while the regions of North Hungary and the Alföld lost the largest number of people in the internal migration processes during the last 5–6 years (Bálint & Gödri 2015).

Figure 1 shows the average internal migration margin between 2006 and 2016 (the indicator calculated by the difference between the incomers and outgoers per thousand people, including temporary migration as well). During the investigation period three regions had negative internal migration margins: the regions of North Hungary, North Alföld, and South Alföld. There are especially large minus margins in two counties: Borsod-Abaúj-Zemplén (-6.8 /1,000) and Heves (-6.6/1,000).

If we focus on smaller administrative regions, from 2010 the regions of Budapest, Lake Balaton, Győr and Sopron were advantageously affected as attractive regions. The south, southwest and northeast regions are heavily affected by the decrease in population, for example Miskolc is one of the cities where the population decreased (Siskáné Szilasi et al. 2018). The extensional aspect of the internal mobility of the Hungarian population in 2013 is reflected by the average distance between the sending and receiving areas, which is 50–55 km, meaning that the willingness to move to a further area is not prevalent (Bálint & Gödri 2015) According to the research of GKI Research Institute the direction of the mobility of the Hungarian population is to the north-west (GKI webpage). Siskáné Szilasi et al. (2018) highlighted that the most important factor behind internal migration is the same as that behind transmigration, the difference between the wages and occupation possibilities. One projection of the effect of the last 10 years' population reduction is the shortage of labour, which affects many economic sectors. The situation is critical in those regions where internal migration and transmigration is negative and the birthrate is also low (Siskáné Szilasi et al. 2018).

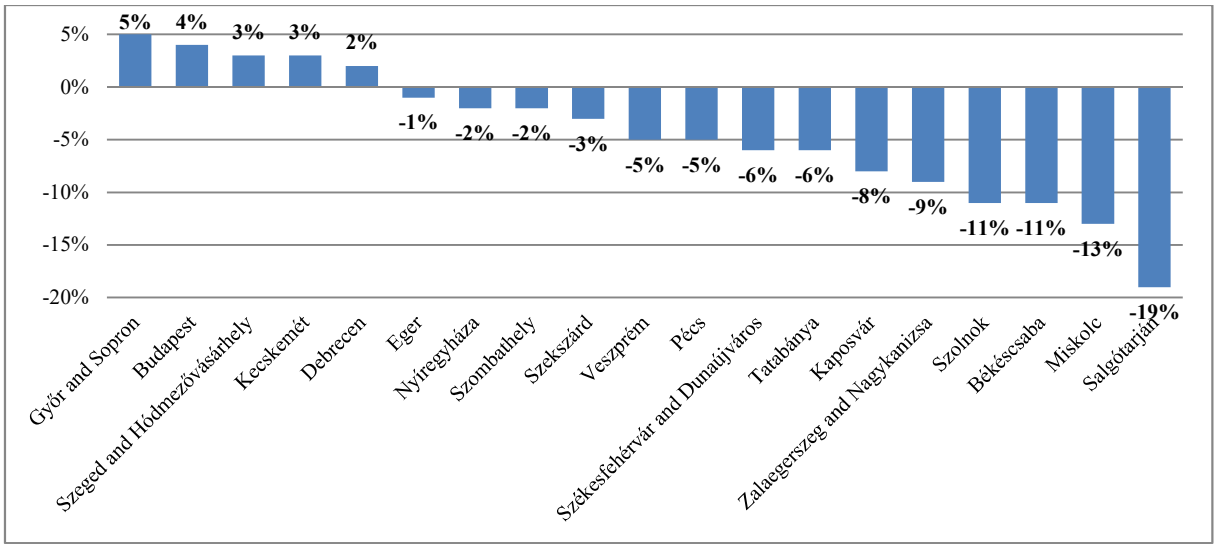
According to the statistics of the Hungarian Central Statistical Office (KSH), the population of Hungary decreased by 2% from 2010 to 2016, which corresponds to about 200,000 people. If we count those who are working abroad and being reported in Hungary as employees, this number is even higher, approximately 500,000 people. Migration tendencies do not affect the regions and cities in the same way. While the population is increasing in several cities, in other parts of the country these numbers are decreasing. The population fluctuates depending on the surroundings of the settlement, the number of work places and the level of the services. The infrastructure, the unemployment rate and the average wage have also a strong effect on the migration inside the country (Világgazdaság, 2017).

If we take these factors into account we realise that the population of settlements in the south and west parts of the country was significantly reduced. On the other hand the regions of Budapest, Győr and Sopron are characterised by gaining population from inner immigration. It is observable that the migration of the popluation has a northwest direction because of the difference in the wages and the number of the working places. The migration is tending towards developed areas and the bigger cities (Világgazdaság 2017; Geoindex 2017).



Source: Compiled by the authors based on KSH webpage
https://www.ksh.hu/interaktiv/terkepek/mo/nepmozg.html?mapid=WNVB001

Figure 1. Average population change per thousand people for Hungarian counties, 2006–2016



Source: Rigó 2017 (based on KSH Mikrocenzus 2005 and 2016)

Figure 2. The change in population in major cities between 2005 and 2016 (percent)

The population of the cities is not growing in every region: among the the 23 cities with county rights the population is growing only in Győr, Szeged, Budapest, Sopron, Debrecen and Hódmezővásárhely (Geoindex 2017). Figure 2 shows the changes of the population in the major cities of Hungary between 2005 and 2016 (Rigó 2017).

Besides the south and south-west part of the country, North Hungary has also lost population. The winners of internal migration processes are those border regions that have variegation of the labor market after the change of the regime (Vas, Zala, and Győr-Moson-Sopron Counties). One of the most important social-demographic variables of migration potential is the age. The younger generation are more likely to leave their hometown than the elder generation (Dabasi Halász & Hegyi-Kéri 2015). Bogárdi (2015) carried out a study in the southern part of Heves County about the younger generation's motivation for migration. Only 33% of the respondents, aged 14–15, said that they would like to work in their hometown when they became older; 68.3% is the rate of those who would like to move. Around 40% of the respondents would like to go to another part of the country, while 23% would like to move abroad. Those 13-to-14-year-old students who do not want to stay in their hometown are mostly likely to want to move to the capital or to the county seat (Eger), while the secondary school students would also consider living in Győr and Debrecen (Bogárdi 2015). Bogárdi also highlighted that in many cases the parents motivate their children to move abroad. Similar findings can be found in Hegyi-Kéri & Horváth's publication: The migration of the younger generation is heavily influenced by the experience of their parents (Hegyi-Kéri & Horváth 2018).

According to Siskáné Szilasi et al. (2018), Hungarians are preparing for for a mobile lifestyle from a younger age and deciding to leave their hometowns. Their research pointed out that after secondary school every third or fourth student decides to do their university studies abroad, but in most of the cases after their studies they come back to Hungary (Siskáné Szilasi et al. 2018). The study finds that each year during the examined period (2006–2015) the average age of Hungarian emigrants dropped by half a year. As of 2015 % of the migrated population is under the age of 30, while 66% is under the age of 42 (Siskáné Szilasi et al. 2018). From 2009 the number of the Hungarian people under the age of majority emigrating doubled (Blaskó & Gödri 2014; Blaskó et al. 2014; SEEMIG 2014,) which means that in 2015 80% of the migrated population came from this age group (Sik & Szeitl 2016, Siskáné Szilasi et al. 2018).

Seen from an international perspective, the mobility lifestyle of Hungarian young adults is below average. The most important reason for their migration is primarily employment related, secondly education related (Dabasi Halász & Kiss 2018), but the migration processes cannot be simplified; most of the time their reasons are mixed and combined (Dabasi Halász & Hegyi-Kéri 2015). The pull factors of the better facilities are important, but the push factors cannot be neglected, such as the young adults not finding a job or being unable to establish their own business (Dabasi Halász & Kiss 2018). Migration of young people has a strong impact on life-time mobility (Lipták et al. 2018). Examining the Hungarian regional characteristics for migrating potential, the duality between the capital and the rest of the country and between the functionally strong cities and the rural villages is obvious. Going down in the hierarchy of settlements, the determination and strength of the leaving intention decrease, that is, the smaller the settlement the lower the proportion of inhabitants that have strong intentions to leave their hometown (Siskáné Szilasi et al. 2017). While 41% of the respondents living in the capital do not intend to move away, this ratio is 45% among the people living in cities and 44.5% among those in rural regions. Most of the

unsure people live in a village (40%) while 37% of the population of the cities and 35% of the population of the capital are considering leaving the country. The sharpest diversity can be found between the sure-to-leave groups: 23% of people living in the capital have decided to leave their original hometown in the near future; however, this ratio scales down to "only" 16% among villagers and 18.5% among urban population (without the capital) (Siskáné Szilasi et al. 2017).

From the perspective of settlement size, it is common that people living in larger settlements, regionally people from Central Hungary, West Hungary and North Hungary, leave their original hometown in the biggest numbers (Dabasi Halász & Kiss 2018). Molnár et al. reported similar results: practically, the migration rate is high in the whole country, but this rate in the Northeast region of Hungary is even higher than the national average. The smallest migrating potential is showed by the counties in the southwestern and southern parts of the country (Molnár et al. 2015). Siskáné Szilasi et al. (2017) underlined that increased, long-term migration most seriously afflicts the regions affected by industrial restructuring caused by demographic and economic erosion (Miskolc is also classified here) and the regions that are far away from the advanced central regions. Borsod-Abaúj-Zemplén County leads the list both in the number of potential leavers and in the people who have already made their decision to leave – this process leads to population loss in the county (Siskáné Szilasi et al. 2017). The loss of population in the counties with higher migrating tendencies can further be increased by two aspects: the decrease in population (natural decline) and internal migration. From the perspective of these two aspects, the three counties with the highest migration indicators are Borsod-Abaúj-Zemplén, Nógrád and Heves (Siskáné Szilasi 2018).

According to Marien (2018), the satisfaction (or mostly dissatisfaction) among Hungarian citizens with their hometowns has a direct effect on the emergence of the intention to leave. From this perspective, there are significant regional differences in Hungary: in the regions where people have the most serious intent to leave, the general satisfaction of the citizens is lower, while their satisfaction with the job opportunities is significantly higher in the regions with basically low intent to migrate. Marien underlines if people are dissatisfied with basic and essential factors (like job opportunities, public safety, etc.), they are more likely to make the decision to leave their home (Marien 2018).

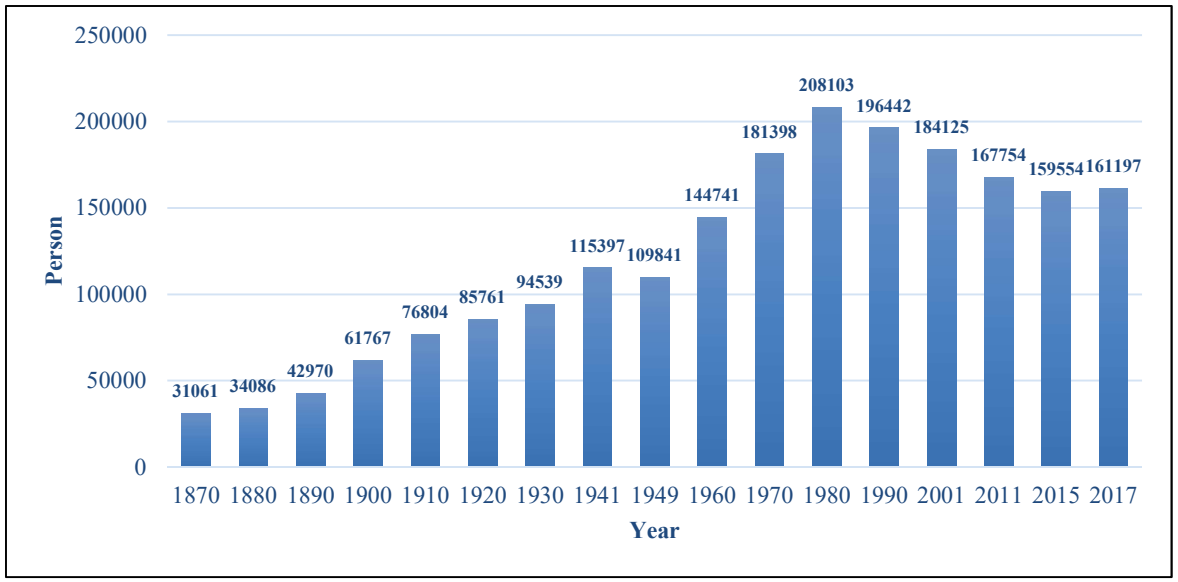
Population Tendencies in Miskolc

Although nowadays approximately 160,000 people live in the capital of the Borsod-Abaúj-Zemplén County, in the 1980s Miskolc was the second biggest and most populous city in Hungary after Budapest. The population of the city reached its highest in the 1980s, around 211,000 (at the end of 1986 it was 211,660). Migration from Miskolc became higher after the change of regime. In this regard the city can be classified as one of the "big losers" of this situation. In the counties of the North Hungary region most of the population was employed by the heavy industry for more than 40 years. During socialism the number of citizens continuously increased. The largest population decline afflicted the city between 2011 and 2015: in this period the number of residents dropped yearly by an average of 1.25, as can be seen in Table 1 and Figure 3. Between 2015 and 2017 this tendency seems to have reversed: the statistics show population growth in Miskolc once again.

Table 1
The yearly change in the population of Miskolc, 1870-2017 (per cent per year)

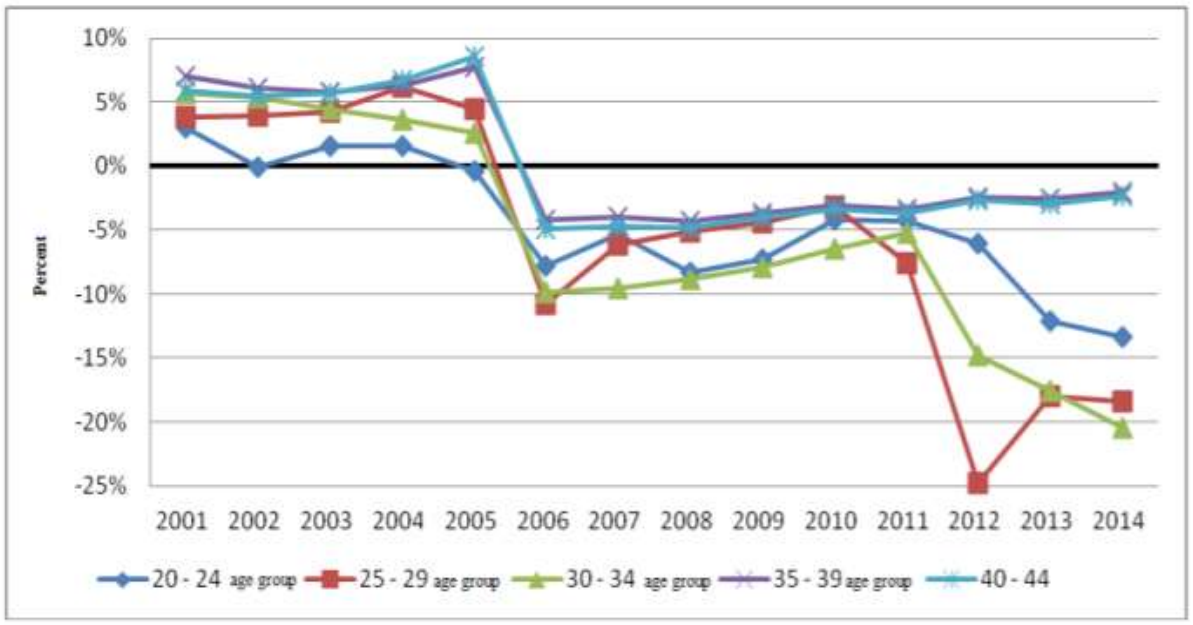
Time period	Yearly change of the population (per cent/year)
1870-1880	0.93
1880-1890	2.34
1890-1900	3.7
1900-1910	2.2
1910-1920	1.11
1920-1930	0.98
1930-1941	1.93
1941-1949	-0.61
1949-1960	2.54
1960-1970	2.28
1970-1980	1.38
1980-1990	-0.57
1990-2001	-0.59
2001-2011	-0.93
2011-2015	-1.25
2015-2017	0.51

Source: Data from nepesseg.com



Source: Compiled by the authors based on data from nepesseg.com

Figure 3. The change of the population of Miskolc between 1870 and 2017



Source: Hegyi-Kéri (2015)

Figure 4. Changes in the population of Miskolc broken down into age groups, based on census data

It can be observed that some groups have decreased significantly more than others. Hegyi-Kéri (2015) analysed the population change according to age groups. Her research highlighted that recent migration is significant in the circle of youths between ages 20–24 and 25–29. (Miskolc's population transformation according to age group is shown in Figure 4.) The change between 2012 and 2014 is rather negative, because statistics show a 15–20% reduction in the 25–29 age group. Although the reduction includes the natural reduction of the population, this rate is negligible, since the mortality rate is very low in this age group. The migration rate in the 30–34-year-old age group is also continuous, while migration of the 35–39 age group has reduced in the last few years (Hegyi-Kéri 2015).

According to Bába (2018) the migration processes within the country are due to labour market reasons and social and the economic inequalities; the low prosperity and the worsening mood in some regions are strengthening migration tendencies. Behind the tendencies of migrating

from Miskolc there could be many reasons, but the most important is the termination of heavy industry in the middle of the 1990s, which had been the basis of the city's economy; this process had a negative effect on the economic status of the region and on the number of work places. A significant portion of employees decided to move to Budapest, Transdanubia or abroad because of the wage differences and the better living conditions. Many students chose to start their university studies in another city. In this case the chance that they return to Miskolc after graduation is really low (Boon 2015; Rigó 2017).

According to Hegyi-Kéri (2018) the population reduction in Miskolc can be traced back to similiar reasons. She argues that the realisation of labour market problems can make the people feel disappointed. Moreover the inhabitants living near the closed-down factories, who lived through the industrial transformation, also have to face the scenery of the empty or underutilised facilities. On one hand they are aware of the imperfect, structurally reformed labour market, on the other hand they see the local labor market and the situation of their own and their children even worse than real. Their visions are affected by their own experiences acquired during the industrial transformation and this depressing labour market perspective is strengthened by the presence of the vacant factories. While their own migratory willingness is low, this depressing picture prompts them to encourage their children to migrate from Miskolc (Hegyi-Kéri 2015). Another study has highlighted that many times parents encourage their children to leave the city: according to a survey made during the SEMIGRA project in 2011, 45% of 116 youths between the ages of 17 and 19 were encouraged to emigrate from the city and from the region, while only 27% were encouraged to stay in Miskolc or in the region, while 17% did not get any parental guidance on this point.

A questionnaire distributed among students majoring in economics at the University of Miskolc yielded similar results: a high number of young people in Miskolc would be willing to leave the city, only 10.3% of the respondents would prefer to stay in their hometowns, and 58.7% would prefer to move to other regions of Hungary if they found better possibilities there. We have to note, however, that the rate of respondents who were undecided was relatively high, 31%. The reasons for moving were higher wages, career opportunities and better living conditions. The experiences of friends and acquaintances have supporting effects: in 67.8% of the responses they showed up among the reasons for the movement. Factors arguing against emigration are difficulties in keeping in touch with family and with friends (Berényi 2018).

The population loss in Miskolc, which is the centre of the region of North Hungary, is not unique. With the exception of three cities (Nyékládháza, Onga and Szendrő), all cities in the region of North Hungary experienced declining populations in the last few decades after the change of regime, of course at different rates. Population loss of settlements located in a big city's agglomeration is lower; one of the reasons for the increasing population in the previously stated cities such as Nyékládháza and Onga may be the closeness of Miskolc, through agglomeration processes at work (Nagy 2018).

Encouraging Young University Graduates to Stay in Miskolc

The number of the young generation (between 24 and 34 years old) entering the labour market is falling in Miskolc, their numbers are decreasing in the city and their activity in the labour market is declining (Dabasi Halász & Hegyi-Kéri 2015). The change of the population of a city strongly depends on the economic situation of the region, the number of the workplaces and the standard of living and wages. These effects have been influenced by the multinational companies of the region, which are making efforts, along with the University of Miskolc, to keep graduates in the city or region. While residents of Miskolc like living in the city, the economic situation makes them move away (Világgazdaság 2017).

Besides employing full-time workers, the multinational companies also employ students doing their secondary school or university studies. They are employed as interns, which has positive effects not just on the company, but on the interns as well. Interns are defined as workers of the company who have less than three years working experience and their employment is for an undefined time, for duties in the scope of activities belonging to the main profile of the company (HR Portál 2017). If the company is satisfied with their work, the contract may be extended and full-time work may be offered in the future. This practise is quite common in Hungary, and usually the best interns stay in the company as full-time workers (HR Portál 2017).

EMPIRICAL RESEARCH AND ITS RESULTS

Our research is intended to be an initial, exploratory study, which consists of two different surveys. The target group of the first survey was students of the University of Miskolc, while a subgroup of University of Miskolc students who are interns of the county's most significant multinational company formed the target group for the second survey. The structure and the topics were similar to each other, which simplifies the analysis and offers a look into the internship programme of this particular multinational company from the viewpoint of the university students. The aim of our research was to gain a view of the interns' motivation, satisfaction with their work, and futhermore whether they would like to work for the company and thanks to that to stay in Miskolc. Survey responses provided information on the long-term plans,

job hunting and working situation of students attending the University of Miskolc.

Review of a Multinational Company's Internship Programme

The internship programme has played a significant role in the company's operation during the past few years. This is shown by the fact that in 2017 35% of the company's white-collar workers employees were interns. Most of the interns are students of the University of Miskolc and a low proportion of them are secondary school students. (Our research covered only the interns who are students at the University of Miskolc.) 73% of the interns studying at the University of Miskolc are full-time students and 23% of them are part-time students. Most of them study in engineering and economics fields. According to the company's internship database, the oldest interns have been employed from 2011 by the company, while we can find interns who have been employed less than a year. Between 2013 and 2016 the number of the interns increased by 172%, while in 2016 35% of the full-time employees had previously been interns before.

During exploration of the company's internship programme we have enquired whether, while keeping the corporate culture in sight, employees can reach their aims in all life periods in the multinational company. Within the confines of the dual education, as the member of an internship programme, or as a full-time employee this firms employs students, recently graduated workers, technicians and qualified leaders, according to the HR records of the company. Secondary school and post-secondary vocational students who apply to the company during the school holidays or for their professional practice can get an inside view of the world of work. For students in higher education the company's internship programme offers several opportunities: they can acquire valuable work experiences, they can conduct research for their thesis in the company, and they can prepare for studies at the master level. After graduation, technicians with appropriate qualifications are employed within programmes for recent graduates, and at the same time the applicants can find appropriate challenges at all career levels. The delegated foreign workers, who work with co-operation agreements from few months up to several years, strengthen the diversity of the company.

As we have mentioned before, the company puts significant efforts into the matter of employing more interns, including employing increasing numbers of interns in full-time positions. To motivate the interns, in addition to the three-level internship system, discounts for several services throughout the city and free tickets for concerts and sport events are provided. During our research we investigated how satisfied the interns are with their pay and other benefits, with the motivational factors, or if could they imagine a future for themselves at the company.

Research Method and the Characteristic of the Sample

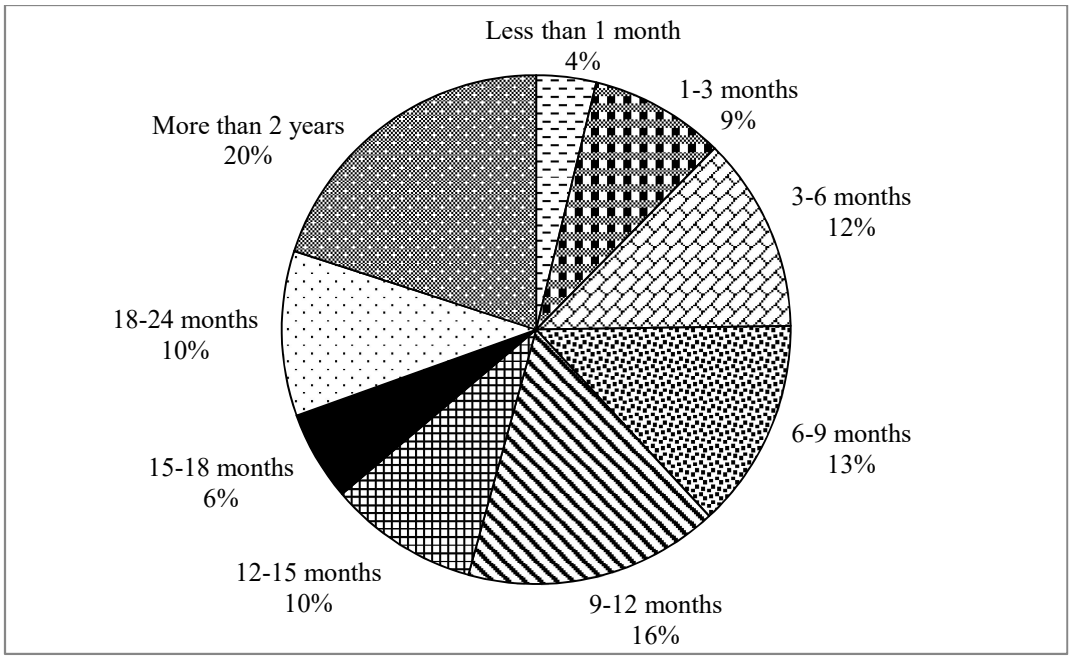
For our research we compiled an online survey about the employment of the interns with the aim to reveal the problems and to find solutions. The research highlights fields and questions posing the main problems in the recruitment, selection and employment of the interns. Proceeding from the fact that there are a significant number of interns at the company who are students of the University of Miskolc (we have no information about the exact numbers and proportions), we created two questionnaires to get a clear view of their working situation motivational factors, expectations and their satisfaction. The comparison of the two surveys makes it possible to understand the whole situation, get an inside view on the topic and find the best solutions.

The surveys were sent out online, using the internal electronic mailing system of the company, the university's student portal and social media. The questionnaire was anonymous because we wanted to get substantive and authentic answers about the problems, deficiencies, motivations and satisfaction.

Both of the surveys have the same structure, consisting of two parts. In the first one, the questions concern the respondents' motivation and their background, which helps to analyse them. In the second questionnaire the emphasis is on the expectations, the aims and the viewpoints of the respondents.

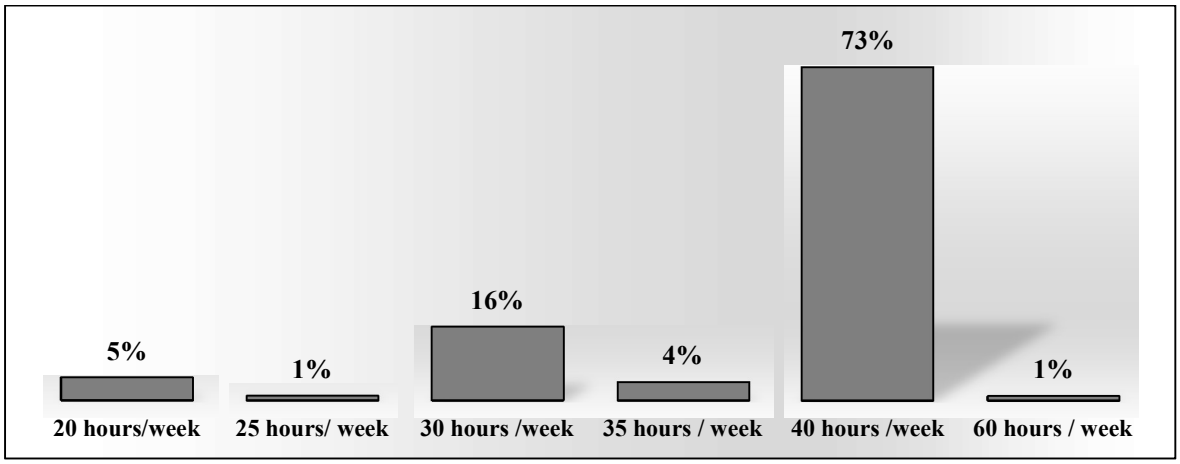
Questionnaires were returned by 121 university students: 57% women and 43% men. Most of the students were in their bachelor studies, with the average age of 23. There was a predominance of engineering and economics students, reflecting the typical majors of the interns.

In 2017 the number of workers in the three plants located in Miskolc was around 6,500 workers, while the percentage of the interns was 37% of the white-collar workers. Since 159 people filled out the survey, we were able to reach nearly 10% of the interns. In gender the predominance of men could be highlighted, which also applies to the distribution of the workers: 53% of the respondents were men, while 47% were women. By position, 68% of them were junior interns, 30% were in the senior level and 2% of them had a superior internship. On the average the interns have worked for the company for 15 months. The lowest value was 1 month, while the highest was 108 months, so he has worked for the company since 2008 and now he is on the superior level (and he has not yet graduated). Analysing the numbers of months spent at the company according to the level of internship, the average among the junior interns is 10 months, among the senior interns 23 months and among the superior interns 52 months. These results show that it takes time to reach the next level of internship. Figure 5 shows the number of months the interns had already spent in the company at the time of completing the questionnaire.



Source: Compiled by the authors based on the questionnaire

Figure 5. The number of months that interns had already spent in the company (per cent) before completing the questionnaire

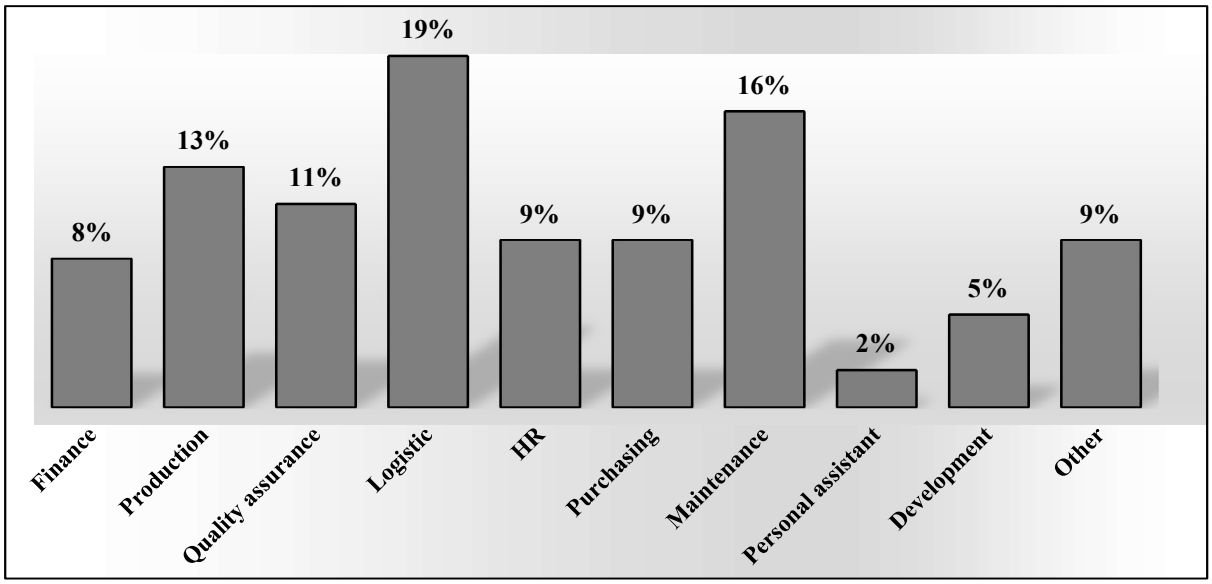


Source: Compiled by the authors based on the questionnaire

Figure 6. Percentage of interns having different weekly working hours

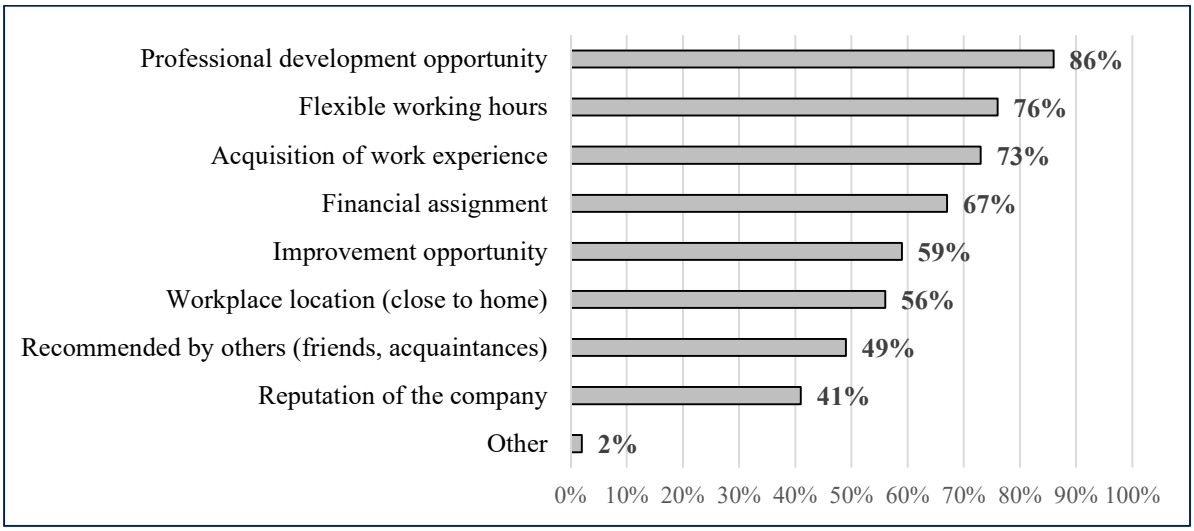
The results of the survey show that most of the interns have a 30–40 weekly-working-hour contract with the company: 94% of the interns work a minimum 30 hours per week and 74% of them are employed for 40 hours per week. Only 6% of the respondents work less than 30 hours per week. However, the high number of working hours makes it difficult to reconcile the work with university studies; that is why internship programmes demand flexibility from the students and from the company as well. Figure 6 shows the weekly working hours of the students.

The distribution according to the scope of activities shows a particularly multicoloured picture, revealing that the interns at the company work in different fields with different scopes of duties, tasks and processes day by day. Most of the students work in the fields of logistics, maintenance, production or quality assurance, but the number of interns who work in the field of HR, finance, purchasing and development is also high. The differences between working fields, duties and tasks have a strong effect on the answers, perspective and satisfaction of the respondents. Figure 7 shows the distribution according to the field of work.



Source: Compiled by the authors based on the questionnaire

Figure 7. Distribution according to the working fields (percent)



Source: Compiled by the authors based on the questionnaire

Figure 8. Important aspects when choosing an internship place

Results of the Research

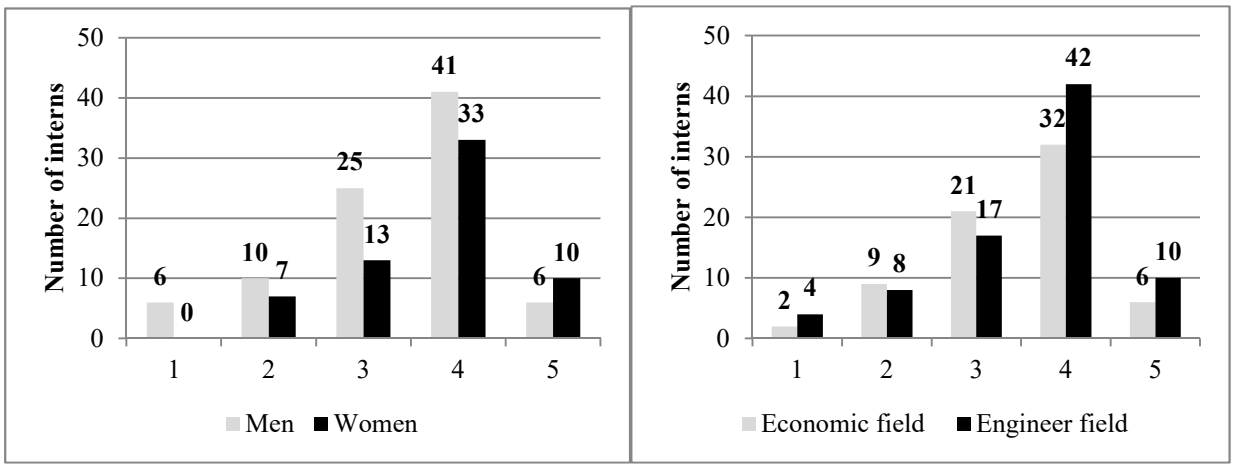
The first step of the interns' job search is to browse job advertisements, either on the webpages of school organisations or of companies who are offering jobs. After finding the job advertisement, the applicants weigh some aspects up before they decide to submit their CV and application for certain positions. During our research we analysed which aspects the students search for in jobs. The respondents could choose among ten possible items (multiple answers were allowed and the number of the answers was not limited) that may be important for them when choosing a workplace. The closeness of the workplace to their place of residence was also presented among the options. The answers are given in Figure 8.

Professional development opportunity was the most important thing for students when choosing an internship place. The flexible working hours is the second most important aspect, namely reconciling the work with the university; the students'graduation can only be ensured if the companies are flexible regarding the interns' working hours. Acquisition of work experience and financial assignment are also important for students. (Wages are necessary for most of the students, because they can only cover their expenses with appropriate payment.) The opportunities to improve themselves and the reputation of the company are also important aspects for half of the respondents, as are the opinions of acquaintances. As Figure 8 shows, 56% of the respondents feel that it is important to be employed close to their home; this is especially true of young women under the age of 23. Those

students at the company who would like to stay in the region mainly come from undergraduate programmemes in economics or engineering. Most of them have little work experience, which could explain why they would like to start their careers in a company close to their home. In this case they need not move to a new city that is not familiar for them. This helps to encourage the young graduates to stay in Miskolc.

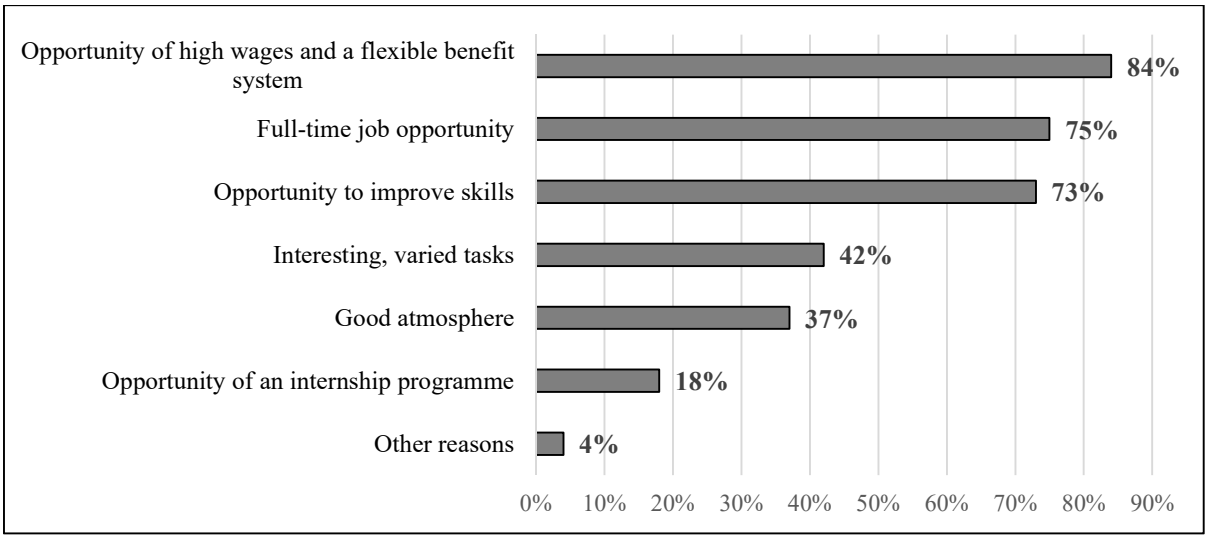
After the investigation of the motivation for working we wanted to highlight the the working situations, their perceptions of the atmosphere of the workplace and their satisfaction with their colleagues and tasks. In the short term, these factors can influence their attitude towards work, their working morale and their work performance, and in the long term they can be determinative in deciding whether they would like to work for the company after graduation. We found that the satisfaction of the respondents, their points of view and their motivation are strongly variable, depending on their internship positions, the plant and the department.

In terms of their working field, mostly economics and engineering related jobs could be highlighted. The main fields are HR, logistics, purchasing and finance for the economics, and development, maintanance, production and quality assurance for the engineering students. Those students who are not satisfied with their workplace mostly work as junior interns in engineer fields and have worked for longer than two years. The typical profile for those students who are satisfied with their working conditions is an intern employed more than one and a half years at the company, mostly in economics fields, as junior or senior interns. The most satisfied group is women who have been working for the company for a year as junior interns in an engineering field. Figure 9 shows the satisfaction rates by working field and gender.



Source: Compiled by the authors based on the questionnaire

Figure 9. Satisfaction with the position, based on gender (left) and field of work (right). 1- not satisfied, 5 - very satisfied.



Source: Compiled by the authors based on the questionnaire

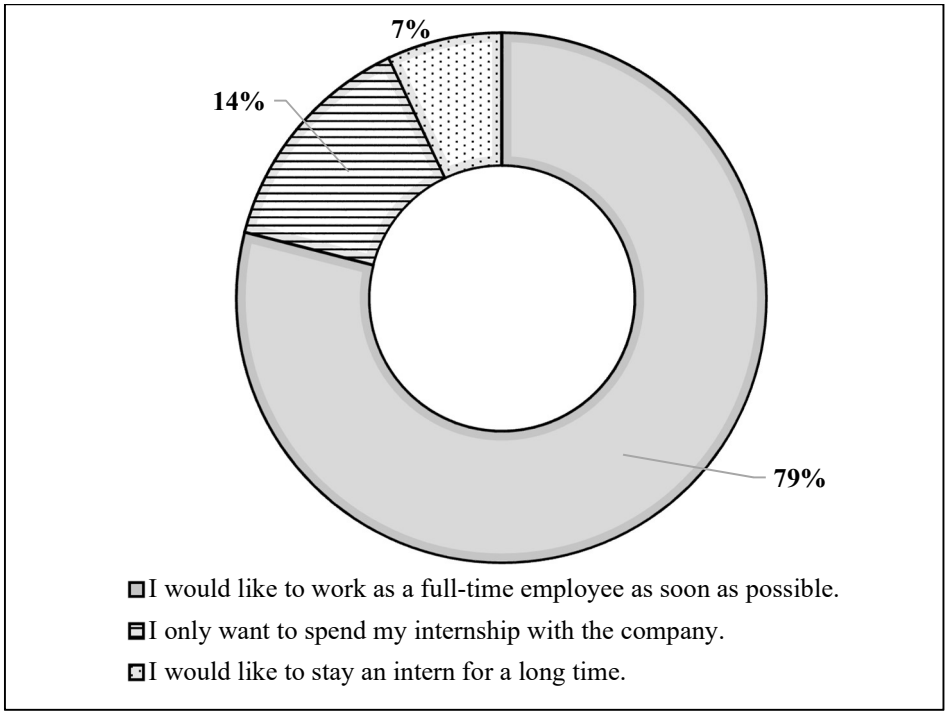
Figure 10. The motivations of the interns to continue their internships (per cent)

During the investigation of the general motivation while working, besides higher wages, the main motivating factors are a flexible benefit system with a wider range of options, making headway between the different internship levels and later the possibility of a full-time position (Figure 10). Therefore these answers reflect that the interns want to stay at the company after graduation, or rather in the county and in Miskolc. So those students who can find an intern position during their university studies are less likely to leave the county or town.

The importance of opportunities for promotion and the intention to stay in the county is analysed by the question regarding the future role of the interns in the company. According to the answers, 80% of the interns would like to get a full-time position there as soon as possible and have got an aim to stay at the company after the internship programme, so they have got long-term plans at the company. Interns who would like to stay at the company as full-time workers usually have more than 18 months of work experience at the company, which has helped them become familiar with the mission and the culture of the company. As in the whole sample, the dominance of men is also seen among those who would like to be employed as full-time workers in the company. 75% of the interns work as junior interns, while 25% of them are at a higher level of internship, which means that their work is more valuable for the company. Most of them are working in engineering fields, mainly in development, quality assurance and maintenance, while logistics and HR positions are also popular among those respondents who could imagine themselves as full-time workers at the company.

Another 14% of the respondents would like to work only during their internship years at the company, because they could not imagine themselves in a full-time position there, only till their graduation. This group consists mostly of young men and those who had worked more than one year as junior interns in the company. 60% of the respondents who would like to leave the company after graduation work in engineer fields, development or maintenance positions. 7% of the respondents would like to be a member of the internship programme in the long-term to take advantage of the promotion opportunities.

Nowadays employee turnover heavily affects the corporations (including multinational companies). During the summer holidays, companies are short of human resources. Interns can also help to overcome this temporary labor shortage. Most trainees have long-term plans for the company. 79% of the interns would like to work at the company as a full-time employee as soon as possible. 14% of the respondents do not want to work for the company after the internship programme and 7% of them would like to stay an intern for a long time. The vision of the interns is presented in Figure 11.



Source: Compiled by the authors based on the questionnaire responses

Figure 11. Perceptions of interns regarding their future role in the company (per cent)

CONCLUSIONS

In the last decade Miskolc was one of the cities of Hungary most affected by the migration wave, and unfortunately it lost more than 20% of its inhabitants between 1980 and 2017. The reasons behind this are the lack of workplaces, the level of wages and the low number of services. In this situation, efforts of multinational companies and educational institutions are essential to encouraging young university graduates to stay in Miskolc, but this process can not be measured immediately.

There are more multinational companies in the region than in the previous years, which offer better conditions and wages for the workers in many fields, and it is also very significant that the young people can find jobs to meet their expectations in the region. Besides full-time workers, the multinational companies have started to employ students as interns, giving them the opportunity to work and study at the same time. In this case after graduation students can earn a degree and already have some years of working practise, which can be very useful in the future. For the company this contract also has a strong positive effect, since it is able to teach the company's vision and culture to the students and try to attract the most suitable interns as full-time workers. (We would like to mention that the multinational companies favour the 30-40 weekly working hours internship programmemess, which can have negative effects as well; for example, the interns cannot take part in all of their university lessons.)

Our research focused on the interns to explore how the internship programme could encourage the young graduates to stay in the city or region. Despite the survey being based on only one multinational company, most firms of this type have similar programmes and experiences. Our aim was to focus on the motivation of the student interns, figure out their future visions and expectations and identify their willingness to move from or stay in the region. The answers show that those students who have already started to work at a multinational company as an intern would like to stay in the region and obtain a full-time job as soon as possible, so they have plans for their future here in the region and in the city. Among their motivations, the distance between their residence/family and the workplace is also an important factor.

The internship programme became available as an opportunity for students fairly recently, so it is hard to determine its long-term results. The survey reflects the situation of the interns nowadays and their expectations about the future. The new university system inspires the students to start their working experience during their university years. During this time period many students work as interns to pay tuition fees. After graduation most of them stay at the company as a full-time worker, because they already know the workplace and its culture, the duties, their colleagues, and have better opportunities for improvement.

According to Marien (2015), the population's intention to stay – especially the value-creating population – is an indicator of success in the strong settlement competition. An excessive intention among its residents to migrate can mean a significant risk for a settlement, as well as the mass migration itself. In Miskolc the statistics show that the population decrease has stopped, moreover between 2015 and 2017 the number of residents increased by a half percent each year on average; hopefully this tendency will continue in the next few years. Nowadays Miskolc has more opportunities, which is good for young people in general and students in particular. It is possible that the multinational companies in the city are contributing to the positive population change through their internship programmes. More research is required to confirm this.

Acknowledgement

The described article was carried out as part of the EFOP-3.6.1-16-2016-00011 "Younger and Renewing University – Innovative Knowledge City – institutional development of the University of Miskolc aiming at intelligent specialisation" project implemented in the framework of the Szechenyi 2020 program. The realization of this project is supported by the European Union, co-financed by the European Social Fund.

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State Aid in the Visegrad Countries: Similarities and Differences

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SUMMARY

This study focuses on the characteristics of those grants that are clearly for the purpose of carrying out economic activities. By giving an overview about the very specific nature of State aid rules in the European Union determining the level playing field, a Member State can grant subsidies. The main aim of this article is to identify whether there can be significant similarities and differences across the Visegrad countries, namely the Czech Republic, Hungary, Poland and Slovakia. As we are facing the next programming period of 2021–2027 it is crucial from the point of view of what can be learned about the current period and, perhaps, what should be changed.

Keywords: State aid, economic growth, territorial analysis, Visegrad countries
Journal of Economic Literature (JEL) codes: H2, H7, K2
DOI: http://dx.doi.org/10.18096/TMP.2018.02.05

INTRODUCTION

*"State aid is defined as an **advantage** in any form whatsoever conferred on a **selective basis to undertakings** by national public authorities. Therefore, subsidies granted to individuals or general measures open to all enterprises are not covered by this prohibition and do not constitute State aid (examples include general taxation measures or employment legislation."* (European Commission) The economics of State aid can be regarded as a little researched field until now. The main reasons for this can be that most of the empirical studies are related to examining whether a (significant) impact can be attributed to public money spent, irrespective of its *"origin"* (e.g. EU funds versus national budgetary sources), but not explicitly focusing on State aid. Because of the fact that competition law is a specific area of the European Union (hereinafter EU), limited to it and applicable to market players active in the internal market, and therefore can be considered unique in the world.

LITERATURE REVIEW – CONCEPTS OF STATE INTERVENTION

Nearly all of the main economic theories and schools deal with the issue of State intervention and the efficiency of public spending and its (possible) impacts, from Adam Smith (1776) through Keynes (1936) and Friedman (1962) to Krugman (1991; 1994). The basic question to answer is whether there is a need to intervene in the economy, and if so, to what extent? The theories are quite shared varied about it.

According to 17th-century mercantilism the State had to take an active role in theeconomy by promoting export growth and protecting the interests of the domestic industry. In contrast, the physiocrats emphasized the support of agriculture. Adam Smith argued that that market forces – influencing supply and demand – will equilibrate where products and goods are exchanged at a natural price, in which the State should not intervene or only to a limited extent. Parallel to the classical theorists, Marshall (1890) and Walras (1872) basically rejected the possibility of State intervention. In perfectly competitive markets demand and supply equilibrate due to market mechanisms. Nevertheless, they did not examine the issue of market shortage and/or failure.

Keynes (1936) was the first who comprehensively dealt with the necessity for State intervention and interpreted its role in the economy in a broader context following the global economic and financial crisis between 1929 and 1932. He argued that in times of crisis there is a need to induce demand artificially and indirectly: he thought that it could be realized through promoting investments in infrastructure and creating jobs, assuming that it would generate income in the economy by consumption and/or savings and raise the revenues of the State budget, too. In contrast to fiscal intervention, Friedman (1962) emphasized the role of money supply and

its volume in circulation on the economy. He rejected the economic role of fiscal policy instruments in essence: the State shall not intervene in promoting economic growth through the central budget. Moreover, (federal) government spending seems to make the economy less stable. In the 1970s, after the collapse of the Bretton Woods gold standard system, the liberal school became more dominant again. The neoliberals are on the side of deregulation and say that State intervention should be limited to the minimum necessary level, its role in the economy shall be reduced and the (not yet liberalised) industries should be opened to the market. Besides ensuring economic liberalism (free market and competition), State intervention shall be confined to monetary policy instruments (e.g. by floating exchange rates).

One of the main focus points of contemporary economic literature and research is the issue of economic growth and its driving forces and the role of State in it. The alternative economic theory reconsiders the fundamental economic dogmas but in a very different way because their essence lies in the different approach and handling of economic issues (see e.g. heterodox, evolutionist, institutionalist and experimental economic schools and models based on the blue, green, free or rainbow economy).

In summary, the opinions on the role of State intervention are heterogeneous, even in the view of contemporary economists who think quite differently about it. For instance, see Kornai (1982) on the role of the State in public administration and the private sector, which is in in full contrast with Piketty (2013) on the role of capital in the 21st century as regards income inequality.

THE VERY SPECIFIC LEGAL NATURE OF STATE AID

The competition policy is a common policy meaning that national sovereignty is limited. To understand how the competition policy works in practice, its fundaments were already laid down in the founding Treaty (namely the Treaty of Rome in 1957) in order to ensure fair market terms across the EU Member States (hereinafter MSs) and to prevent them from turning towards protectionism by protecting their markets, which could basically have undermined the creation of a common and, afterwards, a single and internal market, at the same time. The general rules are unchanged since then. State aid is a special area of the EU Competition Law. While the main task of competition law is basically to create and maintain fair market conditions focusing on the regulation of price agreements (cartels), prohibit the abuse of dominance of market power and unfair market behaviour at the same time. In the context of State aid it has the task to control when a State intervenes in the economy. Irrespective of the form of intervention (directly e.g. through cash grants or indirectly e.g. through the tax system or by regulations) and ownership issues it has to be ensured that the internal market shall not be distorted or threatened and the trade between MSs shall also not be affected as a basic principle.

Table 1

Summary on the concepts of State intervention according to the main economic theories

Economic theory	Need for State intervention	Role of State in the economy
Mercantilism	- to protect domestic industry - to promote export	Active
Physiocratism	- to support agriculture against industry	
Classical	- to act as a night-watchman - to let the invisible hand work *("laissez faire")*	Passive
Neoclassical	- to equilibrate in perfectly competitive markets *(D = S)*	
Keynesian	- to emphasize the imperfect nature of market mechanisms - to use fiscal policy	Active
Monetary	- to regulate the money supply	
Neoliberal	- to deregule State interventions - to improve efficiency - to manage market failures, shortages	Passive
Alternative (heterodox)	- to rethink the role of the State - to use non-orthodox instruments contrary to the mainstream theories	Active/passive

Source: author's compilation

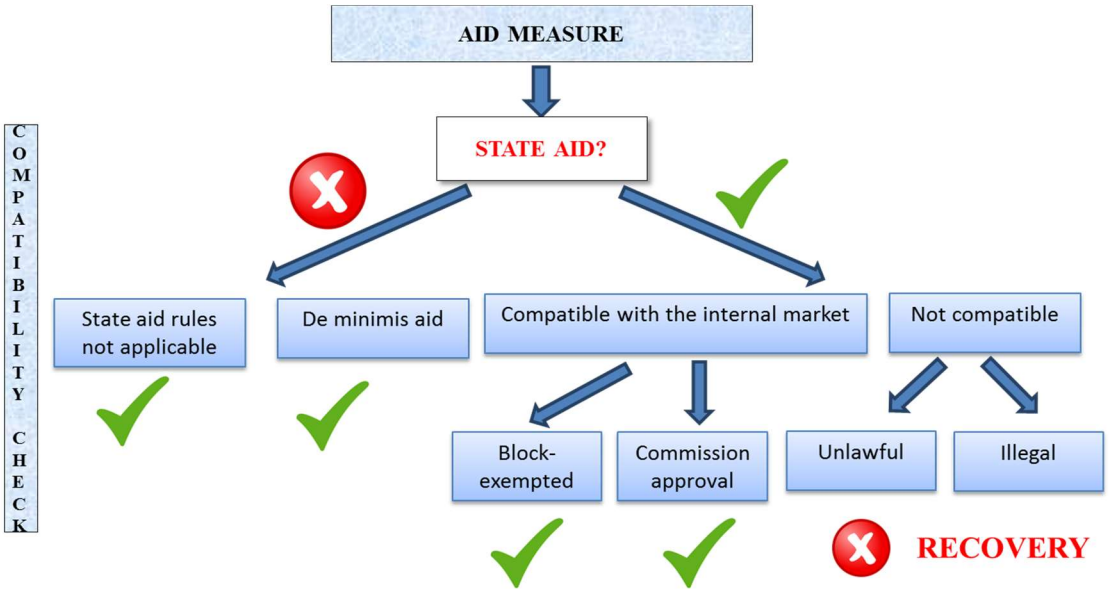
State aid is a kind of state intervention but not vice versa: only some (state) sources some that are allocated to economic players during redistribution qualify as State aid. State aid therefore forms only a part of state interventions; according to the EU terminology, it is a narrow segment focusing on the interactions between the State and business sector with the exception of households (consumers and individuals).

State aid is defined in the founding treaties as the primary sources of law but is regulated by secondary and ancillery sources and the case law of the European Court. With the Treaty of Lisbon (EU 2008) having entered into force in 2007, it is now governed by Article 107(1) on the Functioning of the European Union. According to this article, *"any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States"* normally be incompatible with the internal market and therefore prohibited as a general rule.

The main elements of State aid (EC 2016) are the following:

a) the beneficiary carries out an economic activity: any activity involving the supply of goods and services on a given market which presupposes the risk of service provided for it. Thus, the business is not merely a business with or without legal entity but any market player actually carrying out an economic activity in the internal market irrespective of its legal status.
b) imputability and state resource: the term State includes both an institution established or managed or partly financed either by the central budget or its subsystems. Thus, any direct or indirect aid measure granted by the ministries, institutions (aid grantors) and other authorities belonging to the central government and any local government body (municipality, county, etc.) constitutes State aid. Moreover, measures creating a lack in state revenue such as tax allowances (partial or entire tax benefit and tax credit, too) also constitute aid within the meaning of the EU Competition Law.
c) selectivity: when undertakings in the same factual and legal situation are not automatically eligible for support, the aid measure constitutes State aid because of its selective nature. The selectivity can be sectoral (e.g. covering a particular market), geographic (e.g. limited to a particular region) or discriminatory by aiming at particular market players. If undertakings in the same factual and legal situation are automatically eligible for and benefit from subsidy from an aid scheme and fulfil all the required (general and specific) conditions, it qualifies for a general measure and therefore does not constitute State aid.
d) advantage at the level of the beneficiary: under the same market and financing conditions, the beneficiary will not be able to obtain advantage on the market compared to its competitors.
e) impact on competition: in competing markets, including those which have not yet been liberalised (that is, closed by the state or to be opened gradually) but competition may arise, the aid measure is considered to distort or threaten to distort competition and therefore it qualifies as State aid. If a particular market had been liberalised earlier but later closed to market players, this also distorts or threatens to distort competition.
f) effect on trade between MSs: this arises in cases when due to a subsidy it is likely that customers, investments or services are attracted from other MSs or the establishment of companies are obstructed from other MSs in the area concerned and the free movement of goods and services in the internal market are breached.

The six different constituent elements of State aid are conjunctive, that is, all of them must be fulfiled for an aid measure to qualify as State aid and vice versa: if one of the constituent elements is not met, the aid measure does not constitute State aid. However, the European Commission (hereinafter EC) basically makes the assumption that an aid measure distorts or threatens to distort competition and trade (the supply and/or demand side).



Source: author's compilation

Figure 1. Assessment and compatibility check of aid measures

When considering that an aid measure is State aid (see Figure 1) based on the six criteria, State aid rules are to be applied. The so-called de minimis aid (EC 2013a) is considered not to be State aid because of its *"small"* character (aid not exceeding EUR 200,000 per undertaking over any period of three fiscal years) and therefore it can be assumed that the competition is not distorted and trade is not affected but the rules are to be applied. Article 107(2) and (3) allows that under certain circumstances State aid can be granted if it is for an equitable and well-functioning economy and if it contributes to the economic development. The difference between Article 107(2) and (3) is the applicability; while in the case of the former the aid is automatically compatible with the internal market (e.g. subsidies for restoring natural disasters, social aid, supporting individuals, etc.), in the latter case the aid can only be considered compatible (e.g. to support employment, regional development, environmental protection and energy savings, culture, heritage, etc.). In the case of compatibility with the internal market it has to be assessed whether it can be block-exempted (EC 2014) – meaning that the aid can be granted under national competence – which depends on the type of aid (categories such as regional development or research and development and innovation, hereinafter RDI) and its amount, of course. Above a certain threshold determined in the so-called block-exemption regulations and in several circumstances State aid can only be approved individually (i.e. case by case) by the EC (more precisely by the Directorate-General for Competition, hereinafter DG COMP), and the MS has no more control over it. When under national competence, in Hungary it is the State Aid Monitoring Office that is in charge of ensuring whether the subsidies granted in Hungary are in accordance with the State aid rules of the EU, mediating between DG COMP and the Hungarian aid grantors, and acting if necessary at the same time. The total number of the existing aid schemes was 187 as of 31 October 2018 (i.e. aid programmes but within the meaning of State aid rules, notwithstanding the rules on Structural funds, see EC 2013b) registered with the State Aid Monitoring Office of Hungary and reported to DG COMP.

Timeline of Rules Versus Facts & Figures

Parallel to the rules on Structural funds, State aid rules (regulations, guidelines, etc.) normally adjust to programming periods, too. Between 2014 and 2020 the *"new"* rules entered into force in 2014 and the old ones expired, meaning that they could no longer bee applied (although in some cases a temporary extension was granted). Nevertheless, this does not mean that they remain unchanged during a 7-year period, except for the main frames; otherwise it could lead to anomalies when rules are applied. Some amendments included new aid categories, like in 2017, or the half-time supervision of regional aid map. The State Aid Modernisation process (hereinafter SAM) was launched in 2012 (EC 2012) for the purpose to revise and modernise the rules applicable as of 2014.

One of the novelties of the newly introduced General Block Exemption Regulation (hereinafter GBER) in 2014 is that it has broadened the number of aid categories, for instance with aid to innovation clusters, for broadband and local infrastructures, heritage conservation, audio-visual works, as well as for sport and multifunctional, recreational infrastructures, in accordance with the main common policy objectives (see e.g. Europe 2020 Strategy, EC 2010). This was the case in 2017 when the GBER (EC 2017a) was amended further by new aid categories (e.g.

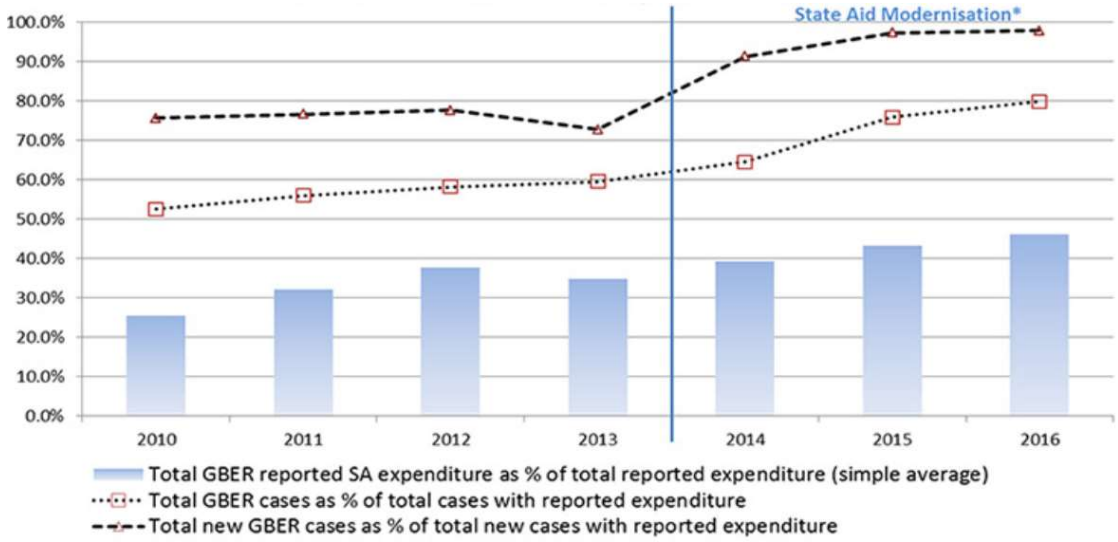
inland and maritime ports, regional airports). The first years' experience and expertise can be crucial for the planning of the next programming period, particularly given that the budget will be lower than the current one (EC 2017d).

On the basis of data provided by the Member States an annual report (named Scoreboard) is published by DG COMP on subsidies according to their category, form (direct/indirect) and purpose (horizontal, sectoral). The aid amounts are collected at current price and with the exception of the euro area are converted into constant prices by the inflation rate of the given reference year in the given MS. According to the latest statistics in 2016 the overall spending by MSs for State aid was EUR 102.8 billion, around 0.7% of GDP. The importance of block-exempted grants is growing, with a relative share of 76% out of all aid measures, representing over 97% of the newly implemented measures. As far as the spending is concerned, a slightly increasing trend can be observed (see Figure 2). MSs spent on average around 46% of the total spending on GBER measures, an increase of more than 10% compared to 2013. Under the GBER aid can be granted either for horizontal or vertical objectives of common interest. The former (e.g. environmental protection, local infrastructures, RDI, regional development, SMEs and risk finance, etc.) is by far the most important, with a relative share of over 90% as regards spending. With the exception of the bailout of financial institutions due to the financial crisis, sectoral aids used to be dominant until the early 2000s but not anymore. The reason behind the increasing use of GBER is the change in approach of competition policy: *"big on big things and small on small things"* and the scenario of *"Doing Less More Efficiently"*, which means the intention of DG COMP to concentrate the resources on the significant cases, which have more impact to distort competition and affect trade, and not to bother with the *"little"* ones (EC Statement 2017c). This does not mean that the latter ones are not controlled and monitored systematically; moreover, considering the the deficiencies in aid schemes under national competence as revealed by the annual report of the European Court of Auditors in 2011, its relevance has grown since then.

MACROECONOMICS AND MICROECONOMICS OF STATE AID

The economics of State aid is crucial when it is controlled. In the light of the development of the regulatory environment Haucap-Schwalbe (2011) laid down the main principles that should be taken into account and argued for the necessity for a more economic approach when State aid is assessed.

Meiklejohn (1999) modeled the effects of State aid on competition by entering into and intervening in monopoly markets. The main feature of the monopolistic market is its dominance in setting the price in the market. Similarly to competitive markets, the monopoly maximises its profit where the marginal revenue is equal to the marginal cost *(MR = MC)*, meaning that the final unit of output still results in the same cost and revenue gains. The difference is, however, that the monopoly sets its price above the marginal cost *(P > MC = MR* and the profit maximum *Πmax = AR > AC)*, that is to say, it provides lesser output compared to a competing business. Smith already recognised in 1776 the fundamental differences between perfectly competitive and non-competitive markets, including that the monopoly raises its revenue above *"the natural rate"* because it can sell its goods at a higher price on the market.



Source: Report on Competition Policy 2017. p. 26. DG COMP, European Commission (DGC 2018a, 2018b)

Figure 2. Use of General Block Exemption Regulation (GBER) for State aid (SA) in the EU

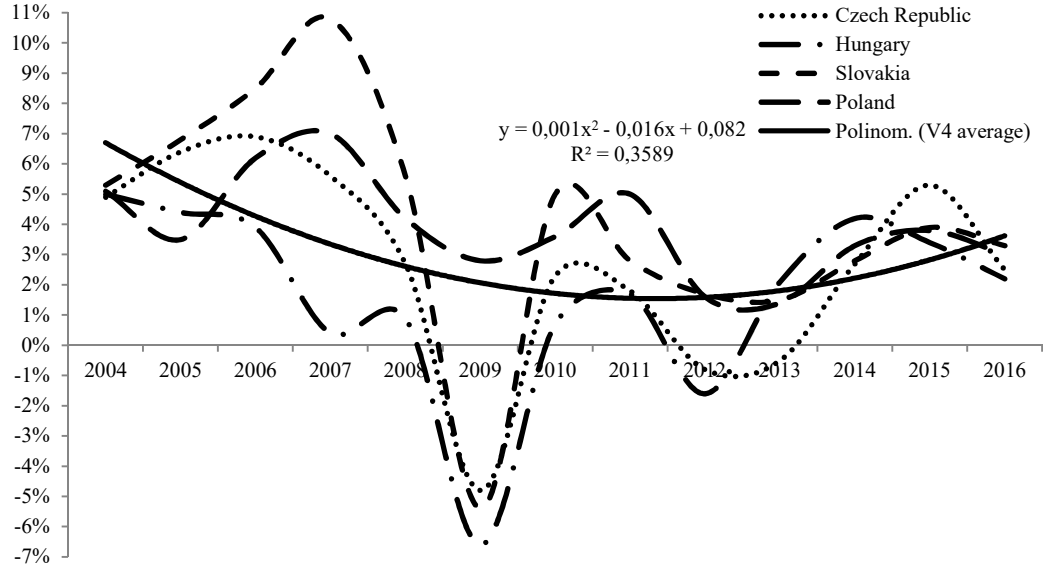
There is no doubt that the State has to intervene as a result of abuse of market dominance but it is quite not sure that by facilitating the entrance of new player(s) into the monopoly market the oligopolistic one would be less distortive to competition if the expenditure of State is compared to the lower price on the market (or on the contrary it could be effective in theory, see e.g. Collie 2000). That is, if the effect of a lower price on the consumer's level is not at least as much as the State's expenditure it can be counterproductive and cannot contribute to an increase in the welfare level at the same time. In competitive markets, therefore, aid is more likely to have an effect on the costs of an enterprise and consumers either directly or indirectly from the aspect of distortion of competition and trade, i.e. how the cost functions and affects the output of a business, and how that contributes to the consumers' utility and welfare. According to Friederiszick et al. (2006), State aid distorts competition in markets which are more competitive because it has a greater impact on the market due to lower profit margins or the volatility of market share as a result of competition. It is the operating aid which always distorts competition to a large extent compared with investment subsidies because it is directly aimed at financing the variable costs of a firm, which has an impact on its competitiveness and market share. Fingleton et al. (1999) examined the impact of State aid on the change in consumers' and producers' surplus, which have to be differentiated according to the incurred losses of a business and yields realised by a consumer.

As regards the contemporary empirical studies, the international trend clearly shows the increasingly importance of microsimulation-based counterfactual impact assessments but not that of macroeconomic effects (eg. Busillo et al. (2010); Cerqua-Pellegrini (2011); Combes-van Ypersele (2012); Criscuolo et al. (2012); Le Den et al. (2012); Martini-Bondonio (2012); Mouqué (2012); Bronzini-Piselli (2014); Einiö (2014); Aristei et al. (2015)).

State Aid and Economic Growth in the Visegrád Countries

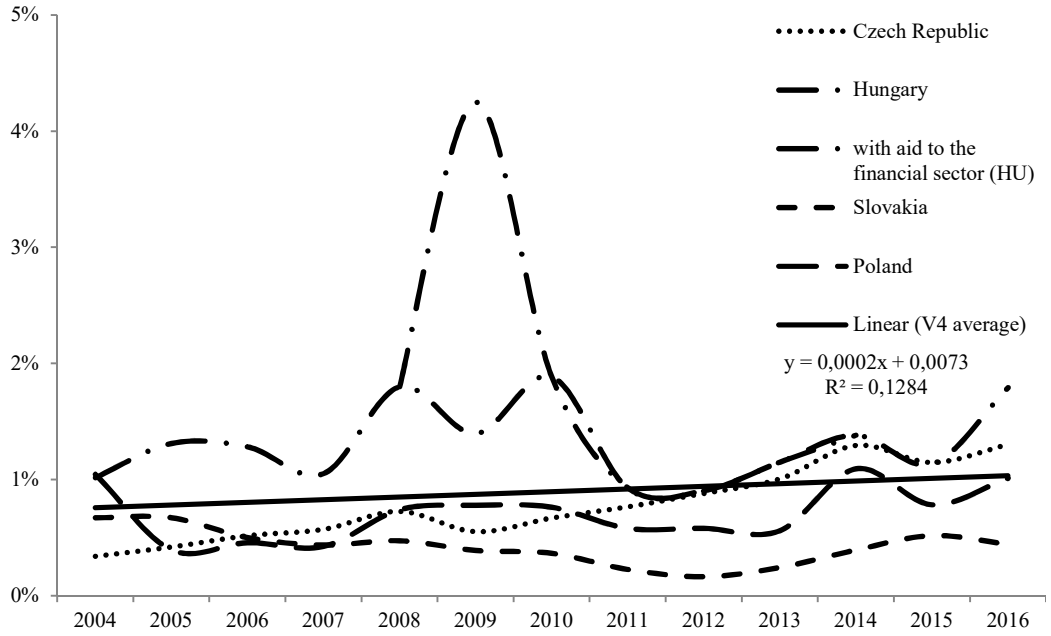
There is no Member State where no State aid is granted. Between 2004 and 2016 the total spending was 0.52% of GDP on average, with a range between 0.2% and 1.67%. In terms of the absolute amounts the difference is more spectacular, with a maximum value of 500 times higher (EUR 72.8 million for Lithuania, 0.22% of its GDP, compared to EUR 38.54 billion for Germany, 1.32% of its GDP); overall the amount came to EUR 95.5 billion in 2016.

Looking at the four Visegrád countries (also called the V4), on average Hungary has the highest GDP-proportionate State aid spending: between 2004 and 2016 it amounted to 1.27%, as compared to 0.79% in the Czech Republic, 0.71% in Poland and 0.42% in Slovakia. In absolute terms, the average spending in Poland was EUR 2.28 billion, followed by Hungary with a value of EUR 1.22 billion, the Czech Republic with about EUR 1 billion and Slovakia with EUR 0.23 billion (DGC Scoreboard 2017). Nevertheless, the real State aid expenditure is significantly higher when the subsidies to the railway sector (as a public service obligation for passenger transport including also infrastructural elements) are also counted. The agricultural (plus rural development, fisheries and aquaculture) and the other transport subsidies qualifying as State aid are much less relevant.



Source: author's compilation based on Eurostat

Figure 3. Real GDP growth rate in the V4 countries between 2004 and 2016



Source: author's compilation based on Eurostat

Figure 4. State aid in percentage of GDP in the V4 countries between 2004 and 2016

As it can be seen in Figure 3 and 4, State aid can be considered to be relatively independent of economic growth and constant over time in all of the Visegrad countries. The level of subsidies seems to be inflexible to the macroeconomic performance.

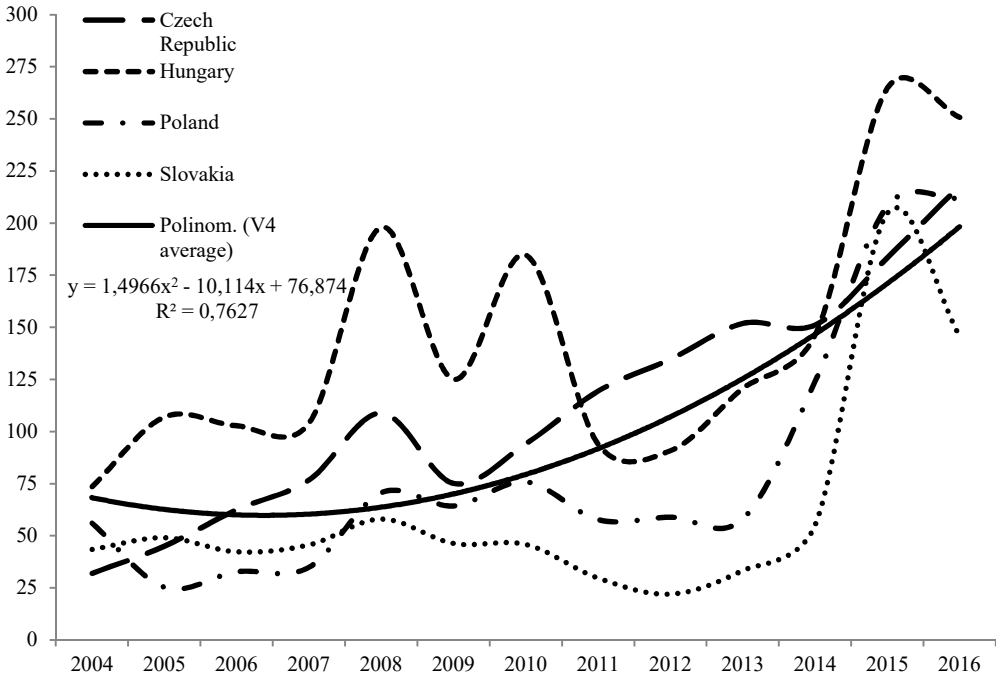
The impact of the financial crisis spilled over the MSs and affected them to different degrees, including of course the Visegrad countries. One can assume that the level of State aid must have changed (i.e. increased): in 2008 the total expenditure on subsidies (i.e. with the provisional aid granted to the financial sector) obviously rose and reached its peak in 2009. In practice, however out of the four countries only in Hungary and Poland was aid approved for the bailout of the financial sector: in 2009 EUR 1.07 billion and EUR 4.6 billion, respectively, for recapitalisations and EUR 5.4 billion and EUR 4.6 billion, respectively, for guarantees. In 2009 impaired assets were acquired by Hungary in the value of EUR 40 million and in 2010 for liquidity measures an additional EUR 3.9 billion was granted in Hungary. In 2012 Poland provided a much more significant amount for recapitalisation (EUR 29.3 billion) relying on a guarantee with the same value.

The overall amount approved for bailing out the financial sector in the EU reached EUR 4,885 billion (around 35% of GDP) between 2008 and 2014. However, the subsidies actually paid out were much lower: in Poland only a tiny amount was spent and only for recapitalisation (EUR 3.75 million), and in Hungary it was EUR 0.214 billion and EUR 2.5 billion for liquidity purposes. Overall, EUR 1,935 billion (14% of GDP) was actually spent in the EU, which means that the expected negative effects of the crisis were overestimated. For comparison in the US about USD 24.8–29 billion went into the financial sector. Interestingly, in the Czech Republic and Slovakia no aid was approved in the financial sector. Nevertheless, in Poland there is no evidence that the crisis affected the economic growth – there were no other MSs that could produce a growth rate with a positive sign in 2009.

The temporary State aid to the financial sector (in the form of recapitalisations, impaired assets, guarantees, liquidity measures) had the aim to remedy the recession and to help the economy recover its pre-crisis growth path. In line with the Keynesian theory, the State intervened in the economy in order to alleviate the effects of the crisis. Not is the same vice versa: despite of the Czech Republic and Slovakia relatively prospered between 2004 and 2007 – and after 2012 all of the V4 countries – there is no sign that their expenditures on State aid would have decreased. In 2016 the level of State aid to the financial sector (both approved and used) is the lowest since 2008; in addition, there was no recapitalisation aid used for any bank. The European banking sector is relying less and less on government guarantees for liquidity support, as it is able to find the necessary liquidity on the market.

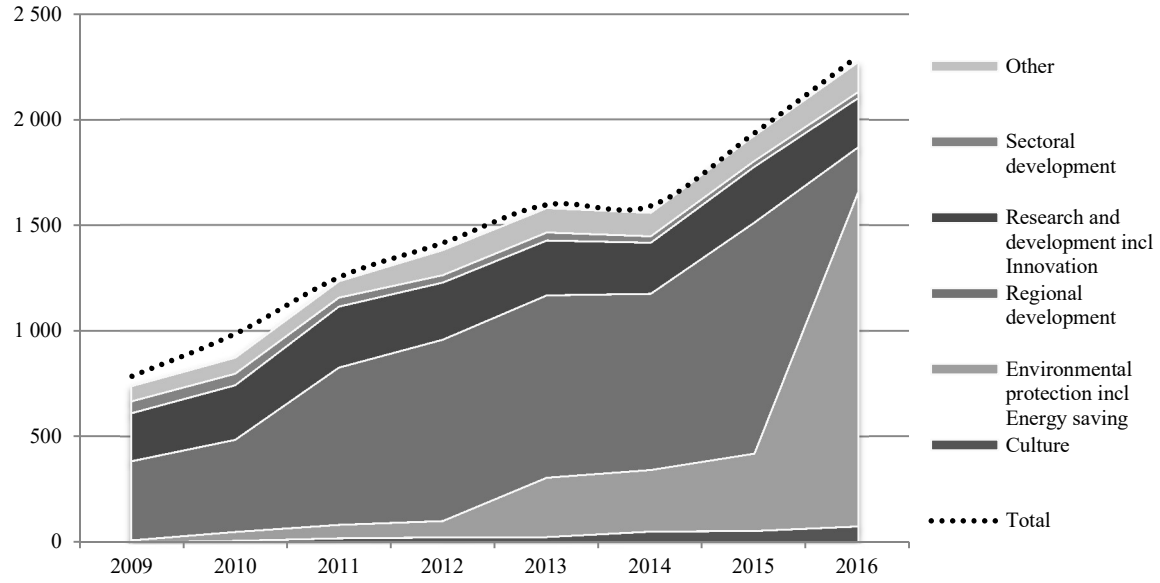
Source: author's compilation based on Eurostat

Figure 5. GDP per capita (EUR, PPS) in the V4 countries between 2004 and 2016



Source: author's calculation based on Eurostat and Scoreboard (DGC 2017)

Figure 6. State aid per capita (EUR, PPS) in the V4 countries between 2004 and 2016



Source: author's compilation based on Eurostat

Figure 7. State aid by the main objectives in Czech Republic, 2009–2016 (EUR, million)

The average income level was EUR 18,083 in the Visegrad countries between 2004 and 2016, while the average spending on State aid per capita was around EUR 100, ranging from EUR 63 in Slovakia to EUR 143 in Hungary. Interestingly, the average level in the EU was about the same as the V4 average. The compound annual growth rate of State aid expenditure was relatively higher than that of the income level in all of the Visegrad countries (over 11.5%, compared to the average of 3.7%), meaning that all of them spent more on subsidies than their change in income level. The annual level of State aid and GDP per capita is strongly correlated (0.53 in Slovakia followed by Hungary with a value of 0.72, in Poland 0.77 and 0.96 in the Czech Republic). The turning point in the change of State aid per capita (i.e. an increasing trend) in 2015 (see Figure 4) can be obviously attributed to the beginning of the *"new"* programming period.

STATE AID OVERVIEW IN THE V4 COUNTRIES

Out of the 15 aid categories it is regional investment aid that is one of the most relevant in all of the Visegrad countries and it preserved its dominant role as of 2009: on average with a relative share of 49% in Slovakia, 48% in the Czech Republic, 31% in Hungary and 21% in Poland, respectively (see Figures 5-8). The reason for this is quite prosaic. It is the eligibility (based on the regional aid map determining the maximum aid intensities), which depends on the relative development of a region (at NUTS2 level). Out of the 272 regions the number of the *"a"* regions falling under Article 107(3) is 72 (with maximum aid intensities of 25%, 35% and 50% of the eligible costs), with another 158 which qualify as *"c"* areas (meaning that regional investment aid can be granted only in the designated areas, usually at the level of LAU1 or LAU2, with maximum aid intensities varying from 10% to 35%) in the period of 2014–2020. There are an additional 39 regions where no regional invesetment aid can be granted: with the exception of the Czech Prague and the Slovakian Bratislavský kraj all are situated in the *"old"* MSs. Apart from two regions (namely the Hungarian Közép-Magyarország and the Polish Mazowieckie, which are *"c"* areas) 31 regions qualify s *"a"* regions out of the 35 in the Visegrad countries, meaning that their income level is under 75% of the average in the EU-27. As the 7th Cohesion Report (EC 2017b) reveals, this is not exactly the sign of convergence process, meaning that the sources proved to be allocated in not the most efficient and effective way.

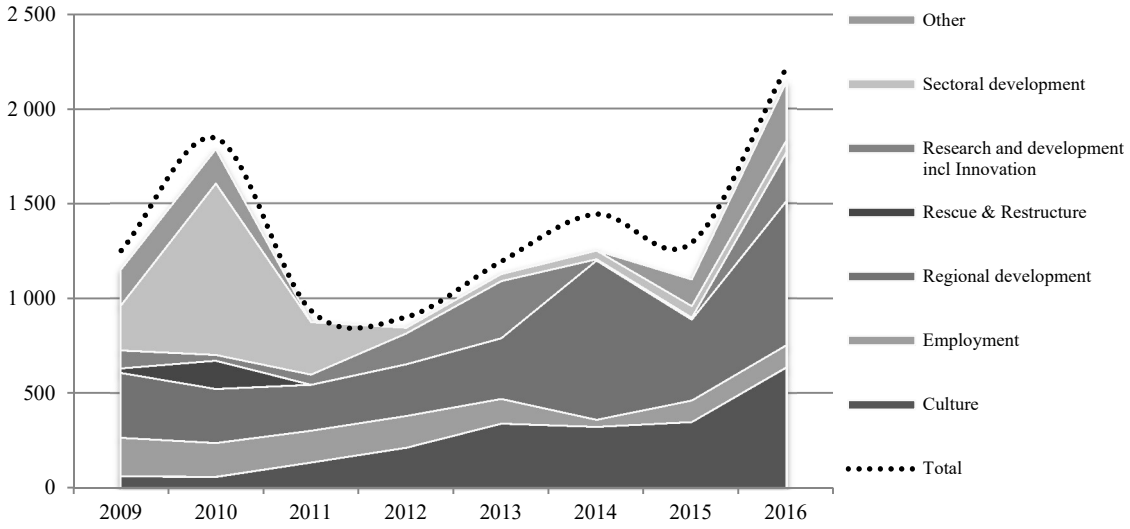
Regional aid is an important instrument in the EU's toolbox to promote greater economic and social cohesion. The main aim of regional investment aid is to promote investment projects in the relatively underdeveloped regions. It has an important role when attracting investors, especially foreign direct investments (large enterprises such as Audi, Mercedes or the *"newcomer"* BMW in Hungary) financed usually from the central budget or from EU funds when an SME invests. In principle this type of aid can be given for initial investments, whether greenfield or brownfield it covers the following activities:

- the setting up of a new establishment,
- the extension of the capacity of an existing one,
- the diversification of the output of an establishment into products not previously produced,
- a fundamental change in the overall production process of an existing establishment,
- the acquisition of assets belonging to an establishment that has closed or would have closed had it not been purchased and is bought by an investor unrelated to the

seller and excludes sole acquisition of the shares of an undertaking, as laid down in the GBER.

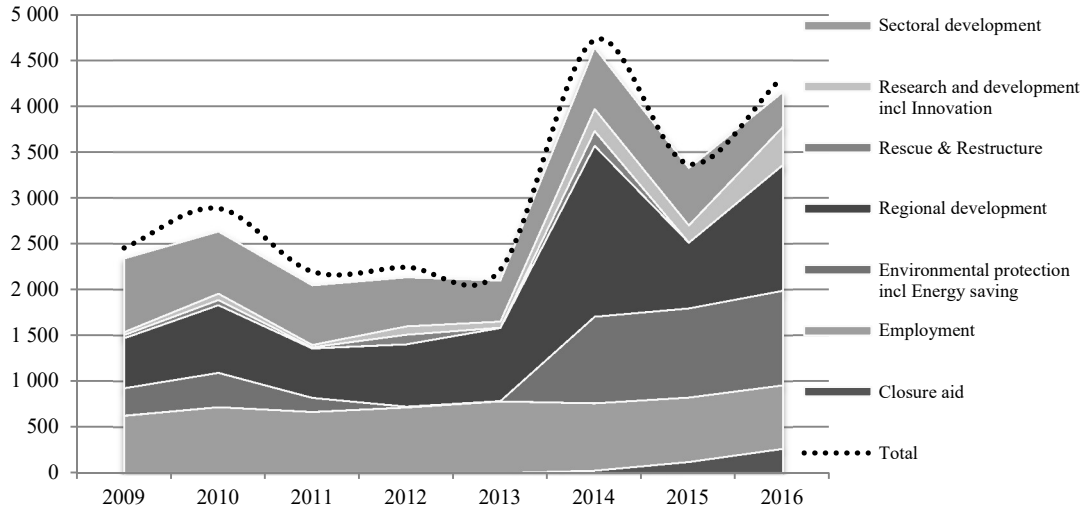
It is typical that when an investor decides to realise an investment project that qualifies as an initial investment, it claims for regional aid and other types of aid, usually for employment and training, and also for RDI if it is planning in the long run. In such a case the different types of aid do not have to be cumulated unless they cover the same or similar eligible costs, or when a project is artificially split into two or more subprojects that are mutually linked to each other, the aid cumulation rules have to be applied.

Besides the increasing trend in State aid expenditure in the V4 countries, the growing importance of environmental protection and energy saving measures (e.g. subsidies for the usage of renewable energy sources, energy efficiency projects, etc) can be observed both in the Czech Republic and Poland (see Figure 5 and 7). Meanwhile, cultural funding tended to increase in Hungary and Slovakia from 2014 (see Figure 6 and 8). Subsidies for employment are also significant in Hungary and Poland, whereas funding for RDI is noticeable in the Czech Republic and Slovakia. Nevertheless, the overall EU spending structure clearly indicates an increasing trend in the energy sector (compared to 2013 it has risen more than 3.7 times to EUR 55.9 billion in 2016) and a decrease in regional development (almost halved to EUR 7.3 billion). The other aid categories such as heritage conservation, promotion of exports and internationalisation and rescue & restructure or closure are less significant. It is also has to be mentioned that there is no available data about the aid categories introduced in 2017 such as investment aid for local, broadband or sport and multifunctional recreational infrastructure, etc. .



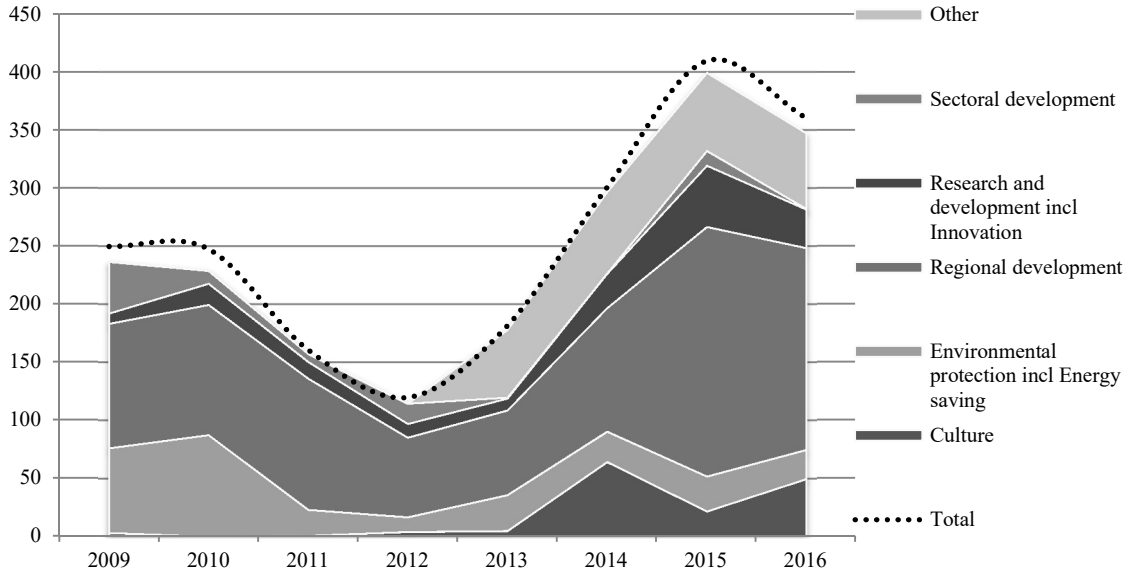
Source: author's compilation based on Eurostat

Figure 8. State aid by the main objectives in Hungary between 2009 and 2016 (EUR, million)



Source: author's compilation based on Eurostat

Figure 9. State aid by the main objectives in Poland between 2009 and 2016 (EUR, million)



Source: author's compilation based on Eurostat

Figure 10. State aid by the main objectives in Slovakia between 2009 and 2016 (EUR, million)

As regards the forms of aid, the most typical is absolutely the cash grant in the Visegrad countries, with a share of over 70% among the aid instruments on average (it is relatively less frequent only in Slovakia, with 62%) followed by tax benefits (deferral, reduction or even exemption) with a share of around 20%. The other forms of aid (equity participation, guarantee, soft loan) are less significant. The dominance of cash grants and tax benefits in the Visegrad countries is not unique – it fits the European trend with similar proportions. The main reason for this is that the aid element of a soft loan is relatively much lower as a result of the difference between the market interest rate and the subsidised rate one (around several percentage points depending on the prevailing interest rate environment). This is the case when equity is granted (e.g. a subordinated debt or a capital injection) which has to be recovered. Guarantess are less used in reality (i.e. rarely claimed), as well as tax benefits, because of the eligibilty criteria to be met: in Hungary the development tax benefit can be used from the first tax year after the completion of an investment and only up to certain amount (up to 80% of the net sales).

CONCLUSIONS

The EU rules on competition law basically determine the level playing field of a Member State, i.e. what shall be done or may not be done. State aid is not equal to a subsidy, as it forms only a type of it which is defined as being explicitly harmful for the competition. The rules on State aid are adjusted to those of the Structural funds covering the seven-year programming period. Therefore the lessons learned from the current programming period is very relevant in considering how to plan the next one between 2021 and 2027 in order to allocate the subsidies in a *"better"*, namely more efficient and effective way. The preparatory work has already started, with the revision of rules and of course negotiations on the budget.

The main aim of this article was to familiarize readers with the very specific nature of State aid within the meaning of EU competition law on the one hand and on the other hand to give some contributions about the similarities and differences in the Visegrad countries as regards the type of and spending on subsidies at macroeconomic level between 2009 and 2016. The V4 countries have gradually increased their State aid spending since joining the EU. Moreover, the growth in their State aid spending was relatively higher than their increase in GDP per capita. The most significant aid is regional investment, which on the one hand is an important *"tool"* in the lagging behind regions but on the other hand makes their economic convergence to relatively developed ones rather questionable. Pisár et al. (2013) examined the deadweight of regional funds in the Czech and Slovak Republics and concluded that around 35% of subsidies can be regarded ineffective meaning that a significant part of the regional investments would have been carried out without grants. Owczarczuk (2013) draws the attention to the importance of R&D subsidies in the Visegrad countries and to the fact that the efforts by the governments are not sufficient in order to facilitate the inflow of foreign direct investments into the R&D sector. However, to raise the – non-governmental – R&D activity in the V4 in the long run is a crucial factor in terms of competitiveness.

Nevertheless, the level of State aid (as a percentage in GDP) seems to have no relation to the economic growth (Figure 3). However, this is not only characteristic of the Visegrad countries but of the EU as a whole.

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