Institute of Economics, Centre for Economic and Regional Studies Hungarian Academy of Sciences

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I. Main duties of the research institute in 2017

In 2017, the institute continued to implement the objectives of its research strategy. It complied with its obligations undertaken under research contracts and agreements. Its main tasks included compiling the Hungarian version of the 2017 Competition and Regulation (*Verseny és Szabályozás*), the Hungarian version of the 2016 Labour Market Yearbook (*Munkaerőpiaci Tükör*), as well as the time-proportionate implementation / completion of the research projects supported by the European Commission and the continuation of research studying mechanism design, agglomeration and social networks, corporate strategies and competitiveness under Lendület (Momentum) programme of the Hungarian Academy of Sciences (HAS).

II. Major research and other results in 2017

a)   **Major research results**

MACROECONOMICS AND GROWTH

"Trading strategies on financial markets" analyzed the question of stock market efficiency. The research project developed a time-varying trading strategy, which out of the many possibilities chooses the regime that gives the best current forecast, and bases the investment decision on this forecast. The strategy seems to be profitable on the majority of stock exchanges when transaction costs are in line with observed values on actual markets. Many stock markets changed as a result of the 2008 crisis: they were less predictable earlier than since the crisis.

"Economic growth in small, open economies" aims to analyze and compare economic growth in the Visegrad countries between 1996-2016.Results show that the main reason why Hungary and the Visegrad countries lag behind Western Europe is lower productivity. There is also, however, significant growth potential in improving the efficiency of labor and capital markets.

"Savings types: an evolutionary approach" analyzes the savings-consumption decision in an agent-based macroeconomic model. The approach does not assume utility maximization, but keeps some aspects of rationality, which are based on the concept of "ecological rationality". Simulation results show that prudent and forward-looking behaviour dominates when selection pressure is strong, but in an economy with only prudent agents there is too much capital relative to the golden rule. When selection pressure declines, first short-sighted consumers appear, and finally the distribution of the basic types becomes essentially random.

"Interest premium and economic growth: Hungary and the Visegrad countries" studies the economic and convergence process of the four Visegrad countries, using an open economy, stochastic growth model. Estimating the macroeconomic model econometrically, the project identifies the main shocks that influenced the volatility of economic growth in the four countries. Results indicate that in Hungary the level of GDP growth was mostly explained by growth expectations, but the composition of GDP was driven by fluctuations in the external interest premium.

EMPIRICAL INDUSTRIAL ORGANISATION

A research project analysed social innovations aimed at tackling marginalisation (SIM). Given the level of initial endowment the marginalised have, different forms of capability building, together with efforts to strengthen their inter-community connections, are indispensable for a successful SIM. Hence there is a trade-off between the type and degree of assistance provided and the short-term empowerment effect. Yet, it is important to grasp the differences between the short and long-term effects: a seemingly more paternalistic approach in the short run can increase the chances of starting a viable business at a later stage, which then leads to a very strong empowerment effect. The project also analysed the regulations on social co-operatives and the policy tools introduced to support them. The high amounts of subsidies, co-financed by EU funds, aimed at fostering the fast diffusion of this new form of co-operatives, have been offered with rather lax conditions. That has created ample and easy-to-exploit opportunities for rent-seeking. A different set of regulations and support schemes would have been needed, nurturing the organic development of social co-operatives. The legislation on social co-operatives has been amended several times, most recently at the end of 2016, making compulsory to have a local municipality, an ethnic minority self-government organisation or a certain, narrowly defined, type of charity organisation as a member of all social co-operatives, including the existing ones. This is not only a distortion of the fundamental principles of co-operation, but clearly against those.

„Fundamental changes in the role of government in the venture capital market after the crisis" reveals that the Central and East European countries, despite the available significant public resources, were unable to successfully use the possibilities provided by new types of government capital programs. One of the reasons for the failure is that government efforts only aimed at increasing the supply of venture capital funds, and there were hardly any steps on the demand side. The small size of venture capital funds, partly funded by the government, was also unable to ensure the efficient and self-sustaining operation of the funds. European regulatory constraints on the size of permissible volume of investments, their geographical scope, and the age of funded companies themselves have undermined the efficiency and effectiveness of investments, and their frequent circumvention has also burdened resources. The biased selection of the fund managers and the lack of experienced managers have led to dilution of the fund management market. The public equity schemes considerably increased the venture capital supply and generated interest from business angels and private investors, in a market segment that had not previously been attractive to them, moreover venture capital as a corporate finance instrument became much more familiar to the public.

EDUCATION AND LABOUR

A research project joint with participants from Belarus, Hungary, Russia, the UK and USA analysed the mortality of the population of 83 towns in Hungary between 1995 and 2004. The main focus of the research was to detect linkages, if any, between mortality and the ownership structure of the selected towns. Individual, firm level and municipality level administrative and survey data were used for the estimation of discrete-time duration models. The findings suggest that mortality was lower in towns dominated by state-owned and foreign-owned firms compared to those dominated by domestic private enterprises.

Another project investigated how the probability of out-migration and attrition of Hungarian medical doctors changed between 2003 and 2011 with the help of event history analysis, competing risk models. The results show that EU accession did not at the time affect the probability of out-migration, while after the end of the transitional period of restrictions on the free movement of labour from the new EU member states to Austria and Germany, the

probability of doctors' migration increased considerably. Relative wages and peer pressure also exercise a significant role in the out-migration decisions of young medical doctors. We also find that more than half of those medical doctors who left the country during the observation period returned some time later. The data furthermore suggest a massive flow of doctors to domestic jobs outside the health care system. Besides out-migration and attrition, leaving employment also contributes – at least temporarily – to the growing shortage of medical doctors in Hungary. The greater part of medical doctors who became inactive during the examined period did so not primarily as a result of retirement, but chiefly that woman medical doctors were on maternity leave for a while.

Another research studied the relationship between consumption and subjective well-being. Using cross-sectional survey data from nationally representative samples in Hungary, it investigated whether spending on experiences or on material goods is associated more strongly with life satisfaction. Although both experiential and material expenditures were positively associated with life satisfaction, this study found no significant evidence supporting the greater return from experiential purchases. The only minor difference between spending on experiences and spending on material goods was that the marginal utility of the experiential purchases appeared to be rather linear, whereas material purchases had a decreasing marginal utility. The results suggest that a reallocation of an average person's expenditures (spending more on experiences and less on material goods) are associated with higher individual well-being.

PUBLIC ECONOMICS AND PUBLIC POLICIES

Researches investigating the spatial distribution of public works found that the actual distribution of public workers diverges from the formula applied during the central planning procedure in the Home Office (the ministry responsible for the public work schemes). The actual value fluctuates around the sum of the long term (over one year) unemployed and the number of public workers in the previous year, with large variance. There is an unequivocal connection between the settlement size and the public workers per long term unemployed ratio. The larger a settlement is, the lower is this proportion. As a consequence of the modifications in the municipal financing system, the management of small settlements became impossible without public works. In backward villages usually there are no well-trained, capable leaders, who are able to develop good public works projects, consequently the system of spatial distribution of the public work resources under-supports these settlements, to the contrary of the declared aims. Originally, public work schemes were planned as active labour market devices, but in the practice their social and settlement-management role became much more important. Rapid downsizing of public work schemes on the expanding primary labour market, without any additional social measures and changes in municipal financing, can cause serious collateral damages.

The new results of their research on health showed that the development level of the countries, rate of destructive health behaviour of the population, the level of education, the geographical location and the air pollution explain with sufficient significance not only the international differences of total mortality rates but the illness-specific (cardiovascular, cerebral and neoplasm illness) cross-country mortality rates, as well. A surprising result was that for working age males the effect of the air pollution on the mortality caused by neoplasm was twice as large as the effect of air pollution due to other illness-caused mortality. Especially true this in the case of lung cancer, where air pollution had much higher effect on

mortality than in the case of other neoplasm' mortality. In the lung cancer related mortality the impact of the air pollution is higher than the detrimental impact of tobacco consumption.

The research finding on corruption risks in Hungarian public procurement point out that there are significant anomalies in the public tenders under the threshold 25 million forints during 2011-2015. The intensity of competition is lower the level of corruption risks are higher under this threshold at interval of two million forints than in other public tenders. The relative price drop (the estimated price minus the contract price and divided by the contract price) is higher in tenders where the corruption risks are the lowest and there were at least six bidders during the public procurement process. According the estimations based on corruption risks and intensity of competition the direct social loss comes to 15-24% of the total spending by public procurement in the period of 2009-2016.

The international cross-country research looking at the subjective well-being of the youth has shown, that being unemployed has a strong, independent negative effect on subjective well-being across all welfare regimes. GDP per capita and social expenditures percentages in GDP have positive effects. In terms of country or welfare regime effects, living in a Scandinavian type welfare state has additional positive effects, while Southern European and post-socialist welfare regimes have negative effects on subjective well-being predicted by other variables.

AGRICULTURAL ECONOMICS AND RURAL DEVELOPMENT

The research has tested and compared the models taking into account of cross-sectional dependence, heterogeneity and time series properties that are used to analyze different macro panels, and compare them to traditional models using the USDA World Agricultural Database. Models that took into account heterogeneity, time series properties and cross-sectional dependency were better matched to the data. The empirical analysis focused on EU agricultural Total Factor Productivity (TFP) analysis. The results show that TFP increased in the EU; growth in the old Member States slowed in 2000; significant growth in the new Member States was observed after accession.

This research describes an assessment of the impacts of regional development programmes on the development of Hungarian regions at a highly disaggregated level between 2002 and 2008 constructing a multi-dimensional composite indicator to estimate the overall development of rural regions and capture social, economic and environmental dimensions. There has been considerable variation with increasing concentration in the level of subsidies distributed during the analysed period. From a policy perspective, the results are disappointing. Irrespective of the subsidy measures or methodology employed, the impact of the former is very close to zero or non-significant. Findings cast serious doubt on the effectiveness of development policy and the long-run convergence of European regions.

The aim of this research is to examine the role of power on supply chain performance (SCP) in the context of small and medium sized agribusiness enterprises (SMEs). Contrary to most of previous studies, which collect and analyze data from one side of a relationship dyad using a focal firm approach, a matched triad approach was employed in data collection and analysis. Results highlight the differences in the perception of power use and how it influences SCP. The differences in perception suggest the existence of power asymmetry amongst supply chain members. This work contributes to the ongoing debate concerning the use of triad as a unit of analysis as opposed to a firm or a dyad.

The research examines global agri-food export performance in the light of these changes with special emphasis on the impacts of economic crisis using the concept of normalised revealed

comparative advantage (NRCA) in terms of both gross exports and value-added for 61 countries over period 1995 and 2011. Systematically comparing these distributions reveals significant differences for NRCA based on gross exports versus value-added data. Results indicate that a value-added approach to assessing NRCA can provide further insights that are not apparent from an exclusive focus on gross exports. Focusing on the EU-27 countries, estimations suggest that relative factor endowments positively, whilst market size negatively influences the NRCA based on both gross exports and value added exports calculations. Surprisingly, government supports and economic crisis have not significant impacts on the NRCA.

The research investigates the drivers in income risk for Slovenian farms using unbalanced and balanced farm-level panel data from the Slovenian farm accountancy data network in less favoured areas (LFAs) and non-LFAs over the period 2004 to 2013. Estimations suggest that subsidies and off-farm income for non-LFA farms and farm specialisation for both LFA and non-LFA farms reduce farm income risk, whilst subsidies and farm size for LFA farms, and financial immobility for both LFA and non-LFA farms increase farm income risk. There is a non-linear relationship between farm size and income risk for LFA farms.

GAME THEORY

In an experiment already prepared in the previous year they investigated whether the agents' risk attitudes affect the emergence of financial bubbles. The experiment was motivated by the MiFID (Markets in Financial Instruments Directive) of the European Union that is, since 2007, also in effect in Hungary. The question is whether the exclusion of clients with more conservative investment attitudes increases the risk of more frequent or more severe financial bubbles. In the experiment a questionnaire was used to allocate subject into 12 8-person groups and they traded with a financial asset of linearly decreasing value. As expected, the asset price was near the expected value in the groups with risk averse agents, while in risk loving groups the price was well above it, and only dropped at the end of the game.

They studied the externalities of information sharing among depositors on bank runs. The hypothesis was that withdrawals are better observable than a decision not to withdraw and this may contribute to bank runs. They found that this leads to positive informational externalities as there are no bank runs in the new equilibirium. The experiment supports the results as in the treatment where participants could signal that they do not withdraw, the occurrence of bank runs was significantly lower.

In one of the group's key projects, it has been studied that if in a simple 2x2 normal game, both players have a clearly dominant strategy, then in the equilibrium the inequality of payoffs can hinder players from playing the dominant strategy. In the case of a clearly dominant strategy, the lowest payoff is better than the best for the alternative strategy, and such strategy coincides with many other decision criteria, such as social optimum, maximin strategy, or Pareto efficiency, for example. By not choosing the dominant strategy due to inequality-aversion, the own and the other player's payoff is reduced. New experimental results also show that inequalities in payoffs can be used to offset people from choosing a clearly dominant strategy, although at most 20% of subjects deviate.

Significant results have been gained in the research that deals with the monotonicity of the so-called cake-cutting problem. Cake-cutting is one of the basic models of allocation theory, in which we want to share a heterogeneous, arbitrarily divisible asset among the participants with different preferences. The monotonic properties prescribe how distribution may change

if the initial conditions are changed (e.g., the cake is smaller or there are more participants). The monotonicity properties are essential to make a procedure feel right to people. The relevance of the results is that, although in the case of other division problems the monotoniticity properties were extensively discussed, no one has ever defined them in the case of cake-cutting.

They also investigated the properties of the proportional bankruptcy rule. The first use of the proportional bankruptcy rule can be traced back to Aristotle. They study financial networks where agents have initial endowments and everyone owes everyone. In a given financial network, the bankruptcy rule defines a payment matrix, the elements of which determine how much each of the players must pay to other players. The assets of a player consist of its initial endowment and the transfers from others. The proportional bankruptcy rule frequently used in the systemic risk literature requires that agents pay their assets in proportion to their debts, up to the amount of the debt. If the proportional bankruptcy rule is valid, the value of assets is determined endogenously, as payments may depend on each other. In their article, they present a detailed characterization of the proportional bankruptcy rule, so that only this bankruptcy rule satisfies all the used properties: claims boundedness, limited liability, priority of creditors, impartiality, non-manipulability by identical agents, and continuity.

FIRMS, STRATEGY AND PERFORMANCE

Their study about reference-dependent job search proposes a model, which shows how preferences of job-seekers adapt relatively to the change in their reference point. According to one of the predictions of this model, newly unemployed individuals search harder, but over time, though, they get used to lower income and thus reduce their search effort. In anticipation of a benefit cut, their search effort rises again, then declines once they get accustomed to the lower postcut benefit level and thus reduce their search effort. The paper, to test the model, uses a unique unemployment insurance reform introduced in Hungary in 2005. The estimates indicate a slow-adjusting reference point and substantial impatience, likely reflecting present-bias.

The paper about "Shipment frequency of exporters and demand uncertainty" examines how exporting firms adapt to the uncertainty stemming from demand volatility. By using monthly customs data from France, they decompose exports into different extensive and intensive margins including two novel margins: the number of months the firms exported (frequency) and the average export value per month. The research establishes four empirical patterns. First, firms export less to markets with higher demand volatility. Second, this effect is mainly explained by the frequency margin. Third, volatility affects the frequency margin through two channels: indirectly through lower trade volume and directly through logistics re-optimization. Fourth, the effect of demand volatility is magnified on markets with longer time-to-ship. We propose that these observations are in line with simple stochastic inventory management approaches.

One of the main topics of the group investigates the heterogeneity of three types of taxes levied on firms (corporate tax, payroll tax and local business tax). We show that business taxes per worker and per unit value added significantly differs among different types of firms and that tax incomes are highly concentrated. The most important factor of corporate taxation is productivity that is positively correlated with tax income per capita and negatively correlated with the value-added tax wedge. Using static microsimulation, we study the effect of Hungarian corporate tax reduction in 2017 on tax income and the distribution of tax burdens. We calculate how much large enterprises benefited from the tax reduction, moreover how the concentration of tax income has reduced due to the corporate tax change.

ECONOMICS OF NETWORKS

The research group analyzed a significant and under-studied issue during which they firstly mapped the networks of labor-flow between Hungarian firms. Researchers found significant empirical evidence that labor-flow between firms is an important instrument of knowledge spread and it has significant effect on firm performance, particularly on productivity. The researchers demonstrated that the influence of labor-flow on firm productivity is affected by the technological similarities of industries, as well as the experience of international operation of firms.

They have made significant achievements in their other project which studied the role of social and economic networks in managing information problems emerging in market transactions. They examined in which markets and under what conditions the problems of asymmetric information and uncertainty can be mitigated by using these network-based relationships, and how these networks affect the market transactions, prices, outcomes, market efficiency, and welfare. They revealed in a Principal-agent model how the social networks can be used for screening to mitigate the information problem. The conclusions they draw can be generalized and can be applied to several situation where asymmetric information appears and social network has important role such as job-seeking in labor markets, micro-finance groups, online peer-to-peer lending and other online peer-to-peer markets.

MECHANISM DESIGN

One new research project of the group focuses on pairing methods used in chess competitions. The World Chess Federation (FIDE) specified a set of complex pairing mechanisms that are in use in the so-called Swiss tournaments. The goal of the research is to determine whether these mechanisms can be transformed into efficient algorithms in a clear mathematical model.

One of the group members considers two variants of the classical Stable Roommates problem that are degree constrained. The first variant, EGAL d-SRI, involves finding an egalitarian stable matching in solvable Stable Roommates instances with preference lists of length at most d. They show that this problem is NP-hard even if d = 3. On the positive side they give a (2d+3)/7 -approximation algorithm for d=3, 4, 5, which improves on the known bound of 2 for the unbounded preference list case.

Given a bipartite graph G = (A u B, E) with strict preference lists and given an edge e. The question is whether there exists a popular matching in G that contains e. It is known that every stable matching is popular; however G may have no stable matching with the edge e. The authors of the paper identify a natural subclass of popular matchings called "dominant matchings" and show that if there is a popular matching that contains the edge e, then there is either a stable matching that contains e or a dominant matching that contains e.

We are given a bipartite graph G = (A u B, E), where each vertex has a preference list ranking its neighbours: in particular, every a in A ranks its neighbours in a strict order of preference, whereas the preference list of any b in B may contain ties. The authors show that the problem of deciding whether G admits a popular matching or not is NP-hard. This is the case even when every b in B either has a strict preference list or puts all its neighbours into a single tie. In contrast, they show that the problem becomes polynomially solvable in the case when each b in B puts all its neighbours into a single tie.

AGGLOMERATION AND SOCIAL NETWORKS

The research project focusing on the advice networks among firms in the printing- and paper product industry in Kecskemét uncovered the main factor behind the dynamics of inter-firm

knowledge networks. Results show that geographical proximity and proximity in the network increase the probability of creating new relations; while tie persistence in the network is fostered mainly by technological similarity. These findings shed new light on the question how the evolution of social networks and lock-in of regional industries are inter-related.

The analysis carried out in collaboration with Umea University explored relations between the structure of co-worker networks and agglomeration economies. The researchers proved that industries in regions take advantage of being co-located with other industries in the region through the co-worker relations they are bound together. In a related project focusing on the link between networks and performance, researchers investigated the influence of collaboration network structure on the quality of innovation by using patent data. This research showed that those companies produce better innovative outputs, where the diverse inter-firm networks of broker inventors is combined with cohesive intra-firm networks.

Related to the topic of innovation diffusion, the group has achieved a new result and managed to identify the deficiencies of social contagion models in describing spatial diffusion. The research uses the example of iWiW, and the spatial diffusion of this online product to demonstrate that network models can efficiently simulate the global dynamics of diffusion but cannot capture local aspects. An important conclusion is that network diffusion models have to be extended with town size and distance parameters to efficiently describe spatial diffusion.

b) Science and society

The Institute's research portfolio contains both theoretical and applied empirical research in topical economic policy and welfare issues. A few examples of topics of this kind include the research on universities group project roster; on the Hungarian food-chain supplies' innovation performance; corruption researches; pension system. They studied the role of networks and labour- flow on labour-market processes and firm-productivity, the role of social networks in regional productivity growth, the labour market situation of those employed under the public work scheme, the effects of foreign currency lending, the growth processes of Hungary, out-migration of Hungarian doctors and also the effect of the unemployment benefit path's reform.

The Institute sets great store by publishing the research results that society is likely to put to good use, raising awareness of them in the right forums and public events and making them available for the interested public at its website.

The results of labour market research are given publicity annually at a labour economics conference in Szirák. Papers were presented in five sections.

Volume 17 of the Labour Market Yearbook presenting the topical characteristics of the Hungarian labour market and employment policy in Hungary and analysing various areas of this topic in detail was published in Hungarian. The yearbook presents the characteristics of the processes in and the internal interconnections of the Hungarian labour market on the basis of available statistics, theoretical research and empirical analyses, in an easy-to-follow style and structure and in an international comparison. In keeping with the earlier practice adopted by the editors of the series, an area that is key to understanding labour market processes in Hungary and the success of fact-based employment policies was selected for special discussion. The Close-up (*Közelkép*) chapter of this year's edition discusses the labour shortage in Hungary.

In 2017, the Institute hosted two successful international conferences. The Vienna Institute for International Economic Studies (WIIW) and CERS-HAS organized a workshop in Vienna to discuss the issue of international migration which is of outmost importance for Hungary and

invites questions from an Austrian perspective as well. The discussion was followed by an introductory presentation about the CERS-HAS Data bank. The 14th 13rd edition of the international conference *Transition in Agriculture – Agricultural Economics in Transition* was organised by the Agricultural Economics and Rural Development research team. Papers were presented in four sections: Productivity and Effiency Analysis, Food Chain Issues, Agricultural Trade, Rural Development.

The research results achieved in the Institute and discussed in seminars were published in 36 working papers and 15 issues of the Budapest Working Papers on Labour Market (Budapesti Munkagazdaságtani Füzetek). A professional blog serving as a discussion forum for the Institute's research results, policy opinions and topical economic, public and socio-political issues is in place and is regularly used by the staff to disclose their opinions and papers thereby facilitating social interaction. News about the media presence of the staff is available in the Press Survey section. The website offers up-to-date information in both English and Hungarian on the main activities, publications and projects of as well as the conferences and seminars organised by the individual research groups.

III. National and international relations and co-operation in 2017

Researchers of the Institute teach at nearly all Hungarian higher education institutions offering undergraduate and graduate courses in economics (CEU, BCE, ELTE, DE, PTE, KE etc.). Furthermore, they are engaged in PhD programmes at Pannon University in Veszprém, Kaposvár University, Szeged University, Corvinus University and Szent István University under a co-operation agreement. They also teach at universities (Cardiff University, UK Open University) and work as external researchers in prestigious research institutes (CEPR, IZA) abroad.

As a result of the measures taken in the interest of establishing the professional integration of research in competition regulations, a forum has been set up for lecturers and professionals at universities, research institutes and institutions of public administration in Hungary and abroad dealing with competition regulations, the economics of network industries and the legal issues of regulations.

The Institute organised its Summer Workshop for the sixteenth time, offering a forum for young economists studying or working abroad.

Researchers provide expert services for the Competition Office, the Central Statistical Office, TÁRKI, FIW, Czech Science Foundation and the Fiscal Council. Its researchers include consulting experts of the Monitoring Committee of the Economic Development and Innovation Operational Programme, members of the Advisory Panel of Parliaments and Civil Society in Technology Assessment (PACITA) and the Expert Group 'Strategic Foresight for R&I Policy in Horizon 2020' (SFRI) at the European Commission's DG Research and Innovation. Its researcher is a member of the Scientific Council of the Technical University of Ostrava. The Institute is an advisory member of the Evaluation Committee of the National Strategy entitled "Let's Make Things Better for Our Children" and the Indicator Sub-committee. Many researchers are members of international councils, such as European Economic Association, International Association of Agricultural Economics, EAEPE, GERPISA, Econometric Society, American Economic Association. Its researcher is co-chair of the Matching in Practice Network and is a member of the directors board of CA COST Action CA15210, the European Network for Collaboration on the Kidney Exchange Program, where he leads the WG1 working group. Its researcher is a member of the Scientific Committee of Global Conference on Business and Economics. Its senior research fellow was invited to the MTMT Scientific Metrology Committee. Many researchers are founders or

members of the presidium of the Hungarian Society of Economics and participate as members of the presidium in the work of the Hungarian Economic Association.

Our researchers are active members of the Hungarian Academy of Sciences and Economics, the Scientific Committee for Human Resources, the Agricultural Economics Committee, the Scientific Committee for Development Economics and the Doctoral Committee on Economics.

IV. A brief description of successful national and international research proposals in 2017

There were 34 OTKA project in progress in 2016. Research in 11 new topics was commenced. Regarding project applications, the HAS Lendület (Momentum) Programme, under which mechanism design research, studying agglomerations and social networks and research in corporate strategies and competiveness continued, is of key importance.

The Institute continued to implement the objectives of the research project entitled *Education Economics Network*. The project is financed under the H2020. It marks the start of an enhanced cooperation in the field of education economics between three top ranked economics of education research groups in EU-15 countries - KU Leuven, U Maastricht and Politecnico di Milano - and the CERSHAS. Education economics is one of the most important applied economics fields that provide direct evidence to policy makers on educational issues. The proposed project focuses on three clusters of methodologies – program evaluation, structural modelling and efficiency analysis – and fosters cooperation between the institutions along more specific research lines within these clusters.

At the end of 2016, SKIN - Short supply chain Knowledge and Innovation Network H2020 project was launched, which aims to build an international network covering various actors in the short supply chains and to find good practices and innovations.

V. Major publications during the year

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