

József Móczár

Barabási-Type Laws of Success, Networks and Public Funds in Hungarian Science

SUMMARY: The book of Albert-László Barabási (2018) tested the laws of success in the American environment, therefore Barabási himself questioned how his laws function in an other environment, and whether his laws could actually be universal. The author formulated this question at the Central European University (CEU), at the excellently choreographed premiere of the book in September 2018, in Budapest. In this study, I analyse the Barabási-type laws of success, the role of networks and the opinion of public funds for recognition in Hungarian science.¹

KEYWORDS: social and technological innovation, innovation policy, artificial intelligence, research funding

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The world is irreducible, everything is connected to everything, either directly or indirectly, the mathematical topology is provided by the Eulerian graph theory, as well as the theory of random graphs of Erdős² and Rényi (1959). These theories, together with artificial intelligence, were the basis of the emergence of the new science, the network theory, which is presented excellently by the textbook of Barabási (2016). His previous books, Barabási (2003, 2010), discussed network theory – which is essentially the practical application of the Eulerian graph theory and the theory of random graphs – embedded in science history references, with less mathematical and artificial intelligence background knowledge.

Professor Barabási examined the components

of success and failure through scientific arguments and laws, even if those are debatable. However, there is general understanding that those topics are the hardest to write about objectively of which everybody has an opinion, and success is exactly like that. Barabási (2018) tested the laws of success in a micro environment, primarily in the area of his field of science, namely natural science, and he humbly drew on his own professional career as well. He identifies the recognition of global success achieved in science (global success) with winning the Nobel Prize, and he researches it under the circumstances of the American democracy and market economy, which have been developing for more than 200 years. This approach raises the question of local success as well, which we may examine among national frameworks. In national frameworks, it is debatable whether gaining the title of member of the national academy

E-mail address: jozsef.moczar@uni-corvinus.hu

of sciences as the recognition of local success can be considered the equivalent of the Nobel Prize won through global success, and whose membership can be considered as success.

In Hungarian science, I examine the question of local success mainly in the period after the change of the regime in 1989, since – in theory – that is the point from when the return to market economy and the widespread establishment of the democratic institutions can be considered. In terms of testing Barabási's laws of success in Hungary, I consider the title of member of the Hungarian Academy of Sciences as recognition, and I concentrate mainly on the social science most exposed to the change in the regime, namely economics.³ The measurement of scientific achievement leading to success is always debatable, in particular in social sciences; in this study, I measure it with the number of articles and citations published in the Q1 periodicals.⁴ In following Professor Barabási, in course of the testing of his laws, I will draw on my own professional career and experience as well.

In Hungary, in the various fields of science, opinions vary whether the achievement of the Hungarian Academy of Sciences membership could in fact be considered as the recognition of professional success and 'whether the Hungarian science does [actually] develop through the privilege of excellent scientists.'⁵ Where the performance can be measured objectively – such as natural sciences –, these questions are less disputed, while where it cannot be measured – such as typically the social sciences –, the Hungarian Academy of Sciences membership without serious achievements and lobbied by certain networks⁶ are strongly debatable. The question shall be examined compared to foreign academies and in the light of the more significant organisational-political turning points which took place during the history of the Hungarian Academy of Sciences.

THE BRIEF HISTORY AND THE OPERATIONAL ANOMALIES OF THE HUNGARIAN ACADEMY OF SCIENCES

The Hungarian Academy of Sciences (in what follows HAS) was established in 1825 upon the initiative of *Count István Széchenyi*, as a politics-free organisation. Count István Széchenyi supported tenders using the wealth of the Academy arising from baronial funds and the yields thereof, he financed book publishing and gave some allowance to the ordinary members. The HAS received state financial support for the first time in 1867, however, from 1869 until 1945, its by-laws adopted excluded state intervention. This was interrupted for a brief period only by the Hungarian Soviet Republic. After the Treaty of Trianon, the losses of the HAS were eased by *Count Kuno Klebelsberg* through state aid. Between the two world wars, the obscurantist, conservative management of the HAS did not accept natural sciences (!), and after World War II, it was almost on the brink of termination. During the summer of 1945, as remedy to old grievances, the Academy of Natural Sciences was founded under the leadership of *Albert Szent-Györgyi and Zoltán Bay*, which merged with the HAS in the next year.

The Socialist era of the HAS lasted from 1948 to 1989. As a first step, the Hungarian Working People's Party established the Hungarian Scientific Council opposite HAS, however, Act XXVII of 1949 merged the HAS and the Hungarian Scientific Council, and converted it into a Soviet-style academy. It followed the 'democratic centralism' of the Soviet example, the Soviet Academy of Sciences: the presidium made the decisions instead of the general assembly, the section of Fine Arts was terminated, and the number of scientific departments was increased from 6 to 10. Between 1950 and 1960, independently from the universities and following the Soviet

model, the network of academic institutions was established, with exclusive research task, which remained until today. The Section of Economics and Law of the HAS was founded in 1965, which elevated the Socialist economics and legal sciences to an academic level (Announcements of the HAS, 1966–67). In 1969, dual leadership was introduced in the management of the Academy: the president was elected by the general assembly, while the secretary general was appointed by the Government with reporting duties. The operation of the HAS has been financed from the state budget, from public funds to this day.

In 1989, a lot of people hoped that the change in the regime would cause the HAS to be reformed as well, and that scientific achievement consistent with the Western international market economy standard would be required from the renewal of the HAS membership. On the contrary, the reform of science policy had not even started, although, the change in the regime in the narrower sense was considered to have been finished by 2005 by for example *László Csaba: ‘... market economy and democracy are undoubtedly functioning [in the Central and Eastern European countries], namely, after one and a half decades, their development is no longer characterised by the issues left behind by the former Soviet model and the reform versions thereof.’* (Csaba, 2005, p. 34). However, in 2008, we could also read that ‘...in safeguarding its privileges preserved from Stalinism, HAS secludes itself in its outdated institutional system.’ (Polónyi, 2008).

In 1989, upon the initiation of the then-president of the HAS – who was a historian –, the general assembly of the HAS confirmed the membership of all academicians, regardless of their scientific achievements so far consistent with the international standard, and at the same time, it rehabilitated the members excluded in 1949. As a further restitution, the Széchenyi Academy of Letters and Arts

was founded in 1992.⁷ In 1994, the public body as legal entity was formed, the members of which could and can be persons with scientific degree, in addition to academicians. The general assembly is the supreme decision-making body of the HAS, the members of which are Hungarian academicians; the research institutions of the Academy are supervised by the newly established Council of Research Units under the leadership of the secretary-general.

So far, none of the governments and none of the scientist bodies have been able to cause the Hungarian science policy and the HAS to be on par with the science policy and operation of academy of the developed countries. Although the first democratically elected government, the Hungarian Democratic Forum made an attempt in this regard, which succeeded only by half, and the governments succeeding usually understood that the reform of the HAS requires a higher level of development and revenue. The 1993 act on higher education and the 1994 act on the HAS gave the right back to the universities to issue academic degrees, which meant the introduction of the PhD and the termination of the academic CSc, or simply the conversion of CSc to PhD.⁸ Despite the political will, however, the network of academicians achieved that they could grant the title of doctor of the Academy. Since the title of doctor of the Academy is a condition of the HAS membership, it represents a scientific qualification higher than the PhD in the Hungarian academic hierarchy.⁹ Obtaining the title of ‘dr. habil.’ granted again since 1994 by the universities, used to be requirement for university associate professor appointments, but now it is necessary mainly for university professor appointments (the system softened to this extent). The ‘dr. habil.’ title appreciates quality education and it is not an academic degree.¹⁰ However, it causes a serious anomaly

that the title of ‘dr. habil.’ may be earned at other universities as well, despite the status of the professor. (For example, the dr. habil. title earned at the university of Sopron or Gödöllő – subject to the decision of the Hungarian Accreditation Committee – makes the holder eligible for appointment as university professor at Corvinus University, but there are examples for the opposite case as well.)

Based on all of the above, it is clear that in the Hungarian academic system, in addition to the interlocking Prussian educational and the American scientific evaluation, the Soviet-type academic structure and titles still live on today.

In my personal experience,¹¹ while the elementary and intermediary level education in the USA is usually of lower standards than in Hungary (even today), their PhD programmes, especially at the Ivy League universities, have the highest of standards in international comparison¹². [It shall be noted that they achieve the high level of standard with the world most skilled American and foreign (including Hungarian) students.] In Hungary, only the natural science theoretical PhD programmes may compete with the latter, however, this finding is doubtful in respect of programmes requiring a lot of experiments, due to the lack of appropriate equipment. However, programmes in the field of social sciences – in particular the Hungarian PhD programmes of economics – are far behind of the programmes of the Western universities¹³, which may be explained partially with the difficulties caused by the change in the regime. Although in the second half of the 1980s, a lot of young lecturers participated in shorter or longer (3–5–10 months) Western study programmes in the framework of the Soros Scholarship, switching over to the market economy approach caused

serious difficulties for the lecturers socialised in planned economy studies. Exceptions to this are the researchers of world economics, who, as a result of the real politics of the HAS Institute of World Economics, have studied the modern market economy and financial theories before the change in the regime as well (since their foundation), although only the descriptive theories without methodology. However, I could also mention the HAS Institute for Economics, from where the two-year seminar of János Kornai introduced the five of us to the questions of the current modern theoretical economics, which was defining in my professional development.¹⁴

At the beginning of the change in the regime, the Hungarian universities concentrated on the mainstream neoclassical theories in their courses, which caused a great difficulty since the majority of the lecturers did not have the necessary mathematical knowledge.¹⁵ This is still true for those older lecturers who obtained their diploma not on a mathematics or foreign language-demanding faculty and then eventually found their place in the institutional economics education, and within that in the fields of verbal ideology and economic policy areas, far from the science of economics.

Today we can already see clearly that the change in the regime made a series of misleading decisions in a lot of areas, the negative effect of which is still with us today. Such was, for example, the transformation of the training-colleges in the countryside into business colleges with unchanged staff of lecturers, which was essentially built on the weekly 1 or 2-day lectures of one or two economics professors (intercity professors).¹⁶ The result could be nothing else but the issuance of college degrees with specialised economics secondary school knowledge.

Namely, the economist profession became strongly diluted, which – similar to the model

of communicating vessels – gradually brought about the significant decrease in level of standard of the Hungarian economic sciences¹⁷ as well. Therefore, over the last 15 years it had been a general phenomenon that after getting their master's degree – or by now after finishing the undergraduate degree, moreover, after the secondary school studies as well – the most talented students who have sufficient ambition and motivation regarding economic questions continue their university or PhD studies at American or Western European universities and they find employment there as well. (Who fails to obtain the PhD degree, for example at Harvard University, will come home and may fulfil the much lower requirements in Hungary as well, and might achieve local 'success' as well.) The students who stay in Hungary usually have medium skills, and they constitute the pool from where the Hungarian PhD programmes can draw from, and they are the ones who will become university lecturers and researchers. The end result is obvious! Under these circumstances, the invitation of one or two more reputable foreign professors will not help either.

The PhD schools compliant with the international standards require quality students and lecturers who have modern and empirical market economy knowledge, and their 'construction' takes longer times and requires appropriate university strategy¹⁸, with giving up counter-selection in the selection of the appropriate lecturers.

Based on the above, it makes no sense to force PhD training in Hungary in the field of social sciences, where in the framework of the study programme the students usually read, translate and interpret English books during the lessons, together with their lecturers. In a lot of cases, the undergraduate and the masters programme are repeated over and

over; the training which raises original ideas and solves problems is absolutely absent, the majority of the lecturers is not even capable to do so.¹⁹ This proposal had already been suggested by many before me. According to the cost-benefit analysis as well, the Hungarian economic science may escape this downward spiral if the appropriate ministry concludes contracts with and provides financial support to the Hungarian students who are studying at American, Japanese and Western European universities, while such students shall agree to lecture and research at the Hungarian universities after they had finished their studies.²⁰ This path has been taken by the Asian countries for a long time and with excellent strategy, in particular China and South Korea, and everybody knows the results. By now, the relaunched university PhD programme of multiple Asian countries are competitive with the PhD programmes of the better universities of the world, not to mention the yields of integration into the network of the scientific world and thereby the yields of deepening the science diplomacy.²¹

However, employing students who obtained PhD degrees at foreign universities in Hungary requires serious change in perception and primarily giving up the counter-selection principle. This requires first and foremost the clearing of the Hungarian science market (market clearing), which requires clean competition and the appreciation of quality in filling the university lecturer and researcher positions, as well as the elevation of the moral codes.

TESTING BARABÁSI'S LAWS OF SUCCESS IN HUNGARIAN SCIENCE

After putting the HAS in a brief historical and science policy context and after the presentation of the anomalies thereof, let us examine whether the Barabási's laws are

proven in achieving local success in Hungarian science.

The 1st law of success:

PERFORMANCE DRIVES SUCCESS, BUT
WHEN PERFORMANCE CAN'T BE MEASURED,
NETWORKS DRIVE SUCCESS.

As I have mentioned before, the measurement of success was the most debatable in the social sciences. Although several of the members of Section IX of the HAS had participated in longer or shorter study tours at American and Western European universities with Ford and Soros scholarships before the change in the regime still, only few of them were able to make use of what they learned there in their researches after the change in the regime, their academic performance is insignificant, therefore it is justified to ask the question how they could become academicians without measurable performance. Which networks helped them to their academician titles? The first law of success answers this question perfectly: after the change in the regime, the memberships of all academicians elected during the Socialist era were confirmed without any selection, even in the social sciences which were the most affected, i.e. their network – together with the new members elected by them – voted and is still voting on who could become an academician. I wonder if this network had sufficient modern theoretical and empirical market economy and methodological knowledge necessary to decide on academician titles directly after the change in the regime? In addition, the clean competition for academician titles were restricted by the counter-selections, as well as the presidential decrees independent from performance. Such as when the network of academician had to take territorial aspects into consideration. An academician from the ‘countryside’ elected in 2004 has no performance compliant with

the international standard, his impact on the development of economics is insignificant – as I will support this with facts later on. The same effect was brought about also by the discriminative presidential decrees in 2013 and it is likely that in Section IX, the network would elect a woman during the current, 2019 election. In 2016, the network of academician elected an academician who made fundamental mistakes in his book, in the Solow prototype model and expansion of neoclassical growth theory, in the examination of the growth potential of the EU, which also reflects on the economic science academicians. However, the election of several post change in the regime academicians in Section IX was supported by networks which survived the Socialist era, and friendship-political lobbies which still have substantial social capital. In summation, as you will see, only four members stand out from the economist academicians of Section IX, who have academic achievement compliant with the international market economy standards as well. From among them, by far academician *János Kornai* stands out of the rest the most.

The 2nd law of success:

PERFORMANCE IS BOUNDED, BUT SUCCESS
IS UNBOUNDED.

The success of a scientist is measured by his impact on the branch of science, articles in international journals which are ranked according to the currently most comprehensive quality Q1-Q4 categories, the number of references made to such articles, acknowledgement for which would be the Nobel Prize in case of global success (world success), and in case of smaller impact, the acknowledgement of local success in Hungary should be represented by obtaining the HAS membership. In the latter case, I examine the impact of the economist HAS members to economic sciences, and in doing so I will take

those publications into consideration which were published in this Q1-Q4 international journal. Their academic performance is tested through the publications published; whether their local success – in accordance with the change in the regime – is supported by their publication performance reflecting international market economy standards, or whether in spite of their low-classification or unrecognised academic performance, their HAS membership was lobbied by certain networks.

What do Q1-Q4 ranked journals actually mean? The quality of international and national research work is determined and measured by the measurement of science based on various measures. The newest measure is the SCImago Journal & Country Rank (SJR), which – as it is signified by its name – ranks international journals and countries based on the complex indicator of the references, which is calculated bases on the bibliography database of SCOPUS, the former together with the Hirsch index. Based on the SJR ranking according to the journal, quality groups are created by division into quartiles (Q), which shows the prestige the journal concerned has in its field of expertise. The top 25 percent of the ranking order was given Q1 excellent qualification, the 26–50 percent part of the ranking order got Q2 good qualification, while the 51–75 percent part of the ranking order received Q3 average qualification and finally the bottom 25 percent of the ranking order got Q4 poor qualification. The quartile division of the SJR does not correspond with the ranking of the Thomson Reuters in all cases. The Hungarian National Scientific Bibliography (MTMT) of the HAS will switch over to the SJR ranking, which is in progress. (See the announcement of the Library and Information Centre of the HAS, 2016)

In Chart 2 in their 2017 article *Sasvári and Nemeslaki* showed that based on the SCOPUS database, the evaluation of the A, B, C, D categories of the international journals

compiled for the applicants for the title of Economist Doctor of the HAS of the HAS Section of Economics and Law is not consistent with the SJR ranking, since a significantly larger part of all categories were ranked in the Q1 and Q2 categories. In the opinion of the authors, the quartile division of the categories is fair, which I think is rather arbitrary and misleading, and it reflects the complete negation of the SJR international standard. In all cases, the average of the Hirsch index, the SJR measure and the Impact Factor of the international journals ranked in the A and B categories was higher than that of the C and D categories, which supports the decreasing appreciation of the categories. In their Chart 4, they published an interesting statement in respect of the number of international publications: at the beginning of 2016, the number of publications in the SCOPUS and WoS journals by the doctors of HAS and HAS members who belong to the GMB (Gazdasági Minősítő Bizottság – Qualifying Economic Committee) was zero, which although does not allow for making negative conclusions regarding their academic performance, it indeed was indicative for my examinations.

Approximately 60 percent of the 2015 announcements of the academic researchers' network recorded in the MTMT and to be characterised by impact factor had been published in international journals with 'excellent' (Q1) qualification, while approximately 80 percent in international journals with 'excellent' and 'good' (Q1 and Q2) qualifications. According to the breakdown to fields of science, in the multidisciplinary, physics, chemistry, psychology – neuroscience field the publications were published in international journals with 'excellent' (Q1) qualification, while in the other areas approximately half of the publications were published in international journals with 'excellent' and 'good' (Q1 and Q2) qualifications. (Library and Information

Centre of the HAS, 2016, Figure 1, pp. 1–2) A little bit more than half of the economic sciences publications written in 2015 were published in journals with Q1 and Q2 rankings.

What is the number of Q1 and Q2 qualified articles of those economist academicians who were elected after the change in the regime, during their entire career?

The SJR has been ranking the international journals and the countries annually²² since 1999, i.e. 10 years after the Hungarian change in the regime. Therefore, I examined the academic performance of the economist academicians who were elected after the change in the regime based on their publication uploaded to the MTMT²³; I examined how many of their publications fall within Q1–Q4 quartiles according to the SJR journal. (I disregarded the Q3 journals *Acta Oeconomica* és *Economy and Society* – which are edited in Hungary – since the articles written by Hungarian authors and published therein

before the change in the regime were usually not peer reviewed.) I presumed that the journals included in the SJR ranking would have been given a similar ranking before 1999 as well, i.e. I took those publications into consideration of all publications of the HAS member written in English and uploaded to the MTMT which are included in international journals with appropriate SJR (!) Q1–Q4 ranking. With regard to the HAS members, I took the multi-author publications into consideration as well, however, I disregarded book reviews. I summarised the statistics in *Table 1*.

The most Q1 and Q2 ranked international journal articles – 45 pieces and 4 pieces – were written by the HAS member elected in 2010, while the HAS member elected in 2013 wrote 14 Q1 articles, and the HAS member elected in 2001 wrote 1 Q1 article and 4 Q2 articles.²⁴ Of the 10 economist academicians elected after the change in the regime, only the above three academicians have an academic performance which complies with the international standard.²⁵ The others published mostly in

Table 1

THE NUMBER OF Q1~Q4 QUALIFIED ARTICLES OF THOSE ECONOMIST HAS MEMBERS WHO WERE ELECTED AFTER THE CHANGE IN THE REGIME

Year of election	Q1	Q2	Q3	Q4
1992	0	0	0	0
1995	0	0	0	0
1998	0	0	0	0
2001	1	4	1	0
2004	0	0	0	0
2007	0	1	5	0
2010	45*	4**	0	0
2013	14	0	1	0
	0	0	0	0
2016	0	0	1***	0

Note*: 11 articles written with 1 – 4 co-authors ; **: 1 article written with 1 co-author ; ***: 1 article written with co-author

Source: Own edited

Hungarian and underwhelming articles in ideological, economic policy or scientific organisational topics, which are far from the modern mainstream market economy questions. According to the above actual statistics and the 1st law of Professor Barabási, the latter became academicians not based on their academic performance but with the help of certain network(s), and some became academicians after the change in the regime through the lobby campaigning of the former presidents of HAS who were historians. Moreover, a Széchenyi Award was lobbied for them! According to the Hungarian academic public opinion, in the absence of performance compliant with the international market economy standard, the HAS membership and the Széchenyi Award cause serious frustration them, and those mean failure rather than success, and no serious Western scientist communicates with them. (It shall be noted that the academic performances of several Doctors of the Academy are compliant with the international standards,²⁶ but they were not nominated to become academicians or their election was not supported by the network of academicians due to counter-selection.)

The 3rd law of success:

PREVIOUS SUCCESS × FITNESS = FUTURE SUCCESS.

In other words: success creates success.²⁷ However, this would require creative scientific researchers who establish new ideas, scientific conjectures and intuitions, which are the true sources of great discoveries. In the Hungarian natural sciences, numerous discoveries had been made which give not only local but global success as well for their discoverers. Although it is true, that in order to achieve global success – as evidenced by the example of Professor Barabási – they had to pursue their scientific research work in America. The

Hungarian scientific environment was not enough for the most excellent of Hungarian natural scientists, as evidenced by those two world-famous Hungarian academician mathematicians who won the Abel award, while the current president won the Wolf Award, the Kyoto Award and recently the European Academy Award. Numerous Hungarian researchers achieved global success in the field of genetics, brain research, medicine, physics, astronomy, etc. In the past, many had achieved global success in the field of social sciences as well. However, the majority of them achieved success abroad – after the excellent Hungarian secondary school education – such as *János Neumann, Miklós Káldor or Tibor Scitovsky*.

From among the economist HAS members, after the change in the regime it was only János Kornai who deserved global acclaim, even without a Nobel Prize, however, in order to achieve this success, Harvard University provided a place for his successful research. Namely, in Hungary, only few people understood his revolutionary new economic idea (Kornai, 1971; Móczár, 2018); and most of the HAS members did not even try to understand and develop it further; and those who thought they understood, explained Kornai's world famous Anti-Equilibrium model from ideological point of view – since they lacked the knowledge of modern economic theories – with which they did more harm than good to the international reputation of the genius idea of the author.

The 4th law of success:

WHILE TEAM SUCCESS REQUIRES DIVERSITY AND BALANCE, A SINGLE INDIVIDUAL WILL RECEIVE CREDIT FOR THE GROUP'S ACHIEVEMENTS.

In the field of natural sciences in Hungary, it is noticeable that the intensive joint teamwork is performed in teams in

the research labs – in particular due to the multidisciplinary approaches –, meanwhile this is less characteristic for the social sciences. In the former field the research is not distributed evenly: there are people who makes use of their network relation and coordinates winning tenders, people who perform the actual experiments, people who compare the actual research results in journal articles with the existing results of that particular field of science, and there are people who presents the results of the teamwork at international conferences, etc. In the tenders, the research labs employ the employees of multiple universities, moreover, the employees of academic research institutions. The universities which teach various disciplines of natural sciences – since they have relatively small number of students – can therefore spend more time on their research, along with their minimal educational burdens.²⁸ In contrast, the field of social sciences – in particular in the economics field – due to the large number of students the lecturers have extremely workloads, a lot of times they do not even have the time to integrate the newest scientific results of their professional field into their syllabus. At the same time, some ‘compensate’ their insignificant research activity with a high number of lectures.²⁹ Success is never in equilibrium, there are questionable income differences in Hungarian science as well, in a lot of instances to the detriment of those researchers who do not use networking relations but do have academic performance compliant with the international standards. Life is not fair, not even in Hungary.

The 5th law of success:

WITH PERSISTENCE, SUCCESS CAN COME AT ANY TIME.

Success and the recognition thereof definitively have to be separated. Through

appropriate academic performance, any of the Hungarian researchers can achieve success in Hungary as well. However, the recognition of the success, the HAS membership and the monthly remuneration attached thereto (which are public funds) constitute a much more complicated issue already. The former minister of education – who was a physicist and was president of the HAS between 2008 and 2014 – unofficially specified the beginning of the 60s years of age as the upper age limit of nomination as academician, with which he caused an incomprehensible damage to the fair competition fought for the academician title, he disputed the scientific achievements and the creative power of the older age group, and he discriminated and divided the Hungarian scientists. This presidential ‘requirement’ went against Professor Barabás’ 5th law; although it was proven that the average age of the HAS members could not be reduced in this way either.³⁰ At the same time, researchers who achieved substantial results in different field of Hungarian science were not nominated for HAS membership merely because of the ‘recommendation’ of the president, which was not stipulated by any science policy or academic law, but it served the political or the professional counter-selection right. Of course, there were exceptions: the various academic and non-academic network lobbies which survived the change in the regime operated and are operating effectively; if necessary, they nominated and elected HAS members regardless of the fields of science. The fairness of the nomination for the Academy is doubted by an additional legend as well: within one of the academic sections, two economic clique networks made an agreement in advance to support their respective nominees³¹ in turns, and therefore they filtered out those researchers from the nominees who were more accomplished and had academic performance compliant with the

international standard, which legend seems to be proven by the reality. The title of ‘Doctor of the HAS’ is often questionable as well, the bevel-edged cards exist there, too, but at least there is no upper age limit.

Professor Barabási’s 5th law applies in case of the achievement of local success only, however, in respect of the recognition – as you could see – it is already problematic. The current level of democracy, transparency and – last but not least – especially the scientific morals is currently not sufficient for fair competition in Hungarian science.

The comparison of the operation and financing of the HAS with foreign academies

Through its achievements in natural sciences, Hungary currently is one of the leaders of the world, and it has always been considered as a world power in the field of sciences. Therefore, from the academies of countries with different systems, I compare HAS with the operation, science policy and financing of the academies of first two in the SJR ranking order, namely the USA and China, in this case I will disregard the enormous differences in the territories, population and the wealth of these countries.

In the USA, two academies are relevant to our topic, the American Academy of Arts and Sciences and the National Academy of Sciences. The former – regardless of age – elected such persons as its members as *Iván T. Berend* (85), *Iván Szelényi* (62), while the latter elected *János Kornai* as its member when he was 88 years of age. The Nobel Prize winner *Albert Szent-Györgyi* has been a member of both academies, since he was 64 in case of the former, and since he was 63 in case of the latter. The former was founded in 1870, while the latter was founded in 1863. Both academies are independent

from politics, both are respectable, private, self-sustaining companies, the members of which are scientists and professionals who have achieved the most excellent of achievements in various fields of science, and who aim at supporting science and technology and making those public benefit. Their members are elected through a complicated election process,³² upon the recommendation of the members of the academy, through the secret ballot of the general assembly. The members are not given any allowance, they pay a membership fee, however, in case of various tenders their membership means a significant advantage for them.

According to the cost-benefit analysis, the American science policy – the same as in the past – is still concentrating on *brain drain*, and thereby in addition to the basic research, it concentrates mainly on the applied research and the most modern developments based on innovative artificial intelligence and which have high added value in the university research institutes.

The Chinese Academy of Sciences, CAS was formed through the renaming of the Academia Sinica – which was founded in 1928 – in 1949, when the Communist Party of mainland China took over control. The CAS currently has six academic sections: chemistry, information technology, earth, life and medicine, mathematics, as well as physics and technical sciences. Its 13 regional branch offices operate more than 100 academic institutes and 2 universities, 4 libraries, 3 technological support centres and 2 communications and publishing units. The Chinese Academy of Social Sciences, CASS was formed as a separate academy from the section of philosophy and social sciences of CAS in 1977, and it manages 38 academic research institutes.

Both CAS and CASS award their members with the titles of academician, emeritus academician and foreign academician, which are the highest level and lifetime national acknowledgement of the significant work of Chinese scientists. At the age of 80, the academicians are given the title of *emeritus*, and they can no longer fill leadership positions at the academy, their membership decision-making right and obligation, as well as their allowance cease. The new members are elected every two years, while nominees are named by existing members or groups of members (neither the foreign, nor the emeritus members may nominate), and the nominations are approved by the presidency of the academic sections. The election is a secret ballot, and approx. 20 percent of the nominees are elected; in 2014, 94 percent of the members were men and 6 percent were women, along with equal requirements.

The members are obliged to promote the development of science and technology, maintain the scientific spirit, improve the scientific and technological knowledge of the workforce, participate in section meetings, perform consultation and evaluation tasks, as well as shall facilitate international exchange and cooperation. The academicians may make proposals and may influence the policy of the Chinese state related to science and technology.

The academicians receive an amount equal to the deputy minister salary from the state, in addition to which the local governments give them numerous aids. In spite of this, the underpaid academicians are constantly forced to apply for various research scholarships in order to supplement their income.

The science policy of the CAS and the CASS serves the Chinese economic reform closely based on *brain-suck-back* and through the strategic high-tech developments, the innovative applied research and the creative

adaptation of artificial intelligence, in the research institutes independent from the universities.

Through the reforms initiated by *Deng Xiaoping* in 1978, they transformed the plan economy into a market economy: today China is the second largest economy in the world.

What stands out in respect of the operation of the academies of both countries are the recognition and the scientific work of the academicians. While academicians in the USA do not get any remuneration, in China the active members are given remuneration. In the USA, the academicians are priced by and the rules of the academies and the scientific obligations of the academicians are determined by the autonomous market economy, while in China, the same are carried out by the controlled market economy. There are numerous rational elements, measures in the functioning of both systems.

Another example may be interesting in this regard: in the Catholic church, at the age of 75 the bishops have to offer their resignation to the Pope [*Canon law of the Catholic Church*, § (1); https://en.wikipedia.org/wiki/Appointment_of_Catholic_bishops], while the cardinals may exercise their right to elect the Pope until the age of 80 (Paul VI, *Ingravescentem aetatem*, IJP, *Universi Dominici gresis*, https://en.wikipedia.org/wiki/Papal_condave#Resignation_of_a_pope).

What can we say about the above in respect of the HAS members?

After the change in the regime, Government Decree No. 4/1995 (I.20.) of the first MSZP-SZDSZ (Hungarian Socialist Party – Alliance of Free Democrats) government increased the remuneration of the HAS members financed by public funds significantly, and it introduced the temporary (5-year) allowance payable

to the relatives, widow and orphan of the deceased academician, as well as it decreased the remuneration of the doctors of the Academy (Hungarian Gazette, 1995). With minor modifications, the Government Decree was kept in force up until today by the right- and left-wing governments following each other. The last amendment was stipulated by Gov. Decree No. 350/2006 (XII. 23.) (Hungarian Gazette, 2006). It is worth to quote from this decree: *‘Subsection 1 Considering his/her scientific creative work and academic performance, the academician shall be entitled to remuneration every month. The amount of this is: For ordinary members of the Academy, 455 000 HUF/month; for corresponding members of the Academy, 353 900 HUF/month.’* The doctoral remuneration can be paid if the doctor of the Academy *‘participates in the Hungarian academic life actively’*, and the amount of the remuneration is 90 000 HUF/month (see in the same Gov. Decree). The remunerations are financed from taxpayer money, from the state budget, therefore the remunerations are public funds.

The factual data included in Table 1 prove that of the economist academicians of Section IX of the HAS who were elected after the change in the regime, only the three academicians have an academic performance which complies with the international market economy standard. The question is, in return for what do they get their remuneration of nearly half a million Hungarian Forints? Today, it is no longer justified by their social situation: certain academicians usually have multiple university positions and significant salary, and they enjoy monthly million HUF incomes from tendering and contractual works although well below the academician level, the same as the pensioner academicians, who – in addition to this – receive exceptionally high pension. Some people from those referred to above try to mislead the Hungarian society

with different titles – such as amicable honourable professor appointments – instead of academic performance consistent with the change in the regime. Their operation is closely knit, their professional international relations are insignificant. Academicians over the age of 75 rarely participate in the section meetings, while the majority of the academicians over the age of 80 do not participate at all. In their case, not only the academic performance specified in the Government Decree is missing, but their outdated knowledge based exclusively on Socialist principles raise the above questions in this respect as well. The survival of the 1995 Government Decree also proves that no change in the regime whatsoever has happened in the field of science, the HAS did not manage to renew, and due to the lack of ambition and modern economics fundamentals, as well as due to the welfare, Section IX of the Academy carries out usually theoretically unambitious research using public funds, which research is ideological or political, or which is insignificant in terms of market economy. Interwoven with the pre-change in the regime ideology, it safeguards its privileges left behind from Socialism, which hinders both the social sciences, and the theoretical research and empirical application of the autonomous market economy significantly.

THE NECESSARY REFORM AND MODERNISATION OF THE HAS: A POSSIBLE PROPOSAL

According to Professor Barabási’s 1st law, in the absence of academic performance, the high remunerations paid undeservedly contradict the spirit of the change in the regime, and the ‘nothing is for free’ rule of the autonomous market economy. Meanwhile, with the acceptance of the 5th law, everybody

shall be given local recognition is they achieve any academic performance compliant with the international market economy standard, regardless of the age and headcount limit, through the customary election procedure.

At the same time, the HAS shall be put on market economy basis, which means that it should be transformed into a self-sufficient public-benefit company, along with the abolishment of its privileges left behind from Socialism, including – among others – the academic remunerations financed from public funds, as well as the elimination of the clique networks, while making the scientific morals stricter, furthermore, with the priority of innovative national economy development objectives in the academic research institutes, based on technologies with high added value and artificial intelligence.³³ In case of active participation in the Hungarian academic life, maintaining the Doctor of Academy remuneration temporarily would encourage further research and would contribute to the creation of a scientific environment of high level of standard. The academicians over the age of 75 shall be placed in emeritus

academician³⁴ status, along with revoking all their management positions and their right to recommend and vote for new members.

The HAS is in need of an organisational restructuring, it has to be homogenised: from the current sections, those sections the academic performance of which can or cannot be measured objectively shall be organised in separate academies, and the natural and social sciences shall be put in a competitive position. This means that Sections I, II and IX would constitute one academy, namely the Hungarian Academy of Social Sciences, while the other sections would create the Hungarian Academy of Natural Sciences.³⁵ The operation of the academic institutes shall be allocated to the universities, and it shall be involved in education and research as well, while their achievement shall be sold on the international market for the benefit of the national economy. The transformation of the Hungarian academic life as described above contributes significantly to achieving Hungarian economic and scientific successes in the near future, both in the microsphere and the macrosphere.

NOTES

¹ The author owes gratitude to the anonymous reviewer who made numerous valuable notes to the first version of the manuscript. I took most of those notes into consideration in the final version.

² The Erdős number is a typical network indicator which is linked to Pál Erdős.

³ I had already analysed in the Móczár (2014/a, 2014/b) articles the Hungarian higher education – and in particular economics – with respect to the challenges of the change in the regime.

⁴ Naturally, this method is not perfect either, since the

Q1 periodicals publish articles written in English only. At the same time, publishing in English can be expected from the academicians of the Hungarian Academy of Sciences.

⁵ The peculiar interpretation of the so-called Matthew effect in Pléh (2015, p. 65).

⁶ In 2006, Act XLIX of 2006 on Lobbying entered into effect in Hungary, which declared that the activity of lobbying was of public interest and transparent. In this study, network lobbying shall mean an activity beyond the law, which in a lot of cases is not transparent.

- ⁷ For the sake of completeness, I have to mention here that pursuing sciences in the spirit of Catholicism was set as an objective in 1915 by the Saint Stephen Academy (Szent István Akadémia), which was then considered to be of equal rank with the HAS, and which operated until 1951. After the change in the regime, it was established again in 2003 under the name Saint Stephen Academy of Sciences (Szent István Tudományos Akadémia), several members of which are HAS members, which proves that there are Catholic Christians among the members of the HAS as well, including two former HAS presidents; additional evidence is that cardinal primate Péter Erdős is also a member of the HAS.
- ⁸ The automatic conversion applied to those economists as well who had previously earned the title of candidate of the Soviet Academy of Sciences in the Soviet Union. Moreover, certain universities reclassified the dr. univ. dissertations as PhD.
- ⁹ ‘*The Doctor of the Academy or the Doctor of Sciences are Hungaricum, it is an internationally unrecognised ‘Stalinicum’!*’, said Polónyi (2008). And it further reads in this study: ‘*With the Doctor of the Academy and the HAS membership, there is a hierarchy in Hungary which operates instead of actual scientific achievements, it is the crucial feature. The Academy plays the role of exclusive representative of Hungarian science.*’ I do not fully agree with these findings. Undoubtedly, there are cases lobbied by the academic and the government networks among both PhD and the doctor of sciences titles, what is more, among the HAS membership titles as well. However, the criticism given in the quote is not true for every field of science, and less for natural sciences. With regards to the actual scientific achievements, in respect of social sciences, the academic-level achievement which complies with the international standard as well can be demanded in a lot of cases. (I will examine this in detail later.) Playing the role of exclusive representative of Hungarian science and narcissism are not typical for the entirety of the Academy, the criticism applies rather to those HAS members who earned their doctoral title or membership through lobbying by certain networks, instead of scientific achievement.
- ¹⁰ In Germany, the role of Habilitation in the appointments as university professor is much stricter than in Hungary; the universities may employ a certain number of professors, and one may apply to the vacant professor positions only with Habilitation. In the United States, full professor tenure is linked strictly to scientific achievement, while excellent educational work is acknowledged by the title of Distinguished Professor. The Hungarian titles of dr. habil. and dr. univ. are not academic degrees, still, a lot of people (even academicians) present them as academic degrees, as substitute for the scientific achievement compliant with the international standard. Title fever knows no bounds in Hungary.
- ¹¹ During the 1995–1996 academic year, I did research at the University of Southern California as a professor of Fulbright, while my sons completed their first and fifth grades, respectively, in Burbank, at the Saint Stevenson school.
- ¹² Szelényi (2015) has a similar opinion as well.
- ¹³ Compare the economics PhD programmes of the Hungarian universities ranked first and the economic PhD programmes of, for example, USC or UCLA: in Hungary, statics from 40–50 years ago, while complex dynamics are typical for the American universities. For more details, see Móczár (2014/a, 2014/b).
- ¹⁴ In 1980, I won the Japanese Monbusho Scholarship and I was a foreign student (ryugakusei) in the world famous ISER institute of the Osaka University for 2 years, where I studied and researched a lot, participated in the weekly seminars and postgraduate courses etc., and finally, in 1994, I earned the PhD degree with a thesis (hakusei

ronbun). In 1994, I returned to ISER for a year as a researcher visiting professor. After this, I researched with the Giovanni Agnelli, Fulbright, Tempus etc. scholarships at those foreign universities (Siena, La Foscara, Groningen, LSE, USC, WU etc.) which attract the economic dynamic in the scientific world. In Hungary, I was appointed as professor at Corvinus in 1994, after the habilitation, and in 1998, I won the Széchenyi Professor scholarship, which allowed me to concentrate on the research of non-equilibrium dynamic. I received the doctor of HAS degree in 2013.

¹⁵ At the Karl Marx University of Economic Sciences, the planning-mathematics faculty was launched in 1960 (!) and lasted until up to 1968, which followed the course of the French indicative planning, with an excellent training programme. The faculty included mathematical, electrotechnology, computer science, logical, philosophical and economics subjects consistently built on each other, and they contacted the best lecturers for teaching these; no similarly successful faculty has been launched ever since in the Hungarian economist education. I graduated from this faculty myself.

¹⁶ Between 1993 and 1996 I was a member of the Higher Education Academic Council, which made its decisions regarding the foundation of business colleges or university faculties by giving in to the lobbyists of the local interests in a lot of cases.

¹⁷ An exception is the Corvinus Business School of Corvinus University of Budapest; however its graduate students achieve serious professional secrets not in Hungary but in the USA and in Western Europe.

¹⁸ The 10 points of Bögel-Mátyás (2018) may be accepted, with one or two exceptions.

¹⁹ In order to verify this, you just have to look at the courses of the Hungarian PhD programmes and the copied textbooks of the lecturers teaching there;

they hold reminiscences from university teaching materials studied 30 or 40 years ago.

²⁰ The original objective of the HAS Momentum Programme was to coax the young Hungarian researches researching abroad in coming back to Hungary with the help of 350 to 400 million Hungarian Forints of grants for a five-year term. Eventually, in the field of social sciences only young people who are teaching or researching in Hungary applied, with disputable topics, i.e. the programme was not successful in this field of science. The lesson learned from this is that money does not solve the absence of scientific environment.

²¹ Diplomacy in science is just as important as in politics or even in sports. A lot of Hungarian researchers who have world class research achievements feel the lack of the diplomatic network through the unfavourable nominations and decisions regarding various awards.

²² In the 2017 SJR ranking of the countries, the USA is in the first place, the second is China; from this region Poland is ranked 19th, Austria 24th, the Czech Republic 27th and Hungary 40th.

²³ I took the MTMT uploaded until 15th November 2018 into consideration.

²⁴ The articles published in Q3 journals were written mostly about the analysis of the former Communist block or are articles which are irrelevant in terms of ideology, politics or market economy.

²⁵ It shall be noted that the HAS member who has the most Q1 had published his Q1 articles in the same international journal (with one exception), almost as an in-house author, which is especially interesting. The Q1 articles of the HAS member elected in a strange manner in 2013 belong rather to the topic of mathematical operation research than economics. On this occasion, I disregarded the references made to the Q1 and Q2 articles.

- ²⁶ My own academic performances: One of my articles was published in a Q1 journal and 4 were published in Q2 journals. My Erdős index is 3.
- ²⁷ This law is the metaphor for Robert Merton's Matthew effect; for detailed explanation see the excellent articles of Pléh (2015).
- ²⁸ Less students mean less 'aid' for the university, however, the share earned from the tenders compensate the university aplenty.
- ²⁹ The majority of the lecturers of the faculties which provide economics programmes at the Hungarian universities only give lectures but do not do research. Similarly, in the USA, at the community colleges, the lecturers do not have to publish in the 'liberal art' education system. See Szelényi (2015).
- ³⁰ See Darvas (2013).
- ³¹ 'Gentleman agreement', as the cliques refer to their agreement.
- ³² See for example the election process of NAS in Albert & Kenneth (2005).
- ³³ Regarding artificial intelligence see Vámos (2016) and Csáki (1970). The newest approaches in the research and education of Western universities are the following: machine learning, data sciences, embodied systems for robotics and learning.
- ³⁴ If the appropriate requirements are fulfilled, university professors are given professor emeritus status usually at the age of 70, which shall be made uniform in respect of the requirements of granting emeritus academician title and the age.
- ³⁵ The proposal is not original, the separate Hungarian Academy of Natural Sciences had already been founded by Nobel Prize winner Albert Szent-Györgyi and Zoltán Bay during the summer of 1945; it could exist only for a short period of time under the political conditions of the time.

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