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# *The Correlations of Corporate Investments, European Union Grants and Competitiveness*

**SUMMARY:** Despite being one of the leaders in the absorption of EU grants, the catch-up performance of Hungary has been poorer than that of the other Member States joining the EU in 2004 and 2007. Among the possible causes, this article attempts to take a closer look at the effects of direct aid to companies, proposing an argument that also draws on the results of multivariate regression analysis carried out on a proprietary database. The effect of aid on companies is partly manifested in a moderate degree of monopolisation in domestic markets. The international competitiveness of companies fails to improve, and increased employment is accompanied by deteriorating productivity in the short term. In modern development approaches, to ensure that aid to companies produces a sufficient catch-up effect, improvements are needed in research, development and innovation, and in the quality of human resources, and highly efficient support needs to be provided for infrastructure development.

**KEYWORDS:** EU, aid to companies, catching up, convergence, rent seeking, Hungary

**JEL CODES:** H25, H32

In terms of funding, economic development in Hungary after 1990 up to the EU accession was based primarily on inflows of foreign direct investment. Yet, the Hungarian Way showed distinct signs of convergence only occasionally. Between 1993 and 2000, the growth rates of exports and investment were outstanding; however, they were not accompanied by rapid growth either in consumption or GDP. The decline in the ratio of labour incomes to GDP, a characteristic of rapidly catching up economies, did not continue after 1999 (Víg, 2014).

Upon the country's accession to the EU, in addition to FDI inflows, EU development funds played a highly prominent role in development funding throughout the 2007–2013 programming period. In relative terms, Hungary used more resources from EU funds for

direct aid to companies than any other country joining the EU in 2004 and 2007, yet its catch-up performance was poorer. In addition to a shortfall in growth, the level of employment also failed to increase between 2004 and 2013. Between 2000 and 2012, the investment rate followed a downward trend, and despite aid that would, in principle, make capital cheaper, there was no increase in the domestic absorption of this production factor (Kállay, 2014).

The reasons for this developmental lag are manifold. Some are attributable to the difficulties in external financing: an unfavourable debt trajectory and a high debt-to-GDP ratio are such obvious constraints. By contrast, other reasons have internal origins. As Hungary delivered a relatively good performance compared to the aid drawdown rates of other emerging countries in Eastern Europe, reasons

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related to aid absorption must also have contributed to the differences in growth. Within purchases made using aid, the analysis of the State Audit Office of Hungary (2015) reports a high share of imports, fictitious and/or over-priced items and institutional costs. Through an analysis of the effects of direct aid to companies, this article attempts to take account of the factors that curb the speed of Hungary's convergence, proposing an argument that also draws on the results of an analysis carried out on a proprietary database.

### SOME BASELINE THEORETICAL CONSIDERATIONS

Without any exception, examples from economic history show that rapidly catching up economies market their gross national product through intensive exports. Since it is not possible to leverage the benefits in economies of scale without exports, in countries seeking to catch up, development policy can only be export-oriented. Apparently, Hungarian economic policy is also export-oriented; however, growth in exports is mostly accompanied by a similar rate of growth in imports, which prevents overall external economic relations from dynamising growth.

Among the examples of successful developmental states after World War II, due to the free movement of factors, neither former European, nor current South-East Asian models can be followed by countries seeking to catch up within the European Union, but even the successful developmental states of the 21<sup>st</sup> century must possess numerous features of the successful examples, such as the ability to discipline capital, the ability to collect taxes, rule of law, providing the conditions to promote investment, and export promotion. Additionally, they must also respond to the challenges presented by a structurally transforming world

economy (knowledge-based economy), the increasing depth in which national economic policies are embedded on a global scale, financial globalisation, and financial and economic crises (Williams, 2014).

In response to these challenges, a new approach to development policy – also known as ‘new structural economics’ – emerged, aiming to eliminate from state participation all factors that have previously failed. For that reason, although today's modern developmental state does support companies in the modernisation of industrial infrastructure, its role is primarily restricted to the supply of information on new industries, the coordination of investments among companies within specific industries, and support for incubation and foreign direct investments. The state should also take on a prominent role in the development of infrastructure with a view to reducing the transaction costs of companies (Lin, 2010; Evans, 2014).

For economy-oriented state intervention, including interventions aimed at development, a framework is provided by a concept known as the theory of market failures. This highlights the fact that in the context of different types of market failure, the greatest potential to reduce the extent of failure is shown by aid provided to produce services of general interest and pure public goods, to eliminate negative externalities (such as environmental pollution), to promote the development of positive externalities (such as R+D aid), and to reduce information asymmetry. In all probability, aid provided in markets for products and services with a negligible presence of market failure deserves the highest level of criticism as in such markets, market coordination could provide an adequate degree of economic efficiency and welfare improvement even without aid.

Similarly, endogenous growth theory points out that as a development policy measure, support for R+D+I or for the development of

the human capital required for R+D+I can influence the long-term growth rate of the economy. *Romer* (1986) identifies research and development as the primary source of innovation required for technological advancement. The spread of innovations in the economy is assumed to have a positive external effect even on the rest of the companies. Given that, as a result of development, the rate of return on capital may also increase as the capital stock increases, economic convergence will not necessarily occur, and developed economies may grow faster even in the longer term than less developed ones. *Lucas* (1988) confirms that the economic convergence of developing countries does not occur automatically because developed countries are more rich in human capital than those catching up. Consequently, developed countries may have a higher rate of return on capital than catching up countries, because in the former, higher productivity counterbalances higher wages.

There is an extensive body of analysis specifically addressing the effects of R+D aid on the financial management of companies. Schools of economic theory consider new knowledge as a source of economic growth. Moreover, they consider the social returns of R+D greater than the private benefit derived from it, since, beyond its patented part, knowledge or know-how cannot be kept secret, and its free diffusion reduces market imperfections. The other reason for the efficiency of R+D aid is attributable to the information imperfections of capital markets, as a result of which not every R+D project with a positive net present value will get implemented, because the risk tolerance of potential financiers is not high enough. This could make it difficult or expensive for a company to have its R+D financed externally. To mitigate that, governments generally support R+D projects.

According to endogenous growth models, long-term convergence may therefore be under-

pinned by research and development, improvements to the quality of human resources, and the development and support of infrastructure. On those grounds, it may be assumed that EU transfers, when aimed essentially at these areas, could make major contributions to economic growth. However, in countries seeking to catch up, these would also need to be applied with great efficiency to ensure that they produce a sufficient catch-up effect.

### SOME CONCLUSIONS TO BE DRAWN FROM THE EMPIRICAL STUDIES

The studies carried out on company data attempt to quantify the effects of aid on companies' sales, added value, employment and productivity. Regarding the forms of aid, studies were carried out in a number of sections, partly according to the corporate function targeted by the aid (e.g. R+D, or training aid to improve employability), and partly according to the difference in the effects of non-refundable aid and aid that was at least partly refundable in one form or another. Another section of the studies was provided by differentiation by company size, i.e. whether there were any differences in the absorption patterns of SMEs and large corporations. A number of studies were also intended to understand the differences in regional effects. A recurrent aspect of analysis in several studies was concerned with the justifiability of the social costs of aid; in other words, the extent of deadweight effects, i.e. unnecessary aid granted for projects that would have been implemented even without the companies receiving any aid. Closely related to an assessment of the social costs of aid are costs belonging partly in the field of study of political economics that are more difficult to quantify, such as those resulting from rent seeking, lobbying or, in more severe cases, corruption.

For the most part, the empirical studies

confirm that the recommendations on aid policy derived from theoretical approaches are justified. In the short term, studies attempting to measure employment effects show the positive effects of aid both in terms of labour force expansion and the increase in companies' training expenses. (Engel, 2002; Jongen – Van Gameren – Graafland, 2003; Görg – Strobl, 2005; Koski – Pajarinen, 2010; Girma et al. 2010; Almus, 2011; Card et al., 2015) However, such effects are often accompanied by a temporary deterioration in productivity.

Studies by *Colombo and Grilli (2007)* and *Lelarge et al. (2008)* found that the forms of aid that reduced information asymmetry, such as aid in the form of credit guarantees, were efficient, but the risk of bankruptcy and default was also higher among the companies taking recourse to such forms of aid.

The empirical studies also confirm that aid schemes can induce additional R+D spending in participating companies (Meeussen – Janssens, 2001; Czarnitzki – Fier, 2002; Hussinger, 2003; Almus – Czarnitzki, 2003; Duguet, 2003; Aerts – Czarnitzki, 2004; Czarnitzki – Licht, 2006; Aerts – Schmidt, 2008).

More recent analyses conducted since the financial crisis have also failed to identify any major crowding-out effects in their assessment of the effect of R+D aid on private sector investment, which means that without aid, companies would have allocated a considerably lower amount of resources to such purposes (Einiö, 2013; Hud – Hussinger, 2014; Afcha – Garcia – Quevedo, 2014).

Some analyses also found that aid contributed to an increase in companies' R+D employment. R+D aid also provided strong incentives for companies' activities in the fields of research cooperation and patenting (Czarnitzki – Fier, 2003; Czarnitzki – Ebersberger – Fier, 2007; Czarnitzki – Ebersberger, 2007; Broekel – Schimke – Brenner, 2011).

## A FEW SIDE EFFECTS THAT WERE NOT GIVEN PROPER WEIGHT IN ANALYSES

One of the aims of EU economic policy is to support private sector investment in order to improve the quality of companies' capital stock. In the case of one fairly widespread form of aid, companies receive aid in the form of non-reimbursable grants for the acquisition of fixed assets such as the purchase of technology and equipment, and the construction of plants. To the extent that aid is provided by the government for private sector projects, the assessment of private investment (which is commonly evaluated against purely financial criteria) must incorporate methods of social cost-benefit analysis, which are designed to take into account external effects as well. Aid should be granted against budgetary resources for projects with a negative financial net present value but a positive social net present value. The calculation is made difficult primarily by the need to determine the costs and benefits that are not priced by the market (Mishan, 1982).

Aid schemes assume that with the capital made cheaper by virtue of the aid, companies will implement more projects and employ more people. If these schemes were successful, it should be possible to demonstrate that both at the level of individual companies and at macro-level, countries with higher intensities of aid have higher levels of investment and higher rates of employment and economic growth. In practice, however, this is not the case. While the EU is making efforts to operate aid schemes to improve both the competitiveness of the integration as a whole and the cohesion of its regions and authorises such schemes in Member States, owing to the resulting side effects (notably, crowding out, deadweight losses, and rent seeking), it is also distorting micro-structures in Member States. In the course of the absorption of aid, it is

often seen that mostly large companies can strengthen their market positions, while the effects on SMEs are not clear. Aid may potentially give certain companies a permanent advantage over competitors, which could lead to monopolisation in markets. In such markets, a reduced total production is often accompanied by higher prices. This causes a loss of welfare to society (Varian, 2005).

Access to non-reimbursable state aid may entail the phenomenon referred to as rent seeking. Given that aid is not available to all economic organisations, it may be worthwhile to make efforts or even financial sacrifices in order to gain access to aid (Lőrincz, 2007). (According to economic theory, however, rent is not always a harmful phenomenon, since rent can also be obtained by means of innovation that improves market position).

One form of harmful rent seeking is corruption, whereby an entity can gain economic advantage without providing a socially useful reward. (The EU defines corruption as the abuse of authority in order to obtain a personal economic benefit). The related social loss materialises both in the inefficient allocation of resources and in the costs of fighting corruption.

The full absorption of EU development aid is a key priority of the Hungarian government. The absorption pressure increases the risk of corruption, because a higher absorption ratio can also be achieved by fund managers overbudgeting the aid amounts to be allocated to specific development purposes, set lax rules for eligible costs, and specify a low level of own funds as an application requirement. In such circumstances, beneficiaries may find it viable to implement their projects even after a part of the aid obtained is surrendered for corruption purposes.

The following forms of fraud are typical during the absorption of EU funds, and they all carry the risk of corruption:

- unjustified selection of development goals;
- exercising influence in the process of project selection;
- positive tender evaluations in exchange for a high rate of payment for proposal writers;
- positive tender evaluations in exchange for using overpriced services;
- recognizing costs at a price significantly above market prices;
- public procurement tailored to a specific bidder;
- “fine-tuning” a public procurement invitation in order to restrict the market;
- awarding contracts in exchange for providing an own contribution.

EU audits enforce adjustments only in the most flagrant cases. As adjustment rates tend to be relatively low, contracts are systemically overpriced by 15 to 25 per cent (Transparency International, 2015). The logic of business would demand just the opposite: a large government buyer could in fact ask for lower prices, whereby it would contribute to the improvement of economic efficiency.

In the aid system, the options of applying for aid are regulated in detail; however, compliance with administrative regulations in itself will obviously not guarantee the efficient absorption of funds. *Kállay* (2014) reports a high share of state and municipally owned companies in aid granted, and that a major part of EU funds has been used to finance corporate investment that would also have been implemented without aid, causing a deadweight loss to society. While aid is presumed to make the factors of production cheaper, in reality the very opposite is happening: projects are implemented more expensively than would be appropriate. In this way, the system of state aid in place absorbs funds in a manner that is essentially regular but is questionable in terms of competitiveness. What actually would deserve aid is in-

novation, because its positive external effect – as mentioned above – could have a beneficial effect on the functioning of the economy. Additionally, reimbursable aid, towards which the EU is planning to shift the emphasis of aid in the next grant period, would restrict opportunities for rent seeking, enabling business considerations to gain more prominence in the course of decision making.

### PROPRIETARY STUDY TO MEASURE THE EFFECTS OF AID TO COMPANIES

Carried out on a proprietary database to gain some insight into the absorption of aid to large companies, my study relied on the data of 80 companies out of those receiving non-refundable investment grants above HUF 100 million in the previous grant period directly (without central government or municipal grant beneficiaries). Grant data were retrieved from the database of the Prime Minister’s Office, and the rest of the data used for the analysis from the annual balance sheets and profit and loss accounts of the companies under review. Sampling was random, but since the descriptive statistics of the entire population are not known, the sample cannot be considered representative. Contrary to the proportions prevailing in the national economy, the sample predominantly comprises companies employing at least 20 persons, in line with the fact that it is mostly relatively large companies

that have the capacity to implement projects that are suitable for drawing HUF 100 million in grants. (See Table 1)

I carried out a multivariate regression analysis to identify the relationship between developments in investment aid and some other potential explanatory variables and developments in corporate revenues and profitability.

The following explanatory variables were examined:

- aid;
- 2 aid intensity indicators (aid to total funds, aid to equity);
- tangible assets;
- plant and equipment;
- number of employees;
- annual changes in the latter 3 indicators.

The following 4 options were examined as dependent variables:

- net sales;
- profit or loss before tax;
- return on assets;
- return on equity, and the annual changes of these indicators.

The most reliable regression results were derived from the following model run, which included the highest possible number of companies, 65, out of the 80 companies under review, so as to obtain estimates of the highest accuracy. (See Table 2)

Regression results show that with 65 out of the 80 companies, a 1 percentage point increase in aid intensity generated an approximately 2.4 per cent increase in sales. Con-

Table 1

#### DISTRIBUTION BY STAFF NUMBER AT THE END OF 2012

	0–9 employees	10–19	20–49	50–249	250–
National economy	97.7%	1.3%	0.6%	0.3%	0.1%
Sample	6.9%	6.8%	20.8%	34.5%	31%

Source: Hungarian Central Statistical Office (HCSO) (Registered companies by staff number categories at the end of 2012) and author’s own sample

Table 2

**IMPACT OF SUBSIDY INTENSITY (SUBSIDY/TOTAL LIABILITIES)  
AND CHANGE IN NUMBER OF EMPLOYED ON CORPORATE TOTAL SALES**

Model 1: OLS, using observations 1–65				
Dependent variable: change in sales				
Heteroskedasticity-robust standard errors				
	Coefficient	Std. Error	t-ratio	p-value
Const	1.01352	0.0878843	11.5324	<0.00001***
Subsidy intensity	2.35743	0.821754	2.8688	0.00563***
Change in number of employed	0.151287	0.0380355	3.9775	0.00018***
Mean dependent var	1.517195	S.D. dependent var	0.853667	
Sum squared resid	16.44134	S.E. of regression	0.514959	
R-squared	0.647483	Adjusted R-squared	0.636111	
F(2, 62)	12.89829	P-value(F)	0.000021	
Log-likelihood	-47.55688	Akaike criterion	101.1138	
Schwarz criterion	107.6369	Hannan-Quinn	103.6876	

Note: \*\*\*, \*\* denote if p value is below 1 or 5%.

Source: own editing

versely, although the staff number changes accompanying investment projects represent a significant variable, they made only a minor contribution to sales growth, which is an indication of deteriorating work productivity. (A 1 percentage point increase in staff number generated an approximately 0.15 per cent increase in sales). However, in the years following the implementation of the projects, no significant correlation could be demonstrated between the above variables.

In the sample, there were 7 companies which, when included in the regression analysis, impaired the accuracy of estimates, and another 8 that eliminated the previously demonstrated correlations. Statistically, these latter are characterised by an ability to generate high sales with few employees, and exhibit extremely high work productivity. Consequently, there is also a smaller group of companies

which, despite their low number of employees, are capable of accessing high amounts of aid without the possibility of measuring the effectiveness of absorbed aid by any of the dependent variables taken into account.

If the sample is broken down into exporters and non-exporters, with non-exporters the correlation is retained between the two explanatory variables and the independent variable. There is even a slight increase in the explanatory power of the model, with a 1 per cent increase in aid intensity generating a slightly higher sales increase of 2.6 per cent compared to the full sample, and approximately the same effect is generated by changes in staff number as with the full sample. (See Table 3)

By contrast, these correlations cannot be demonstrated in the case of exporters, which means that their export revenues do not de-

Table 3

**IMPACT OF SUBSIDY INTENSITY (SUBSIDY/TOTAL LIABILITIES)  
AND CHANGE IN NUMBER OF EMPLOYED ON CORPORATE TOTAL SALES**

Non-exporting corporates Model 1: OLS, using observations 1–31 Dependent variable: change in sales Heteroskedasticity-robust standard errors				
	Coefficient	Std. Error	t-ratio	p-value
Const	0.961071	0.150046	6.4052	<0.00001***
Subsidy intensity	2.64087	0.843076	3.1324	0.00404***
Change in number of employed	0.151701	0.0335092	4.5271	0.0001***
Mean dependent var	1.697143		S.D. dependent var	1.168356
Sum squared resid	12.90479		S.E. of regression	0.678885
R-squared	0.684878		Adjusted R-squared	0.662369
F(2, 62)	15.51908		P-value(F)	0.000029
Log-likelihood	-30.40307		Akaike criterion	66.80614
Schwarz criterion	71.1081		Hannan-Quinn	68.20847

Note: \*\*\*, \*\* denote if p value is under 1 or 5%.

Forrás: own editing

Table 4

**IMPACT OF EXPORT INTENSITY (EXPORT/TOTAL SALES) ON CHANGE  
OF CORPORATE EXPORT SALES REVENUES**

Model 2: OLS, using observations 1–24 Dependent variable: change in export sales Heteroskedasticity-robust standard errors				
	Coefficient	Std. Error	t-ratio	p-value
Const	2.49941	0.463395	5.3937	0.00002***
Exportintensity	-1.25247	0.581496	-2.1539	0.04247**
Mean dependent var	1.891866		S.D. dependent var	1.061293
Sum squared resid	21.37404		S.E. of regression	0.985671
R-squared	0.174935		Adjusted R-squared	0.137432
F(1, 22)	4.639198		P-value(F)	0.042468
Log-likelihood	-32.664		Akaike criterion	69.32801
Schwarz criterion	71.68411		Hannan-Quinn	69.95308

Note: \*\*\*, \*\* denote if p value is under 1 or 5%.

Forrás: own editing

pend on the project funding received. Arguably, then, non-reimbursable investment aid had no effect on the improvement of the international competitiveness of larger corporations included in the sample. Although with a low explanatory power, this argument is supported by the fact that higher aid intensity (exports to total sales) reduces export growth with companies that received high amounts of aid. (See Table 4)

The results also underpin that aid absorption may have entailed an increase in the market share of large corporations, considering that the study by Béres (2009) could not demonstrate any favourable sales effects of the aids among SMEs. In terms of employment, we found that although development tenders often include requirements for the creation of new jobs, these do not correspond to the staff

increase that larger corporations would undertake voluntarily, since the increase in employment is accompanied by a parallel decline in labour productivity.

Accordingly, my own analysis also points out that while intervention may be successful from the perspective of the company absorbing the aid by strengthening the company's market position, at the level of the national economy the same type of aid may also result in government failure; indeed, owing to inadvertent impact mechanisms, the final output may be in conflict with the original objectives on numerous points. This output has clearly been contrary to the intentions of the government that grants aid in the hope of facilitating the catching up of SMEs rather than increasing the share of large corporations in domestic markets.

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