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Modelling and empirically testing moral hazard issues of government subsidies

- Ph.D Thesis - Substract

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1 Introduction

Unlike funds obtained from financial institutions, state grants, which are intended to boost competitiveness and employment while stimulating investment and innovation, do not have to be repaid provided that the purpose of the aid has been achieved. Banerjee & Duflo (2004) and Miller & Rojas (2004) refer to funds obtained from financial institutions as one of the most significant factors in the growth of an enterprise, and in this regard Beck & Thorsten (2007) draw attention to the limited nature of funds accessible to SMEs. It is precisely with a view to softening credit constraints that assisted lending programmes (Griffith-Jones et al, 2011) and non-repayable grants (EuropeanCommissionStateAidScoreboard, 2015) are used. These methods of state aid are similar in that they both make procuring factors of production cheaper, and in this way exert their economic-stimulus effect. The companies, therefore, do not repay the money in cash, but instead generate social value added by achieving economic development objectives. It is important to examine this process in more depth, because owing to the moral hazard we can observe that, in the absence of appropriate incentives, companies may give preference to maximising their own profitability rather than increasing the social value added.

Non-repayable state aids create an additional opportunity to obtain funds for the implementation of developments, in excess of what can be achieved with internal funds, and to improve competitiveness through a reduction in the acquisition cost of production tools. The operating mechanism of financing by commercial banks is as follows: The financial intermediation system offers financial resources and requests collateral to secure them, the company repays the principal and pays the interest on it. During the provision of direct state aid grants, firms also receive funds for a defined purpose, but do not pay interest on it; and if the development objective is fulfilled, it does not even have to be paid back. In this event, the state receives social value added in return for the financial aid. In the case of bank financing, the moral hazard is that of a company taking out a loan in the knowledge that it will be unable to repay it. When it comes to state aid, the

received funds do not have to be repaid, so the definition of the moral hazard also changes accordingly. In the case of state aid, the basic scenario of the moral hazard is where the entrepreneur knows that he or she will not generate social value added, but nevertheless uses or applies for the non-repayable grant.

If state grants are paid out, firms can achieve higher accumulation of equity because the paid-out amounts of aid are stated as profit-increasing items during the amortisation period. The firms' liquid assets, similarly to projects implemented with non-repayable grants, increase by the value of the given year's profit and depreciation during the maintenance period; but firms that have received grants can recognise the part of the previously paid aid apportioned to the given year as a profit-increasing item. This means that the profit and retained earnings of the subsidized firms, and through this their equity, grows by more. It is through this mechanism that state aid grants lead accelerated capital accumulation of firms receiving state aid.

It is in the state's interest to support projects that benefit society, because this is how firms repay the funds transferred to them. It is no simple task to select the cases in which the social value added matches the given economic-policy objective. Owing to the asymmetric distribution of information, the businessperson knows about several quality parameters relating to his or her own project that he or she does not share, or only partially shares, with the bank. This is a passive behaviour pattern, resulting in a choice: the entrepreneur plans to use a service that will increase his individual profitability, but for the lender it might result in a loss.

Means of reducing moral hazard could be obtaining supplementary information or requesting certain amount of internal funds. This makes it possible to achieve a situation in which projects that really do have better quality parameters, and thus a better chance of success, receive financing or state aid. This is why I am examining more closely the Internal Funds for Development, by which I mean the amount of available liquid assets previously generated by the firms, which can be used for implementing further development projects.

In case of commercial bank financing moral hazard can be defined as a hidden action, where the bank doesn't know the expected effort level of the firm, effecting the probability of success of the project. Using a unified model (Holmstrom & Tirole, 1997) analyzed the common situation where firms and banks are also equipped with a constrained amount of capital, therefore both require outside sources to fund development projects. Firm's savings are insufficient to fully back the planned investment, while banks struggle to ensure enough credit facilities required by companies. This is described as credit constraint, a non-equilibrium situation, where changing incentives will also not help reaching equilibrium. Increasing interest rates will not improve lending, because the market does not believe in, that enterprises would start profitable projects or even if they are in position to launch such developments the funds requested for it would be used for cross financing purposes. In order to deal with the efficiency of non-refundable subsidies we should enhance the original model with central government, which is responsible for it. Recently (Berlinger E. J., 2015) (Berlinger, Lovas, & Juhász, 2016) considered moral hazard issues of subsidies.

2 Moral Hazard of State Aid

There can be no empirical studies found that discusses moral hazard of EU state aids. This may be because it is difficult to analyse an incentive-related problem based on macroeconomic data. For this, we need to set up an analytical framework that specifically examines moral hazard in relation to state grants. No such theoretical model is available, however, and several reasons for this can be identified. Firstly, we can define several forms of state intervention, including but not limited to the bail-out of a corporation or sector, the provision of interest free funds of development banks, or the granting of direct non-repayable aid. In domestic practice, the intermediation system created for the transfer of EU funds to SMEs has a high weight within the system of development policy tools. This is also underpinned by the fact that strengthening the SME sector is a key economic development objective, which in the 2007-2013 period received

HUF 811.5 billion paid out under the Economic Development Operative Programme (GOP), to be followed in the 2014-2020 cycle – according to plans – by some HUF 2,733 billion in direct aid under the Economic Development and Innovation Operative Programme (GINOP).[1]

International literature is divided in its views of state intervention. Tirole (2009), following on from Holmstorm & Tirole (1997), continues to see the state's role in corporate lending as being limited to bail-out. The analytical background of the Holmstrom & Tirole model could serve as an excellent basis for analysing the mechanism of effect of direct state grants; but it must be stressed that it views the state's role as something completely different. It distinguishes between fiscal and monetary bail-out, which defines it in different ways. This is the only form in which the model defines state aid; that is, as a type of state intervention, and it does not regard the state aid examined in my research as an economic stimulus tool. In the Hungarian literature, the correlation between moral hazards and grants is investigated by Berlinger et al (2015 and 2016). In his detailed analysis of the economic stimulus measures of the 2008 economic crisis, Vives (2010) also regards the money pumped into the financial intermediation sector as state aid. The author gives an excellent overview of the complete rearrangement of the European banking market, in which the financial institutions restructured, or sold and reorganised their operations with the aim of reducing their moral hazard.

State intervention was interpreted as taking the form of regulation, which can be defined as a trade-off between competition and stability. Berger (2006) proposes a general framework for the examination of access to credit by SMEs. They highlight that access to external finance by SMEs is both an important theoretical economic issue and a key problem for policy-makers. Kállay (2014) examines the spill-over effect of state grants provided to SMEs, which he pinpoints as an improvement in income-generating capacity and competitiveness. He proposes that, in addition to the abundance of funds, the economic and regulatory environment in which the SMEs eventually receive the grants also needs to be examined. A hard-to-predict economic environment, and competing aid programmes, give rise to problems like crowding out. It's

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[1]http://gazdasagfejlesztes.gov.hu/sites/default/files/gazdagsagfejlesztes_2015_kiadvany.pdf

important to find the parallels between state grants and bank financing; and use them as a lens through which to read research papers which, at first glance, appear to examine entirely different issues. Kállay's study contains an implicit examination of the framework, relating to the mechanism of effect of state grants, which Berger (2006) describes explicitly in relation to SME lending problems. They describe in detail how the access of SMEs to credit is influenced by the structure of the banking system and by government interventions, through their impact on the lending methodology.

State intervention is regarded in different ways in the economic literature. The role of the state in corporate lending (J. Tirole 2009) sees in bail-out, based on the original (Holmstrom-Tirole 1996) model, which is a framework for examining the commercial bank lending and following (Berlinger, et.al 2016) it is considered also for state aid grants.

Empirical research was linked to car-insurance industry, by statistically measuring the effect of introducing incentives, like the bonus reward systems, in which case (Dionne 2005) (Richaudeau 1999) proved a significant drop of moral hazard. The price reduction given for accident free driving has a positive effect, i.e. there is no need to control the behavior if it can be found an incentive forcing the players to co-operate. (Cardon és Hendel 2001) (Abbring, Chiappori és Pinquet 2003) analyzed on large data sets the positive effect of any change in submitted claims of newly introduced incentives. The empirical analysis of moral hazard in insurance policies might be relevant to state-aid grants, if there can be found relevant incentives which might handle the unwanted outcomes of subsidies, rather than controlling behavior of firms. The same outcome might be achieved in fighting against subsidized development project without real social surplus by introducing powerful incentives rather than intending to pose administrative control on firm's spending. There is obviously further research needed in this matter.

By examining policy details of the business development details after the 2008 crisis (Vives 2010) considers the utilization of state aid grants. It is highlighted that the financial intermediary system has dramatically change as commercial banks have sold part of their portfolio and

reorganized its internal policies in order to decrease moral hazard. State intervention was regarded as regulatory policy, as trade-off between stability and competition.

(A. N. Berger 2006) proposed a general framework for studying the SME's access to credits, as relevant question both in economic theory and highly important for development policy maker. We conclude that there are several similarities in commercial bank financing and state-aid subsidies, and therefore a similar comprehensive framework would be helpful for understanding real effects, however there is no such is available. Due to two basic reasons: once, the form and structure of state intervention varies even across member states of the European Union, second, the vast variety of the available products and its combinations. (Berger-Udell 2006) contributes with a coherence in SME financing, by linking the role of the bank ecosystem with state intervention policies to demonstrate how firms can access to credit.

In the framework of commercial bank lending (A. N. Berger 2006) summarizes the elements of items to be considered: methodology of credit policy, the source of information for submission, structure of the credit contract and the relationship management. There is a mixture of information derived from financial statements and quality information received from other sources. The same breakdown would be helpful for investigating state aid policies; therefore, we examine the documentary requirements in order to utilize the similarity of commercial bank lending experience.

3   The Use of Internal Funds in Development Projects

In what follows, we examine the availability of internal funds in the development projects in relation to the grants awarded to the SME sector during the 2007-2013 EU planning cycle. Prior to making use of the grants, the firm concerned had differing extents of internal funds. Certain firms would have been capable of implementing the entire development project without any external help whatsoever. The question is whether it could be regarded as desirable from an

economic development perspective to support firms which would anyway be capable of implementing the development project without the grant.

The table below shows the ratios of the company's deposits as percentage of the value of planned investment. The first five columns each cover a range of ten percent; companies possessing less than one tenth of the expenses of the development to be implemented represented 28 percent of all the firms that received aid. Adding together the items in the next four columns shows that 64 percent of the firms had less than half, while around a fifth of the subsidized firms (15+6 percent) would have been able of implementing a larger investment project than originally planned while applying for the non-repayable funds. It is also thought-provoking that almost half of the firms did not even possess internal funds amounting to 20-30 percent of the total investment cost.

	0-10%	10-20%	20-30%	30-40%	40-50%	50-100%	100-150%	150% +
As a proportion of all firm	28%	14%	9%	7%	6%	15%	6%	15%
Cumulative value	28%	42%	51%	58%	64%	79%	85%	100%

Source: own research, palyazat.gov.hu

Table 1: Savings of firms receiving grants, in percentage of development project cost

SMEs grow if they have sufficient internal funds available for development projects. The market value of companies can only be increased by reliably and predictably high cash-generating capacity. All ad-hoc or one-off interventions can have a positive impact on the firms' operation and market value. At the time of payment of the grants, however, the research question concerns the extent of the positive impact that the one-off intervention could have on the firms' operation. Increasing sales revenues is not an aim, but a tool of the development projects; the primary

objective is improving profitable operation, which we can identify as growth in the value of equity from the profit accumulated over the years.

When an enterprise implements a development project, production tools are stated in the books at their true acquisition cost. In the case of development projects, we would like to show the social value added; but this remains hidden, and we can only monitor the impact on economic indicators relating to the whole enterprise. As a result of the non-repayable grant, firms' sales revenue increases because during the maintenance period the amount of the grant, which was formerly stated as an accrual, can be released and recognised as other revenue. Due to this, in comparison with a similar sized competitor implementing a similar-sized project that has not received a non-repayable grant, the profit will also increase; and this in turn will raise the value of equity through the increase in retained earnings. The social value added takes the form of growth in the equity of the companies that have received a grant, which materialises in the growth of current assets; in other words, it appears as savings, bank deposits, thereby generating internal funds for the next development project. The grant, therefore, is a substantial contribution to the firms' next development project or investment, for which the company will be able to assemble the internal funds more quickly due to the increased profitability.

The success of the development policy has to be separated from the success of the firm themselves. To be more precise, I propose that the growth in firm's general profitability should not be regarded as the main characteristic. Let's take a typical, ideal enterprise that has received a non-repayable grant and/or discounted credit from a development banking system, and/or any credit product from the commercial banking sector. Here there are four possible outcomes, depending on whether firms made use of one or both of the loans in addition to the grant. Specifically, whether it

- received a grant
- received a grant and development credit

- received a grant and a commercial bank loan

- received a grant, development credit and a commercial bank loan.

If we also examine the possibilities in terms of the internal funds available for implementation of the development project, then in one scenario the internal funds would be sufficient, but a grant and discounted and/or commercial bank credit are used nevertheless; while in the other, the internal funds would not be sufficient, which is why the discounted and/or commercial bank credit are used. This makes 10 basic scenarios, which are then supplemented with the additional variable of whether a business partner is involved in the development, thus increasing the number of possible outcomes to 20. The simplest scenario is that internal funds would be sufficient for implementation of the project, but firms implement it accepting a grant. The most complex scenario is where firms' internal funds are not sufficient for implementation of the project, and therefore it makes use of a grant, interest-subsidised and market-rate credit, as well as the collaboration of a business partner.

The projects implemented in this way can have a negative or positive impact on the cash-generating capacity of firms as a whole. As a consequence of this, the whole enterprise may go from being profitable to being more profitable or less profitable, or from loss-making to being profitable, or from loss-making to being less loss-making or more loss-making. These five possible outcomes increase the number of basic scenarios defined earlier to one hundred. This means that, with respect to grants, there is a total of 100 different possible basic scenarios that can be compared with each other to a limited extent. If we examine the impact on social value added of the use of a grant by a formerly profitable enterprise that became less profitable after using the grant, and which possessed sufficient internal funds for implementation of the development project but still made use of a commercial bank loan, then this should be compared with an enterprise implementing a development project of a similar volume and size that did not receive a grant, but drew down commercial bank funds despite possessing the full amount of liquid assets necessary for the implementation. If there is any divergence in the parameters; that is, if we do not compare companies of the same size, then the result will be distorted. However,

we cannot forecast the direction of this, and there are no available experiential facts that could help us do this.

The costs and risks of implementing the development project are known to firms at the time of planning the project, as are the revenue plans and the costs of operation; and based on these, it is possible to compile the profit plan for the return on the project, and the cash-flow statement, which together can be used to determine the return on the development project. The grant, however, is applied for by an operational business, and accordingly not only does the project have to yield a return, but the whole enterprise has to profit from it, since the logic of the aid system is based not on projects, but on subsidised firms.

Firms have to define the cost-cutting benefit of the development project, but at the same time it needs to identify the additional costs arising due to the requirements of the funding application system, as well as the quantifiable costs of the increase in risk. The slowing in the rate of revenue growth due to the requirements of the funding application system also has to be determined, although it is also possible to assume that this is zero. If all the modifying factors have successfully been identified, then it becomes possible to compare the costs and revenues of the project implemented under the aid contract with those of the original development project; and the difference between these also reflects the bridging costs incurred due to the ex-post financing. In this way, the return on the two projects becomes comparable, and thus the difference can also be calculated. From this, we can deduce the perceived costs of the assets transferred free of charge.

In relation to direct state aid, the moral hazard can be defined as follows: An enterprise applies for direct state aid although it does not contribute to an increase in social value added. The formal modelling of the moral hazard of direct state aid grants is addressed by mainstream international research. The analytical model set up by Homlstrom & Tirole (1997), regarded as a seminal work for research into both state aid grands and SME financing, does not examine direct state aid, but

investigates the role of the state as a potential source of financial bail-out. Berlinger, Lovas & Juhász (2016) extend the study to encompass direct state aid and assisted loans, but use basic assumptions based on which the moral hazard of state aid cannot be investigated in more depth. Owing to the assumption of risk-neutral actors, a constant size increase and positive external conditions, the conclusions cannot be applied to the problem investigated in my research. We might call it second degree moral hazard when firms are excepting state aid grants in order to substitute different forms of financing sources or accumulate higher savings.

4   Framework of the tendering process and the contracting phase

The European Commission has the authority to control the state aid subsidies in the European Union, and the emphasis is more on formality rather than examining the real effect on social surplus. Since there are several segments receiving grants: innovation driven sectors, economically underdeveloped regions, start-ups, and more generally small and medium size companies, the proper utilization of state funds is highly important from economic development policy's point of view. The most relevant international empirical study concerning this was (Banerjee 2004), by investigating the anonymized data of different commercial banks. He concluded that return on investment measures the effects of commercial bank financing in both developed and underdeveloped markets.

The European Union regulates the forms of state interventions and the types of subsidies. For achieving the positive effect, i.e. increase social surplus approx. one percent of GDP was used for state aid grants totaling to EUR 100 billion (EuropeanComission, European commision. (n.d.)., 2018). The types of state aid grants show high variety, there cannot be defined such as typical subsidy-product, however it is expected that whey will be used for assisting non-equilibrium market segments, e.g. the micro, small- and medium size enterprises, since SME's face credit constraint and are not able to raise as much credit as they could utilize.

The 7-year planning period of 2007-2013 made available some new products, such as subsidized loan, grants, guarantee programs and venture capital financing as well, however before the 2014-2020 period new financing methods became available. Independently from the EU the National Bank of Hungary targeted the SME's by making widely available discounted credits in the framework of the Increase Development by Loans[2] (NHP) program.

The real expenses associated with state-aid grants are awarded in different ways by beneficiaries. First, the methodology to determine net present value of the different types of grants is not unique, and secondly the perception of temporarily distributed cash-in and outflows might also vary. Consider now the several possibilities that companies can choose from if financing needs are present:

1. Credit line with a commercial bank
2. Discounted loan program by a development bank
3. Venture Capital financing
4. Capital market financing
5. State aid subsidy

The firm has exact knowledge about the profitability of its projects, by at least knowing the possible highest income and profit from the project. There is however a chance that there will be no social surplus after completion, i.e. no increase in profitability or in revenues. This is the moral hazard of the state aid financing. It widens the question even more, if we consider that only the free money received from the state makes the project feasible, and without this financing it from commercial banking sources would have not been possible.

It is therefore highly important to set the precise goal of the investigation, whether we examine the successful operation of the development policy, or the intermediary system, or the development projects themselves. Furthermore, we aim to analyze the intermediary system

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[2] We refer here to the Növekedési Hitelprogram (NHP) of National Bank of Hungary

responsible for absorbing the state aid grants to SME's, if we consider that administrative measurers might have negligible effect on the success of the development projects. There is unfortunately no internationally accepted methodology to detect the effects on economic development policy details derived from the state aid subsidized companies.

The grants are transferred to the SME's after a formal decision, completion of the contracting phase and finally after execution of the development project. Monitoring of the project boils down to, checking the fulfillment of the administrative requirements, intending to secure that the non-refundable grants will not be used for any case related to fraudulent behavior, rather the to contribute to boost social surplus.

The communicated goal of the Operational Program of Economic Development[3] being part of the New Hungarian Development Plan as master document approved by the European Committee is economic development, strengthening the knowledge-based economy, supporting underdeveloped region, promoting to discover new export markets, and finally supporting the permanent economic growth.

For achieving economic development goals there are certain specific objectives defined, called priorities:

(i)   Research and development, innovation capacity and cooperation
(ii)   Increasing complex capacity of corporates
(iii)   Developing business infrastructure
(iv)   Access of SME's to required financing sources

Certain technical details might influence the tendering process, such as set up and operation of the Monitoring, the Governing, and the Paying Authority. Their complex aim indeed is to find the balance of achieving development goals of Operational Programs and utilize the possible maximum funds available by uncovering fraudulent activity. This activity requires control and

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[3] In Hungary as GOP (2007-2013) and GINOP (2014-2020)

management on quantitative criteria, if powerful qualitative elements would be involved it could make the transparent process doubtful.

The state aid subsidy grants of the European Union differentiate across public and private companies, government institutes and other organizations. The combination of the requested goal, the source, i.e. which European development fund is affected, and the form of subsidy will define the finally available maximum of the operational programs. Considering the statistics of the European Union, however, we conclude that the share of micro, small- and medium size enterprises was less than ten percent of the regional development programs and remained below three percent considering the sum of all the domestic subsidies. The huge number of companies receiving fund would require modification in the tendering, contracting and monitoring phase, but the execution is done by the same government agency.

SME's might receive European Union's co-financed state-aid grants, development bank loans or financial guarantees. Economic growth is generated by firms with and without subsidies. We should consider the effect of firms benefiting from the discretionary policy, in relation to firms, which are not. There is no clear theoretical methodology of measuring social surplus. We define social surplus based on (Varian 2014) as the sum of consumer and producer surplus. It is not possible to measure it for the tens of thousand companies; therefore, we concentrate on the future effect of investment decisions on social surplus. Economic growth might be expected from increase in profit level of the SME's; therefore, we examine the potential positive effects of receiving grants.

The **investment** as a consequence of state-aid grant became **bigger**, the project generated **larg**er profit and contributed to increase in social surplus, with

1. larger own contribution and larger bank financing,
2. larger own contribution but smaller bank financing,
3. smaller own contribution but larger bank financing,

The investment as a consequence of state-aid grant became bigger, but the project generated smaller profit and contributed to a lesser increase in social surplus, with

4. larger own contribution and larger bank financing,
5. larger own contribution but smaller bank financing,
6. smaller own contribution but larger bank financing,

The investment as a consequence of state-aid grant became smaller, but the project generated bigger profit and contributed to a higher increase in social surplus, with

7. smaller own contribution and smaller bank financing,
8. smaller own contribution
9. smaller bank financing

The investment as a consequence of state-aid grant became smaller, but the project generated smaller profit and contributed to a lesser increase in social surplus, with

10. smaller own contribution and smaller bank financing,
11. smaller own contribution
12. smaller bank financing

After listing all possible outcomes, we examine the effect of the individual cases on economic growth. In the first group we have selected the most desirable cases from economic development policy perspectives. Social surplus increases with the larger project size, leading to higher investment. This would potentially increase employment, bank lending and generate larger profit by SME's. This is in line with the main goal of economic policy, as (BANAI 2017) pointed out.

5 The governing role of documentary requirements

We can talk about moral hazard in case of the 3 plus 3 elements belonging to the second and fourth group, whereby due to the state-aid a different project size was selected, with lesser profit generation, i.e. we conclude that the social surplus became also smaller. Moral hazard lies in the modified social surplus of the development project, compared to the original intent of the firm implementing it without state-aid subsidies. The firm indeed might have different projects effecting profitability, therefore there might be misleading to derive the success of the project from the company's overall performance.

Moral hazard of state-aid can be reformulated as firms are accepting subsidies by knowing that the new development project will not have the optimum size, it might be bigger or smaller, but the increase in net revenues or profit lags behind compared to the original project without any restriction of documentary requirements. Any restriction might alter the development project's success, therefore, to understand the planned hidden action of the firm regulators should understand what would have been the real project size without state-aid grant, or in other worlds, what is the firms understanding of optimum project size.

In the following we turn to the different elements of the state-aid tendering and final contracting documentation requirements. The grants can be defined in four different ways regarding backwards the effective date: (1) the year of the grant was transferred, or (2) all contracts have been mutually signed, or (3) the positive decision was communicated by the authorities, or (4) the tender documentation has been submitted. There might be several differences in the effective calendar year of the grants, which makes more difficult statistically capture the business development effect[4]. The grants are equipped with the following criteria:

- the calendar year of submitting tender documentation
- amount of subsidy / grants in tender documentation
- amount of subsidy / grants in final contract

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[4] Take the example: submitted in late 2014, decision made in 2015, contracted in early 2016, and financially settled only in 2017. This comprises 4 calendar years, making it highly difficult to assign the positive effect of business development to a specific year.

- the calendar year of contract signed
- amount of subsidy / grants financially settled
- the calendar year of financial settlement
- size of the development project
- own contribution to the project
- partner's contributions to the project
- the form of subsidy
- the final goal to be achieved using state aid funds

Considering the sets of data to be submitted in the tendering process until the contracting phase we can understand all details the information basis, on which the development project is accepted, subsidized and monitored.

- Admission of the project

All quantitative project details are presented, including a long-term business plan and an impact analysis. All financing needs and sources such as commercial bank loans, other subsidy grants and different business partners' contributions. All documents required for submission have to in original format and have to be signed by the company. The tendering process starts with introducing the company and the planned development project. Concentrating on the impact of the planned project the firm has to prove its capability of proper execution and financial support. Beside that a long-term business modelling has to be submitted as well, consisting all relevant information in a pre-defined format.

- Proof of legitimacy and completeness check

Any project has to undergo a legitimacy check, which is by definition a quantitative approach. If any shortage prevails then there is one single opportunity to deliver the missing documents, unless the submission for subsidy will be rejected.

- Content assessment, evaluation and approval

Evaluation is performed by independent personnel on anonym documentation, which should ensure a neutral approach to all tenders. Formal elements are checked for validity and by considering long term business plan this time the viability and reasonability is analyzed for approval.

- Signing the contract of subsidy

After the decision for subsidy has been made the contracts will be signed by both parties, or sometimes even by several parties involved. The contract contains all details regarding execution of the development projects and also all penalties associated with non-performance or partial fulfillment.

- Financial settlement after executing the project

State aid subsidy grants in Hungary for micro, small- and medium size enterprises are post financed after execution, if the projects' indicators are successfully and in detail presented and are complete and fully in line with the development policy requirements. This measure is merely a snapshot providing no further incentives for company to perform orderly in the standstill period.

- Monitoring phase

The standstill period of the projects the companies shall submit to inspections. The state aid subsidy grants shall be only repaid fully or partially if inspectors will ascertain any irregularity. Considering the eligible costs, the industry and regional restrictions it has to be shown the fitting of the project to certain economic development goals[5], detailing start, financial settlement and

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[5] As an example, we quote the Digital Welfare program setting new standards for IT infrastructure related projects

end date, standstill obligation period and other limitations. All of these criteria are neutral from moral hazard point of view, except eligible expenses, but this is still a restriction and not an incentive to alter future actions. Social consultation and dialog might have more positive impact on development projects than the disqualification of certain form of expenses. Those are for example the rental expenses and the infrastructural investments of research, development and innovation, or licenses and know-how rights, or general management costs. The aim of monitoring remains simply to prevent any fraudulent activity.

6 Defining Internal Funds for Development

For a high number of firms, we need to determine the indicator that provides the value of internal funds necessary for implementing the development projects. At the point of making the investment decision, firms need to be aware of their Internal Funds for Development at that moment in time. By this we mean existing liquid assets, or those that can be mobilised within a relatively short time, over which firms have disposal. In practice, this means cash, bank deposits or money invested in securities, and there may also be investment assets which can be sold in the given business year, such as real estate, artworks, etc. Here, it is important to note that if there is a substantial divergence between the calculated Internal Funds for Development and the available liquid assets, then the cause of this divergence might be some operational issue.

For the purpose of investigating the accounting settlement of the grants and their impacts on economic development, we can review the publicly available economic data that firm disclose annually as a part of their mandatory reporting. When evaluating the business management of a company, profitability is one of the most important factors. A direct consequence of the accounting settlement of the grants is that the companies receiving grants will grow relative to those that have not received them. It is also important, however, to examine how firms would manage their resources without the profit-boosting effect of the state aid grant, as this shows how the firms' income-generating capacity would have developed ceteris paribus. It is advisable to

perform this analysis on a group of firms of a similar size, which are active in the same sector and region.

Submission of the funding application took place during the calendar year, so the values may have changed mid-year as a consequence of certain economic events, because

- payments may already have been made in connection with the funding application

- there may have been significant movement in the volume of liquid assets, due to the change in working capital

- dividends may have been paid out

- any payment may have been made in connection with another investment that is the subject of a funding application

- certain financing decisions may have altered the volume of liquid assets

- personnel-related withdrawals of cash may have occurred.

In what follows, I will examine the potential distorting effect of the individual modifying factors, with a view to selecting the most accurate indicator of internal funds for development. While firms are aware of the extent of available internal funds at the moment of the investment decision, clearly defining this in retrospect can run into difficulties. The possibilities are presented below.

1. Deposits in the year of submitting the application

This indicator shows the cumulative cash flow, in the event that firms retain all previously accumulated profit. Domestic SMEs' capitalization is low so if the accumulated liquid assets are serving as a form of capital replacement in the course of the firm's operation, then the value of deposits may be substantially lower than the profit accumulated in previous years.

2. Deposits in the year prior to submitting the application

With this, we can estimate the value of available internal funds more accurately if we assume that payments related to implementation of the development project were made in the year of submitting the application. In this case, the value of deposits at the end of the previous year better expresses the firm's liquidity position, because this is the amount that may have been available when the decision to apply for funding was made.

3. Retained earnings in the year of submitting the application

Expenses may be incurred in the interest of the subsudized project after submission of the application; but typically, those are due after the decision has been made to grant the aid. Consequently, the profit for the given year, and its recognition, could still be important when determining the size of the development project.

4. Retained earnings in the year prior to submitting the application

If we assume that firms make the decision of launching the development project some time in advance, then it could be reasonable to look at the value of retained earnings at an earlier point in time.

We have to decide what type of balance sheet item could be most suitable for estimating the accumulation of an firms' funds available for development purposes: an asset, namely the firms' more broadly defined liquid assets, or a liability, i.e. the retained earnings. For the investigation, it is still necessary to consider whether we are examining these items in the year of submitting the application or in the previous year. We could also propose a composite indicator, which shows what share of the firms' retained earnings is available in the form of liquid assets. This could be the ratios of the firms' deposits, retained earnings and equity to each other. However, this indicator would only provide information about the firms' capital structure, and it offers no substance for an investigation of the economic-stimulus effect of the grants. Finally we can conclude that, for the empirical studies, observing the economic data of the companies, the

retained earnings in the year of submitting the application may be the most precise definition of the Internal Funds for Development.

The table below shows the value of retained earnings and volume of deposits measured in the year of submitting the application at companies submitting a funding application in each individual year. The last column shows the ratio of retained earnings to deposits. The year 2007, the first annual period in the seven-year planning cycle, is not shown in the table because only a few hundred firms submitted grant applications in that year.

	Retained earnings / Project size		Bank Deposits / Project size		Retained earnings / Bank Deposits
2008	49.249%		25.921%		1.9
2009	86.350%		46.444%		1.9
2010	76.711%		36.941%		2.1
2011	121.662%		75.049%		1.6
2012	56.098%		26.034%		2.2
2013	123.652%		57.816%		2.1
2014	134.968%		41.060%		3.3
2015	81.510%		55.186%		1.5

Source: own research, MNB, KSH

Table 2: Selected data of firms submitting grant applications

It is clear that in the first three years, the retained earnings of firms that were awarded grants are regularly twice the value of their deposits, and this is in line with the eight-year average, which shows a figure of 2.1. The years 2011 and 2015 diverged downwards, while in 2014 the difference more than tripled. In addition to 2011 and 2015, the year 2014 was also characterised by retained earnings that exceeded the project size on average. While there was relative stability over the examined eight years in terms of the ratio of retained earnings to deposits, in comparison to the project size the volume of deposits moves within a range of 25-75 percent without any real trend, and retained earnings were between 49 and 135 percent. The explanation is that, in each year, different assisted and commercial-bank financing was available to supplement the grants.

And this brings us to the comparability problem: Based on the economic indicators, we observe that the internal funds identified as Internal Funds for Development show considerable trendless movement, which signifies the attitude of economic actors to the use of non-repayable grants. In the case of non-repayable grants we have defined moral hazard as being the risk of firms utilising the aid without creating any social value added; but the empirical observation of this only becomes possible in the years following the grant payments, when firms prepare their financial statements for the years following payment of the grants, and make them available to the Tax Authority and the Controlling Authority managing the grants. From this, it is possible to deduce the extent to which firms were able to improve their own economic performance with the non-repayable funds, and thus create social value added.

7 Summary

Non-repayable state grants are an ex-post funding instrument. This means that firms have to possess sufficient funds for full implementation of the funded project, which may consist of internal funds, institutional funding sources, bridging funds from a business partner, or other tendered funds. It is up to firms to implement the project, and if it can prove that this has taken

place in accordance with the terms of funding, then the funds that have been applied for are paid out.

It is important to clarify what really takes place between the state and the subsidized enterprise when a grant is awarded. One question is whether (1) a reallocation of funds takes place; in other words, do firms simply replace their external funding requirements with the cheapest available funds, which we refer to as crowding out. If (2) a reallocation of income takes place, then besides achieving higher profitability, firms receiving the state aid could also see an increase in capital accumulation. This can boost the competitiveness of the assisted firm, thanks to the improvement in their capital structure. If (3) a transfer of assets takes place, then the machines, equipment or rights come under the firm' ownership free of charge, thereby increasing the value of the firm.

The most relevant and binding document of the state aid subsidies is the contract. Substantive parts of the documentary requirements consisting both qualitative and quantitative information might have impact on moral hazard issues. As we concluded earlier that shortage of qualitative criteria limit the useable tools of control, and leave merely a formality check of quantitative data, which might help detect fraudulent behavior, but is insufficient to tackle moral hazard issues. Closely monitoring all the project could guarantee more success but considering the huge number of projects and consequently companies effected, it is not feasible. The next table shows number of projects in question. The 7-year planning period between 2007 and 2013, followed two more years of project admission, approval and financial settlement resulted in approx. forty thousand cases.

If it would be more securities required in advance it would decrease the number of companies eligible, which is actually against the basic logic of the state aid subsidies. It is intended to subsidies SME's in order to loosen credit constraint by making available cheap financing sources for those companies, which one would have not been able to apply for commercial bank loan. Bank collaterals are risk management tools and are not aimed to secure profitability of the

company. It is designed to incentives the company management and owners not to lower their performance level during project execution and operation, and not to seek for private benefit.

During the approval phase a formal check of the election criteria is done to ensure that all the submitted documents are valid and suitable. The substantive parts concentrate on the economic rationality and the expected impact on social surplus, all of these are ex-ante commitments, which should be closely controlled later. During monitoring and ex-post evaluation, however, there is only possible to analyze the company's performance.

It is still a question what type of documentary requirements could be added, when the communicated goal of the operational programs for micro, small- and medium size enterprises is strengthening the market presence of those companies. It can be achieved through increase in turnover and profit level, which will contribute to increase in accumulated profits and finally share equity. First, it should be differentiated between successful closing the development project and more profitable operation of the company itself, since the project might generate positive revenue, whereas the entire company might perform better or worse. From economic development policy point of view the company's performance should be regarded, however during monitoring solely the project. There is need for a detailed business plan of the project alone, in which all company internal physical and financial contribution should be accounted on the basis of the project. This could allow the Monitoring Authority to have better oversight on the subsidized project, which would guarantee at the end of the day the more profitable company operation and the fulfilling of economic development goals.

We identified moral hazard as a hidden action of firms, by lowering effort level causing lesser probability of success, which is materialized in private benefit instead of increasing social surplus. It is straightforward that it is not possible influencing the behavior of companies in advance. There is a need for control the behavior of companies after they have received non-refundable state aid grants, however the documentary requirements con not be made responsible for doing this. We conclude furthermore that monitoring can be only made based on the requirements set in the original tender documentation and in the contract. As pointed out

previously qualitative measurers could be most welcome, however the logic and structure of the documentation requires rather quantitative indicators, since the fulfillment is unambiguous. This could be similar to the insurance industry incentives, where there is a proven record of success, that offering future financial benefits could have better controlling impact than closely monitoring the daily behavior.

If the Monitoring Authority were able to monitor closely the development projects than it could encounter moral hazard issues, which could be done on the basis of the documentary requirements of the tendering and contracting process. On the long run it would result in decreasing number of companies accepting state aid subsidy grants, but in case of successful project execution it could be more positive impact on social surplus. If firms in the standstill period might expect an effective control process than they would concentrate on keeping the promise they made in the tendering phase and they would follow the goals of economic development policy and the operational program, respectively. This would, however, raise the operating expenses of the intermediary system, which also has to be considered.