BALANCING EFFICIENCY, EFFECTIVENESS AND ECONOMY

THE INFLUENCE OF CHANGES IN GOVERNMENTAL SUBSIDIES ON THE PERFORMING ARTS IN THE NETHERLANDS

Master Thesis Cultural Economics and Entrepreneurship

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ABSTRACT

This research aims to explain the relationship between three major performance indicators; efficiency, effectiveness and economy and to what extent these indicators and relationships are influenced by changing levels of subsidies. Based on longitudinal data consisting of 882 observations from 144 non-profit performing arts organizations in the Netherlands, that received funding from OCW and FPK between 2009-2016 generalized linear mixed model analysis shows a significant negative relationship between efficiency and effectiveness and a significant positive relationship between both efficiency and economy, and effectiveness and economy. Changing levels of subsidies are found to have a significant negative influence on economy, but no significant influence on the relationship between efficiency and effectiveness.

KEYWORDS

Efficiency, effectiveness, economy, subsidies, performing arts

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"Not everything that can be counted counts, and not everything that counts can be counted."

With this thesis I conclude almost ten years of being able to call myself a student. During this period I have not only acquired academic knowledge, but it has also taught me perseverance and discipline, and I have learned that everything happens at its own time.

They say it takes a village and it definitely has taken a village to get me to this point. Therefore, I would like to use this opportunity to express my gratitude. First and foremost to my supervisor Ellen Loots for her advice, interesting readings, time and patience. They say third time's a charm.
Many thanks to Carlien Schrijvershof and Paul Stolwijk for providing data, more data, and then some more data. To Hessel Peters Sengers and Maartje Gielen for advising me on statistical matters.
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1. INTRODUCTION

The non-profit sector as a whole has experienced an increased emphasis on performance measurement in the past years, as a result of financial and competitive pressures (Lee & Nowel, 2015). Governments are spending public money and therefore they are required to account for the way they allocate subsidies. The need for *evidence-based* policy, in which there is an growing emphasis on the evaluation of the outcomes of a certain policy has increased since the 1980s. As a result quantitative measures have become more prominent (van den Hoogen, 2012). Since several decades results-based management has become the norm in the public sector. A strong emphasis is found on monitoring efficiency within organizations (van Thiel & Leeuw, 2002). The question is whether this emphasis on efficiency affects results on other performance indicators.

One of the most distinctive characteristics of cultural organizations is the existential tension between artistic and managerial values. To reach an alignment between the different values is key to the viability and survival of the organization (Daigle & Rouleau, 2010). Most cultural organizations claim that they are able to put the same amount of emphasis on financial performance indicators as on non-financial ones (Turbide & Laurin, 2009). Several researches have studied the relationship between artistic and managerial or financial values, using different indicators. According to Davis and Pett (2002) these indicators fit within the concepts efficiency and effectiveness. Efficiency refers to the relationship between inputs and outputs whereas effectiveness refers to the relationship between objectives and outputs (Davis & Pett, 2002). A third concept that is used to express the performance of organizations is economy, which is defined as how actual costs relate to expected or budgeted costs. These 'Three E's' can be regarded as the fundamental concepts of monitoring (Gilhespy, 1999).

1.1 MOTIVATION AND RELEVANCE

As a result of the financial crisis in 2008, the Dutch government, was required to, amongst others cut the cultural subsidies. This budget cut was implemented in the next 'kunstenplanperiode'. In 2013 the Dutch government cut the cultural subsidies by a quarter. This 200 million euro budget cut was accompanied by the recommendation to organizations to focus on how to operate more effectively, efficiently and economically (Zijlstra, 2011). Declining government subsidies and pressure on the accountability of cultural policy have, for several decades, led to a more economic and managerial relationship with the government (Loots, n.d.). Bunnik and van Huis (2011) and Bunnik (2016) indicate that policy makers and grant givers are under high pressure to justify the way they spend public resources. This has led to a mainly quantitative assessment of organizations. It is argued that this is not desirable because it results in an incomplete analysis of the state of the organization (Bunnik & Huis, van, Niet Tellen maar Wegen: over de zin en onzin van prestatieafspraken in de culturele sector, 2011). While policy in granting subsidies has created room for a qualitative appreciation, the assessment afterwards resorts largely to quantitative measures.

An example of a quantitative statement was made by Fonds Podiumkunsten in their annual report of 2015. They observe that while the number of subsidized organisations decreased by 30%, the total number of activities has not declined (FondsPodiumkunsten, 2015, p. 4). The question that arises is whether these organizations have been able to become more efficient, producing the same, or higher levels of output at a lower input? Another quantitative explanation could be that organizations have been able to increase their income from other sources (Klink, van, Born, van den, & Witteloostuijn, van, 2011). Focussing only on the efficiency paints an positive but possibly biased picture. Therefore this research looks at other performance indicators, their interrelatedness, and the effect of subsidies on these indicators.

1.2 AIMS AND OBJECTIVES

This thesis aims to explore the relationship between efficiency, effectiveness and the ability to economize of non-profit performing arts organizations in the Netherlands and explain the relationship between the changes in the amount of subsidies received by these organizations and the three concepts. Previous research suggests that organizations are able to balance both efficiency and effectiveness when it comes to organizational goals. Most studies however are primarily based on interview and questionnaire data and the main focus in these researches have been on management strategies and intentions. To find whether these statements correspond with actual performance this thesis will attempt to find an answer to the following research question, based on performance data.

How do three major performance indicators (efficiency, effectiveness and economy) relate in the case of non-profit performing arts organizations in the Netherlands? To what extent has a change in subsidies affected these indicators and these relationships?

First, a theoretical framework is developed based on previous research. Second, the methodology of this thesis is presented and the dataset which used is explained. In chapter four the results of the analysis are presented followed by the discussion and limitations and recommendations. Finally we close with some concluding remarks.

2. THEORETICAL FRAMEWORK

This chapter first explains the characteristics of non-profit performing arts organizations which are the subject of this research. Second, it provides an overview of the different definitions of the concepts of efficiency, effectiveness and economy and the relationship between those concepts based on previous research. Finally, the subsidy system in the Netherlands and its relationship with the performance indicators is explained.

2.1 NON-PROFIT PERFORMING ARTS ORGANIZATIONS

Preforming arts still is a broad term, containing several disciplines from dance and theatre to opera and live music which itself consists of many genres (Towse, 2010). This research looks at all the different genres, but focusses on non-profit performing arts organizations. Non-profit organizations have one distinguishing mark, namely that they are barred from distributing the net earnings. A non-profit organization is allowed to make a profit in the form of net earnings; however, these must be kept in the business to help further the objectives of the organization (West, 1987). As a result, the motivation to focus on financial goals is different from for profit organizations. Voss, Cable and Voss (2000) identify five value dimensions for non-profit professional theatres, which differ from the primary goals of other organizations. The first is a *prosocial value* which refers to the societal contribution that non-profit organizations aspire. The second are *artistic values*, related to art for art's sake. In regards to *financial values* they recognize a tension between artistic values, while having to deal with financial constraints. They also find a tension between art for art's sake and *market values*, achieving customer satisfaction. The last value achievement concerns an interest in *recognized excellence*.

Performing arts organizations have some additional specific characteristics that distinguish them from other organizations from an economic as well as an artistic point of view (Kirchner, Markowski, & Ford, 2007). First of all, the product, performances, can only be consumed at a specific moment in time, they are ephemeral. Regardless of the number of tickets sold and especially the number of possible unsold tickets, the costs per performance stay the same. Also the product relates to aesthetics and is experimental and interpretive which results in an ambiguous and unstable environment with uncertain customer demand and where success is unpredictable (Voss, Cable, & Voss, 2000). Additionally, performing arts organizations have a high amount of fixed – sunk costs related to the creation process and rehearsals that are unrelated to the amount of performances and the amount of visitors (Towse, 2010). In regards to these costs, Baumol's cost disease hypothesizes that performing arts organizations face rising resource and operating costs due to rising wages whilst being unable to achieve significant productivity gains (Baumol & Bowen, 1966). While other organizations are able to make the production process more efficient due to for example technology, an orchestra needs a certain amount of musicians to perform and is not able to for example play without a harpist or cut two of the violinists from a piece. This phenomenon is presented as one of the reasons why there is a need for governmental intervention. There are a few objections to Baumol's cost disease, other

authors state that in case of economic growth as a result of increasing productivity, incomes rise which means that demand can be sustained as a result of positive income elasticity, even if prices should rise above the normal rate of inflation. Additionally, cost disease is a market outcome and not market failure, which is required to make a case for arts subsidies.

2.2 THE THREE E'S

This section explains the concepts of *efficiency*, *effectiveness* and *economy* based on previous research. Because the literature concerning these concepts is limited within the field of cultural economics, to define these concepts several researches with a broader scope concerning (non-)profit organizations (including hospitals, public schools and public transit organizations) have been reviewed. Table 1 provides an overview of the different definitions of the concepts, the aim of the research and the method used.

Table 1 Definitions and methods used researching efficiency, effectiveness and economy

Author(s)/source	Definition	Aim & Approach
Nyman & Bricker (1989)	*Efficiency*: a given number of outputs with the fewest number of inputs.	Calculate efficiency scores using Data Envelopment Analysis (DEA) and regression analysis to investigate the determinants of efficiency. Analysis of 184 nursing homes.
Ostroff & Schmitt (1993)	*Efficiency*: input-output ratio or comparison. *Effectiveness*: an absolute level of either input acquisition or outcome attainment.	Examine the relationship between various characteristic of organizations and the effectiveness and efficiency. Discriminant analysis of data of 172 secondary schools.
Forbes (1998)	*Effectiveness*: several approaches – goal-attainment approach, system resource approach, reputational approach, multidimensional approach, emergent approach.	Literature review of empirical studies on non-profit effectiveness from 1977-1997 .
Karlaftis & McCarthy (1998)	*Efficiency*: the amount of output produced per unit of input, or the level of input necessary to produce a given amount of output. *Effectiveness*: How well the system meets its intended objectives.	Analyse the effect of operating subsidies on performance. Multiple regression over 12 years in public transit.
Gilhesphy (1999)	*Efficiency*: the best possible	Present a model of a performance

	relationship between inputs and outputs. *Effectiveness*: how far the output achieves the objectives. *Economy*: how actual input costs compare with planned or expected costs.	measurement system for application to and by cultural organizations 27 interviews with key professionals in the management of or arts organizations.
Davis & Pett (2002)	*Efficiency*: the amount of output obtained from a given input. *Effectiveness*: the resource getting ability of an organization.	Develop a typology of efficiency and effectiveness and explore the possible relationship between efficiency, effectiveness and business level strategies. Questionnaire, 1383 managers in the paper and pulp industry.
Bishop & Brand (2003)	*Efficiency*: the relationship between outputs and inputs.	Examine the technical efficiency of museums using the parametric stochastic frontier approach based on 153 questionnaires
Asmild, Paradi & Tam (2007)	*Efficiency*: performing activities as well as possible, doing things right. *Effectiveness*: the proper selection of the activities, doing the right thing.	Present a framework where Data Envelopment Analysis (DEA) is used to measure overall efficiency, and show how to apply this framework to assess effectiveness in the banking industry.
Herman & Renz (2008)	*Effectiveness*: to what extend does an organization reach its goals.	Literature review on organizational effectiveness in non-profit organizations and formulate 6 theses.
Mahamalat (2013)	*Efficiency*: earnings gap, wages over sales ratio.	Investigate efficiency among German versus American Opera Houses, analysis of the balance sheets and income statements of 12 opera houses between 2006 and 2010.
Barrio & Herrero (2014)	*Technical efficiency*: management related, how well the institution functions. *Scale efficiency:* related to the size of the museum.	Evaluate efficiency of museums using Data Envelopment Analysis (DEA). Analysis of quantitative information from a survey completed by 23 museums.

Efficiency

Efficiency is in management literature often referred to as doing things right (Asmild, Paradi, Reese, & Tam, 2007). In general efficiency concerns the relationship between inputs and outputs (Nyman & Bricker, 1989; Ostroff & Schmitt, 1993; Karlaftis & McCarthy, 1998; Gilhespy, 1999; Davis & Pett, 2002; Bishop & Brand, 2003; Asmild, Paradi, Reese & Tam, 2007). More specifically an organization is most efficient when it finds the best possible relationship between inputs and outputs where input is defined as the amount of resources consumed (Gilhespy, 1999). Efficiency is in most cases based on quantitative information and often expressed as a ratio. In for profit literature Return on Assets (ROA) can be an indicator of efficiency (Tzelepis & Skuras, 2004). What makes it difficult in the case of non-profit organizations is that output maximization does not equal profit maximization. Mahmalat, Eng and Mus (2013) use the revenue structure, earnings gap and the wages over sales ratio to compare efficiency in opera houses. Previous research agrees that maximizing efficiency concerns finding the best possible relationship between input and output. However, what is included as input and what is seen as output differs.

According to Towse (2010) the different sources of input are earned an unearned income, and paid and unpaid labour. Earned income can be either direct, like ticket sales and income from merchandise and catering, and indirect such as public and private funding. Different sources of input adding to funds and time, are equipment and expertise (Liket, Rey-Garcia, & Maas, 2014). For museums Barrio and Herrero (2014) identify employment in fulltime equivalent (Fte), size of the museum in square meters and an indicator for the equipment that is essential to realize the museums activities as input. For output Towse (2010) suggests for cultural organizations to look at the number of performances, the number of attendees and/or the number of seats available for sale. Which is for museums translated to the number of visitors, an amount of temporary exhibitions measured in days of occupation per year, and two impact indicators; social impact of the museum and impact of the collection as output (Barrio & Herrero, 2014).

Effectiveness

In management literature Effectiveness is referred to as doing the right things (Asmild, Paradi, Reese, & Tam, 2007). Forbes (1998) distinguishes three major approaches to effectiveness. The *goal-attainment* approach defines effectiveness as the extent to which organizations meet their goals. This is based on the assumption that organizations' goals are identifiable and unambiguous. The *system resource* approach measures effectiveness as the ability of an organization to exploit resources from their environment. In the case of the *reputational approach* effectiveness is perception based and measured according to opinions of persons involved. Doing the right thing is mainly related to organizational goal attainment, this concerns how far the outputs achieve the objectives (Rushing, 1974; Ostroff & Schmitt, 1993; Karlaftis & McCarthy, 1998; Gilhespy, 1999; Asmild, Paradi, Reese & Tam, 2007; Herman & Renz, 2008).

In cultural organizations it is difficult to define the goals. Furthermore within the performing arts, management goals can conflict with organizational goals (Huges & Lukestich, 2004). Also, non-profit performing arts organizations have to deal with a lot of different requirements from different stakeholders (Alexiev, 2017). In the case of non-profit organizations, while receiving additional funding from external constituents can give an organization the freedom to focus on artistic goals, these relationships can also create extra tensions between the intrinsic values and the demands of financiers (Voss, Cable, & Voss, 2000). Artistic goals are not only highly subjective, but also related to impact. Effectiveness as a measure of goal attainment is by extension for cultural organizations also related to impact (Liket, Rey-Garcia, & Maas, 2014).

Economy

Gilhespy (1999) is one of the few researchers who include economy as an additional performance indicator. Economy refers to how actual costs match with planned or expected costs (Gilhespy, 1999). In practise this refers to the ability of organizations to reduce expenditures or to economize. Contrary to efficiency, economy is only related to inputs, and only considers the monetary part of input. Few researchers have previously included economy in the analysis of cultural organizations.

2.3 How are they related?

The relationship between efficiency and effectiveness is previously discussed in for profit management literature, less in non-profit literature. Even less attention has been given to the relationship between both concepts and the third, economy. First of all a distinction needs to be made between organizational strategy and actual organizational performance.

Among managers of performing arts organizations, a distinction has been made between an *and-and mind-set* and an *either-or mind-set*. In contrast to an and-and mind-set, managers with an either-or mind-set don't believe that both goals are equally important. Time spent on finding financial resources cannot be spent on pursuing artistic goals. Managers in cultural organizations however are convinced that they are able to focus on both efficiency and effectiveness (Alexiev, 2017). Alexiev (2017) finds that 80% of managers of cultural organizations experience these tensions as a result of scarcity of financial means. Using analysis of variances (ANOVA) and analysis of covariances (ANCOVA) Davis and Pett (2002) find that an emphasis on both efficiency and effectiveness results in a balanced performance. The research distinguishes either high or low levels of efficiency and effectiveness, using the relative mean for both concepts, and divides companies in four groups making different combinations. No evidence however is found that an asymmetrical performance is the result of an emphasis on either strategy.

Burton, Obel and DeSanctis (2011) write that efficiency and effectiveness are two competing goals. While all organizations value both efficiency and effectiveness to a certain degree, since resources such as time are not unlimited available, when defining an organizations strategy one has to

be the dominant priority. The creative processes of artists need room to thrive, but with limited resources, choices need to be made (Langeveld, Economie van het Theater, 2006). Money can only be spent once and the same goes for the time of the personnel. While efficiency can be seen as an important organizational goal, and therefore as a part of effectiveness (Tzelepis & Skuras, 2004), in cultural organizations it is plausible to assume that effectiveness is the primary goal. Since non-profit organizations are not allowed to distribute their net-earnings (West, 1987) there is no incentive to maximize profits for the sole purpose of making profit. Because they are only allowed to reinvest profits in order help further the organization's objectives (West, 1987) even making a profit contributes indirect to effectiveness. Maximizing profits is by definition not an organizational goal for non-profit organizations (Davis & Pett, 2002). Frey (2000) notes that most commercially produced art is of low quality suggesting that there is a trade-off between an efficiency and effectiveness strategy.

While managers can value both equally and performance on both indicators can be high, we to find a negative relationship between efficiency and effectiveness. In regards to efficiency. If input declines, which means high ability to economize, and output remains at the same level, organizations become more efficient. Based on the statement of fonds podiumkunsten (2015) that the amount of output, as a whole, has not declined, this research expects to find a positive relationship between economy and efficiency. Based on the same phenomenon a negative relationship is expected between economy and effectiveness.

2.4 The subsidy landscape in the Netherlands

As in most continental European countries, support for the arts has always been embedded in the Dutch culture. The development of clear governmental regulations however, is a phenomenon that is relatively recent. It was not until 1965 that in the Netherlands the ministry of Culture, Recreation and Social Work was founded (Zimmer & Toepler, 1999). There are several ways in which the government can support the arts (Overheidsuitgaven, 2015). They can either stimulate the demand for the arts using indirect subsidies, such as lower taxes on tickets or a tax discount on donations. Or use direct subsidies to stimulate arts supply. In the Netherlands, these direct subsidies are granted by the ministry of Education Culture and Science (OCW), municipalities, provinces and six national funds. These national funds are divided based on the different specialisations; cultural participation, performing arts, visual arts and heritage, film, literary arts, and the creative industry including architecture, design, e-culture and other possible cross-overs. A distinction is made between structural subsidies, which are allocated to facilitate continuous activities of cultural organizations, and incidental subsidies, which are allocated to projects which strengthen or support the existing cultural climate (Geldstromen, 2015).

The basisinfrastructuur

Since 2009, the Dutch subsidy system knows the *basisinfrastructuur* (BIS). A distinction is made between four different areas in which the government seeks to provide a "reasonable distribution of

activities that are the links that constitute the chain of creation, production and distribution and the accessibility and experience of cultural expressions" (Zijlstra, 2011). The organizations in the BIS are evaluated on quality, entrepreneurship, reaching a big and broad audience, education, and geographical location. It is important that an organization competes on an international level, and is able to generate its own income (Zijlstra, 2011). An organization that is included in the BIS is certain of four years of financing without having to apply each year. Every four years the BIS is evaluated and reconstituted.

POLICY GOALS AND OBJECTIVES

Historically, cultural policy is motivated mainly intrinsically (van den Hoogen, 2012). Intrinsic motivations, as opposed to extrinsic motivations, are related to quality, aesthetic value, and the option- and bequest value of cultural goods - art for art's sake (Throsby & Withers, 1983). Van den Hoogen (2012) lists how, over the years, accents have shifted in policy goals. Policymakers have shifted from a focus on economic legitimization around the 1980's to social legitimization in the first half of the 1990, especially focusing on the contribution of arts and culture to the empowerment of (disadvantaged) groups in society. In the second half of the 1990's, the focus shifted to the question whether policy efforts achieve the intended goals – related to the rising popularity of evidence based policy since 2000 (van den Hoogen, 2012; Liket, Rey-Garcia, & Maas, 2014). More recent, Bunnik (2016) identified the four most common criteria of governmental evaluation of cultural organizations: *artistic quality, audience reach, business quality* or *entrepreneurship,* and *added value* or *importance for the city.* While most constituents use the same or comparable criteria, it is more complicated to find a consensus on how to assess these criteria. Bunnik (2016) emphasizes the voice of the public and argues that quality can be evaluated also by the public. After all, if they do not appreciate what is on offer, they stay away.

2.5 THE INFLUENCE OF PUBLIC SUBSIDIES

As Voss, Cable and Voss (2000) indicate, depending on external constituents has the advantage that an organization can focus on (other) artistic goals, but on the other side it creates a tension between organizational values. In return for their contribution there is a possibility that constituents emphasise other organizational goals. Huges & Lukestich (2014) find that spending patterns of cultural organizations show that a greater reliance on private funding does not result in less emphasis on program services. This could indicate that organizational goals and governmental goals are more similar than it seems at first sight. Kirchner et. al. (2007) find that, while a higher level of government support results in a higher level of marketing activities, it also has a negative influence on financial performance. An increase in government subsidies is found to have a positive influence on productivity in the first year, but after the initial year subsidisation can make firms less efficient (Bergström, 2000). This suggests that non-profit performing arts organizations are prone to a subsidy

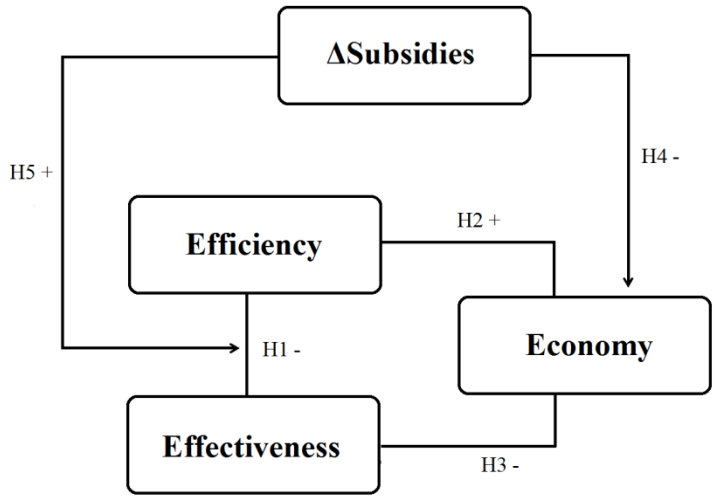
addiction as a result of government intervention (van den Born, van Klink, & van Witteloostuijn, 2011).

However, if subsidies decline, an organization becomes more reliant on other resources such as private donations or box office income to substitute the loss in subsidies. If this happens, the question that arises is whether the pursuit of other income, or trying to be more efficient, happens at the expense of obtaining artistic goals and therefore affecting effectiveness. This research is interested in the effect of changing levels of subsidies and it is expected that the change in subsidy has a negative influence on economy. When subsidies decline, a higher level of economizing is expected. Based on previous research it is expected that changing subsidies have a negative influence on the relationship between efficiency and effectiveness.

2.6 CONCEPTUAL MODEL

Based on the theoretical framework the model in Figure 1 shows the relationships this research is attempting to explain.

Figure 1 conceptual model



H1: there is a negative relationship between efficiency and effectiveness
H2: there is a positive relationship between efficiency and economy
H3: there is a negative relationship between effectiveness and economy
H4: Δsubsidies have a negative influence on economy
H5: Δsubsidies have a positive influence on the relationship between efficiency and effectiveness.

3. METHODOLOGY

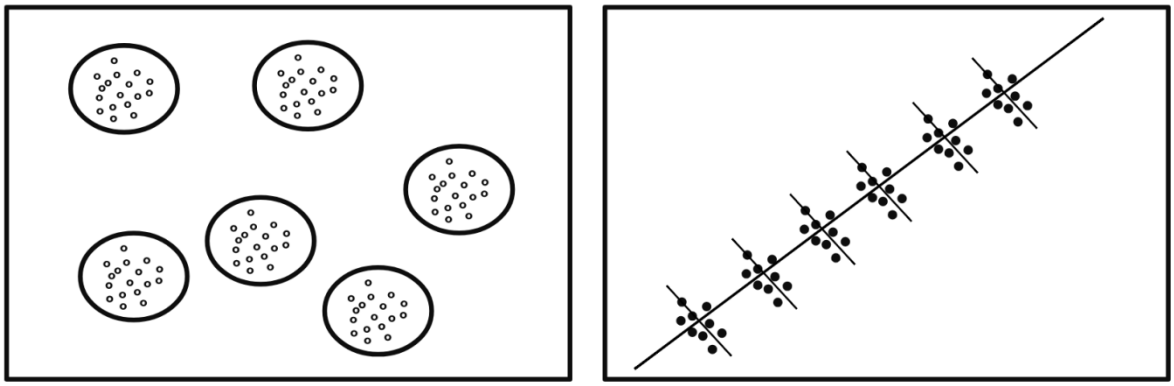
To provide an answer to the research question a quantitative strategy is applied. This is consistent with a deductive approach which is best suited for testing theories (Bryman, Social Research Methods, 2012). The first part of this chapter explains the research design and the method used. The second part of this chapter elaborates on the indicators of efficiency, effectiveness and economy.

3.1 RESEARCH DESIGN AND METHOD

A longitudinal design is used to understand causality (Bryman, Social Research Methods, 2012). Longitudinal research is usually time- and cost intensive and therefore not much performed. For this research data could be retrieved in retrospect. As a result the data are very general and concessions had to be made when operationalizing the concepts, but because of these concessions, this thesis is able to analyse a lot of data over a relatively long period of time.

Generalized linear mixed model (GLMM) analysis is used to explore the relationship between efficiency, effectiveness, economy and the effect of changes in the amount of total subsidies on the concept of economy and on the relationship between efficiency and effectiveness. By predicting the concepts in a regression model, causality can be determined and the effect of an increase of one unit of the independent variable on the dependent variable can be calculated. While linear regression models assume that the observations are independent. Mixed model regression adds to linear regression by allowing to recognize correlations between the data and allow for missing observations (Cnaan, Laird, & Slasor, 1997). GLMM recognizes relationships between clustered or hierarchical data, therefore it is much used in for longitudinal designs (McCulloch, 2003). The assumptions of GLMM are similar to linear regression. Linearity is assumed as is the independence of the error and the independent variable (IBM, n.d.). GLMM is often used in medical research where for example in the dataset a distinction is made between groups of patients, treated by different doctors, working at different medical centers, measuring the effects of different kinds of treatment on a specific disease. Comparable with patients, the performing arts organizations each have their own set of characteristics. In an unbalanced dataset which includes four observations of one organization and six or eight of another organization, which is often the case when collecting longitudinal data in retrospect, it would be distorting to treat the observations as independent. The same goes for the different amounts of organizations that are categorized as theatre or as a festival. For example in Figure 2 (UCLA, n.d.) six different groups of organizations are distinguished. An example of the results is shown where within each group the relationship between dependent and independent variable is negative, but between groups the relation is positive. GLMM recognized these relationships and allows us to explore these effects.

Figure 2 groups of data and relationship between variables



DATACOLLECTION

The data for this research are secondary data and were provided by the ministry of OCW and additional data by the Fonds Podiumkunsten (FPK), the national fund responsible for funding performing arts organizations. Data can be reviewed in retrospect because the organizations that receive subsidies are asked to report annually on their performance. They are asked to report on the number of realized performances and visits[1], in addition to a financial report. The ministry of OCW collects these data and uses a format which makes the data uniform and which makes it possible to compare and analyse the data. OCW has data collected these data starting from 2005. it would have been ideal to start the analysis from this year because then three policy periods could be compared. Four years before the financial crisis, four years after the financial crisis - but before the budget cuts and four years after the governmental budget cuts. However, changes have been made in the format that is used making it difficult, if not impossible, to compare 2005-2008 data to later data. From 2009 onward the same format is used; therefore a period of eight years, covering two policy periods can be analysed. This last period is proclaimed by the VSCD (Vereniging van Schouwburg- en Concertgebouwdirecties[2]) in their annual report of 2012, as a period of transformation for the Dutch stages (Alexiev, 2017), incorporating much of the austerity measures, which makes it a very interesting period to look at these organizations.

The dataset includes 882 observations of 144 organizations between 2009 and 2016. The sample consists of the whole population of performing arts organisations in the Netherlands that received multi-year financing either in the national BIS or from FPK. After the first policy period some have not received funding from OCW or FPK in the second policy period. From nine of these organizations additional data is obtained from the municipalities which have taken over as main subsidiary in this period.

[1] There is a difference between the number of visits and the number of unique visitors.
[2] Association of theatre and concert hall management

Table 2 shows the number of observations per year for the different sources of subsidies and per subsector. The subsidy sources mentioned sources are considered the main subsidiary and are not necessarily the only subsidiary of these organizations. For the research the total amount of subsidies is taken into consideration, including subsidies received from other (secondary) sources.

Table 2 Observations: main subsidiary, sector and year

Main subsidiary			**year**								**Total**
			2009	2010	2011	2012	2013	2014	2015	2016	
OCW	sector	Music	10	10	10	10	9	9	9	9	**76**
		Theatre	18	18	18	18	16	16	16	16	**136**
		Dance	11	11	11	11	5	4	4	4	**61**
		Opera and music theatre	3	3	3	3	2	3	3	3	**23**
	Total		**42**	**42**	**42**	**42**	**32**	**32**	**32**	**32**	**296**
FPK	sector	Music	33	33	33	33	14	13	13	13	**185**
		Theatre	39	39	39	39	18	17	16	16	**223**
		Dance	9	9	9	9	8	9	9	9	**71**
		Opera and music theatre	11	11	11	11	3	3	3	3	**56**
		Festival	6	6	6	6	0	0	0	0	**24**
	Total		**98**	**98**	**98**	**98**	**43**	**42**	**41**	**41**	**559**
MUN	sector	Music					3	3	3		**9**
		Theatre					5	5	5		**15**
		Dance					1	1	1		**3**
	Total						**9**	**9**	**9**		**27**
TOT			**140**	**140**	**140**	**140**	**84**	**83**	**82**	**73**	**882**

Note: OCW = the ministry of Education, Culture and Science; FPK = the fund for the Performing Arts; MUN = the municipality

Towse (2013) considers four genres within the performing arts – live music, dance, theatre and opera. OCW/FPK also identify festivals as a subsector because the differences with organizations that have a year round program. Also, they use a broader definition for opera, including all sorts of music theatre. In the period 2013-2016, one new organization was introduced in the BIS and eleven organizations that previously received subsidies from OCW were not again included in the BIS. Two continued to received funding from FPK and one continued being financed by the municipality. Of the 98

organizations that were subsidized by FPK between 2009-2012, 59 were excluded from multi-year financing in the period 2013-2016. Eight of those received funding from the municipalities in this period and two new organizations were introduced. One organization did not continue to receive financing from FPK after 2013 and one did not receive financing from FPK after 2014.

Data collection was started in the spring of 2017. In the autumn of 2017 the dataset was supplemented with data from the year 2016. This year completes the policy period. The data concerning 2016 includes 25 new organizations that were previously not included. These organizations were excluded from the dataset. Due to the limited time available, no effort was made to find the missing data over 2016 of the nine organizations that were subsidized by the municipalities between 2013-2016. Since this only concerns nine organizations this does not have major implications for the outcome.

OPERATIONALIZATION OF THE CONCEPTS

According to previous research efficiency concerns the relationship between input and output. In the literature input has been considered to consists of income, labour, expertise and equipment and output is the number of performances, number of attendees and the number of seats available for sale (Towse, 2010; Liket, Rey-Garcia, & Maas, 2012). Due to the time and data constraint, this research considers income as the only reliable source of input. For performing arts organizations it is difficult to quantify the labour since there are a lot of unpaid jobs and unpaid hours involved. Also, there are a lot of freelancers working in the cultural sector (Ministerie van Onderwijs, 2016). These hours are difficult to compare since not all are registered the same way or sometimes the data is not available at all. Expertise is difficult to measure and information about expertise and equipment is not uniformly available. Regarding output, the number of productions, the number of performances and the number of attendees are known. Per production organizations usually have several performances. Due to the limited time available, no impact indicators are included in the measurement of output and neither is the amount of seats available for sale since this is not included in the dataset. Since the number of attendees is more of an indirect output that is difficult to influence by the organization, the ratio for efficiency is based on total income divided by the number of performances that year. As organizations should strive for the lowest amount of input for the highest amount of outputs a higher ratio implies lower efficiency since a higher ratio is a consequence of a higher value for input or lower value for output.

Effectiveness is referred to as being able to attain organizational goals (Rushing, 1974; Ostroff & Schmitt, 1993; Karlaftis & McCarthy, 1998; Gilhespy, 1999; Asmild, Paradi, Reese & Tam, 2007; Herman & Renz, 2008). This research assumes that the common goals of the organizations in this dataset are similar to the policy goals and indicators identified by Bunnik (2016). Business quality and entrepreneurship is closely related to efficiency and economy, therefore it is not included in this indicator to prevent interdependence. Artistic quality is difficult to express and is mostly judged by

externa experts. Since all the organizations in the population have received funding from important government bodies it can be assumed that the artistic quality is sufficient. As suggested by Bunnik (2016) total visits is taken as an indicator for both artistic quality and audience reach, since more detailed information about the composition of the audience is not available. Effectiveness is also related to impact (Liket, Rey-Garcia, & Maas, 2014). The impact of a performance can be translated into the audience that is reached per performance. A higher ratio value of effectiveness in this case means a higher level of effectiveness.

Economy is defined as how actual costs match with planned or expected costs (Gilhespy, 1999). Since there is no information available on the budget at the beginning of the year, the difference in organizational costs between years is used as a measure of economy. As shown in Table 4 in chapter 4.1 Descriptive statistics, the values need log transformation for analysis. Therefore a ratio is used, since it is not possible to take the natural logarithm of a negative integer. Dividing the total costs per performance from the year before by the total costs per performance of the year of interest gives a ratio that can be interpreted as follows: values > 1 indicate economizing, the higher the value the greater the economization. Values < 1 indicate higher costs per performance, for example a value of 0,5 indicates that costs per performance have doubled since the year before.

The change in subsidies is a ratio value, for the same reason as for economy, based on the total of received subsidies in the year of interest divided by the total of received subsidies in the year before. If subsidy > 1 it indicates an increase in subsidies. If subsidy < 1, the total of subsidies has declined. shows the descriptive statistics for the variables used in the equations. In case the amount of total costs, the number of performances or the number of visits was equal to zero it was treated as a missing value. Table 3 show the formulas used to calculate a ratio value for the concepts.

Table 3 Operationalization of the concepts

Concept	Used formula	Measurement level	Number of observations
Efficiency	$\frac{Total\ income}{\#\ performances}$	Ratio	873
Effectiveness	$\frac{\#\ visits}{\#\ performances}$	Ratio	873
Economy	$\frac{Total\ costs_{t-1} / \#\ performances_{t-1}}{Total\ costs_{t0} / \#\ performances_{t0}}$	Ratio	742
ΔSubsidy	$\frac{Subsidy_{t0}}{Subsidy_{t-1}}$	Ratio	742

4. ANALYSIS

4.1 DESCRIPTIVE STATISTICS

Table 4 shows the descriptive statistics for all the variables that are used in calculating the values for the concepts. Total income consists of earned and unearned income. Earned income can either be direct income, for example from ticket sales, or indirect income from merchandise and catering. Unearned income distinguishes between private funding, from sponsors and private funds and public funds such as governmental subsidies. Total subsidies include all public and private subsidies, not sponsors, both structural and incidental subsidies. Total costs is the sum of activity costs and organizational costs. The standard deviation indicates large differences within the group.

Table 4 Descriptive statistics for variables used

		Total income	Total subsidies	Total costs	Performances	Visits
N	Valid	881	880	839	873	873
	Missing	1	2	43	9	9
Mean		2874927	2065735	2798403	113.95	32404.02
Std. Deviation		5144909	3648608	4996384	97.0	39099.79
Minimum		668	668	456	1	180
Maximum		37265000	25737000	36293000	870	250000

The descriptive statistics for the concepts are shown in Table 5. For all distributions the values of both skewness and kurtosis are high. To approximate a normal distribution log transformation is used. Figure 4 - Figure 11 in Appendix II show the distribution of the original concepts and the corrected distribution after log transformation.

Table 5 Descriptive statistics for the concepts

		Efficiency	Effectiveness	Economy	Subsidy
N	Valid	873	873	666	738
	Missing	9	9	216	144
Mean		29838.90	307.60	1.437	1.280
Std. Deviation		55392.59	330.20	4.392	6.077
Skewness		4.329	2.538	21.025	25.952
Kurtosis		23.735	7.473	490.951	689.852
Minimum		1274.64	.00	.05	.00
Maximum		552727.77	2118.64	106.17	163.36

After log transformation the values for kurtosis in the distribution of economy and especially for subsidy are still too high to assume normality, which is required for linear regression. This is probably because during each policy period the structural subsidies remain at the same level. These organizations don't often receive additional incidental subsidies and if they do, this is usually only a small amount compared to the structural subsidies which can result in outliers. Table 6 shows the descriptive statistics after log transformation.

Table 6 Descriptive statistics for log transformed concepts

		LnEfficiency	LnEffectiveness	LnEconomy	LnSubsidy
N	Valid	873	871	666	738
	Missing	9	11	216	144
Mean		9.52	5.34	.03	-.02
Std. Deviation		1.13	.84	.62	.45
Skewness		.70	.50	.82	-2.24
Std. Error of Skewness		.08	.08	.10	.09
Kurtosis		.25	-.22	9.20	81.36
Std. Error of Kurtosis		.17	.17	.19	.18
Minimum		7.15	3.07	-2.98	-5.71
Maximum		13.22	7.66	4.67	5.10

A Pearson's correlation was run to determine the relationship between efficiency, effectiveness and economy. Table 7 shows a strong significant positive correlation between efficiency and effectiveness and a very weak but significant negative correlation between efficiency and economy.

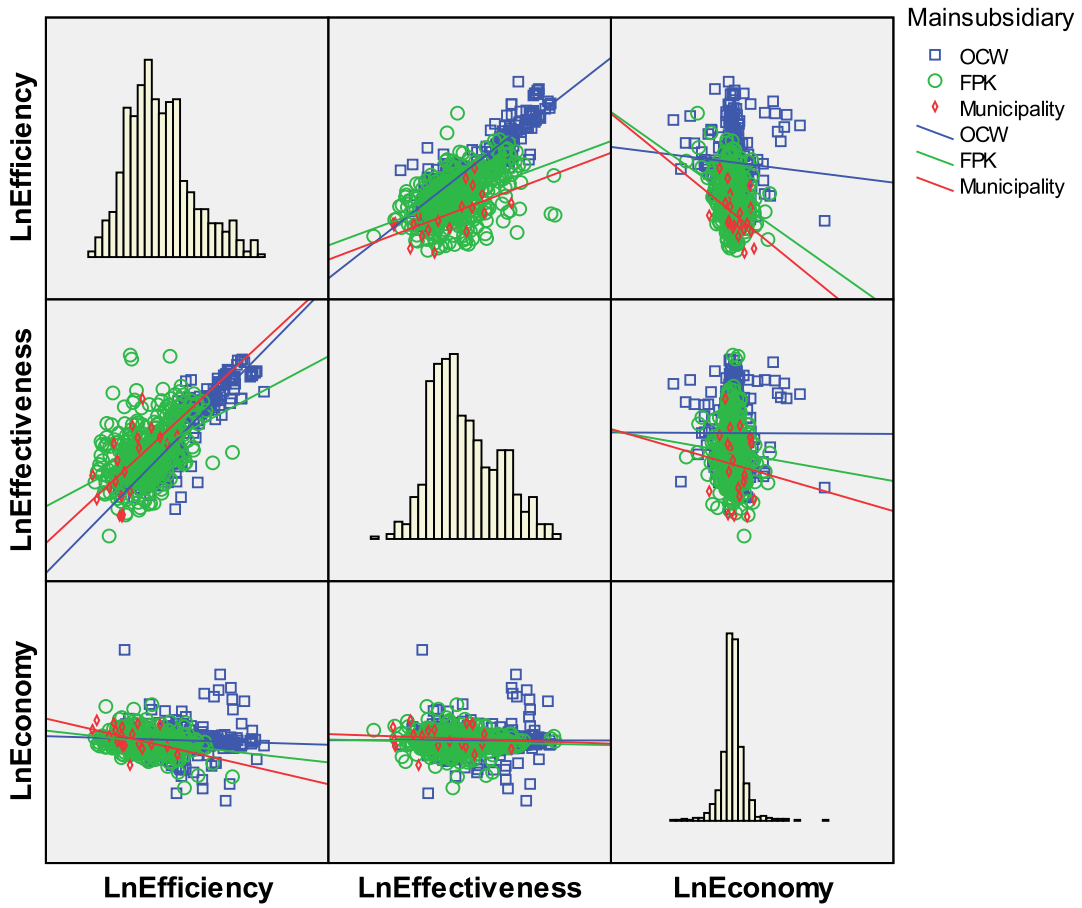
Table 7 Correlation matrix

		Efficiency	Effectiveness	Economy
Efficiency	Pearson Correlation	1	,697**	-,102**
Effectiveness	Pearson Correlation	,697**	1	-,012
Economy	Pearson Correlation	-,102**	-,012	1

*Note: **. Correlation is significant at the 0.01 level (2-tailed).*

The scatterplot in Figure 3 visualizes the correlation coefficient and takes into account the main subsidiary as a possible intervening variable. Slight differences are visible when dividing according to main subsidiary, but no apparent spuriousness.

Figure 3 matrix scatterplot of the relationship between efficiency, effectiveness, and economy



4.2 Generalized Linear Mixed Model analysis

To determine causality and calculate the effects on the dependent variables GLMM is used. GLMM is found to be significantly a better fit $F = 7.38$ ($p < 0.01$) than linear regression $F = 4.911$ ($p < 0.01$). The data do not violate the assumptions of linearity and homoscedasticity. No multicollinearity is found between the concepts.

The models include the effect of the two concepts on the third concept. In the third model to predict economy, the change in subsidies is included as a direct effect. In the first two models predicting a value for efficiency and effectiveness, subsidy changes are included as an interaction effect to measure the effect on the relationship between efficiency and effectiveness, rather than a direct effect on either of the two concepts.

To control for aggregate trends and possible environmental factors, the years are included as dummy variables. It allows the model to allocate a part of the variation to unobserved events that occurred during each year. The AIC (Akaike information criterion) and BIC (Bayesian information

criterion) together with the -2 log likelihood[3] indicate that for economy a model excluding the years as dummy variables is a better fit. Therefore the year-dummy variables are only included in the models estimating efficiency and effectiveness. 2009 is excluded because for economy and Δsubsidies the value for the year t-1 is not known for 2009. 2015 used as a reference year and therefore excluded from the models. No other control variables are included in the model since there are no uniform data available.

The following models are estimated:

$$EFFICIENCY_{it} = \alpha + \beta 1 EFFECTIVENESS_{it} + \beta 2 ECONOMY_{it} + \beta 3 EFFECTIVENESS * \Delta SUBSIDIES + \beta 4\text{DUMMY2010} + \beta 5\text{DUMMY2011} + \beta 6\text{DUMMY2012} + \beta 7\text{DUMMY2013} + \beta 8\text{DUMMY2014} + \beta 9\text{DUMMY2016} + \varepsilon_{it} \quad (1)$$

$$EFFECTIVENESS_{it} = \alpha + \beta 1 EFFICIENCY_{it} + \beta 2 ECONOMY_{it} + \beta 3 EFFICIENCY * \Delta SUBSIDIES + \beta 4\text{DUMMY2010} + \beta 5\text{DUMMY2011} + \beta 6\text{DUMMY2012} + \beta 7\text{DUMMY2013} + \beta 8\text{DUMMY2014} + \beta 9\text{DUMMY2016} + \varepsilon_{it} \quad (2)$$

$$ECONOMY_{it} = \alpha + \beta 1 EFFICIENCY_{it} + \beta 2 EFFECTIVENESS_{it} + \beta 3 \Delta SUBSIDIES_{it} + \varepsilon_{it} \quad (3)$$

Where i = organization and t = year

Effectiveness is found to have a significant strong and positive effect on efficiency which is also significant negatively influenced by economy. The interaction effect of Δsubsidy on the relationship between efficiency and effectiveness is not significant (p=.422). There is a significant weak positive effect of both efficiency and economy on effectiveness in model 2 the interaction effect of Δsubsidy on the relationship between efficiency and effectiveness is again not significant (p=.188) . The effects of efficiency, effectiveness and Δsubsidy on economy are found to be significant but weak respectively negative, positive, negative. Of the dummy variables only 2011 is found to have a significant effect on efficiency (p=.084) and effectiveness (p=.40). Table 8 shows a summary of the coefficients for all three models. The detailed output of the GLMM can be found in Appendix II.

[3] AIC, BIC and -2 log likelihood have a relative value, the smallest number indicates the best fit. By predicting the concepts in a regression model, causality can be determined.

Table 8 Summary of coefficients

Variable	Model 1 Coefficient	Model 2 Coefficient	Model 3 Coefficient
Intercept	5.391***	1.029***	1.122***
Efficiency		.046***	-.178***
Effectiveness	.770***		.113***
Economy	-.224***	.049*	
ΔSubsidy			-.138*
Effectiveness*ΔSubsidy	.014		
Efficiency*ΔSubsidy		-.010	
dummy 2010	-.144	.105	
dummy 2011	-.164*	.139**	
dummy 2012	-.128	.048	
dummy 2013	.104	.055	
dummy 2014	.123	-.072	
dummy 2016	.115	-.099	

Note ** p < 0.1; ** p < 0.05; *** p < 0.01*

Since the variables are log transformed using the natural log (ln) in order to interpret the coefficients, the exponentiated values need to be calculated. So for model 1 the value for the intercept is 219.42 ($e^{5.391}$). For model 2 this is 2.80 ($e^{1.029}$) and for model 3 the intercept is 3.07 ($e^{1.122}$). Because both the outcome variable and the predictor variable are log transformed to interpret the coefficient, the following equation needs to be solved (UCLA Institute for Digital Research and Education):

$$\ln(EFFICIENCY_{t+1}) - \ln(EFFICIENCY_{t=0}) = \beta 1 * (\ln(EFFECTIVENESS_{t+1}) - \ln(EFFECTIVENESS_{t=0}))$$

Which can be simplified to:

$$\ln\left(\frac{EFFICIENCY_{t+1}}{EFFICIENCY_{t=0}}\right) = \beta 1 * (\ln(\frac{EFFECTIVENESS_{t+1}}{EFFECTIVENESS_{t=0}}))$$

Which leads to:

$$\frac{EFFICIENCY_{t+1}}{EFFICIENCY_{t=0}} = \frac{EFFECTIVENESS_{t+1}}{EFFECTIVENESS_{t=0}}^{\beta 1}$$

For example a 10% increase in the ratio for effectiveness results in a ($1.1^{0.770}$) = 1.0761 = 7.61% increase in the ratio for efficiency. When applying the same formula on the other coefficients Table 9

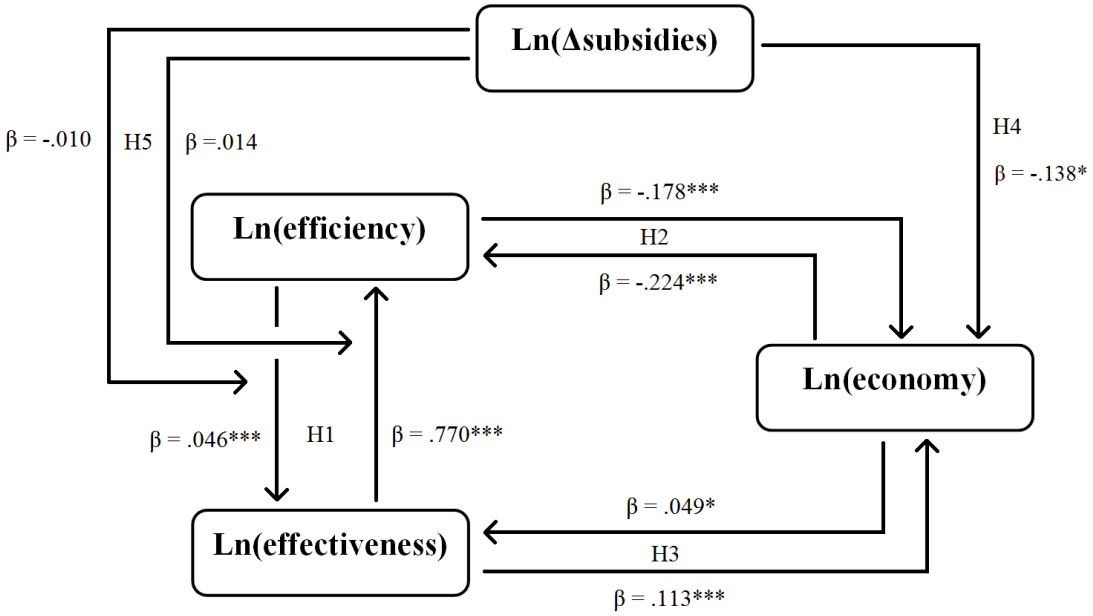
shows the effect of a 10% increase of the independent variable on the dependent variable in percentages.

Table 9 effect of a 10% change of independent variable

Variable	Model 1 Coefficient	Model 2 Coefficient	Model 3 Coefficient
Efficiency		.046***	-.178***
Effectiveness	7.61%		.113***
Economy	-2,11%	.049*	
ΔSubsidy			-.138*

5. DISCUSSION

Figure 4 model and effects



Note ** p < 0.1; ** p < 0.05; *** p < 0.01*

5.1 EFFECTS ON EFFICIENCY

The strongest significant effect that is found is the effect of effectiveness on efficiency (H1). The positive β indicates that a higher value for effectiveness results in a higher value for efficiency. This means an increase in the number of visitors per performance results in an increase of income per performance or rather a higher amount of input per unit of output. This means that while the value for β is positive higher effectiveness results in lower efficiency. This negative relationship is consistent with the findings of Frey (2000) and Burton Obel and DeSanctis (2011) who finds among commercial organizations that there is a trade-off between efficiency and effectiveness. This suggests that the difference between commercial organizations and non-profit performing arts organizations is smaller than expected. While Alexiev (2017) finds that managers of cultural organizations can have an and-and mind-set focussing on both efficiency and effectiveness, this research shows that when it comes to performance, higher effectiveness comes at a cost of lower efficiency. What could play a role in this, is the fact that non-profit organizations are obligated to reinvest their profits (West, 1987). While in theory this means that organizations are allowed to make a profit and can reinvest these at a later time, in practise a profit can result in a reduction of contributions of subsidizers. If there could be a more flexible system, this might create an incentive for organizations to become more efficient, closing the gap between ambition and performance.

The effect of economy on efficiency (H2) is consistent with the finding of FPK. This research finds that higher levels of cost reduction also lead to lower input per unit of output. This could indicate

that the loss of subsidies is compensated by being more efficient either finding other sources of income or producing at a lower costs per performance, but does not result in less performances overall (FondsPodiumkunsten, 2015, p. 4). This could be the result of performance agreements between organization and subsidiary. The threat of a subsidy discount can be the cause of, for example, more co-productions.

5.2 Effects on effectiveness

The effect of efficiency on effectiveness (H1), while having the same direction, is much weaker. The effect of economy on effectiveness (H3) is also a weak effect. The weak effects on effectiveness suggest that effectiveness is a more natural goal for performing arts organizations. While organizations can still improve on efficiency or other performance indicators, effectiveness is as a primary goal always maximized and little influenced. This finding confirms Voss, Cable and Voss (2000) who claim that product success and customer demand is uncertain and unpredictable for performing arts organizations due to the aesthetic, interpretive and experimental value of the performances. That the relationship between economizing and visitors per performance is positive was not expected. Previous research has not thoroughly investigated this relationship. A possible explanation for this positive relationship could be in programming. Organizations could choose to programme more blockbusters and reprises instead of more experimental (new) productions, resulting in a higher number of visits per performance. Since programming diversity is not included as an indicator for effectiveness this is not measured in this research. This needs further exploration. Cultural organizations need room for experiment and failure in order to advance. To give a more detailed view of effectiveness, a uniform method should be developed to measure and include performance indicators on experiment and innovation when expressing effectiveness.

5.3 Effects on economy

Efficiency and effectiveness both have a weak, positive effect on economy (H2 & H3). This means that higher numbers of visitors per performance and higher income per performance lead to slightly lower total costs. An explanation could be the trend of co-producing. Sharing production costs with other organizations leads to lower costs per production or performance. This also affects programming diversity and should therefore be further explored.

The effect of changing subsidies is found to have a slightly significant negative effect on economy. Declining subsidies lead to lower cost per performance, which is consistent with the expectation that performing arts organizations are not able to supplement their resources with other funds. It however is a weak effect, this can be explained because performing arts organizations have to deal with a great amount of fixed costs (Towse, 2010). First of all is it difficult to instantly cut back on these fixed costs, for example due to long term contracts, this explains the increasing amount of freelancers in the sector (Ministerie van Onderwijs, 2016). While a high amount of freelancers makes an organization more flexible, this flexible relationship makes the position of a freelancer very

insecure this lack of long-term prospects can result in artistic limitations. Additionally Baumols cost disease makes the performing arts difficult to economize. This research does not distinguish between the different kinds of constituents and the different kinds of subsidies. The population consists mainly of BIS organizations and organizations that receive or received multi-year financing from FPK. This could indicate a level of *too big to fail*. Additionally, because these organizations receive structural subsidies, this could make them less flexible as suggested by van den Born, van Klink en van Witteloostuijn (2011).

5.4 DUMMY EFFECTS

Only 2011 proved to have a slightly significant influence on efficiency and effectiveness. The negative effect on the value of efficiency, indicates higher efficiency and there is also a positive effect on effectiveness. This effect was not expected because the subsidy reformation was in 2012. This effect in 2011 could be the anticipation of the announced budget cuts.

5.5 MANAGEMENT AND POLICY IMPLICATIONS

Regarding efficiency there is room for improvement. Managers of non-profit performing arts organizations indicate that they value efficiency, but they might need a better incentive in practise. A more flexible subsidy system without a penalty for making a profit would motivate organizations to be more efficient. Therefore subsidiaries must place more trust in the organizations and at the same time organizations need to take responsibility and strive for efficiency, even if this is at the cost of public subsidies.

This research shows that effectiveness is only slightly influenced by the other concepts. This is partially because the indicator only incorporates audience reach. Governments and organizations should collaborate to formulate more qualitative, uniform indicators to give a more complete representation of effectiveness. Innovation and diversity are components that should be taken into consideration.

The effects on economy show that there is not a lot of flexibility in the organizations when it comes to cutting costs. Employees should not suffer from economizing. The government is already working in the right direction in their collaboration with the sector to formulate fair practise code. Now that there is additional funding available this should be used to create more room for experiment, failure and renewal. This to ensure the future of the sector.

5.6 LIMITATIONS, AND RECOMMENDATIONS

Because of simplifying the variables according to the data that are available, this thesis is able to research organizational performance for a large group of organizations over a longer period. However, in the case of efficiency it would be interesting to see if labour and resources can be quantified in a uniform way so they can be included in calculating efficiency. Only taking into account the monetary part of input leaves a chance that a monetary deficit is covered by labour either in the form of cheap

employees like interns or volunteers or in working unpaid overtime giving a distorted image of increasing efficiency. Especially unpaid overtime is difficult because it is often not registered and very common in the cultural sector.

To find better fitting aspects of effectiveness, additional qualitative research is needed. In qualitative research there is more room to look at organization specific goals which would give a more accurate representation of effectiveness. This research, due to time and resource constraints mostly overlooks aesthetic aspects of effectiveness. Artistic quality and diversity, for example in the form of new productions and revivals, but also experimental versus blockbuster programming, would be interesting to assess in further research.

Additionally, regarding economy, only weak correlations are found. A probable explanation is that economizing is difficult based on total costs since fixed costs are not only harder to eliminate, but also have an undetermined reaction period. It would be interesting to distinguish between fixed and variable costs. Looking at variable costs could give a more detailed view of an active reaction of organizations.

Lastly, although the total amount of subsidies had declined a great deal, the subsidies per organization have not changed that much. For future research it would be interesting to see whether the same effects are found in organizations that had to deal with larger changes in the amount of subsidies received.

5.7 CONCLUSION

This thesis sought to explain the relationships between three main performance indicators, efficiency, effectiveness and economy and the influence of changes in subsidy level on those indicators and these relationships. In conclusion, conform previous research a negative relationship was found between efficiency and effectiveness. Indicating that there is a trade-off between financial goals and other organizational goals. This relationship was not found to be influenced by changing levels of subsidy. Both the relationship between efficiency and economy and effectiveness and economy are found to be positive. Declining subsidies have shown to lead to more economizing, however it would be interesting to further investigate these relationships in a population with more diverse levels of change in subsidies. This thesis calls for subsidies not based on the number of performances or the number of visitors, but subsidies for experiment and innovation. Grant givers should place more trust in the organizations they subsidize and these in their turn must take more responsibility to not only maximize effectiveness, but also to work as efficient as possible.

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APPENDIX I

Figure 5 Histogram of efficiency

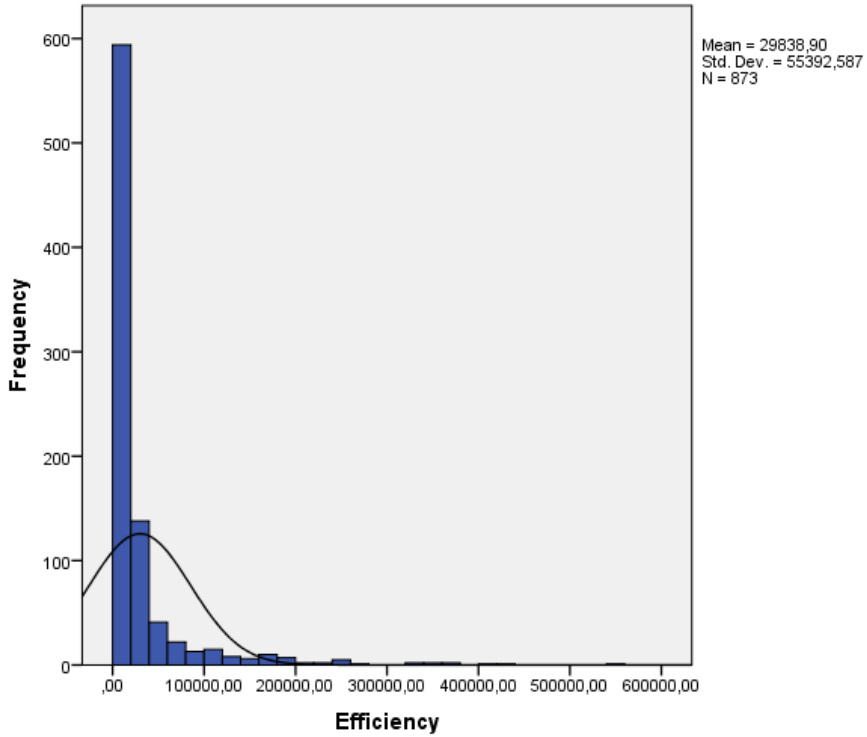


Figure 6 Histogram of log transformed value of efficiency

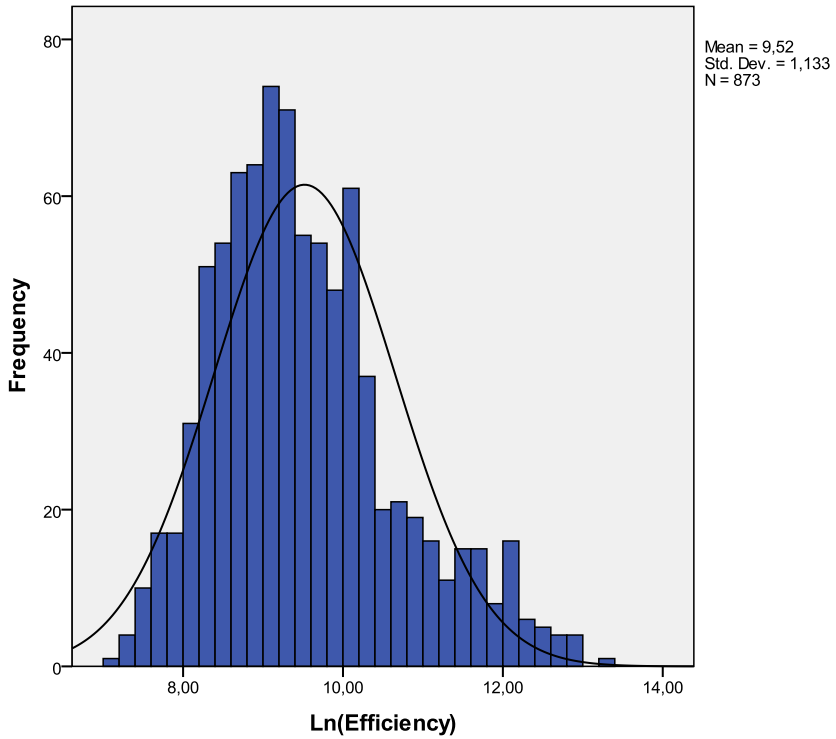


Figure 7 Histogram of effectiveness

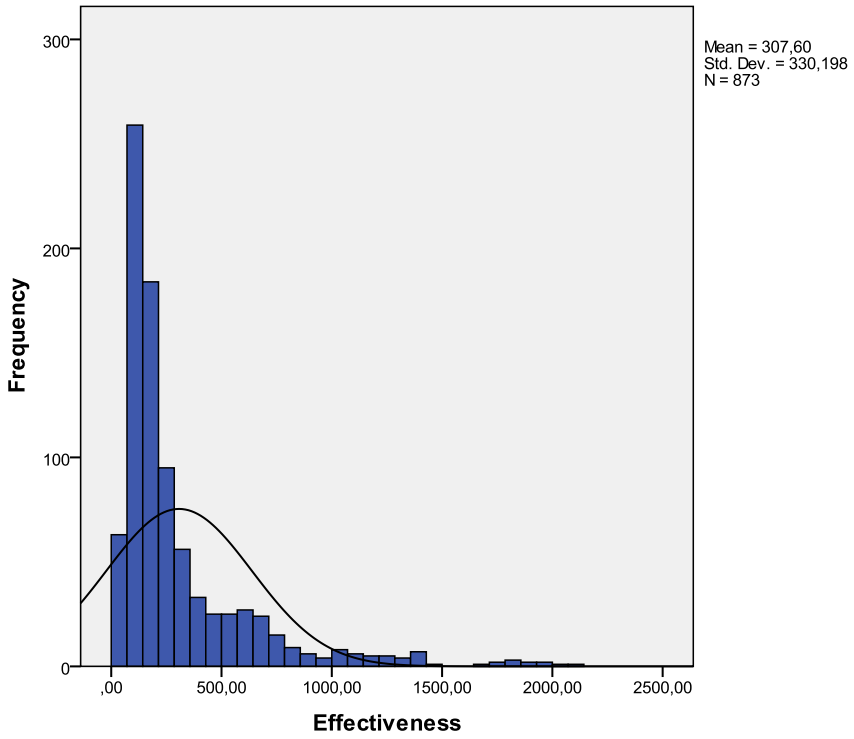


Figure 8 Histogram of log transformed value of effectiveness

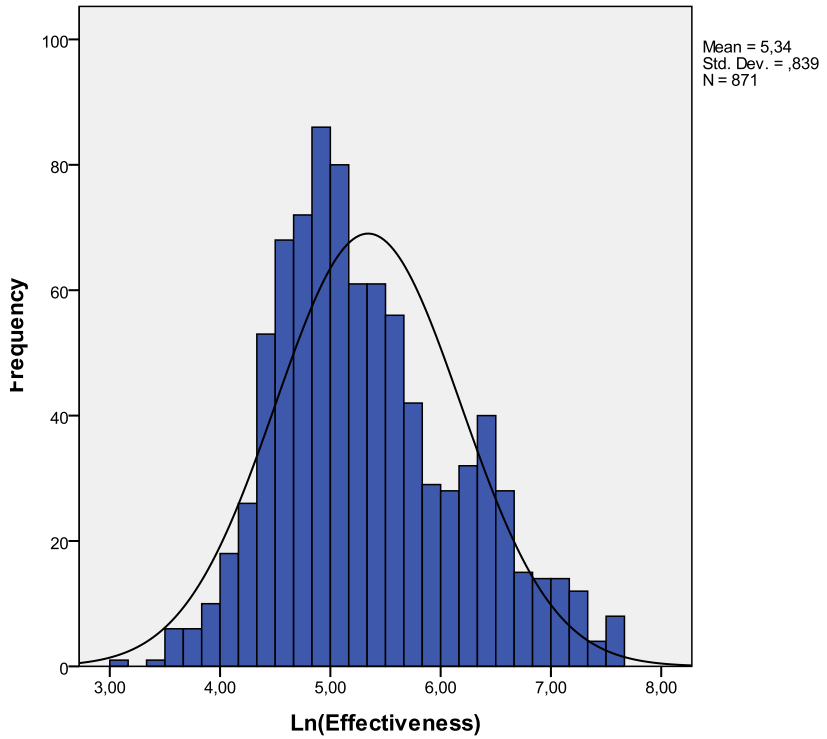


Figure 9 Histogram of economy

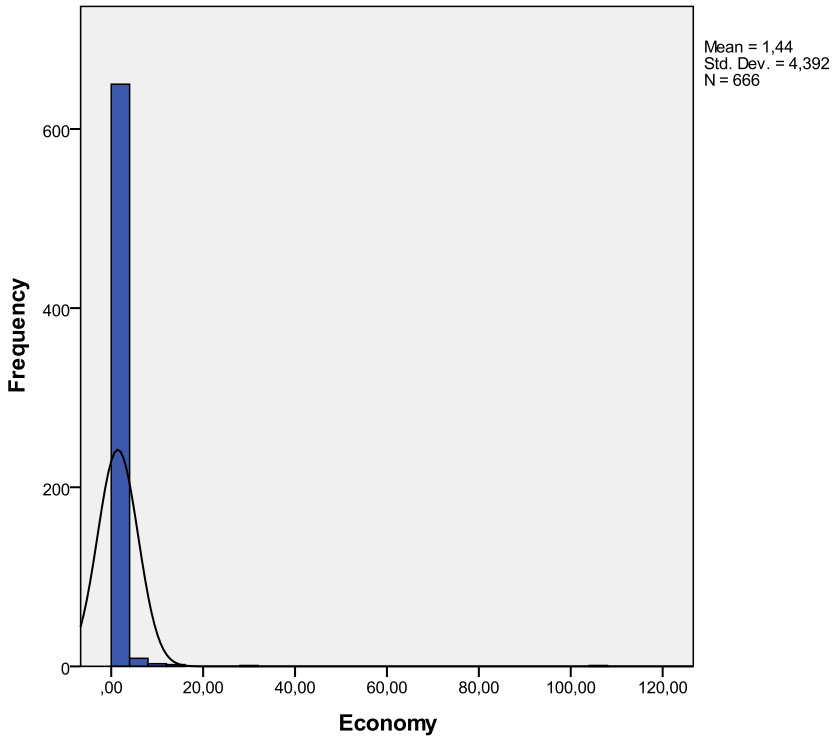


Figure 10 Histogram of log transformed value of economy

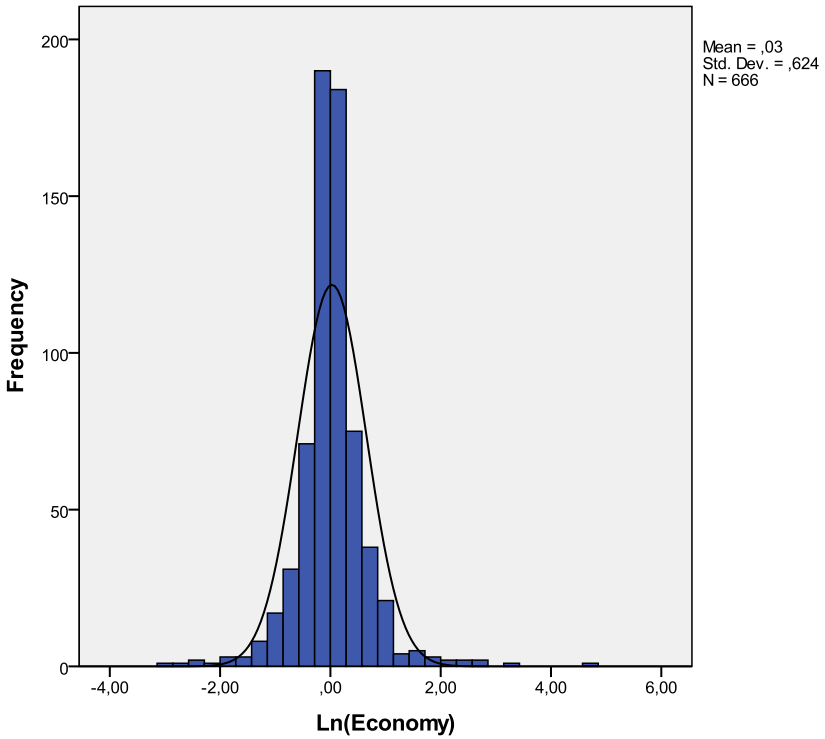


Figure 11 Histogram of Δsubsidy

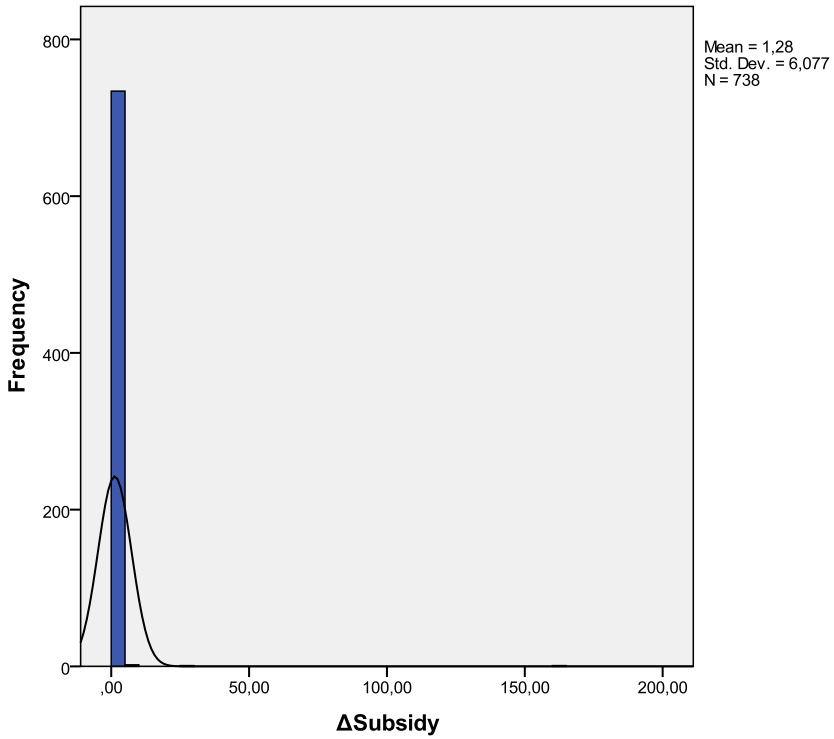
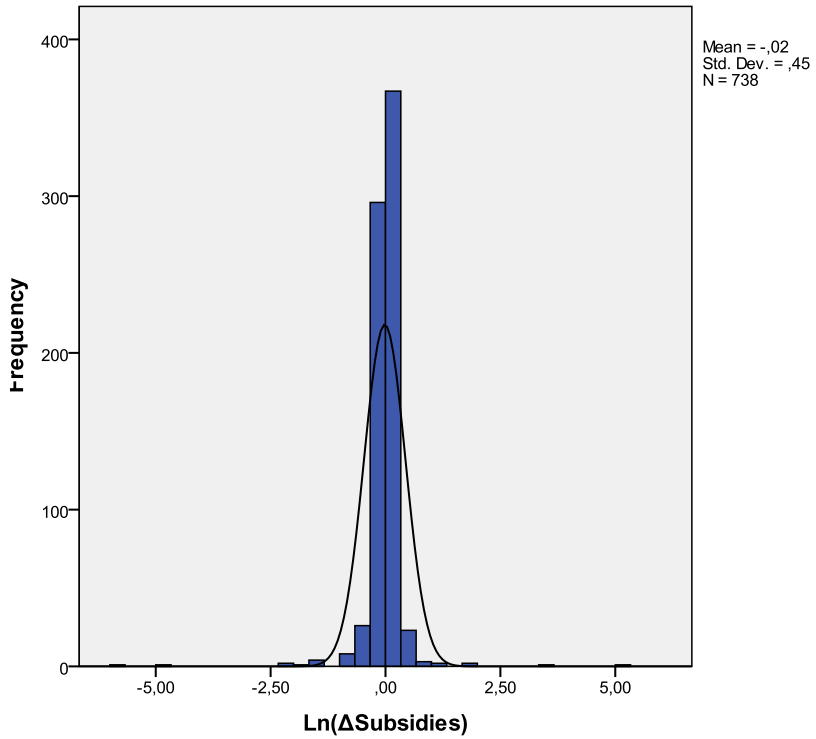


Figure 12 Histogram of log transformed value of Δsubsidy



APPENDIX II

Table 10 Results model efficiency

Parameter	Coefficient	*SE*	*t*	*p*	95% confidence interval	
					lower bound	upper bound
Intercept	5,391	0,620	8,692	0,000	4,173	6,608
Effectiveness	0,770	0,041	18,961	0,000	0,690	0,849
Economy	-0,224	0,040	-5,642	0,000	-0,301	-0,146
Effectiveness*Subsidy	0,014	0,018	0,803	0,422	-0,021	0,050
dummy 2009=0	0,000[a]					
dummy 2010=0	-0,144	0,098	-1,475	0,141	-0,337	0,048
dummy 2010=1	0,000[a]					
dummy 2011=0	-0,164	0,095	-1,733	0,084	-0,350	0,022
dummy 2011=1	0,000[a]					
dummy 2012=0	-0,128	0,104	-1,235	0,217	-0,332	0,076
dummy 2012=1	0,000[a]					
dummy 2013=0	0,104	0,095	1,101	0,271	-0,082	0,290
dummy 2013=1	0,000[a]					
dummy 2014=0	0,123	0,096	1,275	0,203	-0,066	0,312
dummy 2014=1	0,000[a]					
dummy 2015=0	0,000[a]					
dummy 2015=1	0,000[a]					
dummy 2016=0	0,115	0,095	1,208	0,227	-0,072	0,302
dummy 2016=1	0,000[a]					

Note [a] *this coefficient is set to zero because it is redundant*

Table 11 Results model effectiveness

Parameter	Coefficient	*SE*	*t*	*p*	95% confidence interval	
					lower bound	upper bound
Intercept	1,029	0,363	2,834	0,005	0,316	1,743
Economy	0,049	0,029	1,684	0,093	-0,008	0,106
Efficiency	0,046	0,023	19,678	0,000	0,413	0,505
Efficiency*Subsidy	-0,010	0,007	-1,318	0,188	-0,024	0,005
dummy 2009=0	0,000[a]					
dummy 2010=0	0,105	0,068	1,544	0,123	-0,029	0,240
dummy 2010=1	0,000[a]					
dummy 2011=0	0,139	0,067	2,059	0,040	0,006	0,271
dummy 2011=1	0,000[a]					
dummy 2012=0	0,048	0,075	0,634	0,526	-0,100	0,195
dummy 2012=1	0,000[a]					0,44
dummy 2013=0	0,055	0,062	-0,875	0,382	-0,177	0,068
dummy 2013=1	0,000[a]					
dummy 2014=0	-0,072	0,065	-1,095	0,274	-0,200	0,057
dummy 2014=1	0,000[a]					
dummy 2015=0	0,000[a]					
dummy 2015=1	0,000[a]					
dummy 2016=0	-0,099	0,062	-1,588	0,113	-0,221	0,023
dummy 2016=1	0,000[a]					

Note [a] *this coefficient is set to zero because it is redundant*

Table 12 Results model economy

Parameter	Coefficient	*SE*	*t*	*p*	95% confidence interval	
					lower bound	upper bound
Intercept	1,122	0,207	5,429	0,000	0,716	1,528
Efficiency	-0,178	0,025	-7,129	0,000	-0,227	-0,129
Effectiveness	0,113	0,032	3,511	0,000	0,050	-0,176
Subsidy	-0,138	0,080	-1,721	0,086	-0,295	0,019

Note [a] *this coefficient is set to zero because it is redundant*