State Aid in Europe – Investigating Factors Affecting Aid Intensity from a Business Perspective

Jan Philip Böckers
Maastricht University
J.Bockers@Student.Maastrichtuniversity.nl

ABSTRACT
The effect of state aid has been widely discussed in the existing literature from a policy makers point of view, yet the business perspective on obtaining state aid has not. This paper attempts to shed light on this viewpoint by examining potential factors affecting the aid intensity of state aid in Europe. It finds that the extent of state aid differs between countries, governing parties and the type of aid. Furthermore, it finds a general trend of decreasing aid intensities in Europe. Based on these findings, businesses can adapt their strategy to optimize their expected aid intensity.

Keywords
State aid, aid intensity, European Union, political affiliation

INTRODUCTION

The European Commission's (EC) 2016 decision, ruling the tax deal between Apple and the Republic of Ireland to be illegal state aid to the extent of €13 billion, has shown the significance of state aid in the European Union (EU) (European Commission, 2016a). Basis of this decision is the Treaty on the Functioning of the European Union, which ensures in Article 107 that aid granted by a member state or through state resources does not distort competition and trade within the EU (Council of the European Union, 2012). By hindering that governments favor certain companies or the production of certain goods, the EC attempts to maintain fair market conditions. Nevertheless, cases such as the one involving Apple come up on a frequent basis, with more than €101.2 billion of state aid being approved in 2014 (European Commission, 2016a). Amounting to 0.72% of the European GDP in 2014, it is of great importance for firms to understand the factors affecting the extent of state aid in the EU.

This paper investigates the question of: What are the factors influencing the extent to which government is willing to provide state aid to non-state actors? Taking the aid intensity, measured by the percentage of a projects costs covered by state aid, as a dependent variable, this paper will evaluate the impact of the following factors: The region within Europe; the political party in power; the type of state aid and the timing of the application. By regressing these against aid intensity, this adds to the existing literature by taking a business point of view on state aid, contrary to the more commonly discussed policy makers point of view. This approach may lead to findings that indicate how a firm can optimize its strategy in its effort to obtain state aid. In order to do so, this paper begins by defining state aid before analyzing the existing literature on this topic. Following this, the methodology will be outlined. Furthermore, this paper will then describe and analyze the results of the research. Finally, it will conclude by elaborating on the implications of the findings and outlining the limitations.

State Aid in Europe

A high-level view of state aid and the EU's classification thereof serves to illustrate its role for governments and businesses, permitting a detailed investigation into factors affecting aid intensity. In order to control state aid in the EU, a 'Transparency System for Regional Aid for Large Investment Projects' was created by the EC, in which state aid must be requested by any EU government based on the following definition: It is an "advantage in any form whatsoever conferred on a selective basis to business projects by national public authorities" (European Commission, 2016b). Therefore, subsidies granted to individuals or general measures open to all enterprises are not covered by this prohibition and do not constitute state aid. To qualify as illegal state aid, a measure must show the following features (European Commission, 2016b):

- There has been an intervention by the state or through state resources (e.g. grants or interest and tax reliefs, etc.).
- The intervention gives the recipient an advantage on a selective basis, for example to specific companies or industry sectors.
- Competition has been or may be distorted.
- The intervention is likely to affect trade between member states.

Aid Intensity and Absolute Value of Aid

Having defined state aid, it is important to quantify state aid for the purpose of this paper. To do so, there are two possible measures: The absolute amount of aid and the 'aid intensity'. The latter is defined as the maximum level of public funding that can be given to a project expressed as a percentage of the total costs eligible for support (European Commission, 2016b). While the absolute amount of aid might seem to be the most important factor for firms at first sight, it is strongly dependent on the nature and the size of the project. Additionally, aid intensity simplifies the comparison between different projects and according to Ginevičius et al. (2008), it is better than the absolute value in predicting the effectiveness and impact of aid. Altogether, aid intensity appears to be the more appropriate variable to analyze the extent of state aid.

Potential Factors

Considering the literature on this topic, not much research has been done specifically on the factors affecting the intensity of state aid. The focus is generally rather on foreign aid and its effects or the effectiveness of state aid from a policy makers' perspective. However, several authors have made findings which suggest that certain factors might have an impact on aid intensity. Taking the political party in power on a national level as a first potential factor, Thérien and Noël (2000) found that there is an effect of the governing party on foreign aid in the long run. Bringing this to a European level, McElroy and Benoit (2010) wrote that

party affiliation in Europe is primarily based on policy congruence, inferring that parties with similar stances on state aid will support the same political group on a European level. Therefore, the government's affiliation on an EU level might be a proxy for its opinion on state aid. An example would be that the European Peoples Party (EPP) would present similar views as the Dutch center-right party CDA. Another relevant factor might be the region the state aid is provided in. Kriesi (2016) divides Europe into three regions (Northwest, South and Central East) and finds that the EU is perceived differently by the people and governments, particularly with regard to its purpose. Following Kriesi, politicians in Central and Eastern Europe "tend to see the EU as a 'cash cow to be milked'" (Kriesi, 2016, p.43). This difference in perception might lead to a different behavior towards granting state aid. Another finding which could have implications on the aid intensity is that certain types of state aid are more likely to be supported by politicians (Hainz and Hakanes, 2009). More specifically, Hainz and Hakanes (2009) found that politicians prefer granting subsidized loans over direct subsidies, indicating that the type of aid is a factor to be considered by firms when applying for state aid.

METHODOLOGY AND RESEARCH DESIGN:

In order to evaluate the relevance of the aforementioned potential factors, this paper uses clustering, ANOVA and multiple linear regression. Based on the prior definition of state aid and the 'Transparency system for regional aid and large investment projects', the European Commission offers a public database on the intensity of granted state aid. This means that all approved state aid exceeding €300,000 over three fiscal years is in this database, excluding investments in R&D&I and railway infrastructure. Additionally, it provides the following data for each case: the country granting aid, the date of award and the type of aid. In order to test the influence of the governing party, the variable political party in power is added. The data sample consists of all 529 observations from 2003 – 2014.

Using this data, the paper will analyze the factors leading to successful government aid by first subjecting the 'awarding country' variable to hierarchical clustering before then testing with a one-way ANOVA if aid intensity is dependent on the political party in power. Lastly, it runs a multiple linear regression with aid intensity as a dependent variable. Using the clustering results, the following linear regression model was estimated:

$$Aid\ Intensity = \alpha + \beta_1(Country\_Clustered) + \beta_2(Aid\_Type) + \beta_3(Political\_Party) + \beta_4(Trend) + \varepsilon$$

Variables

Aid_Type: This variable refers to the type of aid granted by the national governments. Considering only the types which were the most important component in at least one state aid case granted from 2003 – 2014, the EC differentiates between 'grants', 'tax credits and other tax measures' and 'tax allowance and tax exemptions'. The former three are similar as they are all transferred in full to the recipient. This is different to the category 'tax allowance and tax exemptions', which is dependent on having a tax liability. Any excess amount will not be paid out (European Commission, 2016b). Based on this information the dummy variables D_TaxNonDep, and D_TaxDep will be used for the regression, using D_Grant as a baseline.

Political_Party: This variable refers to the party with the most seats in parliament in the country in which the state aid was authorized. To make this variable comparable, each party's European counterpart is used as a dummy variable. This results in the following variables: D_EPP for the conservative, center-right European Peoples Party; D_PES for the social-democratic, center-left Party of European Socialists; D_ALDE for the liberal center Alliance of Liberals and Democrats for Europe Party; and D_ACRE for the center-right Alliance of Conservatives and Reformists in Europe. In a year in which an election takes place, the party with the most seats over the majority of the year will be considered the awarding party. An exception to this is the Slovenian party 'Pozitivna Slovenija', which is considered part of ALDE due to the recent political alignments in Slovenia. Even though they are not formally part of this alliance, they have applied to be before deciding to not join any European party.

Trend: This variable refers to the year the aid is awarded in, taking 2003 as a baseline. By doing so, the variable controls for a trend in giving out higher/lower aid intensities in general. It variable is computed by the formula:

$$Trend = (Year\ awarded - 2003)$$

DATA ANALYSIS:

Clustering of countries

Kriesi (2016) found that Europe's states can be grouped into 'Northern and Western Europe' (NWE), 'Southern Europe' (SE) and 'Central and Eastern Europe' (CEE) based on their perception of the EU and their political activity. This clustering is later referred to as traditional grouping. In order to test whether this also extends to the aid intensity with which these countries give out state aid, a one-way ANOVA and Tukey HSD test was performed. While the ANOVA test confirmed that the means are different at the 1% significance level, the Tukey HSD test showed that the Hypothesis that SE and NWE have different means could not. In order to further improve this grouping, hierarchical clustering was used to group together the countries based on the intensity of the state aid they gave out in the time from 2003 – 2014. The results of this grouping suggested that there are 5 clusters with France, Ireland, Italy and the United Kingdom in the cluster with the lowest mean aid intensity. The cluster of countries with the highest mean aid intensity consists only of Poland. Further running an ANOVA test on this grouping confirms different means at the 1% significance level. The Tukey HSD test further shows that all means are different at the 1% level aside of group 4 and 5. Based on this these two groups are combined for the further course of this paper. These groups are referred to as C_Grp1, C_Grp2, etc. respectively (See table 1).

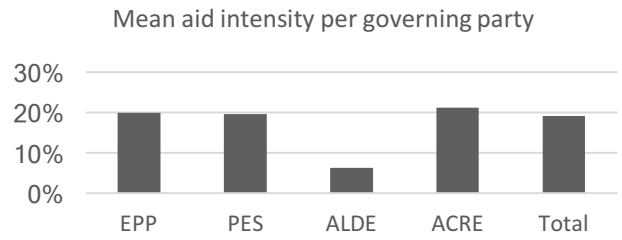
Table 1: Cluster allocation by country (Aid Intensity in%)

Cluster	Allocation	Mean
1	Germany	19.5
2	France, Ireland, Italy, United Kingdom	8.5
3	Austria, Belgium, Bulgaria, Netherlands, Portugal, Slovakia, Spain, Sweden	12.9
4	Czech Republic, Greece, Hungary, Romania	26.3
5	Poland	27.9

ANOVA of political party in power

Analyzing the previously defined variable Political_Party with an ANOVA test, it confirms at the 1% significance level that the mean aid intensity differs per awarding party. Going more into detail with a Tukey HSD test, it can be seen that the difference stems from the party ALDE, which mean is significantly different from all other parties. In comparison, the other parties' means do not differ significantly.

Figure 1: Mean aid intensity per governing party



Considering these results the dummy variable D_ALDE is added to the database taking all other political parties as the baseline. This variable is 1 if the previously defined political_party is equal to ALDE and 0 otherwise.

Regression Analysis

In order to get an overall view on the factors affecting aid intensity, this paper uses multiple linear regression. The model is based on the previous findings and operationalizes as:

$$\begin{aligned} Aid\ Intensity = \alpha &+ \beta_1(D\_C\_Grp2) + \beta_2(D\_C\_Grp3) \\ &+ \beta_3(D\_C\_Grp4\&5) \\ &+ \beta_4(D\_TaxDependent) \\ &+ \beta_5(D\_TaxNonDependent) \\ &+ \beta_6(D\_ALDE) + \beta_7(Trend) + \varepsilon \end{aligned}$$

This model results in an adjusted R^2 of 0.373 with all variables significant on the 1% level as shown in the following output:

Table 2: Output of multiple linear regression with Aid Intensity as dependent variable

Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.224	.013		16.901	.000
C_Grp2	-.091	.015	-.265	-6.008	.000
C_Grp3	-.071	.013	-.227	-5.254	.000
C_Grp4_5	.063	.012	.237	5.271	.000
Tax_NonD	.068	.017	.149	3.977	.000
Tax_Dep	.043	.012	.142	3.692	.000
D_ALDE	-.064	.022	-.111	-2.933	.004
Trend	-.006	.001	-.158	-4.307	.000

a. Dependent Variable: AidIntensity

The output suggests that on average countries in group 2 (France, Ireland, Italy and the United Kingdom) and group 3 (Austria, Belgium, Bulgaria, Netherlands, Portugal, Slovakia, Spain, Sweden) are expected to grant aid at a 9.1% and 7.1% lower aid intensity respectively compared to Germany. Aid in countries from group 4 and 5 (Czech Republic, Greece, Hungary, Rumania and Poland) are expected to have an average intensity of 6.3% higher than Germany. Considering the type of aid, both 'tax credits and other tax measures'(*Tax_NonD*) and 'tax allowance and tax exemptions'(*Tax_Dep*) are on average expected to have a 6.8% and 4.3% higher aid intensity relative to grants. Concerning the party with the most seats in parliament in the aid awarding country, if this party is affiliated with ALDE the aid is on average expected to be 6.4% lower relative to a country where it is not the case. Furthermore, according to the model, aid intensity has on average dropped by 0.6% yearly since 2003. Interpreting the constant and to give a typical case, state aid granted in Germany as a grant by an EPP majority government in 2003 would be expected to have an aid intensity of 22.4%.

DISCUSSION AND IMPLICATIONS

Aid intensity differences by country

Considering the results of the ANOVA test, it can be said that there are differences in the aid intensity based on the region the country is in. Grouping the countries in NWE, SE and CEE, it can be confirmed that the means of aid intensities in these areas differ significantly. This shows that Kriesi's (2016) findings of political difference between these regions also extends to the state aid granted by these countries, with the mean aid intensity in CEE countries being almost 10% higher than in NWE and SE. Examining the countries that have given state aid falling under the 'Transparency System for Regional Aid for Large Investment Projects', the two group of countries with highest aid intensity consist mainly of CEE countries. The only exception to this is Greece. Further, three of the 'Big 4 European Countries' (United Kingdom, Germany, France and Italy) as defined by the Organisation for Economic Co-operation and Development (OECD) (2008) are grouped together as the countries with the lowest aid intensity. The only exception is Germany with a much higher aid intensity compared to the rest of group two and three. Furthermore, there are 10 countries which have not granted state aid under the prior definition. These countries are Croatia, Cyprus, Denmark, Estonia, Finland, Latvia, Lithuania, Luxembourg, Malta and Slovenia. With regard to this, it must be noted that Croatia only joined the EU in 2013, which might have led to a reduced number of state aid reported. In conclusion, it can be said that among the aid-giving countries, the average aid intensity in the groups 5, 4 and 1 is the highest respectively. Therefore, firms seeking to maximize state aid intensity can be advised to apply for aid in these countries.

Difference by political party in power

Analyzing the effect of the political party in power, the only parties with significantly different aid intensities from the mean are those affiliated with ALDE. This is confirmed by the results of the Tukey HSD test and further supported by the results of the regression. Based on this model, it can be expected that countries governed by parties affiliated with ALDE on average give state aid with 6.4% lower aid intensity (See table 2). For businesses interested in receiving high-intensity state aid this means that countries governed by such parties should be avoided.

Difference by type of aid

With regard to the type of aid that was granted, a significant difference was found in the regression model. Comparing 'grants', 'tax credits and other tax measures' and 'tax allowance and tax exemptions', the latter two tend to be

characterized by higher aid intensities. On average, 'tax credits and other tax measures' and 'tax allowance and tax exemptions' are expected to have a 6.3% and 4.3% higher aid intensity respectively compared to grants (See table 2). For firms aiming to receive state aid, applying for these two types of aid tends to be beneficial.

Trend

Regarding the regression model, the variable trend is significant at the 1% level. Interpreted, this means that the average aid intensity is expected to drop by 0.6% annually since 2003. This confirms Collie's (2000) point of view that the EC have been working towards reducing the extent of state aid. For companies, this means that it can be advised to apply for state aid as early as possible in order to avoid the negative trend.

Limitations and suggestions for further research

Based on the build-up of this study, a number of limitations must be mentioned. The first and possibly most important is based on the characteristic of the data source. While the database offers good insight in the state aid granted in Europe, it excludes a variety of other cases in which companies receive state aid. Such examples include aid valued at less than €300,000; research and development subsidies or investments in railway systems. Additionally, cases such as the previously mentioned one about Apple are not recorded, as tax agreements are generally not considered state aid by the contracting country. Furthermore, several aid cases received additional funds over the course of time. Due to the lack of data on each additional round of funding, only the earliest date is considered in this paper. This might have skewed the *trend* as well as the *political_party* variable. Further, it must be noted that hierarchical clustering was used for combining nominal and scale data, something that is not recommended. Lastly, it must be said that 10 countries did not grant aid under this scheme and therefore were not analyzed. Overall, this paper researched the effect of certain factors on aid intensity while neglecting the cases that were rejected by the EC or national governments. This leaves great room for further research to determine what characteristics increase the chances of state aid being approved by the government.

CONCLUSION

Based on the results it is recommended for aid seeking firms in Europe to consider the following factors: The choice of country, the type of aid, the political party in power and the timing of the application. With regard to the country, the deviations in aid intensity are particularly large. Particularly Poland, the Czech Republic, Greece, Hungary and Romania are characterized by extensive state aid. In comparison, there are 10 countries which have not granted state aid under the analyzed framework from 2003 – 2014. Considering the type of state aid, this paper finds that aid with a tax-related payout scheme is expected to have significantly higher aid intensity. Furthermore, it is advised to apply for state aid in countries not governed by ALDE-affiliated parties, as this significantly reduced the expected aid intensity. Lastly, there appears to be a negative trend concerning the aid intensity in Europe from 2003 - 2014. This leads to the conclusion that firms should apply for state aid as soon as possible in order to avoid further progression of the previously mentioned trend. Overall, this research suggests that the level of state aid can to a certain extent be influenced by companies, hence a thorough analysis in the process of requesting state aid is advised and should be part of the overall business case. This analysis should consider the following 4 pieces of advice for maximizing the intensity of state aid in Europe:

- Apply in countries such as Poland, the Czech Republic, Greece, Hungary or Romania
- Apply for state aid with a tax-related payout scheme
- Apply in countries not governed by ALDE-affiliated parties
- Avoid the trend of decreasing aid intensities in Europe

ROLE OF THE STUDENT

Jan Philip Böckers was an undergraduate student working under the supervision of Prof. Dr. Martin Carree when the research in this report was performed. The topic was proposed by the student. The processing of the data, the analysis as well as the formulation of the conclusions as well as the writing were done by the student.

REFERENCES

1. Collie, D. R. (2000). State aid in the European Union: The prohibition of subsidies in an integrated market. International Journal of Industrial Organization, 18(6), 867-884. doi:10.1016/s0167-7187(98)00051-4
2. Council of the European Union. (2012). Consolidated version of the Treaty on the Functioning of the European Union. Official Journal of the European Union, 326(1), 1-390.
3. European Commission. (2016a). Press release - State aid: Ireland gave illegal tax benefits to Apple worth up to €13 billion. Retrieved from http://europa.eu/rapid/press-release_IP-16-2923_en.htm
4. European Commission. (2016b). "Transparency system" for regional aid for large investment projects. Retrieved from http://ec.europa.eu/competition/state_aid/register/msf_2016.pdf
5. Ginevičius, R., Podvezko, V., & Bruzge, Š. (2008). Evaluating the effect of state aid to business by multicriteria methods. Journal of Business Economics and Management, 9(3), 167-180. doi:10.3846/1611-1699.2008.9.167-180
6. Hainz, C., & Hakenes, H. (2009). The Politician and His Banker - How to Efficiently Grant State Aid. SSRN Electronic Journal. doi:10.2139/ssrn.1421142
7. Kriesi, H. (2016). The Politicization of European Integration. Journal of Common Market Studies, 52, 32-47.
8. McElroy, G., & Benoit, K. (2010). Party Policy and Group Affiliation in the European Parliament. British Journal of Political Science, 40(02), 377. doi:10.1017/s0007123409990469
9. Organisation for Economic Co-operation and Development. (2008). OECD glossary of statistical terms. Paris: OECD.
10. Thérien, J.-P., & Noël, A. (2000). Political Parties and Foreign Aid. American Political Science Review, 94(1), 151–162. doi:10.2307/2586386