Erasmus University Rotterdam

Master Thesis

Design of Export Credit Agencies

A cross-section analysis of the effect of different ECA characteristics on new commitments

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Abstract: Public export credit insurance is an important tool in export promotion. Both theory and empirics show that public export credit agencies (ECAs) are successful in mitigating financial constraints. This research uses a cross-section analysis to identify whether certain characteristics in the set-up of ECAs are related to higher yearly new commitments. The results show that formal government involvement, in particular in decision-making on transactions, is connected to lower levels of new commitments. Furthermore, ECAs that actively seek new customers enter into more new commitments than those that do not.

Preface

You have before you my master thesis 'Design of Export Credit Agencies', on the relationship between characteristics of Export Credit Agencies and the amount of relative new commitments they enter into. The thesis was written as the final work in the Master Policy Economics in the Erasmus School of Economics, while following an internship at the Dutch Ministry of Finance. I have worked on it from March until June 2016.

I would like to thank my supervisor, prof. Dr. Jarig van Sinderen, for his support and helpful academic feedback. Furthermore, I would like to thank my colleagues at the Ministry of Finance for their help with this research, as well as the employees of Atradius Dutch State Business, for their share in collecting the relevant data.

Finally, I would like to thank my friends and family for their support, not only during the writing of this thesis but for the whole course of my education.

I hope you all enjoy reading this thesis.

Charlotte Janssen

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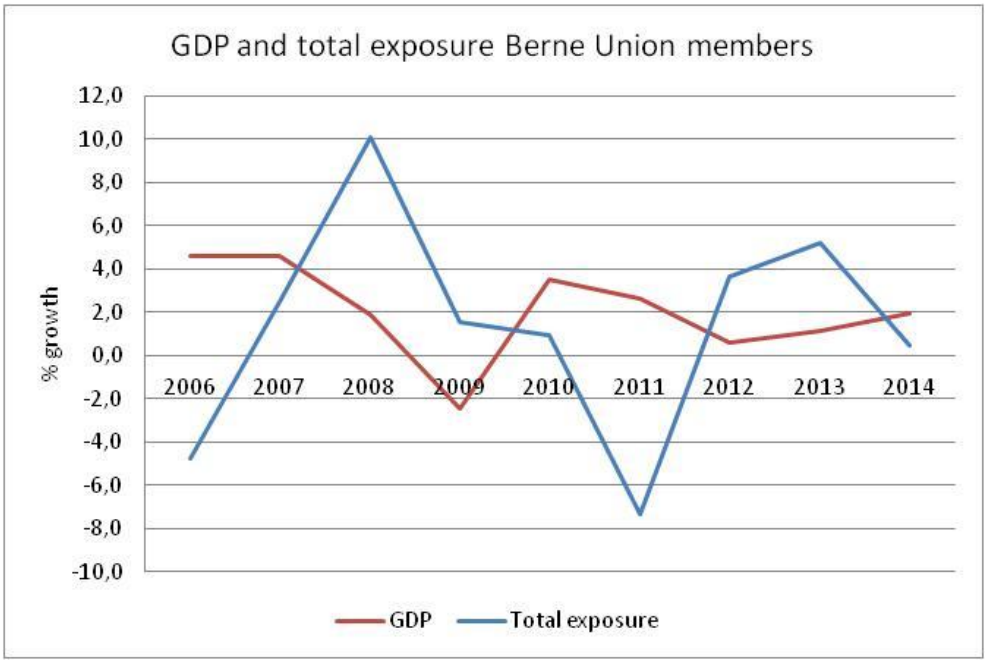
1. Introduction

Public export credit insurance is a popular instrument by governments to support exports. In 2014, total exposure of Berne Union members, the association for export credit agencies, amounted to 700 billion US dollars.[1] They insure export credit on transactions where the market fails to do so, for example because the transactions are too large or too risky. That insurance then alleviates the risks for banks and allows them to provide financing easier. That way, governments can mitigate financial constraints and boost exports to the benefit of national industries. It is therefore not surprising that insurance coverage was increased between 2008 and 2009, when the financial crisis hit its peak and led to strong financial constraints (Dinh and Hilmarsson, 2012) (see Figure 1). Indeed, both theory and empirics support the idea that public export credit insurance helps to mitigate financial constraints and thereby promotes exports (Badinger and Url, 2013). On average, the members of the Berne Union cover between one and two percent of national exports.[2]

Figure 1 – Exposure



Public export credit insurance is provided by Export Credit Agencies (ECAs). The first ECAs were established in the United Kingdom and the United States around the 1920s, but many were founded

[1] Not all countries have reported total exposure for 2015, therefore the data for 2014 is reported.
[2] Based on new commitments in the period 2005-2015, as reported to the Berne Union.

after World War II with the purpose of supporting and encouraging exports (Stephens, 1999). They operated as part of the government or on the account of the government as 'insurers of last resort', providing insurance only complementary to the market (Stephens, 1999). Today, there are many more types of ECAs. Some are government departments, others are private and operate on behalf and account of the state or have a system where the government guarantees their activities or their existence. For some ECAs, the government still takes all decisions and the ECA is only the executor, whereas other ECAs operate more or less independently and are only financially connected to the government. Furthermore, ECAs may differ in how commercially oriented they are. Some may develop more products than others to better serve the market. Furthermore, some may explicitly avoid competition with market players, whereas this is not an explicit goal for others. Similarly, some may actively be seeking new customers whereas others prefer to wait for exporters to find them.[3]

Although efforts have been made to compare ECAs in terms of their design, for example through considering their legal status, most important ECA characteristics have never been mapped out in a structured manner. Moreover, those characteristics have not been linked to how 'active' the ECA is in terms of yearly new commitments. Knowing such a link exist can be useful in the design of ECAs, especially since the literature has shown that those new commitments lead to a more than proportional increase in (Egger and Url, 2006; Moser, Nestmann and Wedow, 2008; Badinger and Url, 2013).

Therefore, this thesis aims at answering the following research question:

> *Are differences in the design of ECAs, connected to its commercial character and the involvement of the government in the ECA, related to the amount of new commitments entered into?*

Here, ECA refers, by definition, to the provider of *public* export credit insurance. A cross-section will be used to connect indicators of both government involvement and commercial character, as obtained through a questionnaire, to the amount of new commitments. Furthermore, t-tests will be used to identify differences between groups based on specific characteristics. Of course, not all countries are the same in terms of the potential market the ECA might serve. Therefore, the amount of new commitments will be scaled to gross domestic product (GDP). Furthermore, other determinants of new commitments will be explored as controls.

[3] In the world of public export credit insurance, this is known as being a 'broad supporter', in contrast with the traditional 'insurers of last resort' that have more of a 'wait-and-see'-attitude (Dutch Ministry of Finance, 2016).

So far, finding empirical determinants of new commitments entered into by ECAs is unexplored research territory. In answering this research question, the first step will be taken in empirically linking ECA characteristics and other determinants to its performance in terms of new commitments. Furthermore, it will provide policy makers economic insight in how (and if) ECA characteristics are related to the amount of new commitments into. Although various other considerations can be, and probably have been, relevant for ECA design, this thesis provides an empirical economic perspective on what characteristics may be important.

The thesis is organized as follows. First, an overview of the background to this research and the related literature will be given (chapter 2). Next, the methodology for the research will be described (chapter 3). Then, the results of the research will be given (chapter 4). The thesis ends with a conclusion (chapter 5).

2. Background and related literature

2.1. Introduction

This chapter provides the background information for the research conducted in this thesis. It starts by highlighting the importance of export for economic growth (section 2.2). Next, it describes the role ECAs play in facilitating exports through mitigating financial constraints (section 2.3) and the empirical literature on the effect of ECAs on export (section 2.4). After focusing on the benefits of ECAs for exports, some potential downsides will be considered (section 2.5). Finally, attention will be paid to the differences in ECAs and how this has been dealt with in literature so far (section 2.6). The chapter ends with a conclusion (section 2.7).

2.2. Export as a driver of economic growth

Export is important for economic growth. Of course, exports are a component of aggregate output and contribute to GDP growth in that way (Feder, 1982). But export can also stimulate economic growth more than proportionally (Balassa, 1978; Heller and Porter, 1978; Tyler, 1981). For example, improvements in the balance-of-payments could make a country more attractive for foreign capital (Balassa, 1978). Furthermore, increased trade can bring the economy closer to an optimal allocation of resources (Krueger, 1980; Feder, 1982). It allows for a greater capacity utilization and the exploitation of economies of scale (Feder, 1982). Finally, exports provide incentives for technological improvements, as domestic firms also face competition from firms abroad (Feder, 1982). That way, exports lead to improvements in productivity. Therefore, export promotion has a positive effect on economic growth (Subaset, 2002).

2.3. Role of ECAs in facilitating exports

Given the importance of export for national economies, export support is an important policy objective for many governments. Even if governments do not wish to interfere too much with the market, they generally agree that there is a role for the state in mitigating market failures. In particular, governments establish public Export Credit Agencies (ECAs) to mitigate financial constraints in exports.

Exports typically use some form of credit or financing, as the physical distance between the exporter and the buyer often leads to a discrepancy between the time of payment and the exchange of goods. The

market for export credit can be very complex and associated with certain risks. In the simplest form, the foreign buyer has a contract with the exporter for certain goods. The exporter may demand a down payment, after which it will start producing the good. During production, there is a risk that the debtor will default. In that case, the exporter has already made costs of production, but does not receive the full payment. Besides this case of supplier credit, the debtor may also rely on a bank for financing. In that case, the bank will provide the payment to the exporter upon supply of the goods and the debtor will need to pay off his debt to the bank. Again, there may be risks that the debtor does not pay off his debts to the bank. If those risks are high, the bank may not always be willing to finance the transaction.

The risks associated with export credit may be commercial or political in nature. Commercial risks are related to the possibility that the buyer goes bankrupt before he has fulfilled the full payment, to the possibility that the buyer terminates the contract if he is unsatisfied or the possibility of default for any other reason (Rienstra-Munnicha and Turvey, 2002). However, and possibly more importantly in the context of international trade, there may also be political risks involved. These risks are related to foreign exchange conversion, cancellation of permits and in general to actions of the importer's government (Stephen, 1999).

Due to these risks, some form of export credit insurance may be necessary to facilitate the transaction. Such an insurance can cover the risk that the buyer (debtor) does not fulfill the rest of the payment. In that case, the insurance company will insure that the exporter gets paid and will try to recover the damage from the buyer. If the debtor uses some form of financing, the insurance can be used to cover the risk that the bank does not receive its payments. Such an insurance will also make it easier for banks to provide loans. That way, export credit insurance facilitates the export transaction directly or indirectly, by facilitating the financing aspect.

However, private export credit insurers are not willing or able to cover all risks. This is especially the case for large, long-term and risky transactions, for example the export of large capital goods to developing countries. Large transactions do not allow for proper risk diversification and a single transaction may result in the company's bankruptcy. For those transactions, the risks are too high and the expected returns too low. As insurers do not cover such risks, the foreign buyer will be unable to obtain credit and the transaction will not take place, which is unfortunate for the exporter.

Therefore, governments create public export credit insurers (ECAs) to insure exporting risks that are not covered by the market. Governments may be better able to recover damages, as they also have political

measures to pressure the foreign debtor, especially if the debtor is another government. Furthermore, governments have larger financial resources and are able to spread risks over longer time horizons. Seen in this way, ECAs facilitate exports by mitigating financial constraints.

2.4. Empirical evidence of ECAs' positive impact on export

In general, (insured) export credit has a positive effect on trade.[4] As described, public export credit guarantees should theoretically increase exports by covering risks that cannot be insured by the market and thereby mitigating financial constraints. However, the question remains whether this theory is also supported by empirics. Up until recently, not much was known about the effectiveness of ECAs in stimulating exports, but now the evidence is growing (Van der Veer, 2015).

Most of the research on the effectiveness of ECAs in stimulating exports looks at industry level data related to the activities of one ECA. For example, Egger and Url (2006) estimate the effect of covered transactions, i.e. new commitments, between 1996 and 2002 by the ECA of Austria on exports using a gravity model. This means that the amount of trade between two countries is predicted by the economic size of the countries and the distance between them.[5] Furthermore, they control for the importer country's relative factor endowments and other features. The GLS estimates show a significant positive effect of new commitments on exports. This effect is larger in the long run, which can be explained by the lag between the provision of the guarantee and the actual shipment of the good, as well as learning effects about the importer's creditworthiness (Egger and Url, 2006).

Moser, Nestmann and Wedow (2008) use a similar analysis for Germany in the period 1992-2003. They extend the model by Egger and Url (2006) by including political risk as an important friction in international trade. Furthermore, they estimate a dynamic version of the model in which past exports also impact current exports. The results show that the German ECA does indeed foster exports. This effect is more than proportional. According to their estimates, a one percent increase in guarantees, which would amount to around 1.7 million Euros, leads to a 2.9 million Euros increase in exports.

Felbermayr and Yalcin (2013) conduct a similar analysis for official German export credit guarantees over the period 2000 until 2009. However, they add sector effects whereas Moser et al. (2008) use aggregate data. Using this data to control for heterogeneity, they find a positive effect of export credit guarantees on export, although this effect is smaller than the effect found by Moser et al. (2008).

[4] See e.g. Auboin and Engemann (2014) and Van der Veer (2015).
[5] See Tinbergen (1962) and Pöyhönen (1963) for explanations on gravity models.

Furthermore, Felbermayr and Yalcin (2013) find that there is little need for public guarantees if there are only weak financial constraints, which is the case for export to richer countries. Interestingly, they also find that the German ECA is particularly effective in the aviation, shipbuilding and transportation sector. This may be different for different countries, as each country may have their own specialization of exports which qualifies for export credit guarantees. However, it is typically the export of large capital goods that qualify for public insurance, since these transactions normally concern large sums of money and also long term commitments due to the depreciation rate of the goods. Finally, there is a strong constraint-mitigating effect in vulnerable sectors during the financial crisis. This research thus shows that the German ECA is effective at mitigating financial constraints that inhibit exports.

Felbermayr, Heiland and Yalcin (2012) extend the analysis for Germany by using firm-level data rather than industry-level data, which allows for a control for selection bias in guarantee programs through matching. For example, as they argue, more successful firms may be better at obtaining larger export contracts as well as obtaining a public insurance. They find that firms that receive export credit guarantees have higher sales growth than similar firms that did not receive this.[6] These results are robust and causal due to the matching methodology.

Badinger and Url (2013) also use firm-level data. Their approach uses two stages. First they identify the determinants of the use of export guarantees by firms. Next, they estimate the effect of export credit guarantees on exports (excluding intra-firm trade) in a cross-section model. Here they find a significant effect that is more than proportional. This is again proof that export guarantees are effective in mitigating frictions in trade (Badinger and Url, 2013).

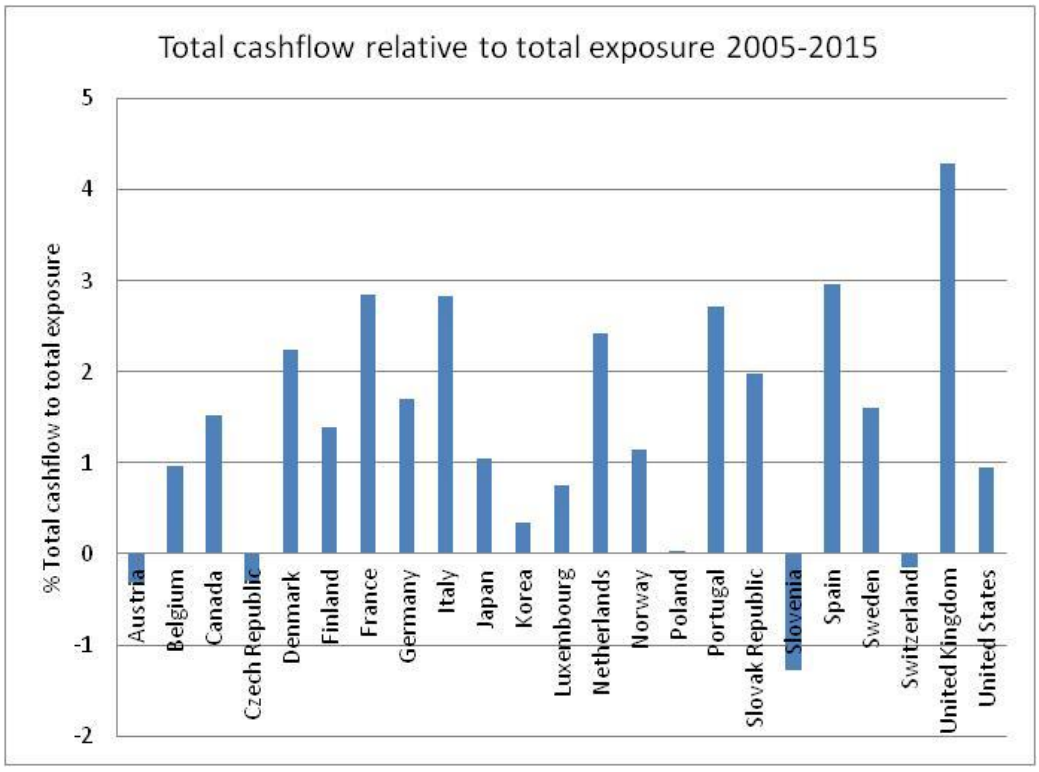
Baltensperger and Herger (2007), on the other hand, use a panel dataset of OECD countries in the period 1999-2005. They find that ECAs have modestly stimulated trade with high and middle-income countries, whereas there doesn't seem to be an effect on export to low-income countries. This seems to be at odds with the hypothesis that ECAs mitigate financial constraints. However, they only consider coverage ceilings and subsidy rates (the extent to which premium are inadequate to cover net damages) rather than actual coverage as parameters.

[6] They focus on total sales rather than exports, as this leaves out a substitution effect from domestic sales to export.

2.5. Downsides to ECA intervention

Although it can be shown, both theoretically and empirically, that the activities of ECAs have positive effects on exports, there may also be certain downsides to public export credit insurance. If the foreign debtor defaults, the state has to cover the damages. This can therefore result in large government expenditures. Nevertheless, ECAs are typically able to recover those damages. This can be seen from Figure 2, which shows that the average total cash flow (which consists of premium income and recoveries, minus claims paid and administrative costs) are generally positive.[7] This means that the premium income is usually enough to cover the damages that cannot be recovered. The exceptions are Austria, the Czech Republic, Slovenia and Switzerland. Nevertheless, it is likely that these negative cash flows will become positive in the long run, as these countries have agreed upon being cost effective in the long-run in the Arrangement on Officially Supported Export Credit.[8]

Figure 2 - Average total cash flow



[7] The average of total cash flow and total exposure is used over the period 2005-2015. For Norway, Sweden and the United States, the observations for total exposure is missing for 2015. Therefore, for these countries the average of the period 2005-2014 is taken.

[8] The Arrangement on Officially Supported Export Credit was established in 1978 as a Gentlemen's agreement, in order to create a level playing field among the members (OECD, 2014). One of the agreements is that premium rates are adequate to cover long-term operating costs and losses.

Another possible downside to public export credit insurance may be distortionary effects. Distortions in world trade are prevented by the prohibition of having premium rates that are too low (Abraham and Dewit, 2000). Furthermore, premiums that are too low would constitute state aid which is not allowed in the EU (Abraham and Dewit, 2000). Abraham and Dewit (2000) show through a theoretical model that fair rates are still enough to cover the risks associated with high risk export transactions. However, they argue that distortions may arise in targeting the export credit insurance on specific industries. Nevertheless, they conclude that official export credit insurance should not be completely banished (Abraham and Dewit, 2000).

2.6. ECAs in all different shapes and sizes

Although ECAs generally serve the same purpose, to facilitate exports to the benefit of national industries, they come in all different shapes and sizes and may therefore be difficult to compare (Stephen, 1999). This diversity can well be seen from the annual report by the Berne Union (2014). Here, each ECA gives a brief overview their activities.

Although ECAs may be difficult, if not impossible, to compare according to Stephen (1999), in Denmark an attempt has been made to systemize different designs, in order to make recommendations to make EKF, the ECA of Denmark, more competitive (*Export Credit Guarantees and Export Credit Financing: a proposal for reform of state schemes*, 1995). In comparing the structure of export guarantee systems abroad, they identify four models with different types of state involvement in the market: market participant, public corporation, operator and reinsurance. Similarly, the Dutch government classifies ECAs in different categories of state involvement: government institution, private company under contract, private company with state ownership and autonomous and capitalized government institution with state guarantee (Dutch Ministry of Finance, 2016). However, these classifications are mostly based on legal form whereas in practice, this may not say as much about actual government involvement.

Another comparison has been made by the ECA of Denmark, through an overview of the financing options for EU exporters (Hansen, 2013). For a number of countries, this book gives information on the export, investment and trade-related aid systems, the exposure by sector and whether decisions on transactions are taken by the ECA, the ministry or either depending on the size of the transaction.

Assuming that more ECA-coverage indeed leads to more exports, it would be interesting to see whether certain types of ECAs are better able to serve the market. It may be the case that ECAs that are more

independent from the government, for example because they are capitalized, are closer to the market and therefore enter into more commitments annually. Conversely, governments may choose to keep ECAs close in order to scrutinize more closely the transactions that qualify for public insurance. The relation between structural differences between ECAs and the amount of new commitments entered into has not been researched yet. This is not surprising, as comparable data on ECA structures is not available. Although the book by Hansen (2013) allows for a more objective comparison than the other sources described in this section, it is still not suitable for such research.

2.7. Conclusion

Export is an important driver of economic growth. International transactions typically take place using credit, which can be risky. Not only is the creditworthiness of the foreign debtor typically unknown, there can also be a long time horizon between the producing and delivery of goods and their payment. Not all of those risks can be mitigated through the market as they may be too large or cover a time horizon that is too long. Given the importance of exports for a country, governments establish Export Credit Agencies to provide export credit insurance where the market fails to do so. The empirical evidence supports the theory that ECAs help to overcome financial frictions, at least in Austria and Germany, as public coverage is found to lead to a (more than proportional) increase in exports. Furthermore, international agreements limit the distortionary effect of these policies.

However, ECAs come in all different shapes and sizes. So far, it has not been researched whether the amount of insured export credit is related to differences in the design of ECAs. As pointed out in this chapter, this first requires comparable data. Then, this information can be related to the amount of coverage provided by the ECA. Therefore, the next chapter establishes the methodology to do exactly that.

3. Methodology

3.1. Introduction

In the previous chapter it was shown that there is empirical evidence that new commitments entered into by ECAs lead to a more than proportional increase in exports. It has however not been researched how the performance of ECAs, in terms of entering into new commitments, is related to their institutional design. This chapter describes the methodology used establish whether the yearly new commitments entered into by ECAs are related to the amount of government involvement, the commercial character of the ECA and the diversity of products they offer. First, the data that is used and the necessary transformations will be described (section 3.2). Next, the regressions that are run on the data are explained (section 3.3), followed by an explanation of how t-tests are used to gain more insight into the specific factors that affect new commitments (section 3.4). The chapter ends with a conclusion (section 3.5)

3.2. Data description

The dataset used for the analysis contains information on 23 countries.[9] These countries all follow the same rules; they are Participants to the OECD Arrangement on Officially Supported Export Credits.[10] Furthermore, for these countries information is available on their cash flows, through the Berne Union, and on the characteristics, as obtained through a questionnaire. Other information will be gathered through the databases of the OECD and the World Bank. As the information on ECA characteristics has only been obtained for one point in time, through the questionnaire, a cross-section analysis is used. For the variables for which more information is available, the average will be taken over the period 2011-2015, as described below.

This section describes how the variables of interest are obtained. It starts with explaining the methodology for gathering information on ECA characteristics (section 3.2.1). Then, the creation of the dependent variable, the amount of new commitments entered into, is described (section 3.2.2). Next, the methodology for determining the level of government involvement is described (section 3.2.3),

[9] For the list of countries, with the names of the corresponding ECAs, see Appendix B.
[10] See footnote 8.

followed by determining the commercial character of the ECA (section 3.2.4). Finally, possible control variables are considered (section 3.2.5).

3.2.1. Questionnaire

The main focus of this research is the effect of ECA design on new commitments. As described in chapter 2 (section 2.6), there is not really comparable information on the design of ECAs. In order to obtain this type of information, a questionnaire has been distributed to ECAs through the Berne Union. This questionnaire contains 22 questions about the design of the different ECAs.[11] It concerns questions on institutional design, the financial responsibility of the government for the ECA, the government involvement in the activities of the ECA, the ECA's commercial characteristics and the representation of the private sector in decision making. The questions are mostly formulated in a yes or no manner and asks mostly about facts, in order to allow for easy comparison. Questions 21 and 22 form an exception, as these questions ask the ECA about their opinion on parliament and government involvement, respectively. In total 38 countries have answered the questionnaire, of which 23 are relevant for this analysis, since they follow the same rules and other information is available for them. Therefore, the dataset comprises of 23 countries. Since this is the first time such comparable data is recorded, it is only possible to do a cross-section analysis.

3.2.2. New commitments

In chapter 2 it was seen that new commitments lead to a more than proportional increase in exports. This research focuses on identifying the factors in ECAs that affect the amount of new commitments entered into. Information on the amount of yearly new commitments can be obtained from the Berne Union. The ECAs that are member to the Berne Union are asked to yearly submit information about their income and expenses. Of interest for this analysis is the amount of new commitments the ECA enters into yearly.

In order to use this information in a cross-section analysis, the average of total new commitments is taken over the period 2011-2015.[12] That way, yearly fluctuations which may occur through a single transaction are averaged out. The assumption is that design of ECAs has been constant over this period.

[11] For the full questionnaire, see Appendix A.

[12] As the ECA of Luxembourg was not established until 2012, the average of total new commitments will be taken over the period 2012-2015 for this country.

As institutional changes are usually very slow, this assumption seems valid. Furthermore, the amount of new commitments is scaled to GDP.[13] The dependent variable is therefore formulated as follows:[14]

$$relative\ new\ commitments_i = \frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} gross\ domestic\ product_{t,i}}$$

3.2.3. Government involvement

One of the factors that may be related to the amount of new commitments entered into by ECAs may be government involvement. If the government is more involved, the eligibility of transactions for public coverage may be more thoroughly assessed, Furthermore, the government may take into account possible reputation risks whereas this is less relevant for more independent ECAs.

In order to determine the level of involvement of the government, the questionnaire on ECA structures is used (Appendix A). From this, an indicator for government involvement is constructed, which can be split up in two indicators. Besides these indicators, the individual answers in the questionnaire will be used to get a more detailed picture of how government involvement is related to the dependent variables. The following sections describe the indicators for government involvement.

Formal Government Involvement Indicator (FGII)

The Formal Government Involvement Indicator (FGII) is constructed out of the answers in the questionnaire related to government involvement in decision-making. This is directly relevant for government involvement. One point is given in each of the following cases:

- *Is the government involved in appointing the key figures within management (e.g. the managing director or the board members)?* (Question 4)
    - Yes (1 point)
    - No (0 points)

  If the government is involved in the appointment of key figures within management, then it has the possibility to influence the way the ECA is managed. Furthermore, if the government is involved in appointment, it may also be involved in the firing of those key figures, which also indicates control over management.

[13] Source: OECD. Data in million US dollars.

[14] This is a simplified version of the definition of the dependent variable. In particular, the average over the period 2011-2015 was used rather than the sum. That way, account is taken of missing observations.

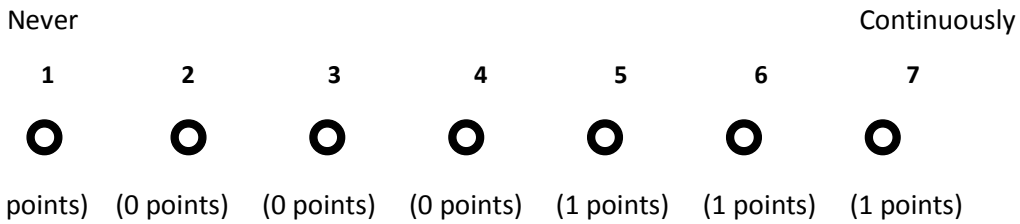
- *Who decides on the policy (e.g. country policy, risk policy) of the ECA?* (Question 7)
    - Only the ECA (0 points)
    - Only the ministry (1 point)
    - Depends (1 point)

  If only the ECA decides on its own policy, then the government is not really involved. If the ministry however decides on policy, this points towards a higher level of involvement. The assumption is that when the option 'depends' is chosen, the government determines the boundaries within which the ECA can decide on policy by itself.

- *Who takes decisions at the transactional level?* (Question 9)
    - Only the ECA (0 points)
    - Only the ministry (1 point)
    - Depends (1 point)

  Here, the same reasoning holds. If the government can decide in some or all cases, it is more involved than when only the ECA decides.

- *How often would you say the parliament asks questions about the activities of the ECA?* (Question 21)



  This question asks for an opinion of how often the parliament asks questions about the activities of the ECA. If this question is answered with a score of 5 or higher, then this means the parliament relatively often asks questions about the activities of the ECA. If that is the case, the activities of the ECA are probably more politically sensitive. The activities can only be politically sensitive if the government is more responsible and therefore involved in the matter.

- *To what extent would you consider the government involved in the policy of the ECA?* (Question 22)

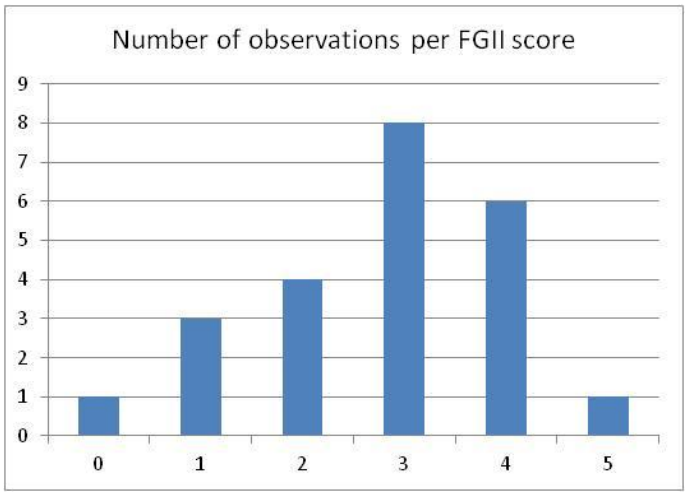
  Not involved at all Completely involved

1	2	3	4	5	6	7
O	O	O	O	O	O	O
(0 points)	(0 points)	(0 points)	(0 points)	(1 points)	(1 points)	(1 points)

  This question asks straightforward what the level of involvement of the government is in the policy of the ECA. If a high score is given, the government is very involved.

For this indicator a maximum score of 5 can be obtained (one point per question, as only one answer can be given), where a higher score indicates a higher level of formal government involvement. For the number of observations per FGII score, see Figure 3.

Figure 3 - FGII score



Government Financial Responsibility Indicator (GFRI)

The Government Financial Responsibility Indicator (GFRI) is built up of the questions related to the government's financial responsibility. One point is given in each of the following cases:

- *Is the ECA capitalized?* (Question 2)
  - Yes (0 points)
  - No (1 point)

If the ECA is capitalized, this means that it has its own assets and it has to cover damages with its own reserves. In that case, the government will have less responsibility for the finances of the ECA. Therefore, if the ECA is not capitalized, this points towards a higher financial responsibility for the government. As one country left this question unanswered, half a point will be assigned for that observation to prevent a bias in the results.

- *Are the ECA's financial results audited by an external accountant?* (Question 10)
    - Yes (0 points)
    - No (1 point)

  Governments typically don't require external auditing in the way that undertakings do. Therefore, if the answer to this question is no, it is more likely that the financial responsibility lies with the government than with the ECA. Again, this question was left unanswered by one country, in which case half a point was assigned.

- *Does the ECA report its finances according to international accounting standards (e.g. IAS, IFRS or GAAP)?* (Question 11)
    - Yes (0 points)
    - No (1 point)

  This element holds similar reasoning as the previous one. Large undertakings typically have to meet international accounting standards, while governments don't.

- *Is there an explicit guarantee by the state?* (Question 17)
    - Yes, on the assets side (for each case) (1 point)
    - Yes, on the liabilities side (only to prevent bankruptcy) (1 point)
    - No (0 points)

  If the state explicitly guarantees the transactions of the ECA or if it guarantees that the ECA cannot go bankrupt, it has more financial responsibility than when there is no explicit guarantee. One country left this question unanswered and received 2/3 of a point (the expected number of points for this question).

- *Are the damages directly borne by the state (budget)?* (Question 18)

- Yes (1 point)
- No (0 points)

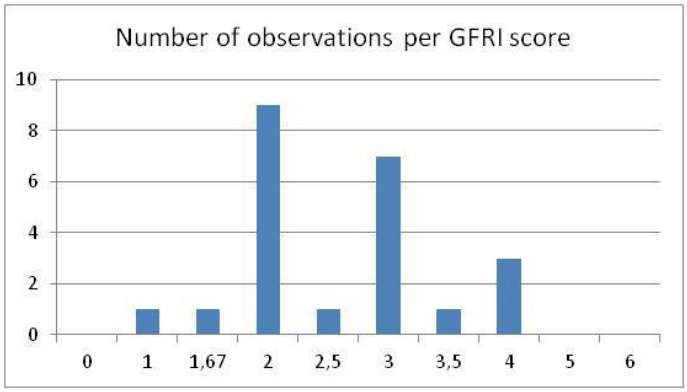
If the damages of the activities of the ECA are directly borne by the state budget, the state has more financial responsibility than when the ECA has to cover any damages by itself in first instance.

- *Does the ECA have actual capital reserves to cover its losses?* (Question 19)
  - Yes (0 points)
  - No (1 point)

If an ECA holds actual capital reserves to cover its losses, this implies that it is primarily responsible for covering damages. If the ECA does not hold capital reserves, the state will have to cover the losses.

This means that the GFRI can take values ranging from 0 to 6 (one point per question), where by a score of 0 implies a low level of financial responsibility of the government in the ECA's activities, and a score of 6 implies a high level of government financial responsibility. For the number of observations per GFRI score, see Figure 4. The scores that are not whole numbers, are due to missing observations.

Figure 4 - GFRI score

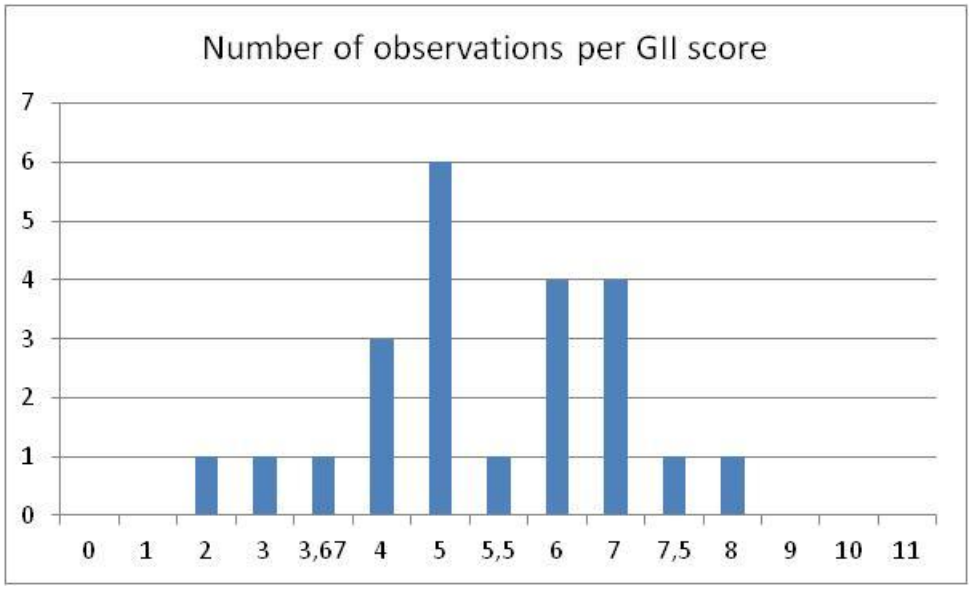


Government Involvement Indicator (GII)

The Government Involvement indicator is composed of the two indicators as described above. The FGII is an indicator for the involvement of the government in decision-making, which is directly relevant for the extent of government involvement. The GFRI is an indicator for the financial responsibility of the

government for the ECA. If the government has more financial responsibility, then it will indirectly probably have a higher influence on the activities of the ECA, even if only informally. The Government Involvement Indicator is simply the sum of these two indicators. It can therefore take a maximum value of 11. For the number of observations per GII score, see Figure 5.

Figure 5 - GII score



3.2.4. Commercial character

Besides government involvement, the commercial character of an ECA can also be of influence on the amount of yearly new commitments. A more commercial attitude can help to obtain more clients. Two aspects of commerciality are considered. First, an indicator is created from the answers to the questionnaire. Second the diversity of products offered is taken as an indicator by itself.

Commercial Character Indicator (CCI)

In order to create an indicator for the commercial character of the ECA, one point is given for each of the following conditions:

- *Is making profit part of the purpose of the ECA?* (Question 12)
    - Yes (1 point)
    - No (0 points)

An ECA that pursues a profit-making objective is more commercial in nature than one that does not.

- *Does the ECA explicitly avoid competing with market players?* (Question 13)
    - Yes (0 points)
    - No (1 point)

  If an ECA aims to operate complementary to the market, it is likely to explicitly avoid competing with market players. Therefore, if it does not (explicitly) avoid competition, this could indicate that it is more commercially oriented. One country left this question unanswered and received 0.5 points.

- *Does the ECA engage in activities that are not directly related to supporting export?* (Question 14)
    - Yes (1 point)
    - No (0 points)

  An ECA that takes on more different activities is assumed to be more commercially oriented.

- *Does the ECA actively seek new customers (e.g. through marketing)?* (Question 15)
    - Yes (1 point)
    - No (0 points)

  An ECA that is more commercially oriented will actively try to obtain new customers, whereas an ECA of a more public nature may act more demand-steered, as it prefers to be complementary to the market. One missing answer was assigned 0.5 points.

- *Is enlarging the customer base an explicit goal of the ECA?* (Question 16)
    - Yes (1 point)
    - No (0 points)

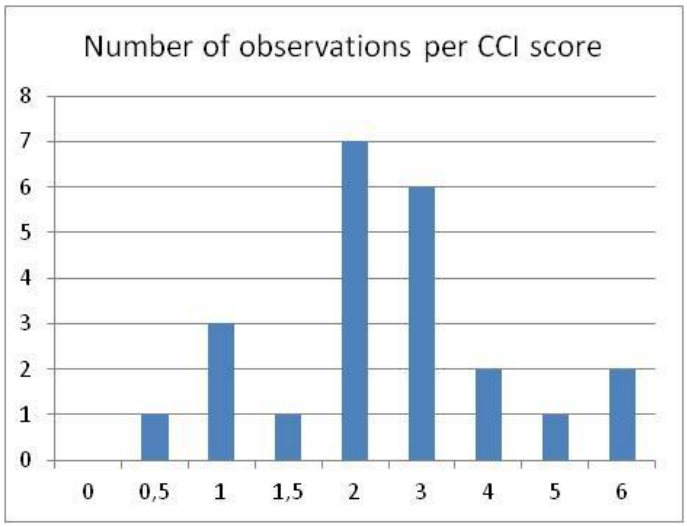
  Here, a similar reasoning applies. If enlarging the customer base is an explicit goal of the ECA, it is more commercially oriented.

- *Does the ECA pay corporate taxes?* (Question 20)
    - Yes (1 point)
    - No (0 points)

    An ECA that operates in a more commercial manner, is more likely to be obligated to pay corporate taxes.

For this indicator, a maximum score of 6 can be obtained (one point per question). The higher the score, the more commercially oriented the ECA is. For the number of observations per CCI score, see Figure 6.[15]

Figure 6 - CCI score



Product diversity

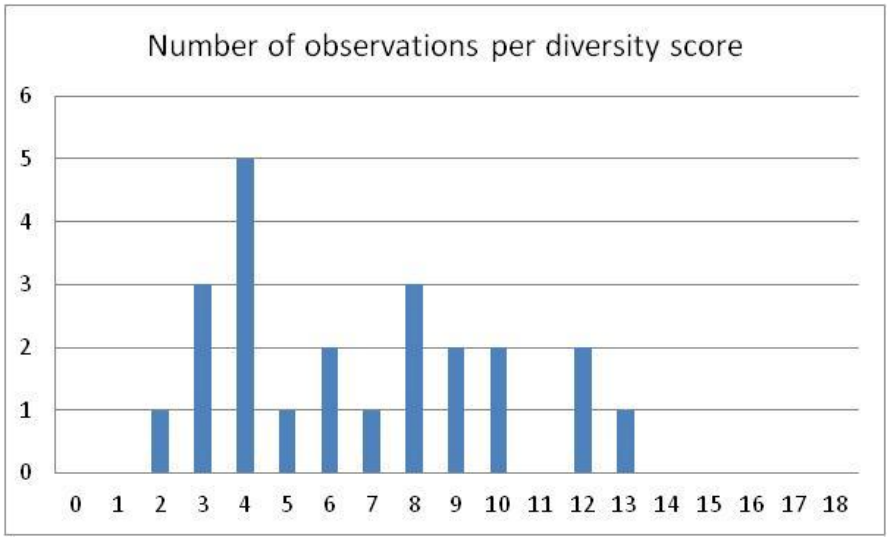
Finally, the influence of diversity of products offered, which can also be an indicator of how commercial an ECA is, may be of influence on the amount of new commitments entered into. An ECA that offers a wider range of products may be better able to serve the market and may therefore attract more new commitments. The OECD's Export Finance Programme and Product Mapping System (EFPM) gives an overview of the different type of products the Members of the Export Credit Group offer. For each of the following categories of products a distinction can be made between pure cover products and direct loan products:

[15] Most countries report quite low commercial characters, with two points being the most often occurring score. This supports the idea that public export credit agencies do not typically operate in a competitive manner.

- Export credit products
- Non-Arrangement long term export credit products
- Non-Arrangement short term export credit products
- Long term working capital products
- Short term working capital products
- Long term overseas investment products
- Short term overseas investment products
- Long term domestic investment products
- Short term domestic investment products

In order to get an indication for the diversity of products offered by ECAs, a point is given for each type of product that an ECA offers. That means that a total of 18 points can be earned in product diversity (two options, pure cover and direct lending, for each of the nine categories). The number of products ranges from 2 to 13, with a mean value of 7 (for the observations per score, see Figure 7).

Figure 7 - Diversity score



3.2.5. Other variables

Besides government involvement and the commercial character of the ECAs, there may be other factors that influence the amount of new commitments entered into. This could lead to omitted variable bias. Therefore, it is necessary to include certain variables as controls. So far, there is no empirical research on the determinants of new commitments entered into by ECAs. Therefore, this section uses theoretical arguments for identifying the factors that are potentially relevant.

As described in chapter 2, ECAs operate complementary to the market. If the market is unwilling or unable to cover certain risks, an export transaction may be eligible for public insurance. It may be that in times of economic distress, private insurers are not as willing to provide coverage. Therefore, the level of economic growth (dlog GDP_i) over the period 2011-2015 in a country may be of influence on the amount of new commitments entered into by ECAs. Similarly, more public coverage may be needed when the domestic insurance market is underdeveloped. Therefore, an indicator of the insurance market, insurance company assets as share of GDP, could be of influence on the amount of new commitments.[16]

Aspects of the financial sector may also be relevant. For example, firms in countries with a large stock market capitalization (relative to GDP) have access to more, and therefore possibly cheaper, finance options.[17] Therefore, those countries may have higher exports and higher demand for public export credit insurance.

Furthermore, the importance of exports for the economy, captured by the log of exports over gdp, may be relevant for new commitments.[18] If exports are relatively important for the economy, the government may be more inclined to provide public coverage for export credit.

On the other hand, if a government has deficits, it may be less willing to issue public guarantees, as potential damages are associated with higher costs.[19] The damages require claims to be paid that cannot be recovered instantly, which eats into the government's budget. Deficits add to the government debt, over which interest must be paid.

3.3. Regressions

In order to identify whether there is a significant relation between the new commitments and the different characteristics of ECAs, regressions are run using Ordinary Least Squares (OLS). The natural log of relative new commitments is taken to normalize the data and to allow for relative interpretations of

[16] Source: Nonbanking financial database, World Bank. Defined as insurance company assets as a percentage of GDP.
[17] Stock market capitalization to GDP (%). Source: Global Stock Markets Factbook and supplemental S&P data, Standard & Poor's, World Bank.
[18] This data is obtained from the OECD database. Export in goods is used, as services are not relevant for ECA coverage.
[19] Source, World Development Indicators, World Bank. Defined as government surplus or deficit as a percentage of GDP.

the coefficients. Furthermore, robust standard errors are used to control for heteroskedasticity. A vector of control variables (**x**) is used to limit the possibility of omitted variable bias.

First, a set of control variables will be identified:

$$\log(relative\ new\ commitments_i) = \beta_0 + \mathbf{\beta x_i} + \varepsilon \qquad \textbf{Regression 0}$$

Then, the effect of government involvement is considered:

$$\log(relative\ new\ commitments_i) = \beta_0 + \beta_1 * GII_i + \mathbf{\beta x_i} + \varepsilon \qquad \textbf{Regression 1}$$

It would be expected that β_1 is negative. If government involvement is higher, the independence of the ECA is lower, whereas more independent ECAs might be better able to serve the market.

Next, the GII is split up in FGII and GFRI to identify which aspect of government involvement, formal government involvement or government financial responsibility, is most influential on new commitments:

$$\log(relative\ new\ commitments_i) = \beta_0 + \beta_1 * FGII_i + \beta_2 * GFRI_i + \mathbf{\beta x_i} + \varepsilon \qquad \textbf{Regression 2}$$

And then again for FGII and GFRI separately:

$$\log(relative\ new\ commitments_i) = \beta_0 + \beta_1 * FGII_i + \mathbf{\beta x_i} + \varepsilon \qquad \textbf{Regression 3}$$

$$\log(relative\ new\ commitments_i) = \beta_0 + \beta_1 * GFRI_i + \mathbf{\beta x_i} + \varepsilon \qquad \textbf{Regression 4}$$

Furthermore, the effect of how commercial the ECA is, is considered. Here we consider the Commercial Character Indicator (CCI) and the diversity of products offered, separately:

$$\log(relative\ new\ commitments_i) = \beta_0 + \beta_1 * CCI_i + \mathbf{\beta x_i} + \varepsilon \qquad \textbf{Regression 5}$$

$$\log(relative\ new\ commitments_i) = \beta_0 + \beta_1 * diversity_i + \mathbf{\beta x_i} + \varepsilon \qquad \textbf{Regression 6}$$

It would be expected that these coefficients are positive, as a more commercial attitude in general, as well as a higher diversity of products offered, should lead to more commitments for the ECA.

3.4. T-tests

In order to get a more detailed picture of what specific aspects of ECA characteristics are related to new commitments, dummies are created for each of the questions that are part of the indicators (FGII, GFRI and CCI). This section describes the hypotheses that underlie these (one-sided) t-tests.

Government involvement

In order to identify individual effects of government involvement on relative new commitments, t-tests are performed on separate elements of the indicators. These elements consist of the different answers to the questionnaire. Answers that correspond to a higher level of government involvement are labeled as group 1, whereas answers that correspond to a lower level of government involvement are labeled as group 2 (see Table 1). Since ECAs that are more independent might be better able to serve the market, the aim is to identify whether higher levels of government involvement correspond to lower relative new commitments. Therefore, the hypothesis for the t-tests on government involvement is formulated as follows:

H_0: relative new commitments$_{(group\ 1)}$ = relative new commitments$_{(group\ 2)}$
H_a: relative new commitments$_{(group\ 1)}$ < relative new commitments$_{(group\ 2)}$

Table 1 – Groups for t-tests on government involvement

	GROUP 1	GROUP 2
	Formal government involvement	
QUESTION 4	Government involved in appointment of key figures in management	Government not involved in appointment of key figures in management
QUESTION 7	Decisions on policy are taken by 'only the ministry' or 'depends'	Decisions on policy are taken by 'only the ECA'
QUESTION 9	Decisions on transactions are taken by 'only the ministry' or 'depends'	Decisions on transactions are taken by 'only the ECA'
QUESTION 21	Frequency of questions asked by parliament ≥ 5 out of 7	Frequency of questions asked by parliament < 5 out of 7
QUESTION 22	Reported level of government involvement ≥ 5 out of 7	Reported level of government involvement < 5 out of 7
	Government financial responsibility	
QUESTION 2	ECA is not capitalized	ECA is capitalized
QUESTION 10	Finances are not audited by an external accountant	Finances are audited by an external accountant
QUESTION 11	Finances are not reported according to international accounting standards	Finances are reported according to international accounting standards
QUESTION 17	There is an explicit guarantee by the government, either per case or against bankruptcy	There is no explicit guarantee by the government
QUESTION 18	The damages are directly borne by the state budget	The damages are not directly borne by the state budget
QUESTION 19	The ECA does not hold actual capital reserves to cover its losses	The ECA holds actual capital reserves to cover its losses

Commercial character

A similar procedure is applied to the elements of the commercial character of the ECA. Answers to the questionnaire that indicate a more commercial character are labeled as group 1, whereas answers that indicate a less commercial character are labeled as group 2. Since it would be expected that more commercial ECAs enter into relatively more commitments, the hypothesis is formulated as follows:

H_0: relative new commitments$_{(group\ 1)}$ = relative new commitments$_{(group\ 2)}$
H_a: relative new commitments$_{(group\ 1)}$ > relative new commitments$_{(group\ 2)}$

Table 2 - Groups for t-tests on commercial character

CCI	GROUP 1	GROUP 2
QUESTION 12	Profit making purpose	No profit making purpose
QUESTION 13	Does not explicitly avoid competition with market players	Explicitly avoid competition with market players
QUESTION 14	Engages in activities not related to supporting exports	Does not engage in activities that are not related to supporting exports
QUESTION 15	Actively seek new customers	Not actively seeking new customers
QUESTION 16	Enlarging the customer base is an explicit goal	Enlarging the customer base is not an explicit goal
QUESTION 20	ECA pays corporate taxes	ECA does not pay corporate taxes

3.5. Conclusion

This chapter explained the methodology to examine whether the yearly new commitments entered into by ECAs are related to characteristics of government involvement and the commercial character of the ECA. The information on ECA characteristics that is obtained through a questionnaire will be used in a cross-section analysis with data obtained from the Berne Union, the World Bank and the OECD, to identify the relationship between those characteristics and the amount of new commitments entered into by ECAs. Since there is only a limited number of observations, 23 countries for which data is available at one point in time, it may be difficult to obtain enough explanatory power. It only allows for a comparison between countries, not for analysis of within country changes over time. This increases the risk that the effects are not causal. Nevertheless, it may be possible to identify differences between different groups of countries in terms of relative new commitments.

4. Results

4.1. Introduction

In this chapter, the results to the regressions and t-tests will be given. This will show which factors in the design of ECAs are correlated with the relative amount of new commitments entered into yearly. First, the results of the regressions will be given (section 4.2), followed by the results of the t-tests (section 4.3). Next, some robustness checks will be performed (section 4.4). Finally, the results will be discussed (section 4.5). The chapter ends with a conclusion (section 4.6).

4.2. Regression analysis

The results to the regressions are shown in Table 3. Three control variables were identified: GDP growth, export intensity and stock market capitalization.[20] These control variables are all significant and have the appropriate sign. As expected, economic growth has a strong negative effect on the amount of new commitments entered into by ECAs. If GDP growth is 1% lower, new commitments are expected to be between 12 and 17% higher. The reason may be that countries that suffer from lower growth levels, will use public export credit insurance as a way of stimulating the economy. Another reason may be that in countries with lower levels of growth, banks are not as willing to finance certain transactions, and sooner require state guarantees. Therefore, the negative sign of economic growth supports the idea that ECAs operate complementary to the market. Furthermore, the export intensity positively affects the amount of new commitments entered into by ECAs. If export intensity is 1% stronger, new commitments are between 0.8 and 1% higher. This makes sense, as countries that rely more strongly on exports, will be more active in export promoting policies. Finally, the degree of stock market capitalization has a significantly positive effect. In countries where stock market capitalization is 1% higher, new commitments are also roughly 1% higher. Firms in countries with a more developed financial system have more (and possibly cheaper) financing options. This allows them to expand their activities, also abroad. Therefore, they may require more public coverage.

[20] The size of the insurance market was also tested as a control variable, but it was insignificant and had the wrong sign. This may be because it concerned the insurance market in general and the variable does not differentiate in insurance that is relevant here (insurance on export credit for risky transactions). Furthermore, the variable for government deficit was not significant and had the wrong sign. These variables were therefore omitted as control variables.

As for the variables of interest, the signs of the coefficients for the indicators of government involvement are negative, as expected (except for GFRI in regression 2, but it is when estimated separately in regression 4). Furthermore, the coefficients for the indicators for commercial character, CCI and diversity, are positive as expected. The results show that the relation between new commitments and formal government involvement (FGII) is significant. This means that ECAs in which the government is more formally involved, enter into significantly fewer new commitments each year. One point more in terms of FGII score is related to 0.25% fewer new commitments. There is however no significant correlation between new commitments and government financial responsibility (GFRI), commercial character (CCI) and the diversity of products offered (diversity). Therefore, based on these results, it cannot be said that there is a relation between new commitments and those ECA characteristics.

Table 3 – Regression analysis

REGRESSION	**(0)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GII		-0.088 (-1.03)					
FGII			-0.288** (-2.62)	-0.247** (-2.25)			
GFRI			0.084 (0.61)		-0.030 (-0.20)		
CCI						0.050 (0.38)	
DIVERSITY							0.081 (1.51)
DLOG(GDP)	-16.017*** (-3.80)	-15.370*** (-3.57)	-12.566** (-2.76)	-13.316*** (-3.21)	-16.125*** (-3.76)	-16.255*** (-3.59)	-16.642*** (-3.91)
LOG(EXPORT/GDP)	0.905*** (2.85)	0.850** (2.85)	0.862** (2.86)	0.842*** (3.04)	0.894** (2.68)	0.936** (2.77)	0.806** (2.64)
STOCK MARKET CAPITALIZATION	1.047** (1.88)	1.024* (1.81)	1.041* (1.88)	1.028* (1.87)	1.041* (1.83)	1.085* (1.79)	1.237** (2.41)
CONSTANT	2.541 (0.98)	2.488 (1.06)	2.461 (1.03)	2.454 (1.12)	2.533 (0.97)	2.658 (0.98)	1.154 (0.45)
ROBUST S.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.4371	0.4661	0.5158	0.5077	0.4384	0.4415	0.4867
OBSERVATIONS	23	23	23	23	23	23	23
RAMSEY RESET F-VALUE	1.52	0.86	0.93	0.47	1.32	2.21	0.74
KURTOSIS CHI^2	2.88*	1.45	1.76	1.25	2.72*	3.29*	1.53

T-values are reported in parentheses.
* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

4.3. T-tests

In order to get more insight into the effect of separate aspects of government involvement and commercial character on the yearly new commitments, this section shows the results of the t-tests performed on individual questions from the questionnaire that were used in the indicators. First, the aspects of government involvement are considered (section 4.3.1). Then, the elements of the ECA's commercial character (section 4.3.2).

4.3.1. Government involvement

This section shows the effects of the separate elements of the Government Involvement Indicator. For convenience, the (one-sided) t-tests are split on questions on formal government involvement and government financial responsibility.

Formal government involvement

The results show that ECAs for which decisions on transactions are taken by the ministry (only by the ministry or depending on the situation) enter into fewer new commitments yearly than ECAs in which only the ECA itself decides on transactions (question 9 from the questionnaire, for the results see Table 6). This effect is significant at the 5% level. Therefore, the null hypothesis of no difference between the groups can only be rejected for this aspect of formal government involvement. For the other elements, the null hypothesis of no difference between the groups cannot be rejected. It does not seem to matter for the relative amount of new commitments who decides on policy (Table 5), as well as whether the government is involved in the appointment of key figures in management (Table 4). Furthermore, there is no difference in the amount of relative new commitments entered into by ECAs that report that the parliament asks a lot of questions with those that report a lower frequency (Table 7) and by ECAs that report a high level of government involvement compared to those who report lower levels of government involvement (Table 8).

Government financial responsibility

This section shows the effects of the different elements of the Government Financial Responsibility Indicator. The results show that the null hypothesis cannot be rejected for any of the elements of government financial responsibility. In particular, it does not seem to matter for the relative amount of new commitments if the ECA reports to be capitalized (Table 9), whether the finances are audited by an external accountant (Table 15) and reported according to international accounting standards (Table 11),

whether there is an explicit government guarantee (Table 12), whether damages are directly borne by the state (Table 13) and whether the ECA holds actual capital reserves to cover its losses (Table 14).

4.3.2. Commercial character

Finally, the separate aspects of the commercial character of the ECA are considered. Here, a significant result is found for question 15 in the questionnaire (Table 18). ECAs that actively seek new customers enter into more new commitments than ECAs that don't. For the other elements of CCI, the null hypothesis of no difference between the groups cannot be rejected in favor of the alternative hypothesis that ECAs with a more commercial character enter into relatively more new commitments. It makes no significant difference whether profit making is an explicit purpose (Table 15), whether the ECA avoids competition with market players (Table 16), engages in activities not related to supporting exports (Table 17), whether enlarging the customer base is an explicit goal of the ECA (Table 19) and whether the ECA pays corporate taxes (Table 20).

4.4. Robustness checks

In order to check for the robustness of the results, the data is checked for outliers. This is done primarily by testing for kurtosis. This test statistic shows significant kurtosis in regression 4 and 5, as well as in the version of the regression without indicators (Table 3). The added variable plots for regression 0 show that Switzerland could be an outlier for stock market capitalization (Figure 8). Therefore, this observation is dropped from the sample. The results of the regressions without Switzerland show that there is now no longer kurtosis (Table 21). Significance is somewhat improved and that the coefficients are somewhat, but not drastically, different. In particular, the effect of stock market capitalization is much higher. A 1% increase in stock market capitalization is related to around 1.5% increase in new commitments. The indicators themselves do not show particular outliers (Figure 9, Figure 10, Figure 11, Figure 12 and Figure 13). There is only some heteroskedasticity, which is already controlled for by using robust standard errors.

Another means of checking for the robustness of the results, is by using different versions of the dependent variable. For example, when new commitments are taken relative to exports, the sign and significance of the ECA characteristics is not affected. The variable for export intensity becomes insignificant, which makes sense, as this is now already accounted for in the dependent variable. Therefore, this variable is omitted (Table 24). Finally, a dummy for who decides on transactions is added to the original regression (with new commitments relative to GDP), to see if the significance of this

variable holds when controlling for other factors. The results show that it does; ECAs in which the ministry decides in some or all cases, enter into 0.69% fewer commitments annually (Robustness t-test

Table 22). The same is done for question 15 and this dummy is also significant (Table 18). ECAs that actively seek new customers generally enter into 0.86% more new commitments.

4.5. Discussion

The previous sections show that, contrary to what was expected, there is no significant correlation of government financial responsibility and the commercial character, in terms of the Commercial Character Indicator and product diversity, with new commitments as a share of GDP. Formal government involvement, however, is significantly and negatively correlated with new commitments. ECAs that report higher levels of formal government involvement, typically enter into fewer new commitments each year. This result is robust for different specifications of the dependent variable.

When considering the separate elements of government involvement, it appears that it only matters who decides on transactions. ECAs that can decide exclusively on transactions, without involvement of the government, have relatively higher yearly new commitments. This result holds when control variables are added. The reason for this outcome could be because governments fear reputation damage. Some transactions may not be eligible for coverage due to political considerations that are not relevant for more independent ECAs. Of course, if the government can decide on transactions, it does not really need other ways of involvement, as this provides it with the ultimate control. Therefore, it is quite plausible that this effect is most significant in relation to new commitments.

Within commercial character, it is mainly question 15 that seems to make a difference. ECAs that actively seek new customers typically enter into relatively more new commitments yearly. This makes sense, as actively seeking new customers is aimed at expanding business.

One should however be careful in making assumptions about causality. The used methodology has shown correlation. It could indeed be that if ECAs are more autonomous, that they are better able to serve the market. However, it could also be that governments who do not want to meddle too much with the market choose fewer new commitments, and want to be involved in decision-making to ensure that this is achieved. That way, the lower level of new commitments is a choice and not a consequence. When it comes to actively seeking new customers, only two countries say that their ECA does not do that. It would be interesting to see why that is the case. This would require qualitative research. If data on ECA characteristics was obtained on an annual basis, more advanced econometric methods could be

used. A time series would allow for within country differences, which makes it easier to identify the effects as causal. Nevertheless, the results of this research provide the first evidence that certain ECA characteristics matter for how active the ECA is.

4.6. Conclusion

The analysis conducted in this chapter aimed at identifying whether differences between ECAs in terms of government involvement and their commercial character are related to the amount of new commitments they enter into annually. The results show that ECAs that actively seek new customers, enter into relatively more new commitments. Furthermore, ECAs in which the government is less involved, generally enter into more new commitments. This result is robust for different specifications of the dependent variable and for outliers. Furthermore, the Ramsey RESET test shows no sign of omitted variable bias (Table 3). Nevertheless, causality cannot assumed based on this analysis. It may simply be a choice to enter into fewer commitments, which is accompanied by a choice to be more involved. No significant effect can however be found for government financial responsibility on new commitments, whereas this would support the hypothesis that government involvement is related to the amount of new commitments entered into. Therefore, caution should be taken in the interpretation of this result. Nevertheless, if the government decides on transactions, it does not really need more involvement.

5. Conclusion

The literature so far has shown that public export credit insurance helps to mitigate financial frictions and thereby stimulates exports. Therefore, it makes sense that governments all over the world establish public export credit facilities to insure export credit where the market fails to do so. These ECAs are structured in many different ways, ranging from government departments to private companies. More importantly, in certain ECAs the government is more involved than in others. Furthermore, one ECA may be more commercially oriented than another.

This research aimed at identifying whether differences in the design of ECAs are related to differences in the amount of coverage provided for by the ECA. The results show that more government involvement, specifically in decision-making on transactions, is related to lower levels of annual new commitments. In other words, ECAs that can decide exclusively on transactions generally enter into more commitments each year than ECAs in which the governing ministry decides in some or all transactions. If the objective for the ECA is to 'do more', in terms of engaging in new commitments, it may therefore be useful to leave decision-making up to the ECA. Furthermore, ECAs that actively seek new customers enter into relatively more new commitments. The way the financial responsibility is organized, as well as other aspects of the commercial character of the ECA and other separate elements of government involvement, do not seem to make a difference for how 'active' the ECA is.

However, one should be careful in interpreting this result as causal. As commonly known, correlation does not equal causality. It may be the case that governments that want to control better which transactions qualify for public insurance, both enter into fewer commitments and simultaneously prefer to have a high influence. Furthermore, this research suffers from data limitations that may bias the results. Further research would be needed to show causality and further statistical significance. For instance, more insight could be gained in the relevance of ECA structures through qualitative research on decision making processes and on incentives within ECA design. This can then be related to aspects of ECA performance. Furthermore, if data was obtained over a longer period of time, there would be a higher number of observations and it would be possible to use more advanced econometric methods. Nevertheless, this research provides the first evidence for the relevance of ECA design for its performance.

Appendix A: Questionnaire

Thank you for participating in this questionnaire on the structures of Export Credit Agencies.

The results will be used in an international comparison, which will be made available to you upon participation.

The questionnaire will take roughly 10 minutes. We kindly request you to read the questions carefully and answer as many as possible. Any additional comments to the questionnaire can be left at the bottom.

Country:

Name ECA:

1. Is the ECA a body under private law?

- ○ Yes, and it is privately owned
- ○ Yes, and the government has (some) direct or indirect ownership. Percentage of ownership:
- ○ No, it is a separate legal entity under public law
- ○ No, it is embedded within a ministry

2. Is the ECA capitalized?

- ○ Yes
- ○ No

3. Which ministry is primarily responsible for the ECA?

- ○ The Ministry of Finance
- ○ Other:

4. Is the government involved in appointing the key figures within management (e.g. the managing director or the board members)?

- ○ Yes
- ○ No

5. Are the key figures within management (e.g. the managing director or the board members) exclusively public officials?

- ○ Yes
- ○ No, they are not public officials
- ○ No, they are both public officials and other members

6. Are representatives of the business community formally involved in decision making on policy?

- ○ Yes
- ○ No

7. Who decides on the policy (e.g. country policy, risk policy) of the ECA?

- ○ Only the ECA
- ○ Only the ministry
- ○ Depends:

8. Are representatives of the business community formally involved in decision making at the transactional level?

- ○ Yes
- ○ No

9. Who takes decisions at the transactional level?

- ○ Only the ECA
- ○ Only the ministry
- ○ Depends on the transaction (e.g. on the size or other characteristics)

10. Are the ECA's financial results audited by an external accountant?

- ○ Yes
- ○ No

11. Does the ECA report its finances according to international accounting standards (e.g. IAS, IFRS or GAAP)?

- ○ Yes
- ○ No

12. Is making profit part of the purpose of the ECA?

- ○ Yes
- ○ No

13. Does the ECA explicitly avoid competing with market players?

- ○ Yes
- ○ No

14. Does the ECA engage in activities that are not directly related to supporting export?

- ○ Yes
- ○ No

15. Does the ECA actively seek new customers (e.g. through marketing)?

- ○ Yes
- ○ No

16. Is enlarging the customer base an explicit goal of the ECA?

- ○ Yes
- ○ No

17. Is there an explicit guarantee by the state?

- ○ Yes, on the assets side (for each case)
- ○ Yes, on the liabilities side (only to prevent bankruptcy)
- ○ No

18. Are the damages directly borne by the state (budget)?

- ○ Yes
- ○ No

19. Does the ECA have actual capital reserves to cover its losses?

- ○ Yes
- ○ No

20. Does the ECA pay corporate taxes?

- ○ Yes
- ○ No

21. How often would you say the parliament asks questions about the activities of the ECA?

Never Continuously

1	2	3	4	5	6	7
O	O	O	O	O	O	O

22. To what extent would you consider the government involved in the policy of the ECA?

Not involved at all Completely involved

1	2	3	4	5	6	7
O	O	O	O	O	O	O

22. Do you have any additional comments?

Thank you for participating in this questionnaire on the structures of Export Credit Agencies.

Appendix B: Country overview

COUNTRY IN THE SAMPLE	ECA NAME
AUSTRIA	Oesterreichische Kontrollbank Aktiengesellschaft (OeKB)
BELGIUM	Delcredere Ducroire (DD)
CANADA	Export Development Canada (EDC)
CZECH REPUBLIC	Exportní Garanční A Pojišťovací Společnost A.s. (EGAP)
DENMARK	Eksport Kredit Fonden (EKF)
FINLAND	Finnvera
FRANCE	Compagnie Française d'Assurance pour le Commerce Extérieur (Coface)
GERMANY	Euler Hermes Aktiengesellschaft (EH Germany – State)
ITALY	Servizi Assicurativi del Commercio Estero (SACE)
JAPAN	Nippon Export and Investment Insurance (NEXI)
KOREA	Korea Trade Insurance Corporation (Ksure)
LUXEMBOURG	Office du Ducroire from the Grand-Duchy of Luxembourg (ODL)
NETHERLANDS	Atradius Dutch State Business (ADSB)
NORWAY	Garanti-instituttet for eksportkreditt (GIEK)
POLAND	KUKE S.A.
PORTUGAL	Companhia de Seguro de Créditos (COSEC)
SLOVAK REPUBLIC	Eximbanka SR
SLOVENIA	SID Bank
SPAIN	Compañía Española de Seguros de Crédito a la Exportación (CESCE)
SWEDEN	Exportkreditnämnden (EKN)
SWITZERLAND	Schweizerische Exportrisikoversicherung (SERV)
UNITED KINGDOM	United Kingdom Export Finance (UKEF)
UNITED STATES	US EXIM Bank

Other countries that answered the questionnaire and are participants to the Agreement include: Bulgaria, Croatia, Estonia, Greece and New Zealand. However, for these countries there was no data on new commitments available. Non-participant countries that answered the questionnaire include: Armenia, Belarus, Bosnia Herzegovina, Botswana, Egypt, Hongkong, Indonesia, Lebanon, Russia and Uzbekistan.

Appendix C: Tables and figures

T-tests formal government involvement

Table 4 – Government involved in the appointment of key figures in management (question 4)

ANSWER	MEAN	OBS.
NO	-5.536	6
YES	-5.768	17
T-VALUE	0.439	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 5 – Policy decisions (question 7)

ANSWER	MEAN	OBS.
ONLY ECA	-5.402	10
ONLY MINISTRY OR DEPENDS	-5.942	13
T-VALUE	1.190	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 6 – Transaction decisions (question 9)

ANSWER	MEAN	OBS.
ONLY ECA	-5.051	8
ONLY MINISTRY OR DEPENDS	-6.057	15
T-VALUE	2.308**	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 7 – Questions by parliament (question 21)

ANSWER	MEAN	OBS.
FREQUENCY ≤ 4	-5.659	15
FREQUENCY > 5	5.798	8
T-VALUE	0.284	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 8 – Government involvement (question 22)

ANSWER	MEAN	OBS.
LEVEL OF INVOLVEMENT ≤ 4	-5.489	12
LEVEL OF INVOLVEMENT >5	-5.946	11
T-VALUE	1.005	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

T-tests government financial responsibility

Table 9 – ECA capitalized (question 2)

ANSWER	MEAN	OBS.
CAPITALIZED	-5.652	14
NOT CAPITALIZED	-5.872	8
T-VALUE	0.438	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 10 – Finances audited by external accountant (question 10)

ANSWER	MEAN	OBS.
EXTERNAL ACCOUNTANT	-5.740	21
NO EXTERNAL ACCOUNTANT	-4.966	1
T-VALUE	(-)	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 11 – Finances reported according to international accounting standards (question 11)

ANSWER	MEAN	OBS.
FOLLOW IAS	-5.693	15
NO IAS	-5.734	8
T-VALUE	0.083	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 12 – Explicit government guarantee (question 17)

ANSWER	MEAN	OBS.
NO EXPLICIT GUARANTEE	--6.127	6
GUARANTEE PER CASE OR AGAINST BANKRUPTCY	-5.623	16
T-VALUE	-0.969	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 13 – Damages directly borne by state (question 18)

ANSWER	MEAN	OBS.
DAMAGES NOT BORNE BY STATE	-5.623	13
DAMAGES DIRECTLY BORNE BY STATE	-5.817	10
T-VALUE	0.415	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 14 – Actual capital reserves to cover losses (question 19)

ANSWER	MEAN	OBS.
KEEP ACTUAL CAPITAL RESERVES	-5.636	16
NO ACTUAL CAPITAL RESERVES	-5.871	7
T-VALUE	0.467	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

T-tests commercial character

Table 15 – Making profit as an explicit purpose (question 12)

ANSWER	MEAN	OBS.
NO PROFIT MAKING PURPOSE	-5.635	20
PROFIT MAKING PURPOSE	-6.187	3
T-VALUE	0.812	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 16 – Explicitly avoid competition with market players (question 13)

ANSWER	MEAN	OBS.
EXPLICITLY AVOID COMPETITION	-5.705	16
DOES NOT EXPLICITLY AVOID COMPETITION	-5.802	6
T-VALUE	0.179	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 17 – Engage in activities not related to supporting export (question 14)

ANSWER	MEAN	OBS.
NOT ENGAGE IN NON-EXPORT ACTIVITIES	-5.687	16
ENGAGE IN ACTIVITIES NOT RELATED TO SUPPORTING EXPORT	-5.754	7
T-VALUE	0.133	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 18 – Actively seek new customers (question 15)

ANSWER	MEAN	OBS.
NOT ACTIVELY SEEKING	-6.813	2
ACTIVELY SEEKING NEW CUSTOMERS	-5.634	20
T-VALUE	-1.481*	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 19 – Explicit goal of enlarging customer base (question 16)

ANSWER	MEAN	OBS.
ENLARGING CUSTOMER BASE NO EXPLICIT GOAL	-5.832	7
EXPLICIT GOAL OF ENLARGING CUSTOMER BASE	-5.653	16
T-VALUE	-0.355	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Table 20 – ECA pays corporate taxes (question 20)

ANSWER	MEAN	OBS.
DOES NOT PAY CORPORATE TAX	-5.426	14
PAYS CORPORATE TAX	-6.145	9
T-VALUE	1.599	

* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Added variable plots

Figure 8 – Added variable plots control variables (regression 0)

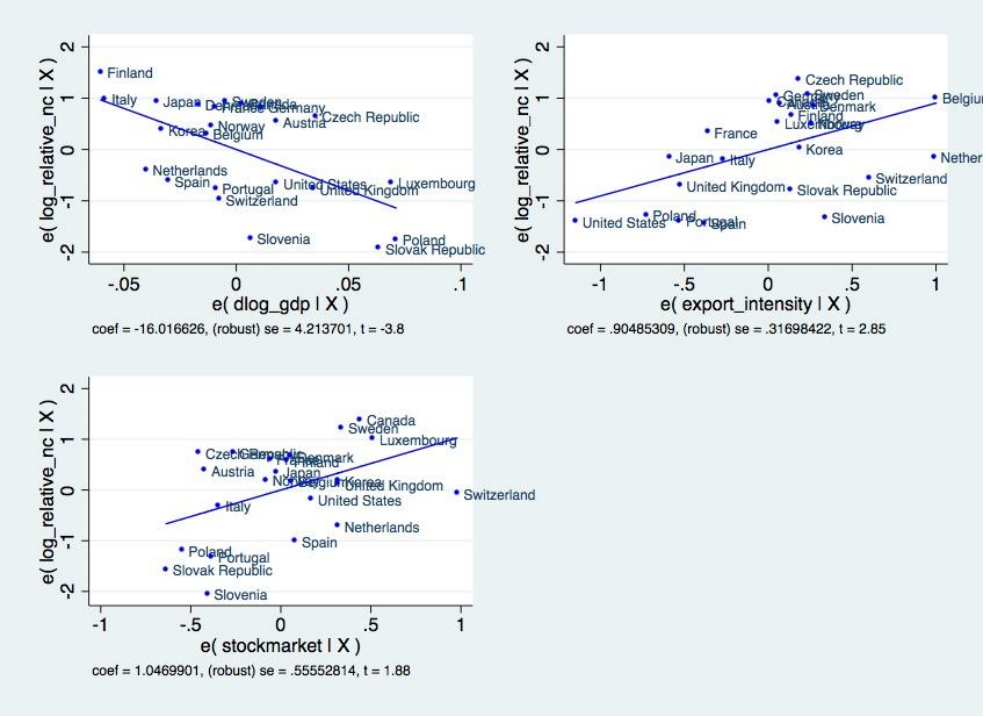


Figure 9 – Added variable plot GII (regression 1)

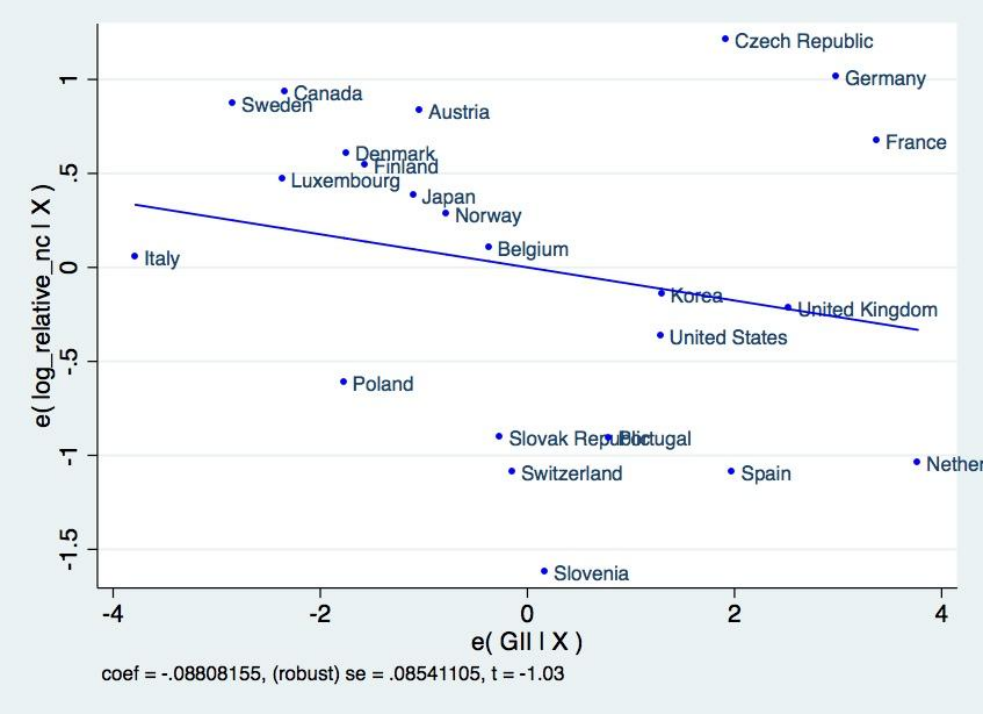


Figure 10 – Added variable plot FGII (regression 3)

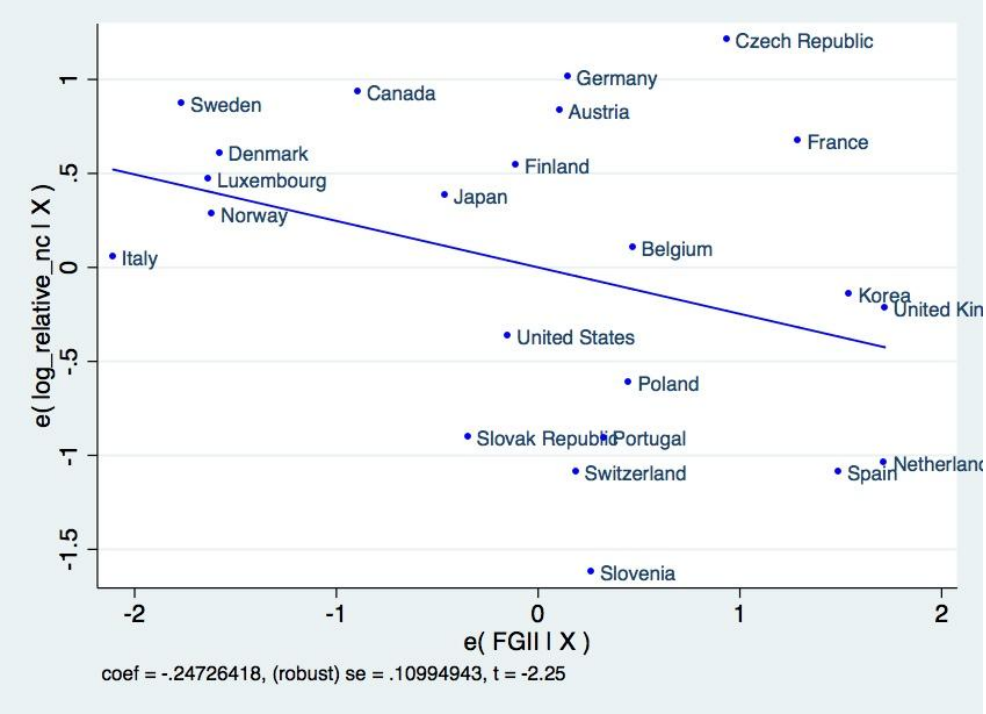


Figure 11 – Added variable plot GFRI (regression 4)

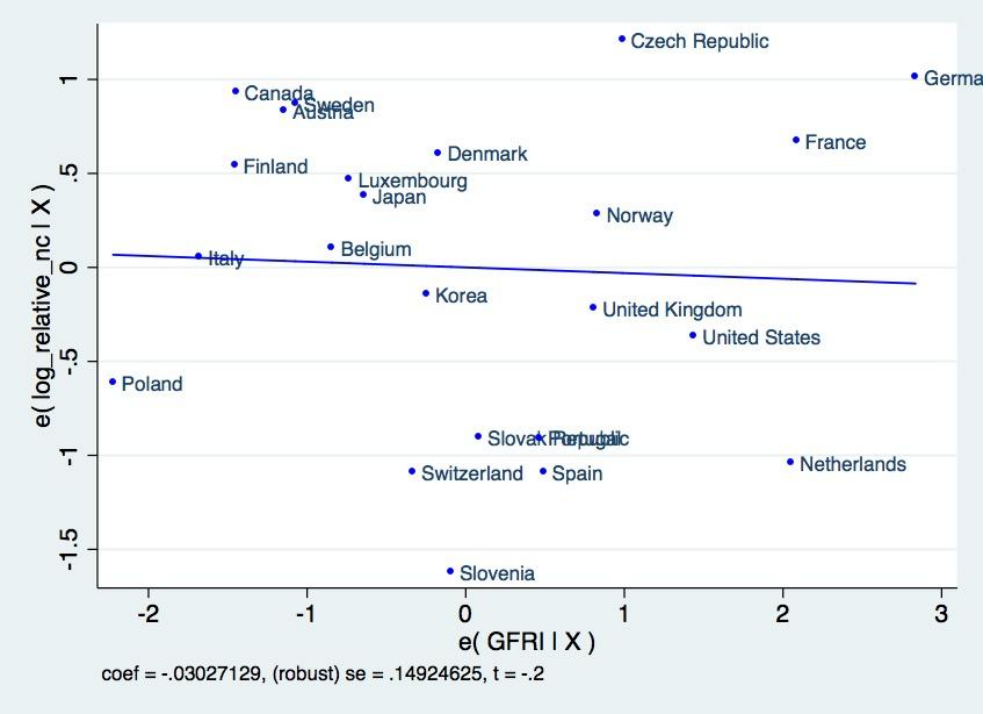


Figure 12 – Added variable plot CCI (regression 5)

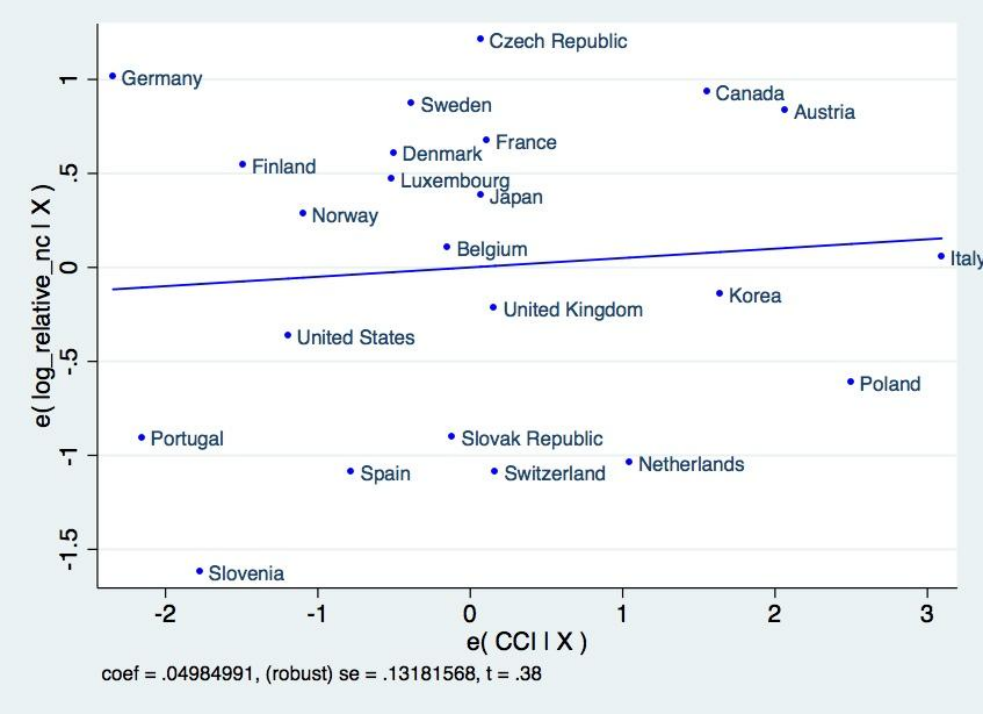
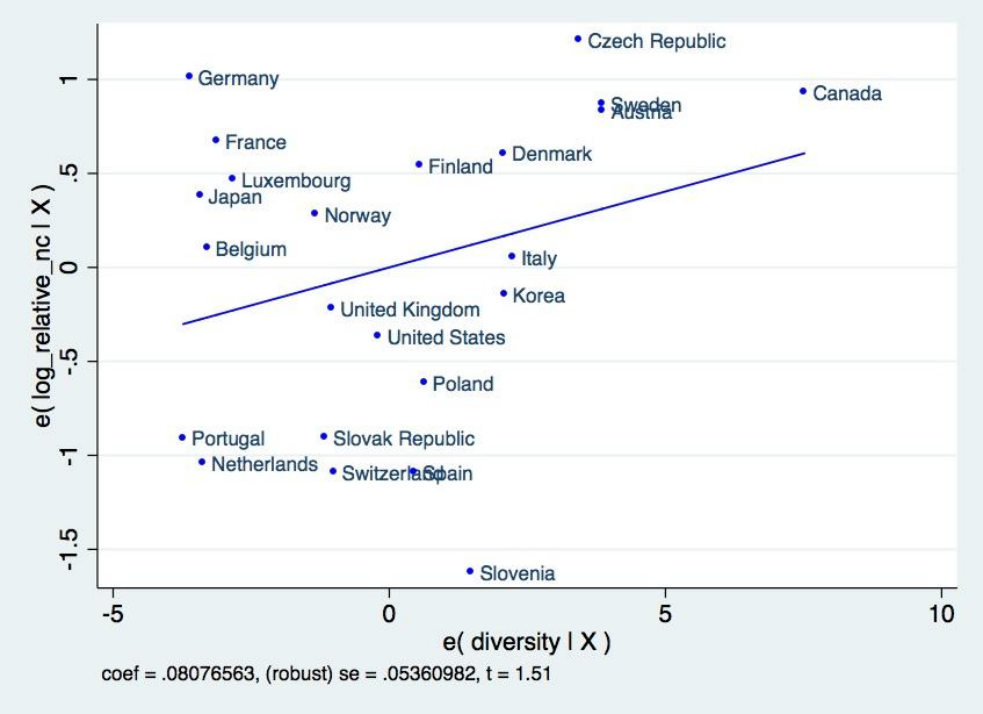


Figure 13 – Added variable plot diversity (regression 6)



Regressions for robustness

Outlier correction

Table 21 - Regression analysis without Switzerland

REGRESSION	**(0)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GII		-0.091					
		(-1.03)					
FGII			-0.268**	-0.237**			
			(-2.48)	(-2.13)			
GFRI			0.062		-0.045		
			(0.43)		(-0.29)		
CCI						0.056	
						(0.44)	
DIVERSITY							0.073
							(1.37)
DLOG(GDP)	-16.433***	-15.774***	-13.256**	-13.824***	-16.601***	-16.705***	-16.970***
	(-4.01)	(-3.80)	(-2.87)	(-3.26)	(4.01)	(-3.75)	(-4.42)
LOG(EXPORT/GDP)	1.075***	1.021***	1.019***	1.008***	1.0601**	1.112**	0.975***
	(3.05)	(3.22)	(3.19)	(3.48)	(2.90)	(2.84)	(2.93)
STOCK MARKET	1.513**	1.495**	1.474**	1.476**	1.511**	1.560*	1.654***
CAPITALIZATION	(2.79)	(2.84)	(2.73)	(2.84)	(2.74)	(2.59)	(3.53)
CONSTANT	3.722	3.681	3.566	3.590	3.726	2.863	2.390
	(1.26)	(1.47)	(1.40)	(1.54)	(1.29)	(1.22)	(0.82)

ROBUST S.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.5062	0.5368	0.5755	0.5711	0.5091	0.5116	0.5463
OBSERVATIONS	22	22	22	22	22	22	22
RAMSEY RESET F-VALUE	1.29	0.61	0.28	0.14	1.10	1.90	0.62
KURTOSIS CHI^2	1.51	0.40	0.48	0.27	1.31	1.66	0.53

T-values are reported in parentheses.
* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

Robustness t-test

Table 22 - Regression with dummy for question 9

REGRESSION	
TRANSACTION DECISIONS MINISTRY	-0.688* (-2.00)
DLOG(GDP)	-12.240** (2.35)
LOG(EXPORT/GDP)	0.942*** (3.05)
STOCK MARKET CAPITALIZATION	0.862 (1.72)
CONSTANT	3.015 (1.21)
ROBUST S.E.	Yes
R^2	0.5104
OBSERVATIONS	23
RAMSEY RESET F STATISTIC	0.57
KURTOSIS CHI^2	2.56

Table 23 - Regression with dummy for question 15

REGRESSION	
ACTIVELY SEEKING CUSTOMERS	0.863* (1.81)
DLOG(GDP)	-16.990*** (3.95)
LOG(EXPORT/GDP)	0.775** (2.34)
STOCK MARKET CAPITALIZATION	0.939 (1.66)
CONSTANT	0.900 (0.31)
ROBUST S.E.	Yes
R^2	0.486
OBSERVATIONS	23
RAMSEY RESET F STATISTIC	1.30
KURTOSIS CHI^2	1.05

Specification dependent variable

New commitments relative to exports

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} export_{t,i}}\right) = \beta_0 + \beta_1 * GII_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 1a}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} export_{t,i}}\right) = \beta_0 + \beta_1 * FGII_i + \beta_2 * GFRI_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 2a}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} export_{t,i}}\right) = \beta_0 + \beta_1 * FGII_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 3a}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} export_{t,i}}\right) = \beta_0 + \beta_1 * GFRI_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 4a}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} export_{t,i}}\right) = \beta_0 + \beta_1 * CCI_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 5a}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} export_{t,i}}\right) = \beta_0 + \beta_1 * diversity_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 6a}$$

Table 24 - Regression on log(new commitments/exports)

REGRESSION	(1A)	(2A)	(3A)	(4A)	(5A)	(6A)
GII	-0.083					
	(-1.01)					
FGII		-0.285**	-0.240**			
		(-2.77)	(-2.25)			
GFRI		0.090		-0.024		
		(0.69)		(-0.17)		
CCI					0.055	
					(0.44)	
DIVERSITY						0.074
						(1.41)
DLOG(GDP)	-15.859***	-12.994***	-13.878***	-16.422***	-16.465***	-17.158***
	(-3.87)	(-2.92)	(-3.36)	(-3.99)	(-3.84)	(-4.22)
STOCK MARKET	1.072*	1.086*	1.079*	1.076*	1.108*	1.281**
CAPITALIZATION	(1.85)	(1.99)	(1.99)	(1.98)	(1.78)	(2.52)
CONSTANT	-3.226***	-3.351***	-3.183***	-3.528***	-3.745***	-4.132***
	(-1.90)	(-6.98)	(-8.33)	(-7.72)	(-5.62)	(-6.60)
ROBUST S.E.	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.4510	0.5025	0.4928	0.4253	0.4300	0.4688
OBSERVATIONS	23	23	23	23	23	23

T-values are reported in parentheses.
* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

New commitments relative to net national income

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} net\ national\ income_{t,i}}\right) = \beta_0 + \beta_1 * GII_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 1b}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} net\ national\ income_{t,i}}\right) = \beta_0 + \beta_1 * FGII_i + \beta_2 * GFRI_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 2b}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} net\ national\ income_{t,i}}\right) = \beta_0 + \beta_1 * FGII_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 3b}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} net\ national\ income_{t,i}}\right) = \beta_0 + \beta_1 * GFRI_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 4b}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} net\ national\ income_{t,i}}\right) = \beta_0 + \beta_1 * CCI_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 5b}$$

$$\log\left(\frac{\sum_{t=2011}^{2015} total\ new\ commitments_{t,i}}{\sum_{t=2011}^{2015} net\ national\ income_{t,i}}\right) = \beta_0 + \beta_1 * diversity_i + \mathbf{\beta x_i} + \varepsilon \quad \textbf{Regression 6b}$$

Table 25 – Regression on log(new commitments/net national income)

REGRESSION	(1B)	(2B)	(3B)	(4B)	(5B)	(6B)
GII	-0.097					
	(-1.12)					
FGII		-0.301**	-0.262**			
		(-2.70)	(-2.40)			
GFRI		0.078		-0.040		
		(0.56)		(-0.26)		
CCI					0.045	
					(0.34)	
DIVERSITY						0.077
						(1.24)
DLOG(GDP)	-14.052***	-11.196**	-11.898**	-14.905***	-14.975***	-15.361***
	(-2.98)	(-2.33)	(-2.28)	(-3.13)	(-3.00)	(-3.00)
LOG(EXPORT/GDP)	0.871**	0.883**	0.864***	0.916**	0.959**	0.836**
	(2.82)	(2.85)	(2.44)	(2.64)	(2.75)	(2.25)
STOCK MARKET	1.040*	1.058*	1.046*	1.057*	1.100*	1.248**
CAPITALIZATION	(1.78)	(1.87)	(2.29)	(1.79)	(1.77)	(2.52)
CONSTANT	2.771	2.744	2.737	2.819	2.935	1.499
	(1.14)	(1.11)	(0.94)	(1.03)	(1.04)	(0.47)
ROBUST S.E.	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.4507	0.5027	0.4955	0.4180	0.4192	0.4616
OBSERVATIONS	23	23	23	23	23	23

T-values are reported in parentheses.
* P-value < 0.10
** P-value < 0.05
*** P-value < 0.01

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