IS THERE A RELATIONSHIP BETWEEN WHO YOU TRADE WITH AND WHO YOU BANK WITH? EVIDENCE FROM HUNGARIAN DATA

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Abstract

In this thesis I address the relationship between exporting to and banking with the same country using Hungarian firm-level data. I find significant relationship, and I am unable to exclude the existence of causality between exporting to and banking with the same country , even after controlling for factors that it is possible to control for using the data available. On the way, I find interesting facts about characteristics of exporting and non-exporting Hungarian firms in terms of their banking relationships.

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Chapter 1: Introduction

In this thesis I would like to answer two related questions. The first one is whether there is a relationship between the country of ownership of a bank a firm has banking relationship with and the countries to which the firm exports. The second question is whether there is a causal relationship between having a banking relationship at a bank that is owned by some foreign country, and export flows to the country of the bank owner. I examine these questions using Hungarian micro-level data between 1991 and 2003.

Knowing the answer to the above questions is important for two distinct reasons. Firstly, the broader question, whether there is a relationship between banking and exporting, is important in order to see whether there is a certain complementarity between trade flows and financial flows and how important it is. This, apart from being interesting for its own sake, might be relevant in terms of understanding the interrelatedness of foreign shocks from the same source country to domestic firms. It seems plausible that firms are subject to shocks through conditions in their export markets, and we do know that firms are subject to shocks through their banking relationships (Gabriel et al (2012), Cettorelli and Goldberg (2012), Ongena et al (2012), Schnabl (2011)). If firms are more likely to bank and trade with entities from the same country, then the magnitude of shocks that reach a certain firm is larger than as if banking and trade partners were independent.

The motivation for the question involving the causal relationship is understanding network effects involving firms. My hypothesis is that having a banking relationship with a bank

whose owners are from a certain country causes a firm to start exporting to that same country or causes it to increase its export intensity. The answer to the question why opening a bank account at a foreign owned bank would be related to exporting to that same foreign country, is the following: banks are not only institutions where firms anonymously have their money deposited. Often, there are personal relationships between representatives of firms and banks involved in the relationship. Not only does the bank have to know specific details about its clients' operations, future plans, purpose of the loan, collateral, etc but there are definitely individual level conversations involved between the consultant of the bank and the representative of the firm. Since banking consultants that work at foreign owned banks might know relatively more about the owner country of the bank than banking consultants working at banks owned by a different country, it is not implausible to think that information one gets through consultations with banking employees might help one expand one`s export markets. Furthermore, banks regularly organize events for their clients where they talk about new products, macroeconomic trends in the economy and anything that the bank might find can be interesting for their clients. With the occasion of these events, participants can network with each other (and do network with each other). If we think that to begin with, there are more clients at a Belgian bank who have some business relationship with Belgium (which is plausible), then we might also hypothesize that during such conversations at coffee breaks, business information about Belgium is circulating more, than business information about another country, like Italy. Then, it is possible that learning about the country of the owner of one's bank helps start/reinforce exporting activity towards the owner country of the bank.

One of the motivations for examining this question was an article on the news portal portfolio.hu about a Hungarian startup company.(portfolio.hu, 2012) According to the article, apart from the great minds working at the company, a key element for the business success of

the firm was an American individual who provided information, experience and contacts in the industry. What caught my attention is the fact that Michael Simon was the channel, the connecting person of the company. Even though he is not a banker, he is a person that provided information about contacts and markets crucial for the success of the company. Since another possible information source for companies that are productive enough to be successful in export markets is their bank, the hypothesis of my thesis is that having a bank account at a foreign bank in Hungary helps firms export to that certain country.

In this thesis I use fixed effects regression and event studies to answer the posed questions. My findings are that controlling for factors fixed over time and across firms, and also for factors fixed over time and across countries, the relationship between being foreign owned and exporting to the country of the owner remains significant. Similarly, the relationship between banking with a bank whose owner is from a certain country and exporting to the same country remains significant. The magnitude of the relationship between foreign ownership and exports is stronger than the one between banking and exports. The fixed effects estimation provides no evidence for causality. Using event studies, given the data and the question I have, it was also not possible to decide whether causality is present. However, it would have been possible to exclude the possibility of causality using either of the two methodologies I applied. My results suggest that causality cannot be excluded. The observed relationship can be driven by causality in either way or a third omitted factor that drives both trade and banking with the same country. I establish that having one's first bank account at a foreign owned bank helps or is perceived to help exports more than having it at a Hungarian owned bank. I also establish that both after becoming foreign owned by a certain country and after opening a bank account at a bank from the same country, the export probability to the same country increases. Further, I find in the case of Italy that opening a bank account at a

bank owned by Italians increases export probability more to Italy, than to other countries. Subsequently, I find that exporting probability to country A is increased significantly after becoming owned by that particular country A, whereas after becoming owned by another country B, export probability to country A does not increase significantly. Last, but not least, I find that after starting to export to a certain country, controlling for becoming owned by a certain country, the probability to start banking with that particular country increases.
To sum up, I have not been able to provide evidence for causal relationship between exporting and banking. However, I have also not been able to reject potential causality in any of the directions between exporting to a certain country and banking with the same country.

To the best of my knowledge, there has been no work done that examine the main question of my thesis. The line of work most closely related is the emerging literature on the relationship between trade finance and export activity, in the context of the financial and trade crisis of recent years. The most notable examples of this literature are Manova and Chor (2012), Amiti, Weinstein (2009) and Schnabl et al. (2012). Manova and Chor (2012) quantify the effect of the financial crises on trade activity, whereas Schnabl et al. (2012) suggest that the credit shortage decreases exports through increasing the cost of working capital for general production and not through raising the cost of exported-related financing.

Chapter 2 describes the datasets used. Chapter 3 provides descriptive statistics and facts about the banking sector in Hungary. Chapter 4 details the estimation methodologies and results. Chapter 5 concludes and provides further lines of research.

Chapter 2: Data

I used firm level data. I created my ultimate database using four different data sources. The first one, the balance sheet data supplied to me by Hungarian Academy of Sciences Institute of Economics was merged with the export-import database of the Customs Statistics. I further merged these databases with bank account and ownership information from the Complex database. From the bank account and ownership database I used those firms in the analysis that were included in the balance sheet or trade database. I identified the banks that firms had a bank account at using the so called GIRO-codes. This is the part of the bank account number that identifies the bank itself. For 2002-2003 I had access to the tables from the Hungarian National Bank that assigns to every GIRO code a bank. For years before 2002 I tracked back for every GIRO code that was among the 20 largest banks in the given year, which bank it belonged to in a given year. I was provided useful help by the National Bank of Hungary. On the basis of the bankname, I determined the ownership information of banks using sources available through websites of banks and the Association of Banks in Hungary (Bankszovetseg). I considered a bank foreign owned if it was majority foreign owned (50%+1). I used the 20 largest banks that firms had a bank account at for my analysis. My sample period is 1991-2003. I considered banking, export and ownership relationships of Hungarian firms for the 19 largest partners in the above three aspects, in my sample period. These were (in no particular order): Austria, Germany, Italy, Belgium, Netherlands, United Kingdom, United States, Spain, Finland, France, Korea, Malaysia, Russia, Serbia, Czech Republic, Slovakia, Switzerland, Poland, Ukraine.

Chapter 3: Descriptive Statistics And Facts

3.1. Firms

Altogether there are 280.235 distinct firms in my database. The second column of the following table shows the number of firms that are in the database, by year. Between 1991 and 1999 I have data on the universe of Hungarian firms that had double-entry bookkeeping. After 1999 I do not have data on the smallest firms, but still have data on the majority of firms.

The third column of Table 1 shows the number of non-exporter firms, while the second column of Table 2 shows the number of exporters. Exporters are few: in every year, there are more non-exporters than exporters in the database. (As documented also by Mayer and Ottaviano (2008).) The last column shows the average number of countries to which firms exported, calculated among exporters only.

The rest of the two tables deal with the two other central variables in this thesis: number of banks a firm has a bank account at and foreign ownership. The fourth from Table 1 and the third column from Table 2 show the ratio of firms that had a bank account and those that did not have a bank account for non-exporters and exporters, respectively.

It is interesting to note that except for the first two years this ratio is larger among exporters than non-exporters. This means that among exporting firms it is more common to have a banking relationship than among non-exporter firms. This is true for every year in my sample. Furthermore, except for four years (1992, 1995, 1999 and 2000) the number of firms that have

a bank account increases more quickly among exporters than non-exporters.[1]

But more is true for the difference in terms of banking between exporters and non-exporters: looking at columns five (Table 1) and column four (Table 2) reveals that among firms that do have at least one bank account, exporters tend to have more bank accounts, on average. This is true for every year in my sample. Furthermore, except for 2000, 2001 and 2003, the average number of bank accounts grew more rapidly in the exporting group.[2]

The facts in the previous three paragraphs add to the findings on the aspects in which exporters and non-exporters are different, documented by, among others Bernard, Jensen and Schott (2007).

Columns six (Table 1) and five (Table 2) show the ratio of foreign owned and domestic owned firms among non-exporters and exporters, respectively. There are relatively more foreign owned firms among exporters than non-exporters, in all years and the difference between the ratios within years is quite large.

1 The fact that in 2000 the number of firms with a bank account increased more rapidly in the non-exporting group is very likely to be due to the loss of the smallest firms in the sample.

2 Similarly, the fact that in 2000 the average number of bank accounts grew more rapidly among the non-exporters, is very likely to be due to the loss of the smallest firms in the sample.

year	Number of firms	Nonexporters			
		Number of nonexporting firms	Ratio of number of firms having a bankaccount and number of firms not having one	Average number of banks firms with a bankaccount have a bankaccount with	Ratio of foreign to domestic firms
1991	33957	25238	0.08	1.03	0.06
1992	73102	61453	0.14	1.02	0.07
1993	84624	71047	0.18	1.03	0.08
1994	96818	82567	0.22	1.04	0.10
1995	109684	92929	0.41	1.09	0.10
1996	121089	106130	0.51	1.10	0.10
1997	134960	119532	0.65	1.12	0.10
1998	145183	129283	0.89	1.15	0.10
1999	148697	133334	1.17	1.18	0.10
2000	75876	59855	1.95	1.36	0.12
2001	75767	58191	2.23	1.46	0.12
2002	77851	60506	2.69	1.52	0.12
2003	77475	60572	2.82	1.55	0.12

Table 1: Non-exporter Firms

	Exporters					
year	Number of nonexporting firms	Ratio of number of firms having a bankaccount and number of firms not having one	Average number of banks firms with a bankaccount have a bankaccount with	Ratio of foreign to domestic firms	Average number of exportpartners	Export/total sales
1991	8719	0.07	1.06	0.09	2.09	0.21
1992	11649	0.12	1.11	0.13	1.98	0.28
1993	13577	0.19	1.15	0.17	2.00	0.29
1994	14251	0.27	1.19	0.20	1.98	0.30
1995	16755	0.44	1.28	0.21	1.98	0.32
1996	14959	0.67	1.36	0.26	1.85	0.33
1997	15428	0.90	1.42	0.28	2.01	0.33
1998	15900	1.35	1.51	0.30	2.02	0.33
1999	15363	1.72	1.56	0.34	2.08	0.33
2000	16021	2.29	1.67	0.35	2.11	0.30
2001	17576	2.83	1.75	0.37	2.12	0.30
2002	17345	3.57	1.88	0.37	2.17	0.29
2003	16903	3.94	1.87	0.37	2.19	0.29

Table 2: Exporter Firms

3.2. Banks

Next to firms, the other central entities in my analysis are banks in Hungary. Since my analysis is performed on data between 1991 and 2003, it is crucial to know some facts about the Hungarian banking sector in this period. The liberalization of the Hungarian banking sector started in 1989, after the introduction of the two tiered banking system in 1987. Starting in the 1990s there was a large privatization wave in the Hungarian banking sector (Varhegyi (2001)). Banks from several countries entered into the market either through greenfield investments or through directly acquiring previously state owned banks. An example for the former is the Dutch bank ING that in 1991 founded a fully owned commercial bank in Hungary. (ING website) for the latter one is the Austrian ERSTE Bank that in 1997 acquired Mezobank and subsequently increased its share capital.

Table 3 shows, for each country that is the owner of the twenty largest banks in Hungary, the ratio of total sales of firms that had bank accounts at banks that had owners of the country in the row. For example, the number 0.318 for Germany in 1998 indicates that among all the firms on which I had total sales data available, 31.8 % of the total sales value of Hungarian firms had a bank account with a German bank in 1998. Firms may have multiple bank account and in the initial years, I did not have data on all the firms bank accounts either because they did not have one, or they did not report it. [3]

3 The reason for having a blank cell in Table 3 might be two: either banks with owners of the certain country were not among the twenty largest banks in the given year, or they were not yet present on the Hungarian market.

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
HU	0.094	0.233	0.363	0.376	0.497	0.494	0.509	0.522	0.547	0.612	0.536	0.552	0.521
FR												0.175	0.177
RU						0.016	0.017	0.020	0.019	0.026	0.028	0.027	
NL	0.002	0.008	0.088	0.115	0.132	0.244	0.335	0.293	0.255	0.296	0.336	0.237	0.238
BE							0.143	0.207	0.222	0.249	0.297	0.481	0.471
DE			0.023	0.037	0.196	0.235	0.268	0.318	0.331	0.505	0.548	0.581	0.607
IT	0.000	0.134	0.161	0.179	0.193	0.221	0.250	0.286	0.307	0.363	0.385	0.396	0.396
MY											0.047	0.044	0.010
KR												0.070	0.075
US	0.009	0.095	0.110	0.126				0.185	0.216	0.248	0.477	0.457	0.377
AT				0.160	0.174	0.196	0.232	0.286	0.308	0.355	0.403	0.406	0.415
total	0.106	0.470	0.746	0.992	1.192	1.405	1.754	2.116	2.205	2.655	3.057	3.428	3.286

Table 3: Sales-weighted share of foreign and Hungarian banks in the corporate banking market

3.3. Ownership, Bank and Export Relationships

The following table shows the correlation coefficients between having foreign ownership of a certain country, banking with the same country and exporting to the same country. One star indicates that the p-value of the correlation coefficient is 0.000.

	foreign	**banks**	**exports**
foreign	1		
banks	0.0457*	1	
exports	0.1338*	0.0379*	1

Table 4: Correlation coefficients of central variables

The summary statistics suggest that there is a relationship between banking practices of firms and their export status. To further understand this relationship I look at how export status, banking status and foreign ownership move together. I use fixed effects estimation methodology and event study methodology. Since due to the question and the data available, it is not possible to establish causality between banking with and exporting to a certain country, I show that causality in either direction cannot be excluded. Also, I try to understand whether there is a causal relationship between becoming foreign owned by an entity from a certain country and exporting to that certain country.

Chapter 4: Estimation strategy and Results

This chapter aims at understanding the relationship between trade with a certain country and banking with the same country using fixed effects estimation and event studies. There are several possible reasons for the relationship to be present:

(i) exporting causes firms to open a bank account at a bank whose owner is from the same country as the export destination

(ii) having a bank account at a bank from a certain country causes firms to start exporting/increase export intensity to the ownership country of the bank

(iii) there is a third variable that causes firms to both open a bank account at a bank with ownership of a certain country and export to the same country.

Using fixed effects regression it is possible to assess whether controlling for certain unobserved characteristics of firms and partner countries, the relationship still remains. If it vanishes, that is evidence for the relationship to be driven by some unobserved variable that is captured by the fixed effects included in the regression. If it does not vanish, it either means that there is a factor not captured by the included fixed effects causing both banking and exports, or that there is a causal relationship between exporting and banking. However, in the case of nonvanishing relationship, the fixed effects regression does not help in understanding whether there is an unobserved third factor causing both or there is a causal relationship and in which direction.

4.1. Fixed Effects

My database is a three dimensional unbalanced panel: not every firm is present in every year. The dimensions of the panel are: firms, years and countries with which firms have a relationship. The relationships I consider are: having a bank account at a bank located in Hungary that is owned by owners of a certain country[4], exporting to a certain country and having owners from a certain country.

The model I estimate with fixed effects methodology is the following:

$$export_{ict} = \alpha_{it} + \beta_{ct} + \gamma * banks_{ict} + \delta * foreign_{ict} + \varepsilon_{ict}$$

where i refers to the index of the firm, c refers to the country and t refers to the year.

Export is a dummy variable which takes the value of one if a given firm, in a given year exports to a given country. Banks is also a dummy variable indicating that the firm has a bank account at a bank owned by a given foreign country, in a given year. Foreign is also a dummy and it takes the value of one, if in a given year, the given firms has owners from a given country.

α_{it} are firm-year fixed effects and beta ct are country-year fixed effects. It is important to include firm-year fixed effects, because they might be driving both banking relationships and/or foreign ownership and exporting. For example, if in a given year, a given firm is more productive, therefore produced a larger volume of products, this might cause it to open a new bank account at a German bank. The reason is that it has more sales, more customers and has the room to diversify its financial relationships. It considers the German bank good, so it

4 In this thesis I sometimes refer to banks located in Hungary that are owned by foreign owners as foreign bank, e.g. German bank. I always mean banks in Hungary that are owned by foreign owners.

opens a new bank account there. Becoming more productive might also cause the firm to start exporting to Germany. If firm fixed effects are not included, one might be capturing the effect of a third variable that is not related to the mechanism at the core of this thesis.

The country-year fixed effects are important to include, because they control for the macroeconomic trends of the partner countries. For example, if Belgium is in a boom in a certain year, that might cause Belgian customers to be able to spend more money, allowing the country to absorb more imports, possibly also from Hungary. At the same time, the Belgian owned bank in Hungary can also profit from the good year of its owner bank and use the opportunity to try to gain larger market share in Hungary. These two together would cause us to see an increase in the intensity of export and banking activity, again unrelated to the mechanism of the thesis.

For estimation I make use of the transformation suggested in Matyas and Balazsi (2012). The type of the fixed effects model in this thesis corresponds to model (9) in their paper and the appropriate transformation through which one is able to estimate the model through a simple OLS is

$$export\_transformed_{ict} = \rho * banks\_transformed_{ict} + \theta * foreign\_transformed_{ict} + u_{ict}$$

where $export\_transformed_{ict} = export_{ct} - export_{it} + export_{t}$

$banks\_transformed_{ict} = banks_{ct} - banks_{it} + banks_{t}$

$foreign\_transformed_{ict} = foreign_{ct} - foreign_{it} + foreign_{t}$

Variables on the right hand side of the definitions refer to averages.

	exps_transformed
banks_transformed	0.0270405***
	(0.0001928)
foreign_transformed	0.0346499***
	(0.0002306)
R2	0.0059
Nr of observations	11933300
Standard errors in parenthesis	
*** p<0.01	

Table 5: Fixed Effects Regression

As Table 5 shows both the banks and the foreign variable is significant in the regression corresponding to the fixed effects regression. (In the calculation of the p-value I have taken into account the number of means that I had to estimate to perform the transformation of the variables.)

This means that in years when a given firm banks more with banks from a given country, the firm is also significantly more likely to export to that given country, even controlling for the ownership of the firm in the given year. Similarly, in years when a given firm is owned by an entity from a foreign country, the firm in that year is significantly more likely to export to the

country of its ownership, controlling for its banking relationships. The ownership-export relationship is stronger than the banking-export relationship. However, on the basis of the fixed effects regressions, it is not possible to say anything about causality between foreign ownership and export in either way or about banking relationships and export in either way.

Due to computational limitations, estimating the model including a third, firm-country fixed effect has not been possible. [5]

4.2. Event Study

Through event study methodology it is possible to learn more about potential causality. The event study methodology allows to understand how the value of a certain variable changed after a certain event happened. The events I consider involve ownership change of firms, opening a bank account at a bank owned by entities from a certain country and lastly, starting to export to a certain country. The outcome variables I study in response to certain events are exporting probability to any country, exporting probability to a particular country and export intensity to a certain country compared to overall export volume. In all of my regressions for the event studies I include the following control variables: logarithm of firm productivity, logarithm of employment, logarithm of capital used by the firm and industry dummies. I indicate where my controls are different.

In an event study, to understand whether the event moves together with the outcome variable, one looks at the change in the levels of the variable of interest, following the event. The event

5 Estimating the model using all three fixed effects was not possible, since the transformation suggested by Matyas and Balazsi (2012) returns biased estimates in the case of unbalanced panel data. Furthermore, the alternative transformation proposed by the paper still requires in the case of my database a too large number of dummy variables that my computer could not handle.

study allows to exclude any causal relationship between the event and the variable of interest. If one finds no significant change in the variable of interest after the event happened, this rules out the possibility of causal relationship. However, finding a significant change in the variable of interest is no proof for causal relationship, since both the event happening and the outcome variable could be driven by a third, omitted variable. In examining whether there is a causal relationship, even though I include control variables in my event study regression, I am unable to control for certain factors. For example, the manager of a firm that manufactures PET bottles might have recently visited Italy and liked the country. Because of her positive feelings about the country she might consider starting to bank at an Italian owned bank and might consider starting to actively search for information about her export opportunities to Italy. In this case, my event study methodology would shows that after the firm opened a bank account, it started to export to Italy, but the causal relationship is not there. Instead, there is a third omitted factor driving both. Or, for some exogenous reason, the manager of the firm might start learning Italian in a language course and the year thereafter, the firm might start to both bank with an Italian bank and export to Italy. Also in the second example, the common cause of banking and exporting is an omitted factor. In my event studies, when I talk about significance, I mean significance at the 5% level, unless I note otherwise.

The first event considered is the opening of firms' first bank account. The aim is to understand whether bank accounts opened at foreign owned banks help exporting compared to Hungarian owned banks. The event time is shown on the x axis, whereas the exporting probability to any of Hungary's largest 19 partner countries is shown on the y axis. Because there is a constant included in the regression and there are many firms that are not exporting, the levels of the estimated coefficients are often below zero. (Because of the large number of industry

dummies, the Stata command "areg" has been used which does not allow the "noconstant" option.) However, what one has to look at is the change in the levels of the variable of interest: comparing the change in the exporting probability of firms whose first bank account is opened at a Hungarian owned bank, versus whose first bank account is opened at a foreign owned bank. (I estimate using data on firms that opened their first bank account during my sample period, excluding firms that already in the first year of the sample had a bank account.)

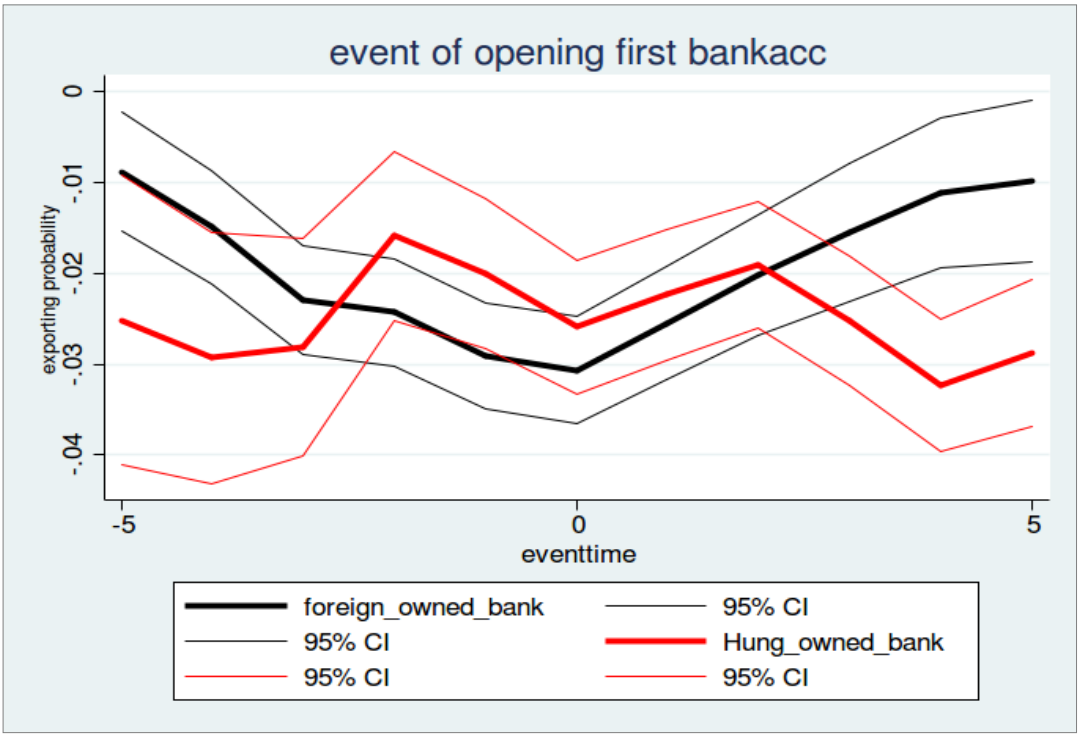

Figure 1: Exporting probability after event of opening first bank account

Figure 1 shows that around 2 years after the event of opening one's first bank account, the exporting probability of firms with a bank account at a foreign owned bank versus a Hungarian owned bank is significantly different.[6] For firms with the foreign bank account, the

6 In all the event studies I performed, I included time dummies for eleven years: five years before the event, the year of the event and five years after the event. On the graphs, I connected the points corresponding to the coefficients of the time dummies for better visibility, even though the time dummies were included yearly,

exporting probability is around 2 percentage points higher 5 years after the event, on average. This does not imply that there is a causal relationship between opening an account at a foreign owned bank and exporting. It might happen that firms already knowing that they might export in the future choose a foreign owned bank. However, the graph does suggest that a foreign owned bank helps exporting, or at least it is perceived to help exporting.

When considering the same event, but the outcome variable is the number of countries firms export to, the pattern is similar: the average number of countries firms export to is 0.01 higher for firms with foreign bank accounts. This difference is also significant, also at 1%. Given that the average number of countries exporters export to is around two, this seems to be not negligible.

The question naturally arises, what drives opening a bank account at a foreign owned bank. It might be by chance or it might be because the firm knows it wants to export. But it is also plausible that firms that become, for example, German owned, prefer to open a bank account at a German owned bank. Therefore, the next step in understanding the relationships in question is seeing whether even controlling for the event of becoming foreign owned, after opening a foreign bank account at the country of ownership, there remains an increase in exporting probability and export intensity towards that same country.

Figure 2 considers two events: becoming foreign owned and opening a bank account at a bank in Hungary that is owned by that same country. For example, being bought by an Italian firm and opening a bank account at an Italian owned bank. I assume that the relationship between exporting probability, foreign ownership and foreign bank account is additively separable in

and not more frequently.

the latter two. The outcome variable is whether a firm exports or not in a certain year.

The relationship shown in the figure is estimated for firms that open their first bank account at a bank with a certain ownership during my sample period. Also, I consider the second or further bank account for every firm, in order to avoid capturing the effect of having a bank account at all, instead of having a bank account at a bank from the country of interest. This event study does not take into account how much time difference there was between opening a bankaccount and becoming foreign owned by the same country. The graph is based on estimation using all the 19 countries in my sample.

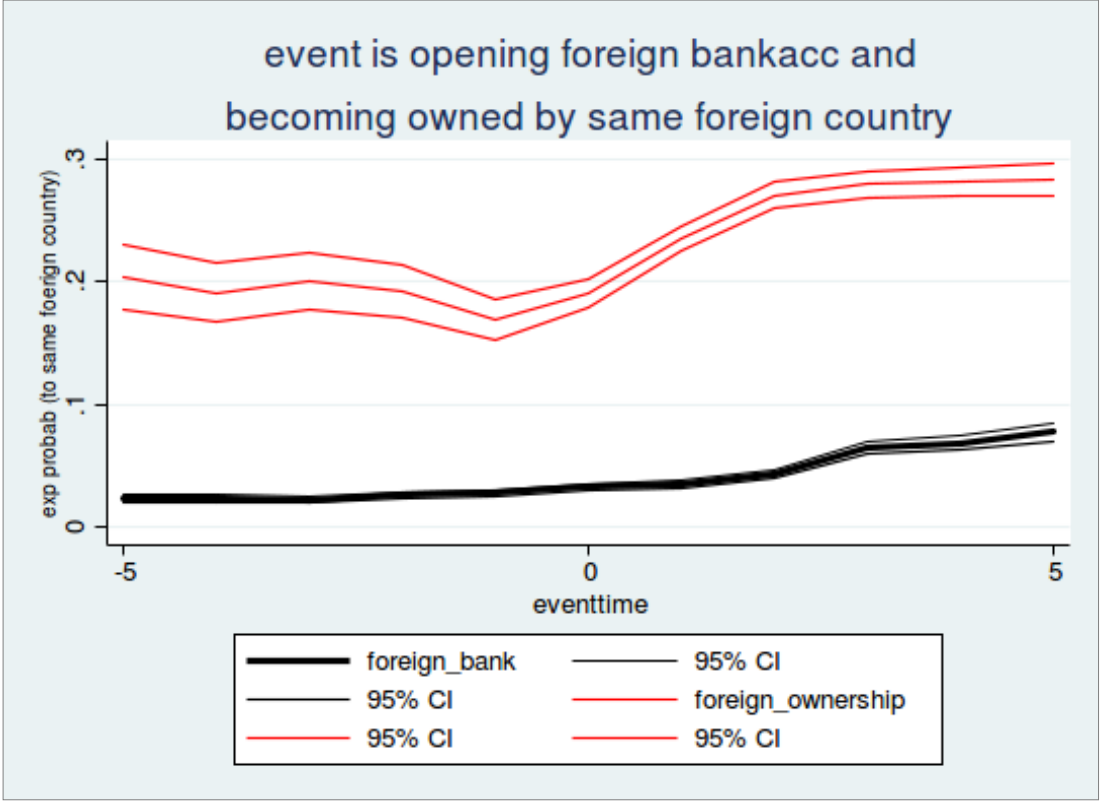

Figure 2: Exporting probability to the country of interest after event of becoming foreign owned by the same country and event of opening a bank account at a bank from the same country

From Figure 2 one can see that after the event of becoming foreign owned, the exporting probability to that same country increases by a little less than 5 percentage points, on average. The graph also shows that three years before opening the first bank account at that foreign bank, the exporting probability, on average, starts increasing. By the time the bank account has been opened, the exporting probability has increased by 1 percentage point. After the event, the exporting probability increases further, however. Two years after opening the bank account there is a sharp increase in exporting probability: it increases by 4 percentage points, compared to the time of the opening of the bank account.

This estimation still does not exclude, nor reinforce potential causality between opening a

bank account and exporting to the country of the owner of the bank. In my database there are 1336 cases in which the firm switched owner to a certain foreign country and also opened a bank account at the bank owned by that country. Even if one performs the estimation using only those observations that had first the bank account opened and then the start of the foreign ownership, and vice versa, one gets a very similar graph, since what can be seen in the graph is driven by those firms that have only one of the events happening.

What one can conclude from this graph is that there might be an effect going from exporting to a certain country to opening a bank account at the bank of that certain country. There are firms, for example, that start exporting to Belgium, and after a certain time they realize that it is worth for them opening a bank account at a Belgian owned bank. This could be because they realize that their banking fees will likely be lower if they have a transaction among two banks that belong to the same country. However, even in this case, both the exporting probability and the bank account opening might be driven by a third omitted factor, as described above through the Italian manager's example.

The fact that we see a larger increase in exporting probability after the opening of the bank account, however, does not exclude (nor does it prove) that there is a causal relationship running from opening a bank account at a Belgian owned bank in Hungary to exporting to Belgium. There still might be a third omitted factor driving both of the events. The figure does suggest that the Belgian bank helps exporting to Belgium or it is perceived to do so. It might, however, also help exporting to other countries, and this is what the next graph is about.

If one looks at a graph with the same events, but the y axis showing the exported sales to the country of the bank divided by the total exports of the firm, one can see a similar pattern as

with the exporting probability: the difference between export/total export in the year of the event is not significantly different from the ratios before the event of becoming foreign owned. However, two years after the event, the export/total export to the country of interest is 9 percentage points higher than at the time of the event and the difference is significant at the 5% level. The difference between export/total export to the country of interest is not significantly different in any year before the event of opening the bank account from the export/total export at the time of opening the bank account. However, three years after opening the bank account, export/total export to the country of interest is 0.8 percentage point higher than at the time of the event. The difference is significant at the 5% This suggests again, but does not prove it, as Figure 2 suggested, that having a bank account at a certain owned bank helps exporting to that same country.

The aim of the next event study is to understand whether there is a country effect: whether the specifically German bank is useful for exporting to Germany, or any foreign bank is useful for exporting. The two events are opening the firm's first Italian bank account and first German bank account. For similar reasons as in the the previous event study, the second or further bank account of the firm is considered. The outcome variable is whether firms export to Italy.

The event study whose result is depicted in Figure 3 shows the increase in export intensity to Italy in response to opening a German bank account is approximately 3 percentage points, whereas the response to the opening of an Italian bank account is approximately 5 percentage points, on average. Performing the same event studies for exporting probability to Italy comparing Italian and Belgian, Italian and Dutch bank accounts, the event study shows the same pattern. When one compares exporting probability to Belgium, or the Netherlands, the increase in exporting probability is larger in the case of the Italian bank account, than the

corresponding country's bank account. This might be because there is no relationship between banking with a bank from the specific country of the export destination, but it also might be because the number of firms that export to Belgium is much smaller than the number of firms with Italian relationships (around three times as many firms export to Italy than to Belgium). When comparing export probability to Germany, in response to opening Italian and German bank accounts, both bank accounts are associated with a similar magnitude of exporting probability increase, around 5 percentage points. The regressions of the event studies aiming to measure country effects include, above the usual controls, dummy variables for whether a certain firm has ever been owned by Germany or Italy, whether it has never had a bank account at a German firm, whether it has never had a bank account at an Italian firm and whether it has banked with a German bank during the whole sample period (when looking at exporting probability to Italy) or whether it has banked with an Italian bank during the whole sample period (when looking at exporting probability to Germany). With the dummy variables included, the interpretation of interest, the changes in the levels is the same as when excluding these dummies. The inclusion of the dummies has been necessary, because otherwise one has a too small sample that satisfy all the requirements to measure what one aims at measuring.

The results from the event study on country effect reinforce that there might be something specific about the country of one's bank and the export probability to the same country. This definitely holds in the case of Italian banks. However, even this result does not exclude or reinforce causality between banking and exports to the same country. It still might happen that there is a third factor specific to the country with which one is in a relationship, that drives both banking and exports. When looking at export intensity as the outcome variable, there seems to be no differential country effect. This suggests that any country specific relationship between banking and exports is limited to entering the export market of the specific country.

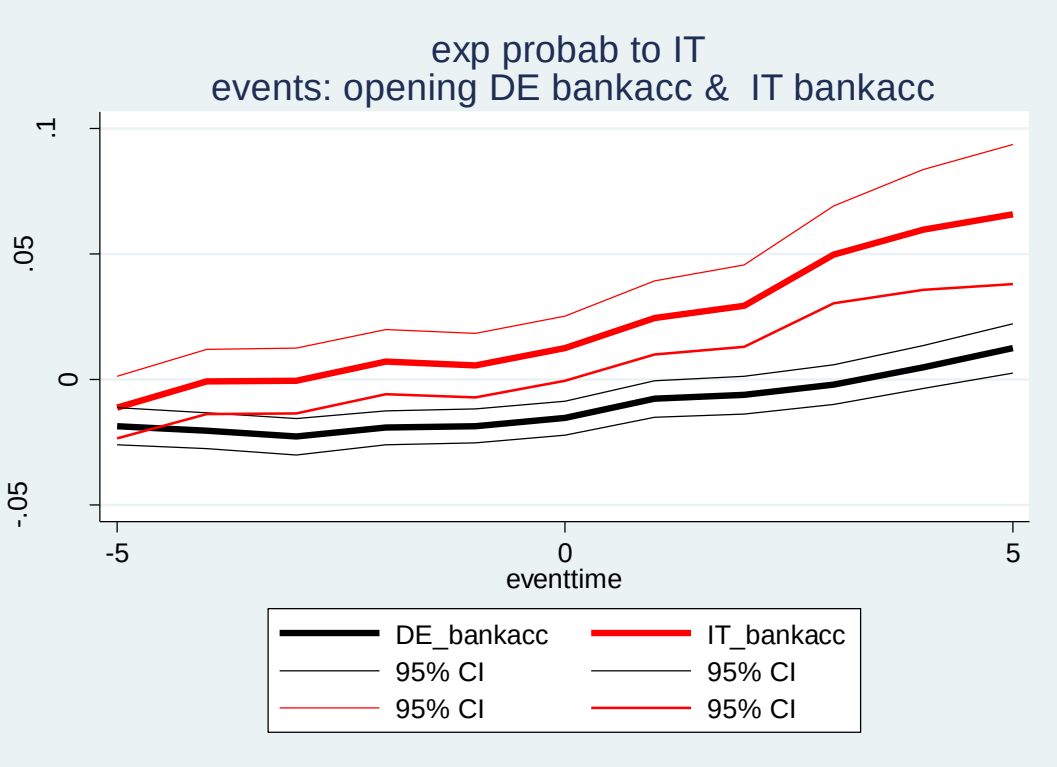

Figure 3: Exporting probability to Italy after event of opening a bankaccount at a German and an Italian bank

The fourth event study answers the question whether there is an ownership effect: is it true that after becoming German owned, firms experience a larger increase in exporting probability towards Germany than after becoming Italian owned, for example? (Figure 2 showed that there is an ownership effect in an absolute sense, exporting probability increases.) Figure 4 shows that there is such an effect. Compared to one year before the event of becoming German owned, one year after the event, firms' probability to export to Germany increases by around 3 percentage points. Whereas, after becoming Italian owned, there is no significant change in exporting probability to Germany. A very similar pattern arises for Italy: there is no change as a result of becoming German owned on the probability to export to Italy,

whereas there is a 10 percentage point increase in exporting probability to Italy, significant at the 5% level.

As can be seen from the same Figure 4, after the bank account opening, the exporting probability increases by around 5 percentage points by the time 3 years have passed after the event (significance level is 5%). This is consistent with Figure 2 that uses data on all of the largest partner countries.

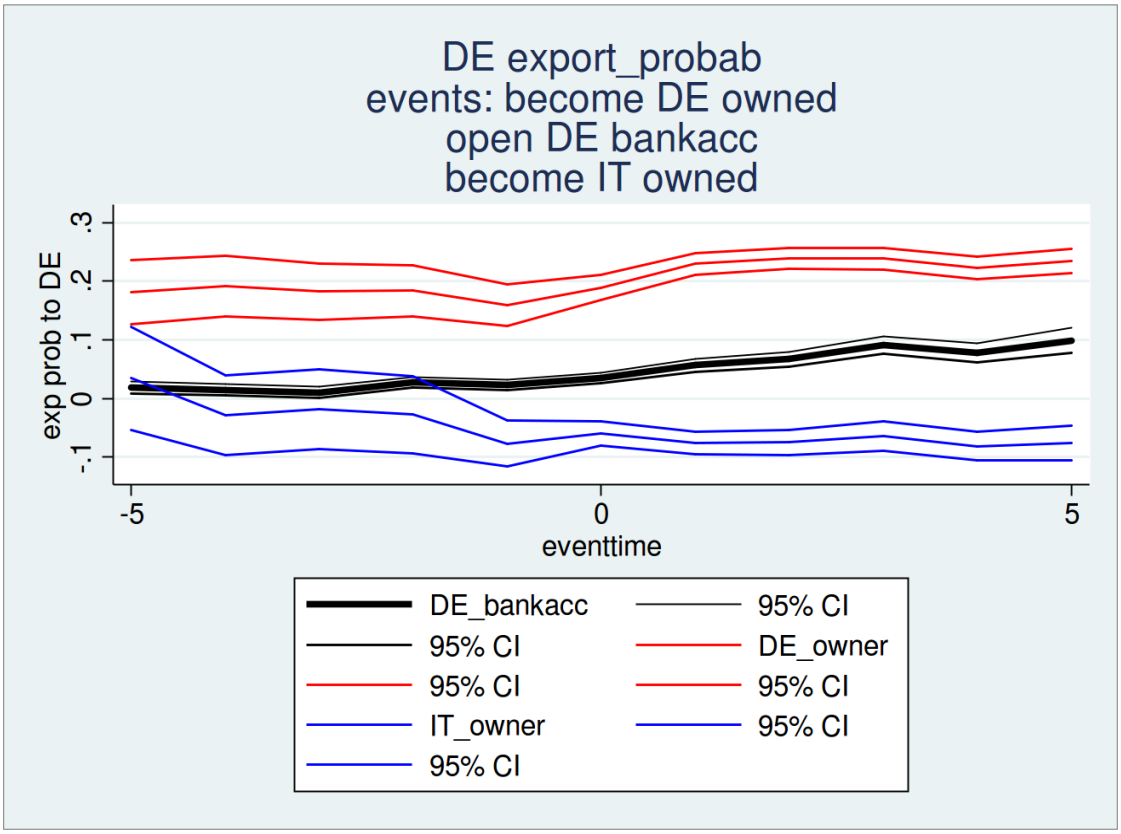

Figure 4: Exporting probability to Germany after event of becoming German owned, event of opening a German bankaccount and event of becoming Italian owned

The question arises naturally, how strong the reverse relationship is: after starting to export to Germany, how does the probability to have a bank account at a German owned bank change, controlling for whether the firm becomes German owned. There seems to be no significant change in banking with a German bank after becoming German owned as shown by Figure 5.

This might suggest that good firms bank with German banks already and nothing changes in this respect after becoming German owned. In contrast, when starting to export to Germany, the probability to open a bank account at a German owned bank increases by around 10 percentage points, over 5 years. The pattern is somewhat different when performing the same event study for Italy: after becoming Italian owned, the probability to have an Italian bank account increases significantly, by around 2 percentage points and after the event of starting to export to Italy, banking probability with an Italian bank increases by around 5 percentage points, where both changes are significant at 5% level.

This last event study suggests that in the case of Germany there is a relationship in the direction from starting to export to Germany towards starting to bank with a German bank that is larger in magnitude, then in the other direction of first starting to bank with a German bank and then starting to export to Germany. However, in the case of Italy, the size of the changes in export probability to Italy after opening an Italian bank account and the size of the change in banking probability with Italy after starting to export to Italy is around the same in magnitude: 5 percentage points. This suggests that, in the case of Italy, if there is causality, neither of the two directions from exporting to banking or from banking to exporting could be determined to be dominant.

These results are not appropriate to assess causality, they are appropriate to exclude causality in any of the two directions, but this has not been possible on the basis of the estimation results. It is possible that there is causality from exporting to a certain country to banking with that certain country; it is possible that there is causality from banking to exporting; and it is possible that there is a third factor driving both of them.

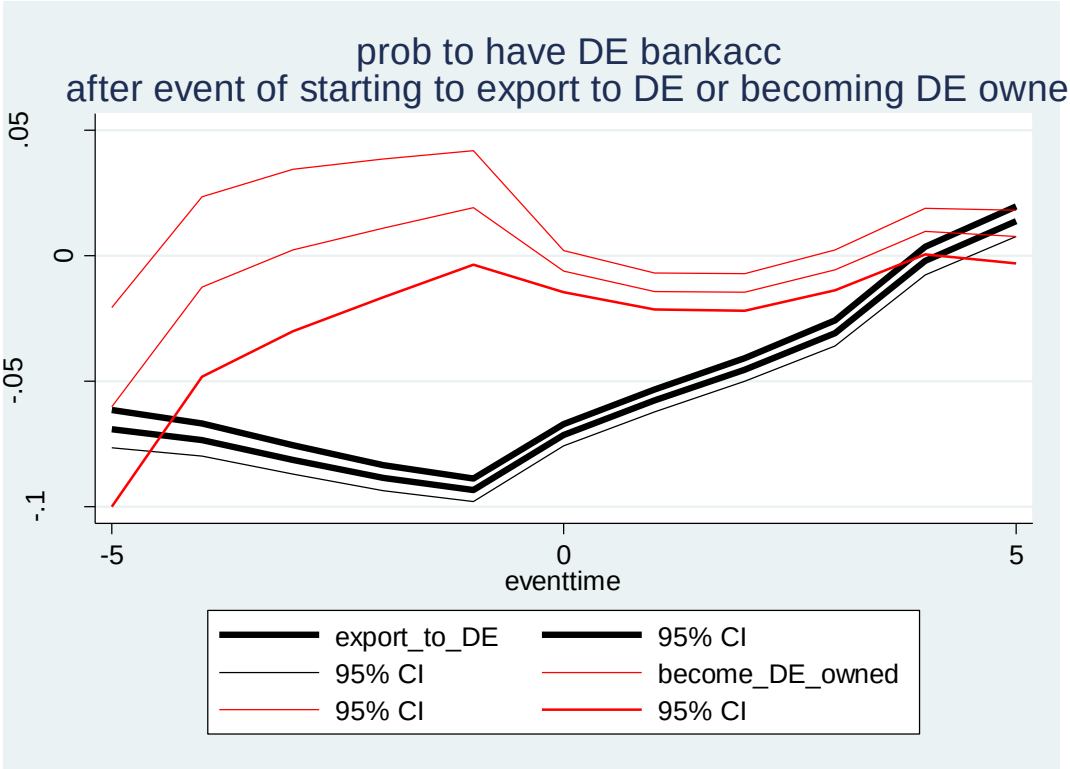

Figure 5: Probability of opening a bank account at a German bank after event of starting to export to Germany and event of becoming German owned

An example for a regression output from the event study analysis is provided below. The event considered is opening an Italian and a German bank account and the outcome variable of interest is exporting probability to Germany. (For saving space, robust standard errors are provided in the second column. One star reflects significance at 1%.)

	exportin probability	robust std. err.
l_muszaki_ber	0.0106599*	0.00051
l_prod	0.0097352*	0.000607
l_letszam	0.0368476*	0.000847
time_banksDE_1	-0.0301554	0.005588
time_banksDE_2	-0.0255055	0.005564
time_banksDE_3	-0.041059*	0.005683
time_banksDE_4	-0.0355861	0.005665
time_banksDE_5	-0.0317305*	0.005524
time_banksDE0	-0.0190306*	0.00564
time_banksDE1	0.0010421*	0.006695
time_banksDE2	0.008969*	0.007139
time_banksDE3	0.0306597*	0.007796
time_banksDE4	0.0197336*	0.008544
time_banksDE5	0.0395226*	0.010343
time_banksIT_1	-0.0404398*	0.006992
time_banksIT_2	-0.0346602*	0.007279
time_banksIT_3	-0.0376791*	0.007217
time_banksIT_4	-0.0319685	0.007252
time_banksIT_5	-0.0317013	0.007448
time_banksIT0	-0.0469723*	0.007007
time_banksIT1	-0.0328045*	0.007178
time_banksIT2	-0.023593*	0.007597
time_banksIT3	-0.0223208*	0.007994
time_banksIT4	-0.005066*	0.008647
time_banksIT5	-0.0097045*	0.009117
never_opened_DE	-0.0526672*	0.005297
foreign_specific_DE	0.2351623*	0.007236
foreign_specific_IT	-0.0640942*	0.009676
always_banked_IT	-0.0055552	0.007728
never_opened_IT	-0.0542277*	0.006853
_cons	0.0765491*	0.008467
industry dummies	Included	
R2	0.2191	
Number of observations	386399	

Table 6: Estimation output of event study

Chapter 5: Conclusion

In my thesis I have addressed the question of the relationship between exporting and banking with the same countries. I have not found evidence for causal relationship running in either way, however I have shown that there is a significant relationship between the two, even after controlling for foreign ownership of firms.

A limitation of the thesis is that data available only allowed to use information on which firm had a bank account at which bank. However, there was no information available on which bank accounts the firm used most intensively. Further research calls for using a measure that describes quantitatively the intensity of the banking relationship between firms and certain countries. This can be a potential way to find how to identify causality.

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