Users and Effects of Austrian Export Credit Guarantees

Harald Badinger[1] and Thomas Url[2]

Introduction

Export and import transactions are usually based on trade credit rather than cash payments. The exporting firm may offer open account finance and thus extend credit directly to the importer. In this case the exporter bears the credit risk and the burden of providing liquidity to the counterparty. In 2008, this form of trade finance covered between 38 and 45 percent of global merchandise trade. Alternatively, firms may use bank-intermediated trade finance. A common instrument is the letter of credit, which is equivalent to a guarantee by a foreign private bank to pay the amount invoiced after delivery of the good. In 2008 bank-intermediated trade finance covered about 35 to 40 percent of global merchandise trade. Exporters are able to make advance payments for about one-fifth of international trade (Asmundson *et al.* 2011).

In general, cross border trade credit is more risky than domestic trade credit because firms assume additional macro-level risks by crossing national borders, e.g. exchange rate fluctuations, political risks, and counterparty risks resulting from difficulties in gathering information about distant trading partners and enforcing repayment in a foreign jurisdiction. During a financial crisis such frictions edge up as the credibility of foreign trading partners or banks erodes due to elevated asymmetric information. A recent World Bank study reports substantially higher costs, and even a lack of trade finance, after the onset of the financial crisis in the second half of 2008, particularly for small and medium-sized exporters located in emerging markets (Chauffour and Farole 2009).

[1] WU Vienna and Austrian Institute of Economic Research (WIFO), Vienna.
[2] Austrian Institute of Economic Research (WIFO), Vienna.

Public export credit guarantees are designed to relax the financial constraint arising from cross border activities of exporting firms. The Austrian export credit agency (Oesterreichische Kontrollbank – OeKB) receives and handles all applications for guarantees on behalf of the Austrian government. Various types of guarantees cover single business cases or provide lump-sum coverage for deliveries to a pre-specified importing firm or to a set of importing countries. The guarantees by the OeKB are fully backed by the Austrian government. In 2012 new commitments totalled 5,140 million euros or 4.2 percent of merchandise exports. Due to obvious opportunities for insurance fraud only extra-firm exports are eligible for public export credit guarantees, i.e. deliveries to own subsidiaries will not be covered by the OeKB. Underwriting is conditional on a positive effect of the underlying transaction on the Austrian current account. This target is supposed to be fulfilled if 60 percent of the value added originates from domestic activities. The underlying export activity is also subject to an environmental impact assessment according to the OECD Common Approaches on Environment and Officially Supported Export Credits if the project's revenue exceeds 1 million euros. Furthermore, technical constraints on the terms of payment, the credit-worthiness of the importing country and the size of the project reduce the coverage ratio.

On an international level OECD agreements restrict the terms of export credit guarantees to promote a level playing field for firms (Knaepen 1998 and EU Council Directive 98/29/EC). As a result, export credit guarantees are limited to non-marketable risks, i.e. to higher-risk export markets, comprising essentially of emerging and developing countries, or to open account terms with payment periods of more than two years. The protection against losses from non-payment is subject to insurance premiums that are supposed to cover the expected loss from underwriting.

The restrictions on coverage are well communicated to firms before they get into contact with Austria's export credit agency. Small projects with revenues of up

to 0.5 million euros that fulfil all of the requirements receive a guarantee without further assessment. Projects with an export volume above this threshold are passed on to the advisory board at the Austrian ministry of finance. The board finally decides whether a project will improve the Austrian current account and fulfil environmental standards. In 2012 the board received 786 applications and rejected none of them. In previous years only a few cases have been rejected by the board.

While the provision of public guarantees is highly restricted by international agreements and European directives nowadays, they are still an important policy tool for mitigating the negative trade effects of financial constraints arising from market failures such as asymmetric information. The use of export credit guarantees has surged after the financial market and economic crisis. Following the G20 decision from 2 April 2009 new commitments by export credit agencies expanded between 30 and 50 percent up to mid-2009, increasing the share of covered world trade from 8 percent in 2008 towards 9 percent by mid-2009 (G20 2009; OECD 2009; Asmundson *et al.* 2011).

The increased use of export credit guarantees raises the question of their effectiveness as a tool for promoting international competitiveness and export activities. While there is some evidence of their export enhancing effects at the industry level (Moser *et al.* 2008, for Germany; Egger and Url 2006, for Austria; Abraham and Dewit 2000, for Belgium), there is virtually no evidence of the trade effect of public export credit guarantees based on firm-level data. One notable exception is Felbermayr *et al.* (2012). They use public export credit guarantees extended to individual German exporters over the period 2000 to 2010 and find positive effects on German exports.

This article presents empirical results on the determinants and effects of export credit guarantees by the Austrian export credit agency (Badinger and Url 2013). Our findings suggest that large firms with a high risk exposure and high R&D intensity are more likely to make use of public export credit guarantees. On the other hand, being part of a foreign multinational enterprise (MNE) dampens usage. Moreover, export credit guarantees have sizeable, economically and statistically significant effects on additional extra-firm exports, ranging from some 80 to 100 percent.

Export credit guarantees, financial constraints and exports

Funatsu (1986) and Ford *et al.* (1996) prove that a profit maximising firm facing uncertainty about the repayment of trade credits will choose a lower output level as compared to the level chosen under revenue certainty. This result holds for both risk-neutral and risk-averse firms, but the output reduction will be bigger for risk-averse firms. Difficulties in contract enforcement are an example of revenue uncertainty, which is growing in the distance between exporter and importer and causing significantly lower trade volumes (Anderson and Marcouiller 2002; Berman *et al.* 2012).

Public export credit agencies may overcome this quantity restriction by providing export credit guarantees, thereby promoting trade that might otherwise not occur due to a lack of finance. Export credit guarantees can hence be informally thought of as a reduction in fixed trade costs related to market entry and in the costs of financing trade credit, which would imply an increase both at the extensive and the intensive margins of international trade in standard new trade theory models with heterogeneous firms (Melitz 2003). An explicit treatment of credit constraints within a heterogeneous-firms model is given by Manova (2013).

Overall, there are strong theoretical reasons, along with some empirical evidence, to suggest that public export credit guarantees help to overcome market failures related to asymmetric information by providing insurance where no private markets exist. They thereby mitigate financial constraints, facilitate the provision of trade credit by exporters to their customers, and reduce uncertainty, such that one would expect an effective system of public export credit guarantees to promote international trade both at the extensive and intensive margin.

Data and descriptive statistics

The data are from a survey among Austrian firms conducted in June 2009 and refer to activities in the last completed business year of the respective firm at that date. The questionnaire asks (among other things) for general management ratios, employment figures, measures of human capital, research and development activities, measures of export activity, and information on the use of export guarantees.

Parts of the firms' identities were provided by the OeKB, the Austrian export credit agency. Those firms represent the OeKB's recent users of export credit guarantees. To this set of firms' (users) we added a control group of firms not using export credit guarantees, which were matched by firm size (based upon the number of employees) and kind of activity (NACE1) to the user-firms. The questionnaire was then sent out to 832 firms by the Austrian Institute of Economic Research on behalf of the Ministry of Finance. A reminder specifically targeted at firms active within classifications that showed low response rates during the first four weeks of the survey helped to achieve a balanced sample.

A total of 252 firms responded to the questionnaire, of which 221 firms indicated export activities. About half of the exporting firms (104) acknowledged at least a one-time use of export credit guarantees in the past. Thus more than one third of the total universe of guarantee-users completed our questionnaire. This group is matched by an equal sized group of non-users. Due to incomplete answers we can only use 178 observations in the econometric analysis of the determinants of export guarantees.[3] Table 1 provides a list of the key variables and summary statistics.

Average sales amount to 101 million euros, but this measure is clearly upward biased, as can be seen by the comparatively low median value of 28.8 million euros. Hence, most of the firms in our sample belong to the group of small and medium-sized enterprises. Around half of the firms used export credit guarantees (D^G) in the recent past and some 30 percent belong to a foreign multinational enterprise (D^{MNE}). Average spending on R&D as a share of sales (*RD*) amounted to 5 percent in our sample. This value exaggerates R&D activity because the median in the sample is at 2 percent. The variable *RISK* is a firm-specific revenue risk from providing international trade credit by aggregating country specific credit rankings, from the Institutional Investor for the year 2008, into regional risk measures, namely for three groups: i) industrialised countries (EU27, NAFTA, USA, CAN, and NZL), ii) Southeastern Europe and Commonwealth of Independent States (CIS), and iii) the rest of world. These regional risk measures are then combined with firm-specific information on export shares to these three regions to obtain a firm-specific risk measure. The indices are rescaled such that our risk measure is defined over a range from -1 to 0 and increasing in risk.

A rough look at the data shows that firms with high export volumes are above average users of export credit guarantees. In the survey their exports accounted for 62 percent of the total export volume declared. Higher revenue risk is positively correlated with export credit guarantee usage. On the other hand, Austrian subsidiaries of a multinational enterprise (MNE) tend to use export guarantees less often; and account for only a quarter of MNE-subsidiaries in the

[3] In the analysis of the trade effects of export guarantees, which is more data-demanding and uses a larger set of variables, the sample is further reduced to 71 firms.

Table 1

Summary statistics of the key variables

Variable	Mean	Median	Max.	Min.	Std. Dev.
Exports	70563	15783	1888733	16	182090
D^G	0.49	0.00	1.00	0.00	0.50
SALES	101331	28794	1888733	615	230564
D^{MNE}	0.29	0.00	1.00	0.00	0.45
RISK	– 0.46	– 0.53	– 0.63	– 0.07	0.18
RD	0.05	0.02	0.73	0.00	0.09
Correlations					
	Exports	D^G	*SALES*	D^{MNE}	*RISK*
D^G	0.10				
SALES	0.88	0.09			
D^{MNE}	0.30	– 0.10	0.35		
RISK	0.06	– 0.23	0.10	0.03	
RD	– 0.01	0.07	0.01	– 0.05	0.12

Notes: Statistics based on a sample of 178 Austrian firms. Variable definitions: firms' sales and exports are given in 1,000s of euros. D^G is a dummy variable, taking a value of 1 if the respective firm has used an export credit guarantee in the recent past. D^{MNE} is a dummy variable, taking a value of 1 if the respective firm is part of a foreign multinational enterprise. *RISK* is a firm-specific index of revenue risk in exports, which is defined over a range from -1 to 0 and increasing in risk. *RD* is the ratio of expenditures for research and development to sales.

Source: A survey conducted by the Austrian Institute of Economic Research (WIFO) among Austrian firms.

sample use Austrian export credit guarantees. This is also reflected in the unconditional correlations in Table 1.

Users of export credit guarantees

The descriptive statistics are instructive and are also confirmed in a more rigorous statistical analysis, using probit and least squares regressions. Larger firms (in terms of sales) are more likely to make use of export credit guarantees. Since the use of export credit guarantees is associated with fixed costs in terms of effort, administrative procedures, and the costs of obtaining information, it is plausible that these costs are less relevant for larger firms. The estimation results suggest that doubling firm size increases the probability of export credit guarantee usage by some 13 percentage points.

Being part of a foreign MNE reduces the likelihood of export credit guarantee usage by 29 percentage points. We interpret this finding as evidence that being part of a foreign multinational enterprise (MNE) reduces the need for (and thus the likelihood of) using export credit guarantees due to improved access to information on foreign markets and trading partners.

Finally, higher revenue risk is associated with a higher likelihood of making use of export credit guarantees. Specifically, an increase in *RISK* by one standard deviation increases the likelihood of export credit guarantee usage by 13 percentage points. This also reflects, to some extent, that the use of export credit guarantees is legally restricted by OECD agreements and EU law for most exports into the lowest-risk region of industrialised countries.

A wide range of further variables from the dataset were explored. Of these variables only the research and development ratio (*RD*) turned out to have a significant effect; results indicate a positive effect on the likelihood of using a guarantee amounting to 0.87 percentage points for a 1 percentage point increase in the R&D ratio. A possible interpretation would be that technologically more advanced firms have a higher success ratio in attracting export credit guarantees.

Export credit guarantees and exports

Having provided an assessment of the determinants of export credit guarantee usage, we go on to estimate the effect of export credit guarantees on export performance, using a gravity type equation. The dependent variable is the (the natural log of) firm i's extra-firm exports, i.e. total exports, excluding intra-firm trade in the form of exports to their own subsidiaries. In the most parsimonious specification, firm size (*SALES*) is included as single explanatory variable; with the dependent variable defined as (extra-firm) exports of a particularly firm (located in Austria) to the world, firm-invariant variables specific to the country of origin (Austria) and the 'country' of destination (the world) are captured by the constant. Moreover, firm-invariant but industry-specific variables are controlled for by seven industry dummies at the NACE-1 digit level (and, alternatively, 21 dummies at the NACE-2 digit level).

Estimates are based on a sample of 71 exporting firms, for which data on the regressors, the instruments, as well as exports to non-subsidiaries (required to calculate extra-firm trade) are available. Least squares estimates point to a significant and sizeable effect of guarantees on export performance, amounting to some 100 percent. This is also confirmed in two-stage least squares estimates, using D^{MNE}, *RISK*, and *RD* as instruments.

Another interesting result emerges from the estimation for exports to each of the three regions (industrialised; Southeastern Europe; rest of world) separately. We find that the effect of export credit guarantees is insignificant for exports to the group of industrialised countries (EU27, etc.), but becomes significant at the 5 percent level for the second region (Southeastern Europe and CIS) with a coefficient of 0.64. It is highest for the third region (rest of world), with a coefficient of 0.83 (statistically significant at the 1 percent level). This reflects the fact discussed above that the use of export credit guarantees is highly restricted for exports to the EU, but also to other OECD countries through international agreements and EU law. Moreover, it suggests that the effect of export credit guarantees is larger for exports to countries associated with higher credit risk.

Overall, our results show a statistically and economically sizeable effect of export credit guarantees on extra-firm export performance, ranging from 100 to 130 percent, i.e. conditional to other explanatory factors already including size, firms using a guarantee export twice as much or even more compared to non-users. In light of our cross-sectional specification, these estimates should be regarded as long-run equi-

librium effects of export credit guarantees. Moreover, if we account for the fact that exports to firms other than own subsidiaries (used in the regression) amount to 80 percent of total exports in our sample, the implied effect of export credit guarantees on total exports ranges from 80 to 100 percent.

Our results are consistent with Abraham and Dewit (2000) and Felbermayr and Yalcin (2014) who find a trade stimulating effect of Belgian and German public export credit guarantees, respectively. Moreover, our estimates are in line with findings based on macro-panels like Egger and Url (2006) or Moser *et al.* (2008), showing a more than proportional effect of export credit guarantees on export volumes. Our firm-level approach has pros and cons relative to previous studies based on aggregate trade data. On the one hand, we learn something about the selection of firms into export promotion schemes in Austria, a developed country, and we are able to make use of firm-level micro-data. On the other hand, the data in our sample is less detailed on export destination countries and the volume of export credit guarantees granted in a given country-year pair. It is thus reassuring that the identified export effects are in a similar range.

Conclusions

In this paper we analyse the effects of export credit guarantee usage on trade in a cross-section of Austrian firms in the year 2008. From a theoretical perspective, export guarantees are expected to foster trade by reducing revenue uncertainty and by improving access to external finance, i.e. making it easier to use cross border trade credit as collateral for bank credit.

Our results show that large, stand-alone domestic firms (which are not part of a foreign MNE) with high R&D intensity and high risk exposure are most likely to make use of public export credit guarantees. Using export credit guarantees has a sizeable, economically and statistically significant effect on extra-firm exports, ranging from about 100 to 130 percent. Given the other explanatory factors in the model, firms using guarantees tend to export twice as much or even more than non-users. Related to total exports, i.e. including intra-firm trade, this amounts to additional exports compared to non-users of between 80 and 100 percent. Our result is in line with findings based on macro-panels, showing a more than proportional effect of export credit guarantees on export volumes.

While the point estimates should not be overemphasized, the results clearly show that export credit guarantees, have a non-negligible effect on the integration of the world economy. Moreover, our results indicate that export guarantees are a particularly effective instrument for mitigating slumps in international trade during times of increased uncertainty and mutual distrust. Finally, the results suggest that the Austrian system works well in bolstering export performance. A full assessment of the export credit guarantee system, however, would have to include the programme costs arising from the state-backed guarantee that substitutes for the solvency capital private insurance companies would have to assign for each underwriting. The OECD agreement eliminates incentives to offer indirect subsidies through premiums below the expected value of losses. Consequently, the Austrian export credit guarantee system is balanced in the long run. Nevertheless, market distortions may well result from the non-profit strategy of export credit agencies and the cost advantage of state guarantees over the provision of solvency capital by private investors. On the other hand, the export-promoting effect of guarantees certainly has positive repercussions for output, employment, and general tax revenues. While a full assessment of all these effects is beyond the scope of this paper, a more comprehensive assessment of the costs and benefits of public export credit guarantees offers an interesting avenue for future research.

References

Abraham, F. and G. Dewit (2000), "Export Promotion via Official Export Insurance", *Open Economies Review* 11, 5–26.

Anderson, J.E. and D. Marcouiller (2002), "Insecurity and the Pattern of Trade: An Empirical Investigation", *The Review of Economics and Statistics* 84, 342–352.

Asmundson, I., T. Dorsey, A. Khachatryan, I. Niculcea and M. Saito (2011), *Trade and Trade Finance in the 2008-09 Financial Crisis,* IMF Working Paper 11/16.

Badinger, H. and T. Url (2013), "Export Credit Guarantees and Export Performance: Evidence from Austrian Firm Level Data", *The World Economy* 36, 1115–1130.

Berman, N., J. de Sousa, P. Martin and T. Mayer (2012), *Time to Ship during Financial Crisis,* CEPR Discussion Paper 9089.

BMF (2013), *Tätigkeitsbericht des Beirates gemäß §6 Ausfuhrföderungsgesetz für das Geschäftsjahr 2012,* Bundesministerium für Finanzen, Vienna, https://www.bmf.gv.at/wirtschaftspolitik/aussenwirtschaft-export/Taetigkeitsbericht_2012_des_Beirates.pdf?4a9cu2.

Chauffour, J.-P. and T. Farole (2009), *Trade Finance in Crisis – Market Adjustment or Failure?,* World Bank Policy Research Paper 5003.

Egger, P. and T. Url (2006), "Public Export Credit Guarantees and Foreign Trade Structure: Evidence from Austria", *The World Economy* 29, 399–418.

Felbermayr, G. and E. Yalcin (2014), "Export Credit Guarantees and Export Performance: An Empirical Analysis for Germany", *The World Economy* 36, 967–999

Felbermayr, G., I. Heiland and E. Yalcin (2012), *Mitigating Liquidity Constraints: Public Export Credit Guarantees in Germany,* CESifo Working Paper 3908.

Ford, J.L., H.C. Mpuku and P.K. Pattanaik (1996), "Revenue Risks, Insurance and the Behaviour of Competitive Firms", *Journal of Economics* 64, 233–246.

Funatsu, H. (1986), "Export Credit Insurance", *Journal of Risk and Insurance* 53, 679–692.

G20, (2009), *London Summit – Leaders' Statement,* 2 April 2009, http://www.g20.org/Documents/g20_communique_020409.pdf.

Knaepen, P. (1998), "The Knaepen Package: Towards Convergence in Pricing Risk", in: OECD (ed.), *The Export Credit Arrangement – Achievements and Challenges 1978–1998,* Paris, 75–80.

Manova, K. (2013), "Credit Constraints, Heterogeneous Firms, and International Trade", *Review of Economics Studies* 80, 711–744.

Melitz, M. (2003), "The Impact of Trade on Intra-industry Reallocations and Aggregate Industry Productivity", *Econometrica* 71, 1695–1725.

Moser, C., T. Nestmann and M. Wedow (2008), "Political Risk and Export Promotion: Evidence from Germany", *The World Economy* 31, 781–803.

OECD (2009), *Officially Supported Export Credits and the Financial Crisis: Measures Taken at the National Level by the Participants to the Arrangement,* as at June 2009, OECD Trade and Agriculture Directorate TAD/PG(2009)17, Paris, http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=tad/pg%282009%2917/final&doclanguage=en.