Credit constraints and margins of import

Wagner, Joachim

Publication date:
2014

Document Version
Publisher's PDF, also known as Version of record

WORKING PAPER

Credit constraints and margins of import: First evidence for German manufacturing enterprises

by

Joachim Wagner

University of Lüneburg
Working Paper Series in Economics

No. 294

February 2014

www.leuphana.de/institute/ivwl/publikationen/working-papers.html

ISSN 1860 - 5508

Credit constraints and margins of import:

First evidence for German manufacturing enterprises

Joachim Wagner*

Leuphana University Lueneburg and CESIS, Stockholm

[This version: February 13, 2014]

Abstract

This study uses tailor made enterprise level data from various sources for firms from manufacturing industries to test for the link between credit constraints, measured by a credit rating score provided by a leading credit rating agency, and imports in Germany for the first time. We find empirical evidence that a better credit rating score is positively related to extensive margins of import – firms with a better score have a higher probability to import, they import more goods and they source from more countries of origin. The intensive margin of imports – the share of imports in total sales – is found not to be related to credit constraints.

JEL classification: F14

Keywords: Credit constraints, imports, Germany

* All computations were performed inside the research data center of the Statistical Office of Berlin-Brandenburg. I thank Rafael Beier, Florian Köhler and Julia Höninger for preparing the project-specific data set that merges data from the statistics of foreign trade, from surveys performed by official statistics and data from a private credit rating agency. The enterprise level data from official statistics are confidential but not exclusive; see www.forschungsdatenzentrum.de for information on how to access the data. The data from the credit rating agency are proprietary; details are available from the author on request. To facilitate replications the Stata do files used to compute the results reported in this paper are available on request.

1. Motivation

Access to sufficient credit at reasonable costs can play a decisive role for firms that decide to participate in international trade or not. Export and import activities both involve extra costs related to the entry into a foreign market. These costs often have to be paid in advance, and firms have to have sufficient liquidity to do so. Credit market constraints may be binding in a situation like this. Furthermore, international trade activities are often more risky than doing business with firms inside the own country due to, e.g., exchange rate fluctuations or less easily enforceable contracts, and this leads to further liquidity requirements. Therefore, financial constraints can be considered as relevant for export or import decisions.

While practitioners of international business are well aware of this, economists only recently started to investigate the links between credit constraints and international trade. The focus of this literature is on exports. Chaney (2013), Muuls (2008) and Manova (2013) introduce credit constraints into the seminal model of heterogeneous firms and trade by Melitz (2003) to discuss the role of these frictions for the export decision.[1] In these models firms that are financially constrained are less likely to export. Starting with the pioneering study by Greenaway et al. (2007) this hypothesis has been tested in a number of studies that use firm level data from a broad range of countries. Wagner (2013a) surveys 32 empirical studies that cover 14 different countries plus five multi-country studies. The central findings in this literature can be summarized as follows: Exporting firms are less financially constrained than non-exporting firms. Studies that look at the direction of this link usually report that

[1] A detailed discussion of the theoretical models is far beyond the scope of this empirical paper; for a synopsis see Egger and Kesina (2013) and Minetti and Zhu (2011).

less constrained firms self-select into exporting, but that exporting does not improve financial health.

Both the theoretical models and the micro-econometric studies that investigate the links between financial constraints and international trade focus nearly exclusively on exports. Two papers consider the role of financial constraints for the import decision of a firm. Using Belgian data for 1999 to 2007 Muuls (2012) finds that firms are more likely to import, import more and more products from more countries if they enjoy lower credit constraints. Bas and Berthou (2011) use data for Indian firms from 1996 to 2006 to investigate the link between financial constraints and the adoption of foreign technology via importing capital goods. Improved liquidity increases the probability of importing capital goods.

Given that the arguments for a role of financial constraints in the decision to engage in international trade discussed above do hold for imports too, and that a bad financial situation of a firm might make potential suppliers from another country less willing to trade with this firm, the apparent lack of interest in the links between imports and financial constraints may come as a surprise. One reason for this might be that data for imports at the firm level are not widely available. Fortunately, this is no longer the case for Germany. Using newly available and tailor made data that are merged from various sources this paper contributes to the small empirical literature on the links between financial constraints and imports by providing first evidence for enterprises from manufacturing industries in Germany, one of the leading importers of goods worldwide.[2]

[2] According to the World Trade Organization's World Trade Report 2012 Germany hold rank 3 among the importers with a share of 6.8 percent in world merchandise imports; see World Trade Organization (2012), p. 30.

To anticipate the most important results, we find that less credit constrained firms with a better credit rating score have a higher probability to import, and that they import more goods and from more countries of origin, while the share of imports in total sales is not related to credit constraints.

2. Data and measurement issues

This paper uses a unique newly constructed data set that merges high-quality data at the enterprise level from various sources. Data are based on information on imports collected for the statistics on foreign trade and on data from surveys performed by the German Statistical Offices. These data are merged with a score that measures the credit-worthiness of the firm and that is supplied by the leading German credit-rating agency, *Creditreform*. The data used are described in detail in this section.

Imports: Data on imports are based on customs' records about goods imported from countries outside the European Union and on information delivered by firms about imports from EU member countries (that exceed a reporting threshold of 400.000 Euro). These transaction-level data were aggregated at the level of the importing enterprise by the German Statistical Office for the first time for the reporting year 2009. These data are available for the reporting year 2010, too. The data include information at the firm level about the value of all imports, the number of different goods imported (measured at the 8-digit level of classification) and the number of countries of origin. These firm-level data are the basis for the aggregate figures of goods imported reported by the Statistical Office.

Credit rating score: The extent of financial constraints faced by a firm is measured by various variables in the literature (see Musso and Schiavo (2008) for a discussion and Wagner (2013a) for a survey of the literature that looks at financial

constraints and exports). There is evidence that not all measures for financial constraints used can be considered as valid measures. Farre-Mensa and Ljungqvist (2013) recently evaluated how well five popular measures from the finance literature that are based on balance-sheet data identify firms that are financially constraint. They report that none of these five measures identifies firms that behave as if they were constrained. An alternative way to measure credit constraints that has been used in studies for Belgium (Muuls 2008 and 1012), Germany (Wagner 2014) and Italy (Secchi, Tamagni and Tomasi 2011; Tamagni 2013) is the use of a credit rating score supplied by a credit rating agency. Compared to other widely used measures that are based on balance sheets information or subjective assessments collected in surveys, this score mirrors the credit market experts' view on the creditworthiness of a firm, and it is heavily relied upon by banks and firms in their day-to-day decisions. Usually a score is based on a number of firm characteristics, including liquidity, turnover, capital structure, information on payment behavior, legal form, industry, firm age, productivity and firm size. Although the score is clearly endogenous to the firm's performance and characteristics, it is not directly affected by its importing behavior, given that imports are not used in constructing the index. Important advantages are that the score is determined independently by a private firm, is firm-specific, varies over time on an annual basis and allows for a measure of the degree of credit constraints rather than classifying firms as constrained or not (see Muuls (2008, 2012)).

In this study we use the credit rating score supplied by *Creditreform*, the leading credit rating agency in Germany. The score is based on 15 firm characteristics, including liquidity, turnover, capital structure, information on payment behavior, legal form, industry, firm age, productivity and firm size (for details, see

Rossen (2012)). The score takes values from 100 to 600, were Creditreform suggests that 100 to 149 should be considered as excellent, 150 to 199 as very good, 200 to 249 as good, 250 to 299 as medium, 300 to 349 as weak, 350 to 419 as high risk of failure, and firms with a score of 420 or more are classified as firms that should not be considered as partners in trade and credit relations.

Data on the credit rating score of manufacturing enterprises were supplied by Creditreform. For several firms the information is updated during a year. The information supplied always refers to the last update during the reporting year. These data from Creditreform are used for the first time in this paper to investigate the link between credit constraints and imports.

In the econometric investigation on the relation between imports and the credit rating score information on a number of firm characteristics that are known to be related to import activities are included as control variables.[3] Information on these control variables are based on the report for establishments in manufacturing industries, a survey conducted regularly by the German statistical offices. This survey covers all establishments from manufacturing industries that employ at least twenty persons in the local production unit or in the company that owns the unit. Participation of firms in the survey is mandated in official statistics law. For this study the information collected at the establishment level has been aggregated at the enterprise level (see Malchin and Voshage (2009) for details). The following control variables are included:

Firm size: The positive relationship between imports and firm size qualifies as a stylized fact (for evidence from German manufacturing firms see Vogel and

[3] Given that these variables are used as control variables only they are not discussed in detail here.

Wagner (2010)). Firm size is measured here by the number of employees. To take care of a non-linear relationship the number of employees is included in squares, too.

Productivity: The positive relationship between imports and productivity is another stylized fact that has been documented in a number of recent empirical studies surveyed in Wagner (2012a). Germany is a case in point. Importing firms are more productive than comparable non-importing firms (see Vogel and Wagner (2010)), and both the number of products imported and the number of countries imported from are positively linked to productivity (Wagner 2012b). Productivity is measured here as labor productivity and defined as total turnover per employee. Information on the capital stock of the firms is not available in the data, so more elaborate measures of total factor productivity cannot be used in this study.

Human capital intensity: The quality of the workforce of a firm is positively related to the quality and innovativeness of the products produced. Firms that produce high-quality innovative products can be expected to source more often and to a larger extent for high-quality materials and capital goods on foreign markets, too. Therefore, human capital intensity and import activities are positively related. Human capital intensity is measured here by the average wage per employee. Information on the qualification of the employees is not available in the data, but Wagner (2012c) demonstrates that the average wage is indeed a good proxy variable for the qualification of the workforce in German manufacturing firms.

Industry: Dummy variables for 2digit-industries are included in the empirical models to control for industry specific effects like competitive pressure, policy measures, demand shocks etc..

The data from the three sources were merged inside the research data center of the statistical office. For West Germany[4] we have information on import activities in 2009 and on the credit rating score (plus information on the control variables) in 2008 for 5,794 firms, 3,483 (or 60.11 percent) of which are importers; the respective numbers for 2010 / 2009 are 5,921 firms and 3,605 (or 60.88 percent) importers. It is known that larger firms have a much higher chance to be rated by the credit rating agency. Given that firm size and import activity are highly positively related the high share of importers in the samples comes as no surprise. To take care of this oversampling of larger firms the number of employees is included as a control variable in the empirical models.

3. Credit rating score and margins of import: Econometric investigation

Import activities involve extra costs related to the entry into foreign markets that often have to be paid in advance, and firms have to have (access to) sufficient liquidity to cover these costs. Moreover, imports may have to be paid in advance of delivery, and usually there is a time span between the payment for imported inputs and revenues generated from selling the goods produced with these inputs. Firms need either financial means generated inside the firm itself or bank credits to finance these imports. Therefore, a better credit rating score of the type used here (described in detail in section 2) can be expected to be positively related to import activities for three reasons: First, by construction, liquidity of the firm is used to compute the value

[4] There are still large differences between enterprises from manufacturing industries in West Germany and in former communist East Germany even some 20 years after the unification back in 1990, and this holds especially for international trade (see Wagner (2008)). Both parts of Germany have to be investigated separately. Given the small number of firms from East Germany in the sample we focus on West German firms in this study only.

of the credit rating score. Second, the score mirrors the credit market experts' view of the creditworthiness of the firm. Therefore, the score value plays a role in the decision over a credit application, and it influences the rate of interest a firm has to pay. Third, the score value can be used by potential trading partners in foreign countries to decide whether and to which conditions they would be willing to do business with a firm.

These considerations about the link between the credit rating score – a higher value of which by construction indicates a lower degree of creditworthiness and a higher degree of credit constraints – and import activities of a firms lead to six empirically testable hypotheses:

H1: Firms with a higher credit rating score are less likely to import.

H2: Firms with a higher credit rating score will import less.

H3: Firms with a higher credit rating score will import a smaller number of goods.

H4: Firms with a higher credit rating score will import from a smaller number of countries.

H5: Firms with a higher credit rating score are less likely to start to import.

H6: Firms with a higher credit rating score are more likely to stop to import.

These six hypotheses will be tested empirically in turn in this section. Here, the credit rating score is treated as a continuous variable that may take values between 100 and 600. As a robustness check the hypotheses will be tested again in section 4 by applying the classification of the score value into seven credit rating classes (following the classification suggested by the credit rating agency *Creditreform*) from "excellent" to "not to be considered as partner in trade".

As a first step in the empirical investigation of H1 – that states that firms with a higher credit rating score are less likely to import - the credit rating scores of importers and non-importers are compared. Table 1 reports mean values and percentiles of the scores for both groups of firms for the two years under investigation. The average score is smaller for importers than for non-importers in both years – importers are judged to be better (because a smaller value of the score indicates a better performance). The difference in means is statistically highly different from zero according to a t-test. This result is in line with H1. The difference between the two groups, however, is only 5 score points and this is small from an economic point of view given the average level of about 200 points for both groups.

[Table 1 near here]

The percentiles of the score distributions for the groups indicate that firms are highly heterogeneous within the groups. Results that point to score differences at the (unconditional) mean might not tell the whole story. As Moshe Buchinsky (1994, p.453) put it: "'On the average' has never been a satisfactory statement with which to conclude a study of heterogeneous populations." An empirical study of heterogeneous firms should look at differences in the whole distribution of the variable under investigation between groups of firms, not only at differences at the mean. The empirical strategy used here, therefore, applies a non-parametric test for first order stochastic dominance of one distribution over another that was introduced into the empirical literature on international trade activities of firms by Delgado et al. (2002). Let F and G denote the cumulative distribution functions of credit rating scores for two groups of firms (say, firms that import and firms that do not import).

Fist order stochastic dominance of F relative to G is given if F(z) – G(z) is less or equal zero for all z with strict inequality for some z. Given two independent random samples of firms from each group, the hypothesis that F is to the right of G can be tested by the Kolmogorov-Smirnov test based on the empirical distribution functions for F and G in the samples. Note that this tests not only for differences in the mean credit rating score of both groups but for differences in all moments of the distribution. Results for the Kolmogorov-Smirnov test reported in Table 1 clearly indicate that the distributions of the credit rating scores do indeed differ between importers and non-importers and that importers have smaller (i.e., better) score values not only at the mean but over the whole score distribution. Again, the result is in favour of H1.

Results reported in Table 1 are for unconditional comparisons of mean values and distributions of the credit rating scores of importing and non-importing firms. In a second step H1 is tested controlling for other firm characteristics that are linked to imports. To do so an empirical model is estimated with a dummy variable that takes the value 1 if a firm is an importer in year t (and 0 otherwise) as the endogenous variable and the credit rating score at the end of year t-1 plus control variables – the number of employees as a measure of firm size (also included in squares), labour productivity, the average wage per employee to proxy human capital intensity and a set of two-digit industry dummy variables – that are all measured in year t-1 as exogenous variables. Results are reported in Table 2 in column 1 for a probit model. In both years the probability of being an importer is higher ceteris paribus for firms with a smaller (i.e. better) credit rating score. This is again in line with H1.

The estimated marginal effects, however, are tiny. A decrease of the credit rating score by 40 points (which is equal to about one standard deviation) increases

the probability of being an importer by about 0.03 percentage points. Even a change by 100 score points changes the estimated probability by less than 0.1 percentage points. From an economic point of view, therefore, the statistically highly significant coefficient of the credit score variable is next to zero.

[Table 2 near here]

We next turn to a test of H2 that states that firms with a higher credit rating score will import less, i.e. they will have a lower import to sales ratio. To test H2 an empirical model is estimated with the share of imports in total sales in year t as the endogenous variable and the credit rating score at the end of year t-1 plus control variables – the number of employees as a measure of firm size (also included in squares), labour productivity, the average wage per employee to proxy human capital intensity and a set of two-digit industry dummy variables – that are all measured in year t-1 as exogenous variables. The endogenous variable, the share of imports in total sales, is a percentage variable that is limited between zero and 100 percent, and that has a lot of observations at the lower bound because some 40 percent of all firms in the samples used here do not import at all. Papke and Wooldridge (1996) showed that for a fractional response variable of this type, and using cross section data, a fractional logit estimator is appropriate.[5]

[5] Wagner (2001) introduced this estimation strategy into the literature on the determinants of trade activities of firms, and discusses the flaws related to alternative approaches like Tobit or two-step estimators. For a comprehensive recent discussion of estimation strategies for fractional response variables with a non-ignorable probability mass at zero see Ramalho, Ramalho and Murteira (2010).

The results from fractional logit regressions are reported in column 2 of Table 2. The estimated coefficient for the credit rating score is statistically insignificant at any conventional level, and the point estimates have different signs in both years. Therefore, results are not in line with H2.

In the next step, we turn to the hypotheses H3 and H4 that are related to the extensive margins of imports with regard to the number of goods imported and the number of countries imported from. H3 states that firms with a higher credit rating score will import a smaller number of goods. To test this hypothesis an empirical model is estimated by OLS that has the number of different goods imported by a firm as the endogenous variable and the credit rating score value plus the set of control variables used in the empirical models to test H1 and H2 as exogenous variables. Results are reported in column 1 of Table 3. The estimated regression coefficients have the expected sings, and they are statistically different from zero at an error level of 3.2 percent or better. In both years the estimated effect of the credit rating score is large. A change in the score value by 40 points (that corresponds to one standard deviation, see Table 1) is related to an estimated change of the number of goods imported by 5 in 2009 and 2.5 in 2010. Firms on average import about 50 different goods, so the estimated effect can be considered to be relevant from an economic point of view, too. Results, therefore, are in line with H3.

[Table 3 near here]

H4 states that firms with a higher credit rating score will import from a smaller number of countries. To test this hypothesis an empirical model is estimated by OLS that has the number of different countries of origin as the endogenous variable and

the credit rating score value plus the same set of control variables used in the empirical models to test H3 as exogenous variables. Results are reported in column 2 of Table 3. The estimated regression coefficients have the expected sings, and they are statistically highly significant. In both years the estimated effect of the credit rating score is large. A change in the score value by 40 points is related to an estimated change of the number of countries imported from by 1.4 in 2009 and 0.84 in 2010. Firms on average import from 16 countries, so the estimated effect can be considered to be relevant from an economic point of view, too. These results are in line with H4.

In the final step, we turn to the hypotheses H5 and H6 that consider the decision of a firm to start or to stop importing. Import starters are defined as firms that did not report any imports in 2009 but did report imports in 2010. Import stoppers are firms that did report imports in 2009 but did not report imports in 2010. This definition of starters and stoppers is a bit fuzzy due to the reporting threshold that applies in the collection of the data for the statistics of foreign trade. The group of import starters includes firms which imported in 2009 from countries inside the EU only but which had not to report because the amount of imports was below the reporting threshold of 400.000 Euro. A similar point applies to firms classified as import stoppers that continued to import from EU member countries only in 2010, but which had not to report any longer because the sum of imports was below the threshold value.

That said, it should be noted that the number of both import starters and import stoppers is tiny in the sample used here. From the 2310 firms that did not import in 2009 only 118 (or 5.1 percent) started to import in 2010, and from the 3611 firms that did import in 2009 only 124 (or 3.4 percent) stopped to import in 2010. These small numbers of starters and stoppers are a consequence of the fact that

large firms are oversampled in the samples used here because larger firms have a much higher chance to be rated by the credit rating agency.

H5 states that firms with a higher credit rating score are less likely to start to import. Results reported in the upper panel of Table 4 are not in line with this hypothesis. Contrary to H5, the average value of the credit rating score of import starters is higher that the score on non-starters. This difference in means, however, is not statistically significantly different from zero at any conventional error level according to a t-test, and the Kolmogorov-Smirnov-test does not reject the hypothesis of no difference in the credit score distribution for both groups of firms.

[Table 4 near here]

Results from a probit model with a dummy variable for import starters as the endogenous variable and the credit rating score plus the set of control variables used before as exogenous variables that are reported in column 1 of Table 5 lead to an identical conclusion. Contrary to H5 there is no evidence that firms with a higher credit rating score are less likely to start to import

[Table 5 near here]

H6 states that firms with a higher credit rating score are more likely to stop to import. Results reported in the lower panel of Table 4 are in line with this hypothesis. The average value of the credit rating score of import starters is higher that the score on non-starters. This difference in means is statistically highly significant according to a t-test, and the Kolmogorov-Smirnov-test does indicate that the distribution of credit

rating scores for export-stoppers stochastically dominates the distribution for firms that continue to import. Results from a probit model with a dummy variable for import stoppers as the endogenous variable and the credit rating score plus the set of control variables used before as exogenous variables that are reported in column 2 of Table 5 lead to an identical conclusion. In line with H5 there is evidence that firms with a higher credit rating score are more likely to stop to import. The estimated marginal effect indicates, however, that the statically significant coefficient is rather small from an economic point of view. An increase in the credit rating score by 40 points increases the probability to stop to export by 0.13 percentage point which points to a weak relationship between the credit rating score and the decision to stop to import.

4. Robustness check: Credit rating score classes and margins of import

In this section the six hypotheses on the links between the credit rating score of a firms and its import activities that were tested section 3 are tested again in a robustness check that uses the classification of the score value into seven credit rating classes suggested by the credit rating agency *Creditreform* instead of treating the score as a continuous variable. The score takes values from 100 to 600, and Creditreform suggests that 100 to 149 should be considered as excellent, 150 to 199 as very good, 200 to 249 as good, 250 to 299 as medium, 300 to 349 as weak, 350 to 419 as high risk of failure, and firms with a score of 420 or more are classified as firms that should not be considered as partners in trade and credit relations.

Table 6 documents the distribution of the various types of firms considered in this study (importer, non-importer, import starter, non-starter, import stopper, non-stopper) over the seven credit rating score classes. About 80 percent of all firms from

each of these types are in class 2 (very good) or class 3 (good), and most of the remaining firms are classified as medium (class 4) or, to a somewhat lesser extent, excellent. Firms in the three lowest credit rating score classes are rare – in some cases there are less than three firms of a type in a class so that the exact number of observations is confidential.

[Table 6 near here]

The empirical models used to test the hypotheses H3 to H6 are identical to the models used in section 3 with one exception. The credit rating score is no longer included as one continuous variable. Instead, the empirical models have six dummy variables for the credit rating score classes 2 to 7, using the left-out highest score class 1 (excellent) as the reference category.

For H1 and H2 the same big picture emerges that is reported in Table 2 in section 3 based on the continuous score variable. From column 1 we see that firms from a better score class have a higher probability to import. The negative relationship between a worse score class and the probability to import is statistically significant for firms in the third, fourth and fifth class (compared to the reference category of firms that are rated as excellent).[6] The marginal effects, however, are again rather low. The estimated probability that a firm from the score class "medium" is an importer is only 0.9 (0.7) percentage points smaller than the probability for a firm from the score class "excellent" in 2009 (2010). Results reported in column 2

[6] Results for the score classes 6 and 7 should not be interpreted because they are based on one or two observations only. This caveat applies to estimation results reported in Table 8 and Table 9, too.

indicate that, in line with results stated in Table 2, the credit rating score class is not related to the amount of imports.

[Table 7 near here]

For H3 and H4, too, results based on credit rating score classes are similar to results based on the continuously measured score. In line with results reported in Table 3 results in Table 8 show that both the number of goods imported and the number of countries imported from is higher among firms from a better credit rating score class.

[Table 8 near here]

Results for tests of H5 and H6 that use the credit rating score classes in empirical models instead of the credit rating score variable are documented in Table 9. According to the figures reported in Table 6 there are only one or two firms among the import starters that are classified as “excellent” (from the reference group), and the same hold for firms classified as “weak” (or worse). Therefore, the results reported in column 1 of Table 9 should be considered as unreliable, and they are not interpreted here. For import stoppers, results reported in column 2 of Table 9 reveal a somewhat different picture compared to results reported in Table 4 and 5 for a test of H6. According to Table 9 only firms from the score classes “weak” and “high risk of failure” have a statistically significantly higher probability to stop to import than firms from the reference category that are rated “excellent”. The number of firms in these

score classes 5 and 6, however, are very small both among the import stoppers and the non-stoppers. Therefore, results should be considered as not informative.

[Table 9 near here]

5. Discussion

This study uses tailor made newly available enterprise level data for firms from manufacturing industries in Germany to test for the link between credit constraints, measured by a credit rating score from the leading credit rating agency Creditreform, and imports. We find empirical evidence that a better credit rating score is positively related to extensive margins of import. On the one hand, firms with a better score have a higher probability to import. While statistically highly significant, this link is, however, is not relevant from an economic point of view according to the size of the estimated marginal effects of a change in the credit rating score on the probability to export. On the other hand, firms with a better credit rating score import more goods and they source from more countries of origin. This link is not only statistically highly significant – according to the estimated marginal effects it is relevant from an economic point of view, too.[7] Firms that import many goods and from many countries have to cover extra costs related to import activities many times, and financial constraints are more important for such firms than for firms that are marginal

[7] In a robustness check the empirical models for the number of goods imported and the number of countries imported from were estimated using a negative binomial regression model that explicitly takes care of the fact that both variables are count variables with positive integer values only. The big picture that results from this robustness check is identical to the results from the OLS regressions documented in Table 3 and Table 8.

importers only according to the number of goods imported and the number of countries imported from.

Contrary to these findings, the intensive margin of imports – the share of imports in total sales – is found not to be related to credit constraints. In light of the results found for the link between the credit rating score and both the number of goods imported and the number of countries imported from this might be due to the fact that a given total value of imports of a firm can be the results of a wide range of import transaction that cover a small or a large number of different goods imported from a small or a large number of countries.

Due to the small number of import status switchers in the sample over a short period of two years the results reported for links between credit rating scores and starting or stopping to import should not be considered as reliable.

To put these results into perspective two characteristics of the enterprise level data used in this study should be pointed out. First, the way credit constraints are measured can be considered as convincing. While the credit rating score used is clearly endogenous to the firm's performance and characteristic, it is not directly affected by its importing behavior, given that imports are not used in constructing the index. Important advantages are that the score is determined independently by a private firm and is not based on subjective assessments, it is firm-specific, varies over time on an annual basis and allows for a measure of the degree of credit constraints rather than classifying firms as constrained or not. Second, while the measure for credit constraints is very suitable for the study of the links between credit constraints and imports, the sample used is less so. As said in section 2 smaller firms are underrepresented because the credit rating score is not available for these firms. Connected to this shortcoming is the small number of import starters and import

stoppers. Smaller firms do more often switch into and out of importing. For these firms credit constraints might be more important than for larger firms who often generate enough liquidity to cover the extra costs of importing.

Furthermore, the empirical investigation is limited to the analysis of data from two cross-section samples only. This limitation is due to the fact that as of today the transactions level data aggregated to the firm level are available for the reporting years 2009 and 2010 only. On the one hand, this limitation hinders the use of panel data and panel econometric models than could be used to control for unobserved time invariant firm characteristics that might be correlated with the credit rating score and, therefore, might lead to biased estimates of the coefficients of the score variables. On the other hand it should be kept in mind that the two years investigated here are special periods with regard to imports. After the severe collapse of international trade during the Great Recession in 2009 global trade flows rebounded strongly in 2010. The value of total German imports declined by 17.5 percent in 2009 compared to 2008, and this was followed by an increase in imports by 19.9 percent in 2010 (see Wagner (2013b) for details). The links between import activities and credit rating scores might look quite different in periods that are characterized by much less turbulence on the international goods markets.

The results of this first empirical study on the links between credit rating scores and import activities of firms in Germany, one of the most important actors on the world market for goods, are interesting in itself and as a contribution to the small literature on credit constraints and imports. However, given the shortcomings mentioned, the results presented here should not be used as a basis to discuss the need for any policy measures to improve the access to credits for firms that intend to start or expand import activities.

References

Bas, Maria and Antoine Berthou (2011), The Decision to Import Capital Goods in India: Firms' Financial Factors Matter. CEPII Working Paper No 2011-6, March.

Buchinsky, Moshe (1994), Changes in the U.S. wage structure 1963-1987: Application of quantile regression. *Econometrica* 62 (2), 405-458.

Chaney, Thomas (2013), Liquidity constrained exporters. National Bureau of Economic Research NBER Working Paper 19170, June.

Delgado, Miguel A., Jose C. Farinas and Sonia. Ruano (2002), Firm productivity and export markets: a non-parametric approach. *Journal on International Economics* 57 (2), 397-422.

Egger, Peter and Michaela Kesina (2013), Financial constraints and exports: Evidence from Chinese firms. *CESifo Economic Studies* 59 (4), 676-706.

Farre-Mensa, Joan and Alexander Ljungqvist (2013), Do measures of financial constraints measure financial constraints? National Bureau of Economic Research NBER Working Paper 19551, October.

Greenaway, David, Alessandra Guariglia and Richard Kneller (2007), Financial factors and exporting decisions. *Journal of International Economics* 73 (2), 377-395.

Malchin, Anja and Ramona Voshage (2009). Official Firm Data for Germany. *Schmollers Jahrbuch / Journal of Applied Social Science Studies* 129 (3), 501 – 513.

Manova, Kalina (2013), Credit Constraints, Heterogeneous Firms, and International Trade. *Review of Economic Studies* 80 (4), 711-744.

Melitz, Mark J. (2003), The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica* 71 (6), 1695-1725.

Minetti, Raoul and Susan Chun Zhu (2011), Credit constraints and firm exports: Microeconomic evidence from Italy. *Journal of International Economics* 83 (1), 109-125.

Musso, Patrick and Stefano Schiavo (2008), The impact of financial constraints on firm survival and growth. *Journal of Evolutionary Economics* 18 (2), 135-149.

Muuls, Mirabelle (2008), Exporters and credit constraints. A firm-level approach. National Bank of Belgium Working Paper Research No. 139, September.

Muuls, Mirabelle (2012), Exporters, Importers and Credit Constraints. CEP Discussion Paper No 1169, October.

Papke, Leslie E. and Jeffrey M. Wooldridge (1996), Econometric Methods for Fractional Response Variables with an Application to 401(k) Plan Participation Rates. *Journal of Applied Econometrics* 11 (6), 619-632.

Ramalho, Esmeralda A., Joaquim J. S. Ramalho and José M. R. Murteira (2010), Alternative estimating and testing empirical strategies for fractional regression models. *Journal of Economic Surveys* 25 (1), 19-68.

Rossen, Jörg (2012), Verfeinerte Bonitätsbewertung für das Kreditrisikomanagement. *KSI – Krisen-, Sanierungs- und Insolvenzberatung* 1/2012, 22-26.

Secchi, Angelo, Federico Tamagni and Chiara Tomasi (2011), Export activities under financial constraints: margins, quantities and prices. Laboratory of Economics and Management Sant'Anna School of Advanced Studies LEM Working Paper Series 2011/24, December.

Tamagni, Federicio (2013), Exporting under financial constraints: margins, switching dynamics and prices. Scuola Superiore Sant'Anna LEM, mimeo, February.

Vogel, Alexander and Joachim Wagner (2010), Higher productivity in importing German manufacturing firms: self-selection, learning from importing, or both? *Review of World Economics* 145 (4), 641-665.

Wagner, Joachim (2001), A Note on the Firm Size – Export Relationship. *Small Business Economics* 17(4), 229-237.

Wagner, Joachim (2008), Why more West than East German firms export. *International Economics and Economic Policy* 5 (4), 363-370.

Wagner, Joachim (2012a), International trade and firm performance: a survey of empirical studies since 2006. *Review of World Economics* 148 (2), 235-267.

Wagner, Joachim (2012b), Productivity and the extensive margins of trade in German manufacturing firms: Evidence from a non-parametric test. *Economics Bulletin* 32 (4), 3061-3070.

Wagner, Joachim (2012c), Average wage, qualification of the workforce and export performance in German enterprises: evidence from *KombiFiD* data. *Journal of Labour Market Research* 45 (2), 161-170.

Wagner, Joachim (2013a), Credit constraints and exports: A survey of empirical studies using firm level data. University of Lüneburg Working Paper Series in Economics No. 288, December.

Wagner, Joachim (2013b), Extensive margins of imports in the great import recovery in Germany, 2009/2010. *Economics Bulletin* 33 (4), 2732-2743.

Wagner, Joachim (2014), Credit constraints and exports: evidence for German manufacturing enterprises. *Applied Economics* 46 (3), 294-302.

World Trade Organization (2012), World Trade Report 2012. Geneva: WTO Publications.

Table 1: Credit rating score for importers and non-importers

	No. of firms	Mean	sd	p1	p10	p50	p90	p99
Importer in 2009; credit rating score at end of 2008	3,483	194.53	38.56	108	147	196	246	293
Non-importer in 2009; credit rating score at end of 2008	2,311	199.87	38.86	116	154	200	249	299
H_0: Mean (Importer) = Mean (Non-importer); prob-value of t-test	0.000							
Kolmogorov-Smirnov-tests for differences in distribution; prob-value								
H_0: Distributions do not differ for importers and non-importers	0.000							
H_0: Non-importers have larger credit rating scores	0.996							
H_0: importers have larger credit rating scores	0.000							

	No. of firms	Mean	sd	p1	p10	p50	p90	p99
Importer in 2010; credit rating score at end of 2009	3,605	200.40	41.26	113	153	200	252	304
Non-importer in 2010; credit rating score at end of 2009	2,316	205.61	41.31	120	159	203	257	309
H_0: Mean (Importer) = Mean (Non-importer); prob-value of t-test	0.000							
Kolmogorov-Smirnov-tests for differences in distribution; prob-value								
H_0: Distributions do not differ for importers and non-importers	0.000							
H_0: Non-importers have larger credit rating scores	0.999							
H_0: importers have larger credit rating scores	0.000							

Note: p1, p10 etc. is the first, tenth etc. percentile of the distribution of the credit rating score. The t-test is a two-sample test with unequal variances.

Table 2: Credit rating score and imports: Regression results

Endogenous variable		Importer-Dummy (1 = yes)	Share of imports in total sales
Method		Probit	Fractional Logit Model
2009			
Credit rating score 2008	ß	-0.0008	0.00008
	p	0.000	0.909
Number of firms		5,748	5,748
2010			
Credit rating score 2009	ß	-0.0007	-0.0004
	p	0.000	0.497
Number of firms		5,893	

Note: The empirical models include the lagged values for labor productivity, number of employees (also included in squares), and human capital intensity (wage per employee) plus two-digit industry dummy variables and a constant. ß is the estimated regression coefficient, p is the prob-value; for the Probit model marginal effects are reported.

Table 3: Credit rating score and extensive margins of imports: Regression results

Endogenous variable		Number of goods imported	Number of countries imported from
Method		OLS	OLS
2009			
Mean / p1 / p99		51 / 1 / 345	16 / 1 / 55
Credit rating score 2008	ß	-0.130	-0.034
	p	0.000	0.000
Number of firms		3,462	3,462
2010			
Mean / p1 / p99		55 / 1 / 357	16 / 1 / 51
Credit rating score 2009	ß	-0.061	-0.021
	p	0.032	0.000
Number of firms		3,589	3,589

Note: The empirical models include the lagged values for labor productivity, number of employees (also included in squares), and human capital intensity (wage per employee) plus two-digit industry dummy variables and a constant. ß is the estimated regression coefficient, p is the prob-value. Mean, p1 and p99 is the average number of goods (countries) and the first and the 99th percentile of the distribution of the number of goods (countries).

Table 4: Credit rating score for import starters, non-importers, import stoppers and importers

	No. of firms	Mean	sd	p1	p10	p50	p90	p99
Import starters in 2010; credit rating score at end of 2009	118	212.42	51.07	###	169	206	263	###
Non-importers in 2009 and 2010; credit rating score at end of 2009	2,192	205.19	40.72	120	159	203	255	304
H_0: Mean (Import starters) = Mean (Non-importers); prob-value of t-test	0.113							
Kolmogorov-Smirnov-tests for differences in distribution; prob-value								
H_0: Distributions do not differ for import starters and non-importers	0.283							
H_0: Non-importers have larger credit rating scores	0.163							
H_0: Import starters have larger credit rating scores	0.570							

	No. of firms	Mean	sd	p1	p10	p50	p90	p99
Import stoppers in 2010; credit rating score at end of 2009	124	212.92	50.32	###	161	205	283	###
Importers in 2009 and 2010; credit rating score at end of 2009	3,487	200.00	40.84	113	153	200	252	###
H_0: Mean (Import stoppers) = Mean (Importers); prob-value of t-test	0.006							
Kolmogorov-Smirnov-tests for differences in distribution; prob-value								
H_0: Distributions do not differ for import stoppers and Importers	0.060							
H_0: Import stoppers have larger credit rating scores	0.038							
H_0: Importer have larger credit rating scores	0.990							

Note: p1, p10 etc. is the first, tenth etc. percentile of the distribution of the credit rating score. The t-test is a two-sample test with unequal variances. ### indicates a confidential value (due to small number of cases).

Table 5: Credit rating score, import start and import stop: Regression results

Endogenous variable		Import starter (Dummy, 1 = yes)	Import stopper (Dummy, 1 = yes)
Method		Probit	Probit
Credit rating score 2009	ß	0.00013	0.0032
	p	0.195	0.001
Number of firms		2,201	3,494

Note: The empirical models include the lagged values for labor productivity, number of employees (also included in squares), and human capital intensity (wage per employee) plus two-digit industry dummy variables and a constant. ß is the estimated marginal effect, p is the prob-value.

Table 6: Distribution of types of firms over credit rating score classes

Credit rating score class	Credit rating score	Share of firms from credit rating score class in year t-1 in group of firms (percentage)							
		Importer 2009	Non-importer 2009	Importer 2010	Non-importer 2010	Import starter 2010	Non-starter 2010	Import stopper 2010	Non-stopper 2010
1 Excellent	100 – 149	10.74	8.52	8.54	7.56	###	7.57	7.26	8.80
2 Very good	150 – 199	44.44	40.72	40.86	36.14	40.37	36.18	35.48	40.81
3 Good	200 - 249	36.55	40.80	39.36	43.09	42.37	43.34	38.71	39.26
4 Medium	250 – 299	7.67	8.96	10.10	11.49	11.86	11.36	13.71	10.04
5 Weak	300 – 349	0.49	0.78	0.78	1.34	###	1.28	2.42	0.75
6 High risk of failure	350 – 419	###	###	###	###	###	###	2.42	0.23
7 Not to be considered as partner in trade	420 – 600	###	###	###	###	###	###	0.00	0.11
Total number of firms		3,483	2,311	3,605	2,316	118	2,192	124	3,487

Note: ### indicates a confidential value (less than three firms) or a value that has to be treated as confidential to prohibit the calculation of a confidential value. For a definition of import starter, non-starter, import stopper and non-stopper see text.

Table 7: Credit rating score class and imports: Regression results

Endogenous variable		Importer-Dummy (1 = yes)		Share of imports in total sales	
Method		Probit		Fractional Logit Model	
Year		2009	2010	2009	2010
Credit rating score class (Year t-1)					
Very good	ß	-0.036	-0.005	0.006	0.017
	p	0.128	0.854	0.941	0.840
Good	ß	-0.079	-0.054	-0.068	0.018
	p	0.001	0.031	0.421	0.834
Medium	ß	-0.090	-0.069	0.153	0.042
	p	0.004	0.024	0.208	0.703
Weak	ß	-0.168	-0.159	-0.176	-0.557
	p	0.050	0.022	0.633	0.048
High risk of failure	ß	-0.135	-0.109	0.184	-0.315
	p	0.518	0.410	0.691	0.424
Not to be considered as partner In trade	ß	-0.340	0.069	-4.328	0.368
	p	0.220	0.705	0.000	0.336
Numnber of firms		5,748	5,891	5,748	5,893

Note: The empirical models include the lagged values for labor productivity, number of employees (also included in squares), and human capital intensity (wage per employee) plus two-digit industry dummy variables and a constant. ß is the estimated regression coefficient, p is the prob-value; for the Probit model marginal effects are reported. The reference category for the credit rating class is “excellent”; for a definition of the classes see text and Table 6.

Table 8: Credit rating score class and extensive margins of imports: Regression results

Endogenous variable		Number of goods imported		Number of countries imported from	
Method		OLS		OLSl	
Year		2009	2010	2009	2010
Mean / p1 / p99		51 / 1 / 345	55 / 1 /357	16 / 1 / 55	16 / 1 / 51
Credit rating score class (year t-1)					
Very good	ß	-7.286	-7.917	-1.656	-1.873
	p	0.080	0.075	0.006	0.005
Good	ß	-13.116	-10.445	-3.532	-3.268
	p	0.002	0.018	0.000	0.000
Medium	ß	-10.835	-9.212	-3.552	-2.798
	p	0.049	0.082	0.000	0.000
Weak	ß	-20.424	-10.073	-4.971	-4.613
	p	0.016	0.275	0.004	0.003
High risk of failure	ß	-84.170	-28.111	-5.496	-4.937
	p	0.354	0.462	0.699	0.337
Not to be considered as partner In trade	ß	###	32.618	###	4.969
	p	###	0.056	###	0.135
Numnber of firms		3,463	3,589	3,462	3,589

Note: The empirical models include the lagged values for labor productivity, number of employees (also included in squares), and human capital intensity (wage per employee) plus two-digit industry dummy variables and a constant. ß is the estimated regression coefficient, p is the prob-value. The reference category for the credit rating class is “excellent”; for a definition of the classes see text and Table 6. Mean, p1 and p99 is the average number of goods (countries) and the first and the 99th percentile of the distribution of the number of goods (countries). ### indicates a confidential value (that is based on one or two observations only).

Table 9: Credit rating score class, import start and import stop: Regression results

Endogenous variable		Import Starter (Dummy, 1 = yes)	Import Stopper (Dummy, 1 = yes)
Method		Probit	Probit
Year		2010	2010
Credit rating score class in 2009			
Very good	ß	0.101	0.001
	p	0.019	0.887
Good	ß	0.080	0.005
	p	0.038	0.637
Medium	ß	0.119	0.020
	p	0.043	0.173
Weak	ß	0.157	0.095
	p	0.087	0.032
High risk of failure	ß	###	0.290
	p		0.001
Not to be considered as partner In trade	ß	0.559	###
	p	0.013	
Numnber of firms		2,189	3,490

Note: The empirical models include the lagged values for labor productivity, number of employees (also included in squares), and human capital intensity (wage per employee) plus two-digit industry dummy variables and a constant. ß is the estimated marginal effect, p is the prob-value. The reference category for the credit rating class is “excellent”; for a definition of the classes see text and Table 6. ### indicates that there are no import starters (or import stoppers) in this credit rating class; therefore, the dummy variable indicating this class is dropped from the empirical model.

Working Paper Series in Economics

(recent issues)

No.293: *Dirk Oberschachtsiek*: Waiting to start a business venture. Empirical evidence on the determinants and effects of wait time., February 2014

No.292: *Joachim Wagner*: Low-productive exporters are high-quality exporters. Evidence from Germany, February 2014

No.291: *Institut für Volkswirtschaftslehre:* Forschungsbericht 2013, Januar 2014

No.290: *Stefan Baumgärtner, Moritz A. Drupp und Martin F. Quaas*:Subsistence and substitutability in consumer preferences, December 2013

No.289: *Dirk Oberschachtsiek*: Human Capital Diversity and Entrepreneurship. Results from the regional individual skill dispersion nexus on self-employment activity., December 2013

No.288: *Joachim Wagner and John P. Weche Gelübcke*: Risk or Resilience? The Role of Trade Integration and Foreign Ownership for the Survival of German Enterprises during the Crisis 2008-2010, December 2013

No.287: *Joachim Wagner*: Credit constraints and exports: A survey of empirical studies using firm level data, December 2013

No.286: *Toufic M. El Masri*: Competition through Cooperation? The Case of the German Postal Market, October 2013

No.285: *Toufic M. El Masri*: Are New German Postal Providers Successful? Empirical Evidence Based on Unique Survey Data, October 2013

No.284: *Andree Ehlert, Dirk Oberschachtsiek,* and *Stefan Prawda*: Cost Containment and Managed Care: Evidence from German Macro Data, October 2013

No.283: *Joachim Wagner* and *John P. Weche Gelübcke*: Credit Constraints, Foreign Ownership, and Foreign Takeovers in Germany, September 2013

No.282: *Joachim Wagner*: Extensive margins of imports in The Great Import Recovery in Germany, 2009/2010, September 2013 [published in: Economics Bulletin 33 (2013), 4, 2732-2743]

No.281: *Stefan Baumgärtner, Alexandra M. Klein, Denise Thiel,* and *Klara Winkler*: Ramsey discounting of ecosystem services, August 2013

No.280: *Antonia Arsova* and *Deniz Dilan Karamen Örsal*: Likelihood-based panel cointegration test in the presence of a linear time trend and cross-sectional dependence, August 2013

No.279: *Thomas Huth*: Georg von Charasoff's Theory of Value, Capital and Prices of Production, June 2013

No.278: *Yama Temouri and Joachim Wagner*: Do outliers and unobserved heterogeneity explain the exporter productivity premium? Evidence from France, Germany and the United Kingdom, June 2013 [published in: Economics Bulletin, 33 (2013), 3, 1931-1940]

No.277: *Horst Raff and Joachim Wagner*: Foreign Ownership and the Extensive Margins of Exports: Evidence for Manufacturing Enterprises in Germany, June 2013

No.276: *Stephan Humpert*: Gender Differences in Life Satisfaction and Social Participation, May 2013

No.275: *Sören Enkelmann and Markus Leibrecht*: Political Expenditure Cycles and Election Outcomes Evidence from Disaggregation of Public Expenditures by Economic Functions, May 2013

No.274: *Sören Enkelmann*: Government Popularity and the Economy First Evidence from German Micro Data, May 2013

No.273: *Michael Berlemann, Soeren Enkelmann,* and *Torben Kuhlenkasper*: Unraveling the Relationship between Presidential Approval and the Economy – A Multi-Dimensional Semi-Parametric Approach, May 2013

No.272: *Michael Berlemann* and *Sören Enkelmann*: The Economic Determinants of U.S. Presidential Approval – A Survey, May 2013

No.271: *Soeren Enkelmann*: Obama and the Macroeconomy Estimating Social Preferences Between Unemployment and Inflation, May 2013

No.270: *Anja Köbrich León*: Does Cultural Heritage affect Employment decisions – Empirical Evidence for Second Generation Immigrants in Germany, April 2013

No.269: *Anja Köbrich León* and *Christian Pfeifer*: Religious Activity, Risk Taking Preferences, and Financial Bahavior, April 2013

No.268: *Anja Köbrich León*: Religion and Economic Outcomes – Household Savings Bahavior in the USA, April 2013

No.267: *John P. Weche Gelübcke* and *Isabella Wedl*: Environmental Protection of Foreign Firms in Germany: Does the country of origin matter?, April 2013

No.266: *Joachim Wagner*: The Role of extensive margins of exports in *The Great Export Recovery* in Germany, 2009/2010, March 2013

No.265: *John-Oliver Engler* and *Stefan Baumgärtner*: Model choice and size distribution: a Bayequentist approach, February 2013

No.264: *Chiara Franco* and *John P. Weche Gelübcke*: The death of German firms: What role for foreign direct investment?, February 2013

No.263: *Joachim Wagner*: Are low-productive exporters marginal exporters? Evidence from Germany, February 2013 [published in Economics Bulletin 33 (2013), 1, 467-481]

No.262: *Sanne Hiller, Philipp J. H. Schröder,* and *Allan Sørensen*: Export market exit and firm survival: theory and first evidence, January 2013

No.261: *Institut für Volkswirtschaftslehre*: Forschungsbericht 2012, Januar 2013

No.260: *Alexander Vogel* and *Joachim Wagner*: The Impact of R&D Activities on Exports of German Business Services Enterprises : First Evidence from a continuous treatment approach, December 2012

No.259: *Christian Pfeifer*: Base Salaries, Bonus Payments, and Work Absence among Managers in a German Company, December 2012

No.258: *Daniel Fackler, Claus Schnabel,* and *Joachim Wagner*: Lingering illness or sudden death? Pre-exit employment developments in German establishments, December 2012

No.257: *Horst Raff* and *Joachim Wagner*: Productivity and the Product Scope of Multi-product Firms: A Test of Feenstra-Ma, December 2012 [published in: Economics Bulletin, 33 (2013), 1, 415-419]

No.256: *Christian Pfeifer* and *Joachim Wagner*: Is innovative firm behavior correlated with age and gender composition of the workforce? Evidence from a new type of data for German enterprises, December 2012

No.255: *Maximilian Benner*: Cluster Policy as a Development Strategy. Case Studies from the Middle East and North Africa, December 2012

No.254: *Joachim Wagner* und *John P. Weche Gelübcke*: Firmendatenbasiertes Benchmarking der Industrie und des Dienstleistungssektors in Niedersachsen – Methodisches Konzept und Anwendungen (Projektbericht), Dezember 2012

No.253: *Joachim Wagner*: The Great Export Recovery in German Manufacturing Industries, 2009/2010, November 2012

No.252: *Joachim Wagner*: Daten des IAB-Betriebspanels und Firmenpaneldaten aus Erhebungen der Amtlichen Statistik – substitutive oder komplementäre Inputs für die Empirische Wirtschaftsforschung?, Oktober 2012

No.251: *Joachim Wagner*: Credit constraints and exports: Evidence for German manufacturing enterprises, October 2012 [published in: Applied Economics 46 (2014), 3, 294-302]

No.250: *Joachim Wagner*: Productivity and the extensive margins of trade in German manufacturing firms: Evidence from a non-parametric test, September 2012 [published in: Economics Bulletin 32 (2012), 4, 3061-3070]

No.249: *John P. Weche Gelübcke*: Foreign and Domestic Takeovers in Germany: First Comparative Evidence on the Post-acquisition Target Performance using new Data, September 2012

No.248: *Roland Olbrich, Martin Quaas,* and *Stefan Baumgärtner*: Characterizing commercial cattle farms in Namibia: risk, management and sustainability, August 2012

No.247: *Alexander Vogel* and *Joachim Wagner*: Exports, R&D and Productivity in German Business Services Firms: A test of the Bustos-model, August 2012 [published in Empirical Economics Letters 12 (2013), 1]

No.246: *Alexander Vogel* and *Joachim Wagner*: Innovations and Exports of German Business Services Enterprises: First evidence from a new type of firm data, August 2012

No.245: *Stephan Humpert*: Somewhere over the Rainbow: Sexual Orientation Discrimination in Germany, July 2012

No.244: *Joachim Wagner*: Exports, R&D and Productivity: A test of the Bustos-model with German enterprise data, June 2012 [published in: Economics Bulletin, 32 (2012), 3, 1942-1948]

No.243: *Joachim Wagner*: Trading many goods with many countries: Exporters and importers from German manufacturing industries, June 2012 [published in: Jahrbuch für Wirtschaftswissenschaften/Review of Economics, 63 (2012), 2, 170-186]

No.242: *Joachim Wagner*: German multiple-product, multiple-destination exporters: Bernard-Redding-Schott under test, June 2012 [published in: Economics Bulletin, 32 (2012), 2, 1708-1714]

No.241: *Joachim Fünfgelt* and *Stefan Baumgärtner*: Regulation of morally responsible agents with motivation crowding, June 2012

No.240: *John P. Weche Gelübcke*: Foreign and Domestic Takeovers: Cherry-picking and Lemon-grabbing, April 2012 [forthcoming in: Applied Economics Quarterly]

No.239: *Markus Leibrecht* and *Aleksandra Riedl*: Modelling FDI based on a spatially augmented gravity model: Evidence for Central and Eastern European Countries, April 2012

No.238: *Norbert Olah, Thomas Huth* und *Dirk Löhr*: Monetarismus mit Liquiditätsprämie Von Friedmans optimaler Inflationsrate zur optimalen Liquidität, April 2012

(see www.leuphana.de/institute/ivwl/publikationen/working-papers.html for a complete list)

Leuphana Universität Lüneburg
Institut für Volkswirtschaftslehre
Postfach 2440
D-21314 Lüneburg
Tel.: ++49 4131 677 2321
email: brodt@leuphana.de

www.leuphana.de/institute/ivwl/publikationen/working-papers.html