Wiener Institut für Internationale Wirtschaftsvergleiche
The Vienna Institute for International Economic Studies

Working Papers | 105 | November 2013

Neil Foster-McGregor, Anders Isaksson and Florian Kaulich

Importing, Productivity and Absorptive Capacity in Sub-Saharan African Manufacturing Firms

wiiw Working Papers published since 2011:

No. 105 N. Foster-McGregor, A. Isaksson and F. Kaulich: Importing, Productivity and Absorptive Capacity in Sub-Saharan African Manufacturing Firms. November 2013

No. 104 I. Mara and M Landesmann: The Steadiness of Migration Plans and Expected Length of Stay – Based on a Recent Survey of Romanian Migrants in Italy. September 2013

No. 103 I. Mara and M Landesmann: Do I Stay because I am Happy or am I Happy because I Stay? Life Satisfaction in Migration, and the Decision to Stay Permanently, Return and Out-migrate. August 2013

No. 102 R. Falvey and N. Foster-McGregor: On the Trade and Price Effects of Preferential Trade Agreements. May 2013

No. 101 R. Stehrer: Accounting Relations in Bilateral Value Added Trade. May 2013

No. 100 K. Laski and H. Walther: Kalecki's Profit Equation after 80 Years. April 2013

No. 99 N. Foster, A. Isaksson and F. Kaulich: Foreign Ownership and Labour Markets in Sub-Saharan African Firms. March 2013

No. 98 N. Foster, A. Isaksson and F. Kaulich: Importing, Exporting and the Productivity of Services Firms in Sub-Saharan Africa. March 2013

No. 97 N. Foster, A. Isaksson and F. Kaulich: Outward Foreign Direct Investment, Exporting and Firm-Level Performance in Sub-Saharan Africa. March 2013

No. 96 N. Foster, A. Isaksson and F. Kaulich: Importing, Exporting and Performance in sub-Saharan African Manufacturing Firms. March 2013

No. 95 S. M. Leitner and R. Stehrer: R&D and Non-R&D Innovators in the Financial Crisis: the Role of Binding Credit Constraints. February 2013

No. 94 G. Streicher and R. Stehrer: Whither Panama? Constructing a Consistent and Balanced World SUT System including International Trade and Transport Margins. January 2013

No. 93 M. Holzner: The Determinants of Income Polarization on the Household and Country Level across the EU. September 2012

No. 92 M. Kelle: Crossing Industry Borders: German Manufacturers as Services Exporters. July 2012

No. 91 S. M. Leitner , R. Stehrer and B. Dachs: The Gravity of Cross-border R&D Expenditure. July 2012

No. 90 N. Foster, J. Pöschl and R. Stehrer: Offshoring and the Elasticity of Labour Demand. July 2012

No. 89 N. Foster, J. Pöschl and R. Stehrer: Manufacturing Productivity: Effects of Service Sector Innovations and Institutions. July 2012

No. 88 A. Breitwieser and N. Foster: Intellectual Property Rights, Innovation and Technology Transfer: A Survey. June 2012

No. 87 N. Foster: On the Volume and Variety of Intra-Bloc Trade in an Expanded European Union. June 2012

No. 86 N. Foster, R. Stehrer and G. de Vries: Offshoring and the Skill Structure of Labour Demand. June 2012

No. 85 M. Holzner and F. Peci: Measuring the Effects of Trade Liberalization in Kosovo. June 2012

No. 84 S. M. Leitner and R. Stehrer: Labour Hoarding during the Crisis: Evidence for selected New Member States from the Financial Crisis Survey. June 2012

No. 83 E. Bekkers and J. Francois: Bilateral Exchange Rates and Jobs. June 2012

No. 82 E. Bekkers, J. Francois and M. Manchin: Import Prices, Income, and Inequality. June 2012

No. 81 R. Stehrer: Trade in Value Added and the Valued Added in Trade. June 2012

No. 80 R. Stehrer, N. Foster and G. de Vries: International spillovers in a world of technology clubs. June 2012

No. 79 R. Stöllinger: International spillovers in a world of technology clubs. May 2012

No. 78 S. Leitner and R. Stehrer: Access to Finance and Composition of Funding during the Crisis: A firm-level analysis for Latin American countries. February 2012

No. 77 E. Bekkers and R. Stehrer: Reallocation Gains in a Specific Factors Model with Firm Heterogeneity. December 2011

No. 76 M. Holzner and F. Peci: The Impact of Customs Procedures on Business Performance: Evidence from Kosovo. August 2011

No. 75 C. Hornok: Need for Speed: Is Faster Trade in the EU Trade-Creating? April 2011

No. 74 S. Leitner and R. Stehrer: Subgroup and Shapley Value Decompositions of Multidimensional Inequality – An Application to Southeast European Countries. March 2011

Neil Foster-McGregor is a research economist at the Vienna Institute for International Economic Studies (wiiw). Anders Isaksson is Industrial Development Officer at UNIDO. Florian Kaulich is Assistant Professor at the Department of Economics, Vienna University of Economics and Business.

Neil Foster-McGregor, Anders Isaksson and Florian Kaulich

Importing, Productivity and Absorptive Capacity in Sub-Saharan African Manufacturing Firms

Contents

List of Tables and Figures

Abstract

Our study extends the recent literature on the importer-productivity relationship to a firm-level dataset for sub-Saharan Africa. Using a cross-section sample of 3090 firms in 19 countries, we find that importers are more productive than non-importers. The observed importer premium is found to be robust to firm-specific characteristics and to a number of alternative estimation methods. Furthermore, we examine the importance of absorptive capacity in enhancing the benefits from importing. Using recently developed quantile threshold regression methods, we find that higher levels of absorptive capacity, as measured by human capital, are associated with a stronger relationship between importing and productivity.

Keywords: *importing, productivity, sub-Saharan Africa, absorptive capacity, human capital*

JEL classification: *D24, F10, M20, L10*

Neil Foster-McGregor, Anders Isaksson and Florian Kaulich

Importing, productivity and absorptive capacity in sub-Saharan African manufacturing firms

1. Introduction

Over the last twenty years, a large empirical literature has developed examining whether there is a relationship between international trade and performance at the firm level (Wagner, 2007). The results from this literature strongly point to the conclusion that exporters perform better than non-exporters, though the direction of causality has not been fully established. While the focus of much of the empirical firm-level literature has been on the relationship between exports and productivity, there are good reasons to believe that there exists a relationship between imports and productivity as well. Similar as in the export-productivity case, the import-productivity literature considers two separate but related questions. First, whether an “import premium”, i.e. a positive relation between importing and productivity exists, and second, what the direction of the causal effect is.

Several arguments for an effect of importing on productivity have been presented in the literature. Intermediate and capital goods imports that embody new technologies would be expected to bring in new knowledge that may ultimately enhance a country’s – or firm’s – productivity (Helleiner, 1994). The rationale for this view, according to Augier et al. (2009), is that imported intermediates can raise productivity due to (i) their better quality relative to domestic alternatives, and due to (ii) complementarity stemming from imperfect substitution across goods – as in love-of-variety models – as well from learning spillovers. Imports may therefore allow firms to produce existing goods using the same inputs as before but at a lower cost. They could also open up new ways of producing existing goods, and even allow entirely new goods to be made. Imported goods, and capital goods in particular, are also likely to embody technology and knowledge that is not available from domestic sources. While this embodied technology can raise productivity directly, it can also do so indirectly through knowledge spillovers from examination of the goods and reverse engineering. In this latter case, the more absorptive capacity firms have, the more they benefit from these types of spillovers.

Another set of arguments considers an effect of productivity on importing, given that there are likely to be costs to the firm from importing capital and intermediate goods. Such costs may include those related to differences in language, management culture and legal systems, as well as the search costs involved in finding partners in foreign markets. Given that there exist such costs associated with importing, one may expect that firms self-select into importing, with high-productivity firms conducting global sourcing, hence importing capital and intermediates, and low-productivity firms limiting themselves to domestic sourcing.

Antras and Helpman (2004) develop a model similar to Melitz (2003) that provides a set of predictions concerning the relationship between imports and firm productivity. Their model assumes that there are fixed costs to importing, leading to the result that high-productivity firms source in foreign markets and low-productivity firms do not.[1] Such costs may arise due to the fact that an import agreement is preceded by a search process for potential foreign suppliers, inspection of goods negotiation and contract formulation, as well as to acquisition and customs procedures.

Nevertheless, although the presence of fixed costs associated with importing provide a rationale for firms self-selecting into importing, Andersson et al. (2008) stress that there are strong arguments in favor of a causal impact of importing on productivity. In particular, importing enables a firm to exploit global specialisation and use inputs from the technology frontier. Importing intermediates also allows firms to specialise on activities where it has particular strengths. Castellani et al. (2010) argue that importers may improve productivity by using higher quality foreign inputs or by extracting technology embodied in imported intermediates and capital goods.

While the vast majority of the existing empirical trade-productivity literature has concentrated on the exporter-productivity relationship, a number of recent studies have considered the importer-productivity relationship in response to the development of the above theoretical arguments and the increasing availability of firm-level import data (Wagner, 2012). In general, the results of these studies indicate that importers tend to perform better than non-importers. Such studies of importing and performance now exist for Belgium (Muuls and Pisu, 2009), Chile (Kasahara and Rodrigue, 2008; Kasahara and Lapham, 2008), Denmark (Eriksson et al., 2009; Smeets and Warzynski, 2010), France (Bas and Strauss-Kahn, 2010; Farinas and Martin-Marcos, 2010; Jabbour, 2010), Germany (Görzig and Stephan, 2002; Vogel and Wagner, 2010), Hungary (Altomonte and Bekes, 2009; Bekes et al., 2011; Halpern et al., 2005), Ireland (Forlani, 2010; Haller, 2010), India (Tucci, 2005), Indonesia (Sjöholm, 1999; Amiti and Wei, 2009), Ireland (Görg et al., 2008), Italy (Castellani et al., 2010; Serti and Tomasi, 2008), Poland (Hagemejer and Kolassa, 2008), Portugal (Silva et al., 2010), Spain (Augier et al., 2009; Damijan and Kostevc, 2010; Dovis and Milgram Baleix, 2009), Sweden (Andersson et al., 2008; Lööf and Anderson, 2010), the UK (Girma and Görg, 2004) and the US (Bernard et al., 2007).[2] To the best of our

---

1 A further distinction can be made, with some firms that offshore production engaging in vertical FDI while others become international outsourcers. Antras and Helpman (2004, 2008) assume that the fixed costs of vertical FDI are higher than those for international outsourcing and predict that the most productive firms engage in vertical FDI, while Grossman et al. (2005) assume the opposite and predict that the most productive firms engage in international outsourcing.

2 Several empirical studies at the country- and industry-level have examined the particular role of knowledge spillovers through imports (see Coe and Helpman (1995) and Coe, Helpman and Hoffmaister (1997) for early studies) and found them to be economically significant both between developed countries, and also from developed to developing countries.

knowledge, only a few studies consider the importer-productivity relationship in developing economies, with even less studies focusing on the sub-Saharan African region.

A number of the above empirical studies combine the impact of importing and exporting by allowing the impact of international trade to differ depending upon whether the firms are exporters only, importers only or two-way traders (e.g. Muuls and Pisu, 2009; Andersson et al., 2008; Castellani et al., 2010; Serti and Tomasi, 2008; Vogel and Wagner, 2010). The results from such studies indicate that the impact of trade on performance tends to be stronger for two-way traders, followed by importers and exporters, with all groups performing better than firms not engaged in international trade. Using the same dataset as in this paper, Foster-McGregor, Isaksson and Kaulich (forthcoming) confirm this pattern for a group of 19 SSA countries.

Some empirical studies explicitly address the issue of causality, hence whether the observed import premium is due to self-selection or learning-by-importing, is often addressed. Vogel and Wagner (2010), for example, using data on German manufacturing firms over the period 2001-2005, find that there are significant productivity differences between traders and non-traders, with the largest productivity differences found for two-way traders. More importantly, their results also indicate that the productivity of new importers was higher than non-importers prior to them beginning importing, a result consistent with self-selection. Results from both linear regression models and a matching estimator provide no evidence in favor of the learning-by-importing hypothesis.

In this paper, we analyse the importer-productivity relationship using data on a cross-section of firms in 19 sub-Saharan African (SSA) countries. The paper makes a number of contributions. Firstly, the paper adds to the recent literature considering the importer-productivity relationship by considering a sample of firms from SSA. This is the first paper that we are aware of that concentrates on this relationship for SSA countries, with few large scale firm-level surveys for African countries being available. Secondly, we are careful to test the robustness of our results to firm, industry and country heterogeneity through the use of firm-specific variables and sector and country fixed effects. We further test the robustness of our results through the use of a variety of parametric and non-parametric statistical tests. Thirdly, we examine whether a measure of firm-level absorptive capacity is relevant for determining the size of the relationship between importing and productivity. To the extent that the benefits from importing involve the transfer of technology and knowledge from the exporting firm to the importing firm, we may expect that the importing firm's absorptive capacity impacts upon the productivity benefits of importing. In particular, we may expect that the ability of a firm to benefit from imported knowledge and technology depends upon the human capital available in the importing firm.[3] To date, this issue has

[3] Existing studies at the aggregate level find evidence in favour of human capital enhancing the productivity benefits of imported knowledge (see for example Crespo-Cuaresma et al., 2008).

rarely been raised in the firm-level literature, though Augier et al. (2009) using Spanish data find that the productivity enhancing effects of importing are significantly stronger in firms with higher skill ratios.

In our analysis we use recently developed quantile threshold regression methods to examine whether absorptive capacity impacts upon the importer-productivity relationship. Our results confirm that – in line with existing studies – there exists a strong positive relationship between importing and productivity in SSA. Moreover, the relationship between importing and productivity is found to be significantly larger for domestically-owned firms than for foreign-owned firms. Finally, we find that the level of human capital has a significant impact upon the importer-productivity relationship, with the relationship being stronger for firms with human capital levels above the estimated threshold.

The remainder of our study is set out as follows: Section 2 presents the data and its descriptive characteristics, Section 3 describes the statistical methods, Section 4 discusses the various test and estimation results, and Section 5 concludes.

2. Data description and basic characteristics

The data used is obtained from the Africa Investor Survey, which was conducted in 2010 by the United Nations Industrial Development Organization (UNIDO)[4]. The survey covered 19 countries in SSA, namely Burkina Faso, Burundi, Cameroon, Cape Verde, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Tanzania, Uganda, and Zambia.

Data collection proceeded as follows: First, significant effort was invested into collecting business directories from various national institutions, harmonising these directories, and verifying the entries. The resulting survey population consisted of about 60,000 formal firms with at least 10 employees, active in all economic sectors.[5] Then, the survey sample was drawn by stratifying the survey population along the dimensions of size (below 50, 50-99, 100 and more employees), ownership (domestic or foreign[6]), and sector (ISIC Rev. 3.1 2-digit level) in each of the 19 survey countries, and selecting companies randomly within each stratum. Eventually, the data were collected by national enumerators mainly via face-to-face interviews using a standardised questionnaire. The respondents were the firms' top-level managers or – in case of foreign ownership – the managers of the local subsidiary. After data collection and entry, the data were checked for correct data entry (UNIDO, 2012).

4 The data used in this paper are confidential, but not exclusive. In order to gain access to the data, a confidentiality agreement with UNIDO will need to be signed.

5 Exceptions were Cape Verde, Lesotho and Burundi, where firms with 5 to 10 employees were also included.

6 A firm is defined as foreign-owned if a direct investor that is resident of another economy has 10 per cent or more of the ordinary shares or voting power or the equivalent. (IMF/OECD, 2003)

In this paper, we use the subset of firms from the manufacturing sector, since firms in the agriculture and service sectors are structurally different and thus should be analysed separately.[7] The final dataset comprises a maximum of 3,090 firms, with Table 1 providing an overview of the data. In particular, the table reports information on the number and share of firms by ownership, size, age, country and industry, as well as the number of importers and foreign-owned importers by each type. The table reveals that around 58 per cent of the firms in the dataset indicate that they import some or all of their production inputs, which is a surprisingly large share, given that the share of exporters is 32 per cent. This observation suggests that the focus of the theoretical and empirical literature on exporting does not adequately capture the trade relations of African firms. The table also indicates that foreign-owned firms are more likely to import than domestically-owned firms (73.9 versus 49.6 per cent), with medium and larger sized firms also more likely to import than smaller firms. There is also a great deal of heterogeneity in the propensity to import by country and sector. The proportion of firms importing in Nigeria is particularly low (33.6 per cent) with much higher values found in Mozambique and Lesotho (96.4 and 86.2 per cent) for example, while the propensity to import is also relatively low in food products and beverages, and other non-metallic mineral products (44.7 and 45.7 per cent).

To measure firm-level performance, we derive several performance indicators from the raw data. These are: (i) Sales per worker, which is calculated as the ratio of total sales in the last financial year to the number of permanent full-time employees at the end of the last financial year; (ii) Output per worker, which adjusts sales to take account of changes in firm stocks and the sales of goods bought for re-sale; and (iii) Value added (VA) per worker, which is calculated by deducting the value of inputs from output (Table 2). Additional variables used in the study include size (measured by number of employees), age (measured by years since start of operations), human capital (HC = share of white-collar workers in all full-time employees) and the capital-labour-ratio (K/L = book value of fixed assets divided by number of full-time employees).[8]

7 Foster-McGregor et al. (2012) present results of the relationship between importing, exporting and productivity for services firms in sub-Saharan Africa.

8 All currency values were converted into US$ using the average of the nominal exchange rate over three years before the data collection. Three-year averages were used in order to exclude any effects of short-term exchange rate fluctuations.

Table 1

Data overview

	Total		Import status: Importer		Import status: Foreign-owned importer	
	Freq.	% of total	Freq.	% of group	Freq.	% of group
Total	3,090	100.0	1,798	58.2	807	26.1
Ownership						
Domestic	1,998	64.7	991	49.6	N/A	N/A
Foreign	1,092	35.3	807	73.9	807	73.9
Total	*3,090*	*100.0*	*1,798*	*58.2*		
Size group						
Micro	191	6.2	58	30.4	9	4.7
Small	1,398	45.5	710	50.8	271	19.4
Medium	597	19.4	397	66.5	186	31.2
Large	886	28.8	628	70.9	339	38.3
Total	*3,072*	*100.0*				
Age group						
0-5 years	402	13.1	229	57.0	121	30.1
6-10 years	548	17.9	323	58.9	157	28.6
11-20 years	1,048	34.2	606	57.8	270	25.8
21+ years	1,062	34.7	630	59.3	254	23.9
Total	*3,060*	*100.0*				
Country						
Burkina Faso	49	1.6	27	55.1	10	20.4
Burundi	46	1.5	23	50.0	8	17.4
Cameroon	82	2.7	55	67.1	26	31.7
Cape Verde	93	3.0	59	63.4	19	20.4
Ethiopia	379	12.3	254	67.0	65	17.2
Ghana	253	8.2	143	56.5	78	30.8
Kenya	350	11.3	245	70.0	148	42.3
Lesotho	87	2.8	75	86.2	44	50.6
Madagascar	104	3.4	60	57.7	35	33.7
Malawi	71	2.3	49	69.0	15	21.1
Mali	139	4.5	51	36.7	23	16.5
Mozambique	110	3.6	106	96.4	57	51.8
Niger	41	1.3	24	58.5	6	14.6
Nigeria	393	12.7	132	33.6	48	12.2
Rwanda	80	2.6	56	70.0	20	25
Senegal	92	3.0	54	58.7	20	21.7
Tanzania	262	8.5	125	47.7	51	19.5
Uganda	315	10.2	174	55.2	103	32.7
Zambia	144	4.7	86	59.7	31	21.5
Total	*3,090*	*100.0*				
Sub-sector (ISIC Rev. 3, 15-37)						
Food products and beverages	666	21.6	298	44.7	126	18.9
Tobacco products	20	0.7	14	70.0	10	50
Textiles	117	3.8	70	59.8	30	25.6
Wearing apparel, fur	192	6.2	116	60.4	63	32.8
Leather, luggage, footwear, etc.	94	3.0	69	73.4	21	22.3
Wood products, cork (excl. furniture), etc.	132	4.3	56	42.4	21	15.9
Paper and paper products	97	3.1	54	55.7	21	21.6
Publishing, printing, media reproduction	248	8.0	125	50.4	23	9.3
Coke, refined petroleum prod., nuclear fuel	12	0.4	7	58.3	6	50
Chemicals and chemical products	283	9.2	205	72.4	110	38.9
Rubber and plastics products	279	9.0	205	73.5	108	38.7
Other non-metallic mineral products	162	5.2	74	45.7	38	23.5
Basic metals	78	2.5	51	65.4	24	30.8
Fabricated metal prod. (excl. machin., equip.)	315	10.2	209	66.3	82	26
Machinery and equipment	88	2.9	56	63.6	25	28.4
Office, accounting and computing machinery	3	0.1	2	66.7	2	66.7
Electrical machinery and apparatus n.e.c.	48	1.6	37	77.1	21	43.8
Radio, RV and communication equipm.	9	0.3	9	100.0	8	88.9
Medical/precision/optical instr., watches	17	0.6	13	76.5	5	29.4
Motor vehicles, trailers and semi-trailers	31	1.0	20	64.5	11	35.5
Other transport equipment	14	0.5	10	71.4	5	35.7
Furniture; manufacturing n.e.c.	175	5.7	92	52.6	43	24.6
Recycling	10	0.3	6	60.0	4	40
Total	*3,090*	*100.0*				

Table 2

Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
ln(Sales/Emp)	9.829	1.629	-2.802	18.290
ln(Output/Emp)	9.761	1.627	-2.802	18.290
ln(VA/Emp)	8.934	1.690	-0.110	18.286
ln(Size)	3.894	1.367	0.000	9.673
ln(Age)	2.678	0.829	0.000	5.094
HC	0.325	0.209	0.000	1.000
ln(K/L)	9.198	1.730	-2.053	18.211

3. Methodology

To analyse the relationship between importing and firm-level performance we use a number of statistical and econometric techniques. Firstly, we use parametric and non-parametric sample comparison tests to compare the group of importers with the group of non-importers. Secondly, we employ various linear regression methods to estimate the size of the import premium. Thirdly, we consider threshold regression models to investigate the role of absorptive capacity as a determinant of the productivity benefits from importing. In this context, we quantify absorptive capacity by the level of human capital.

In terms of the sample comparison tests, we begin by reporting results from simple mean comparison tests, which allow us to state whether there are significant differences in the mean values of our performance variables between importing and non-importing firms. We also consider an alternative non-parametric test that allows us to test for differences in performance not just at the mean, but at all moments of the performance distribution. In particular, we use the Kolmogorov-Smirnov-test (KS) of stochastic dominance, which tests for differences in the location and shape of the cumulative distribution functions. While we assume the reader is familiar with the application of the t-test used to compare means, we briefly describe here the application of the KS-test in the context of our analysis.

Let I and N be two cumulative distribution functions of, for example, the productivity of importers and non-importers. Then, first-order stochastic dominance of I relative to N implies that $I(z) - N(z)$ must be less or equal to zero for all values of z, with strict inequality for some z. This can be tested using the two- and one-sided KS-test.

The two-sided version tests the hypothesis that both distributions are identical, and the null and alternative hypotheses can be expressed as:

$$H_0: I(z) - N(z) = 0 \qquad \forall z \in \Re$$
$$H_1: I(z) - N(z) \neq 0 \qquad \text{for some } z \in \Re \qquad \text{(1a, 1b)}$$

While the one-sided test can be formulated as:

$$\begin{aligned} &H_0: I(z) - N(z) \leq 0 \qquad \forall z \in \Re \\ &H_1: I(z) - N(z) > 0 \quad \text{for some } z \in \Re \end{aligned} \qquad (2a, 2b)$$

To conclude that I stochastically dominates N, it is required that the null hypothesis is rejected for the two-sided test, but not for the one-sided test.

The KS-test statistic for the two- and one-sided tests are

$$KS^{2\text{-sided}} = \sqrt{\frac{s_I \cdot s_N}{S}} \max_{1 \leq j \leq S} \{I_{s_I}(z_j) - N_{s_N}(z_j)\} \qquad (3a)$$

$$KS^{1\text{-sided}} = \sqrt{\frac{s_I \cdot s_N}{S}} \max_{1 \leq j \leq S} |I_{s_I}(z_j) - N_{s_N}(z_j)| \qquad (3b)$$

where s_I and s_N are the sample sizes from the empirical distributions of I and N, respectively, and $S = s_I + s_N$.

In terms of the regression analysis, we follow closely the existing empirical literature by regressing our performance indicators on importer status and other firm characteristics. As such, the basic model is as follows:

$$\ln Y_{ijk} = \beta_1 Imp_{ijk} + \beta_2 Foreign_{ijk} + \beta_3 \ln Emp_{ijk} + \beta_4 (\ln Emp_{ijk})^2 + \beta_5 Age_{ijk} + \beta_6 (\ln Age_{ijk})^2 + \beta_7 HC_{ijk} + \beta_8 \ln(K/L)_{ijk} + \theta_{ik} + \varphi_{jk} + \varepsilon_{ijk} \qquad (4)$$

where Y is performance (either sales per worker, output per worker, or VA per worker) in firm k in industry i in country j, Imp is a dummy variable equal to 1 if the firm is an importer and 0 otherwise, $Foreign$ is a dummy variable taking the value 1 if the firm is foreign owned, Emp is the number of employees, Age is firm age in years, and *HC* is the level of human capital, measured by the ratio of white-collar to all workers. The dummy variables θ_{ik} and φ_{jk} are country- and sector-specific fixed effects, respectively, and ε_{ijk} is the usual error term.

This basic model serves as a test for the presence of a simple import premium. Subsequently, we use finer measures of import behavior to account for the differences within the group of importers. Firstly, we replace *Imp* in (4) with *ForImp* and *DomImp*, which are binary variables taking on the value 1 for foreign- and for domestically-owned importers, respectively. Secondly, we replace the importer dummies in (4) with a measure of the share of imports in total production inputs, *ImpSh*, together with its squared term to account for non-linearities. Thirdly, we analyse the issue of absorptive capacity by treating *Imp* as non-linear, with human capital (*HC*) as the threshold variable.

In the existing literature it is common to estimate equations such as (4) using standard Ordinary Least Squares (OLS) methods. In this study, however, we use two alternative estimation methods, namely Quantile Regression (QReg) and MM regression. The use of these alternative methods serves two main purposes. Firstly, in a sample of heterogeneous firms we expect some certain observations of some variables to be far away from others. These outliers could exist due to reporting errors or idiosyncratic events and can greatly affect the estimated coefficients when using OLS, while. QReg and MM regression are both robust to the presence of various types of outliers. Secondly, the major benefit of QReg is that the entire conditional distribution of the dependent variable can be characterised. More specifically, while MM (and OLS) models the conditional mean of the dependent variable, QReg models the conditional quantile function, in which the quantiles of the conditional distribution of the dependent variable are expressed as functions of observed covariates. Consequently, potentially different solutions at distinct quantiles may be interpreted as differences in the response of the dependent variable to changes in the regressors at various points in the conditional distribution of the dependent variable.[9]

A further benefit of QReg relates to the fact that a special case of QReg, namely the Least Absolute Deviations (LAD) estimator or median regression, can be more efficient than mean regression estimators in the presence of heteroscedasticity. Median regression is also more robust than mean regressions with regard to outlying observations in the dependent variable. In particular, the QReg objective function is a weighted sum of absolute deviations, which gives a robust measure of location, so that the estimated coefficient vector is not sensitive to outlier observations on the dependent variable. Finally, when the error term is non-normal, QReg estimators may be more efficient than OLS estimators.

In our study, we use QReg mainly for the purpose of obtaining the coefficient at various conditional quantiles, while we rely less on the “outlier-protecting” property. The reason for the latter is that QReg – although widely used in the presence of extreme values – protects only against vertical outliers, i.e. observations that have outlying values for the corresponding error term, but not against bad leverage points, i.e. observations that are both outlying for the error term and the space of explanatory variables (Verardi and Croux, 2009). To overcome this limitation, Huber (1964) generalised the median estimator to the class of M-estimators by considering other objective functions than the absolute value. Unfortunately, the M-estimator is unable to identify clustered outliers, and it is not guaranteed that the numeric algorithm converges to a global instead of a local solution. Another approach is to amend the underlying principle of OLS, namely the minimisation of the variance of the residuals, $\hat{\sigma}$, by replacing it with the minimisation of a function that is less sensitive to extreme values. In this respect, Rousseeuw and Yohai (1987) established the class of S-estimators based on such a robust dispersion measure. Their estimator, nevertheless, involves a trade-off between reaching a high breakdown point while maintaining high efficiency.

To overcome this shortcoming, Yohai (1987) introduced MM-estimators that combine the high breakdown point of the S-estimator with the efficiency of a modified M-estimator. This MM-estimator is defined as

9 Useful surveys of quantile regression methods include Buchinsky (1998) and Koenker and Hallock (2001).

$$\hat{\Theta}^{MM} = \mathrm{argmin}_{\Theta} \sum_{i=1}^{n} \rho\left(\frac{r_i(\Theta)}{\hat{\sigma}^s}\right) \quad (5)$$

where r_i denotes the residual of observation i. The loss function ρ is even and non-decreasing for positive values but less increasing than the square function used in OLS.[10] The robust dispersion measure $\hat{\sigma}^S$ satisfies $\frac{1}{n}\sum_{i=1}^{n} \rho\left(\frac{r_i(\theta)}{\hat{\sigma}^S}\right) = b$ where $b = E\big(\rho(Z)\big)$ with $Z \sim N(0,1)$.[11]

In the final section we consider the importance of absorptive capacity for the relationship between importing and productivity using threshold regression analysis. As mentioned above, there are reasons to believe that the relationship between importing and productivity will be stronger for firms that have reached a certain level of absorptive capacity, since this will allow firms to benefit from the knowledge and technology embodied in the imported capital and intermediate goods. Threshold regression methods are a natural way to test for such a non-linearity without imposing some exogenous cut-off on the data. Threshold regression models in the OLS case have recently been developed by Hansen (1996, 1999, 2000), and allow the sample data to jointly determine both the regression coefficients and the threshold value.

We can write the threshold regression for a single threshold as:

$$\gamma_i = \delta_1 x_i + \varepsilon_i \qquad q_i \leq \lambda \quad (6a)$$

$$\gamma_i = \delta_2 x_i + \varepsilon_i \qquad q_i > \lambda \quad (6b)$$

where q_i is the threshold variable. Here, the observations are divided into two regimes, depending on whether the threshold variable is smaller or larger than λ. These two regimes are distinguished by different regression slopes, δ_1 and δ_2. Chan (1993) and Hansen (1999) recommend estimation of λ by least squares.[12] This involves finding the value of λ that minimises the concentrated sum of squared errors. In practice, this implies searching over distinct values of q_i for the value of λ at which the sum of squared errors is smallest. The value of λ is our estimate of the threshold, $\hat{\lambda}$. Once we have a value for the threshold, it is straightforward to estimate the coefficients of the regression model.

Having found a threshold, it is important to determine whether it is statistically significant or not, that is, to test the null hypothesis $H_0: \delta_1 = \delta_2$. Given that the threshold λ is not identified under the null, this test has a non-standard distribution and critical values cannot be read off standard distribution tables. Hansen (1996) suggests bootstrapping to simulate the asymptotic distribution of the likelihood ratio test allowing us to obtain a p-value for this test. First, one estimates the model under the null (linearity) and alternative (threshold occurring at λ). This gives the actual value of the likelihood ratio test,

---

10 We employ an algorithm where ρ is a Tukey biweight function.

11 See Verardi and Croux (2009) for a detailed explanation of the background and the calculation of the MM-estimator.

12 Hansen (1999) discusses how to estimate such models using fixed-effects panel regressions.

$$F_1 = \frac{S_0 - S_1(\hat{\lambda})}{\hat{\sigma}^2} \quad (7)$$

where $\hat{\sigma}^2 = \frac{1}{(n-k)} S_1(\hat{\lambda})$

Here S_0 and S_1 are the residual sum of squares from the linear and threshold models, respectively, *n* is the sample size, and *k* is the number of regressors. Then a bootstrap is created by drawing from the normal distribution of the residuals of the estimated threshold model. Hansen (2000) recommends fixing the regressors in repeated bootstrap samples. Using this generated sample, the model is estimated under the null and alternative and the likelihood ratio F_1 is obtained. This process is repeated a large number of times. The bootstrap estimate of the p-value for F_1 under the null is given by the percentage of draws for which the simulated statistics F_1 exceeds the actual one.

Recently the threshold regression methodology has been extended to the case of QReg (see for example Caner, 2002; Galvao et al., 2010; Kuan et al., 2010), which allow non-linear relationships among variables to be modelled in the quantile regression framework.[13] The general approach is quite similar to that in the OLS case, except that the estimate for the threshold at a particular quantile is obtained as the value that minimises the sum of absolute deviations rather than the sum of squared errors. In addition, the likelihood ratio statistic for a given quantile τ is given by:

$$F_1(\tau) = \frac{S_0 - S_1(\lambda_1)}{\tau(1-\tau)} \quad (8)$$

where τ is the sample quantile.

4. Results

(a) Sample comparison tests: Importers versus non-importers

As an initial step in identifying a relationship between importing and firm-level performance, we compare the arithmetic mean of several logged performance indicators for importers and non-importers, and perform a simple t-test for significance of the difference. In order to control for country- and sector-specific differences in performance, the performance measures are centered, using the mean value of the performance indicator for all firms in a particular sector and country.

The mean of the (demeaned) performance indicators for importers and non-importers, along with the p-values from the t-test of significant differences in the two means are reported in the left part of Table 3. The table shows that the mean values of all of the performance indicators are larger for importers than for non-importers, and that these differences are highly statistically significant. As such, the results indicate that importers are more productive than non-importers, regardless of the particular measure of productivity used.

[13] There is currently, as far as we are aware, no method to estimate the threshold model using MM regression.

Comparing just one point of the performance distribution may not fully capture the performance difference between importers and non-importers. Therefore, we use the KS stochastic dominance test to capture differences for all moments of the distribution. As with the mean comparison tests, we use the demeaned performance indicators to control for country-sector specific productivity levels.

To provide an initial insight into the potential differences in the performance distributions between importers and non-importers, we report in Figure 1 the empirical cumulative distribution functions (CDFs) of the three productivity measures for these two firm-types. It can be seen that the CDF of importers generally lies to the right of the one for non-importers for all productivity measures, thus supporting the view that importers perform better than non-importers.

Accordingly, the KS test procedure provides a formal test of the difference in distributions displayed in Figure 1. The right-hand side of Table 3 reports the results of the KS-test, with the first column displaying the p-values of a two-sided test for stochastic equality. The results imply that the null hypothesis of no difference can be rejected for all three demeaned productivity measures, which leads to the question of to which group is the difference favorable. To answer this question, the second column reports results from testing whether the difference is due to a higher productivity of non-importers, hence whether the CDFs of non-importers lies to the right of the ones of importers in Figure 1. This hypothesis can be rejected at any conventional significance level for all indicators. Finally, the last column reports test results of whether the CDFs of importers lies to the right of that for non-importers, and this hypothesis cannot be rejected. Thus, we have established first evidence for the notion that importers are more productive than non-importers.

Figure 1

Cumulative distribution functions

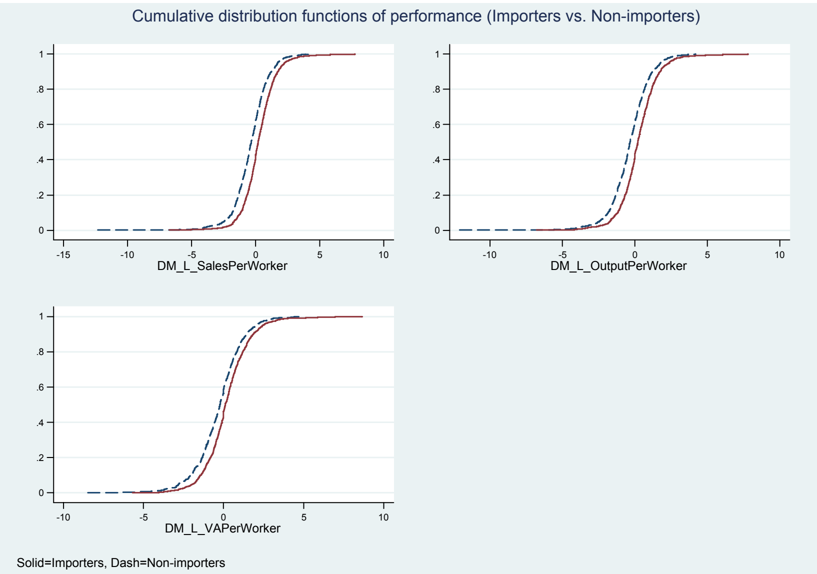


Table 3

est for difference in distributions of demeaned productivity

Performance indicator	Mean of Non-importers	Mean of Importers	t-Test for equality in means Null hypothesis (p-values)			KS-test for stochastic dominance Null hypothesis (p-values)		
			Equality of means	Difference favourable to Non-imp.	Difference favourable to Imp	Equality of distribution	Difference favourable to Non-imp.	Difference favourable to Imp
ln(Sales/Emp)	-0.370	0.259	0***	0***	1	0***	0***	1
ln(Output/Emp)	-0.349	0.244	0***	0***	1	0***	0***	1
ln(VA/Emp)	-0.293	0.202	0***	0***	1	0***	0***	1

(b) Regression results: Import status and intensity

Taken together, the above results strongly indicate a higher average productivity level of importers, even after controlling for sector- and country-specific differences in productivity. In this section we report results from the regression analysis, which further allows us to control for other firm-specific characteristics. More specifically, the regression model given by equation (4) was estimated using MM and QReg (including LAD) methods.[14]

Table 4 reports results from estimating equation (4) by LAD regression, i.e. a quantile regression at the conditional median productivity, with results reported for each of the three performance measures. Coefficients on the importer status dummy are found to be positive and significant for all three performance measures. The coefficients imply an importer premium of around 48 to 55 per cent when considering sales per worker (column 1) and output per worker (column 2), with the premium dropping to 18 per cent when the dependent variable is value added per worker (column 3).[15]

The observed difference between the results when considering VA per worker and the other two variables could be for two reasons. First, when importers make more use of intermediate inputs, irrespective of whether these intermediates are imported or not, then the import premium measured in VA per worker is smaller than the ones measured in sales or output per worker by construction. Second, the number of observations in the VA per worker setup is significantly smaller due to non-response on the usage of intermediate inputs. If this non-response is not random, then we may expect that the coefficient on the importer variable is affected.

---

[14] We also performed OLS regressions, but for reasons of brevity we choose not to report the OLS results in this paper. As mentioned above, OLS is not robust to statistical outliers, which is likely to be a major concern in this firm-level dataset, implying that we place least weight on these results. Despite this, results from the OLS estimation are qualitatively similar to those from LAD and MM estimation. Nevertheless, OLS results are available upon request.

[15] The elasticity of a logarithmised dependent variable with respect to a linear independent variable is $(e^\beta - 1)*100$, where β is the estimated coefficient. Accordingly, all premia reported in this paper are calculated in this way.

Other firm characteristics are also found to be significant in Table 4, with the signs of the coefficients consistent with existing literature. In particular, foreign-owned companies are found to be more productive compared with domestically-owned ones, with a foreign ownership premium of around 39-47 per cent. Firm size and firm age are found to be positively associated with firm productivity, both at a diminishing rate; the coefficient of firm age is not significant in the VA regression. The ratio of capital to labour and human capital correlate positively and significantly with productivity as would be expected.

Table 4

Import status LAD regression results

	(1) ln(Sales/Worker)	(2) ln(Output/Worker)	(3) ln(VA/Worker)
Imp	0.436***	0.395***	0.169**
	(8.123)	(6.198)	(2.318)
Foreign	0.383***	0.330***	0.329***
	(7.092)	(5.797)	(4.450)
ln(Emp)	0.298***	0.284***	0.255**
	(2.986)	(2.692)	(2.041)
$[\ln(Emp)]^2$	-0.025**	-0.022*	-0.019
	(-2.146)	(-1.934)	(-1.345)
ln(Age)	0.424***	0.318**	0.124
	(2.769)	(2.043)	(0.709)
$[\ln(Age)]^2$	-0.062**	-0.044	-0.009
	(-2.179)	(-1.588)	(-0.264)
HC	0.757***	0.755***	1.045***
	(5.156)	(5.383)	(6.374)
ln(K/L)	0.361***	0.368***	0.375***
	(17.960)	(18.839)	(13.316)
Constant	4.917***	3.807***	5.159***
	(7.692)	(2.941)	(5.409)
Observations	2,779	2,752	2,398
Pseudo R^2	0.305	0.297	0.231

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Country and sector dummies not shown

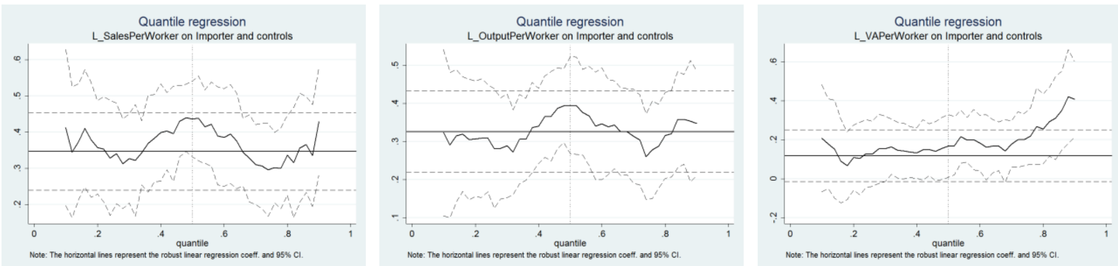
Since the above LAD regression results consider only the median response of productivity to a change in one of the explanatory variables, we complement this analysis by estimating the coefficients on our explanatory variables at all points between the 10^{th} and 90^{th} percentile of the conditional productivity distribution. For reasons of brevity we concentrate here on the coefficients on the importer dummy, with Figure 2 presenting the coefficient on the importer dummy at different points on the conditional distribution (solid line) along with the 95 per cent confidence interval (the dashed lines) for each of the performance variables. Additionally, we include the estimated coefficients and 95 per cent confidence interval of an MM regression in the same figure.

For sales and output per worker, the importer dummy is positive and significant at all percentiles of the conditional distribution of productivity, with the coefficients being largest at the median. The figure also reveals that there is not a great deal of heterogeneity in the coefficients across percentiles, though the coefficients are somewhat larger at the median and at the two ends of the distribution than elsewhere. In the case of VA per worker, the import premium is not significant at the 5%-level for the part of the distribution lying below the median, but the coefficients tend to rise as we move to higher percentiles and are generally positive and significant above the median. In other words, the import premium in this case only exists for relatively more productive firms conditional on the explanatory variables included in the model. The coefficients on the control variables are qualitatively similar to those in the LAD regression.[16]

The MM regression estimates, displayed as horizontal lines in Figure 2, are qualitatively similar to the QReg estimates, but with lower values compared to the percentiles around the median for sales per worker and output per worker. For VA per worker, the robust mean estimates are below the QReg estimates at most percentiles, with the distance rising with higher percentiles.

Figure 2

Quantile regressions of performance on import status and controls



In analogy to the approach of Baldwin and Gu (2003), we also allow for differences in the relationship between importing and performance for foreign and domestic firms. They argue that information is efficiently transferred via international ownership relations, which implies that foreign-owned companies face less potential additional benefits from participating in export markets. In our study, we believe that such a masking effect of ownership could also exist for imports. More specifically, we believe that after controlling for foreign ownership, foreign-owned importers would face a smaller import premium than domestic-owned importers.

Results from LAD estimation when including a separate importer dummy for domestic- and foreign-owned firms are reported in Table 5. The results indicate that the importer premium for domestically-owned firms (31-67 per cent) is indeed much larger – and significantly so –

[16] Estimated QReg coefficients for all covariates are available upon request.

than that for foreign-owned firms (22-23 per cent), suggesting that ownership is the dominant form of information flows for foreign-owned firms. Moreover, the coefficient on the foreign dummy increases when including the separate dummy variables for foreign and domestically-owned importers, suggesting a foreign-ownership premium of between 68 and 85 per cent. The coefficient on the foreign importer variable remains positive and significant however (except in the case of VA per worker), indicating that ownership does not explain all of the importer premium for foreign-owned firms.

Figure 3 reports information on the coefficients of the domestic- and foreign-importer dummies for all percentiles as well as when using MM regression. The results again suggest that the importer premium for domestically-owned importers is considerably higher than that for foreign-owned importers, but the coefficients are found to be insignificant at the majority of percentiles in the case of foreign-owned importers. Hence, the significance at the 5%-level of the LAD coefficient for foreign exporters is rather an exception when seen considering the whole range of percentiles.

Table 5

Foreign-owned Importer vs Domestic-owned Importer, LAD regression results

	(1) ln(Sales/Worker)	(2) ln(Output/Worker)	(3) ln(VA/Worker)
ForImp	0.208**	0.198**	-0.132
	(2.070)	(2.153)	(-1.007)
DomImp	0.515***	0.455***	0.269***
	(7.869)	(6.753)	(2.757)
Foreign	0.616***	0.516***	0.606***
	(6.213)	(4.810)	(4.261)
ln(Emp)	0.265**	0.233**	0.233*
	(2.526)	(2.010)	(1.845)
$[\ln(Emp)]^2$	-0.022*	-0.016	-0.017
	(-1.824)	(-1.273)	(-1.288)
ln(Age)	0.451***	0.330**	0.144
	(2.794)	(2.419)	(0.906)
$[\ln(Age)]^2$	-0.065**	-0.046*	-0.014
	(-2.168)	(-1.869)	(-0.457)
HC	0.770***	0.749***	1.069***
	(5.306)	(5.238)	(6.499)
ln(K/L)	0.366***	0.372***	0.369***
	(18.721)	(19.404)	(12.337)
Constant	4.881***	5.036***	5.332***
	(7.664)	(6.178)	(5.570)
Observations	2,779	2,752	2,398
Pseudo R^2	0.306	0.297	0.233
ForImp=DomImp F-test	7.378	5.487	6.660
ForImp=DomImp p-value	0.007***	0.019**	0.010***

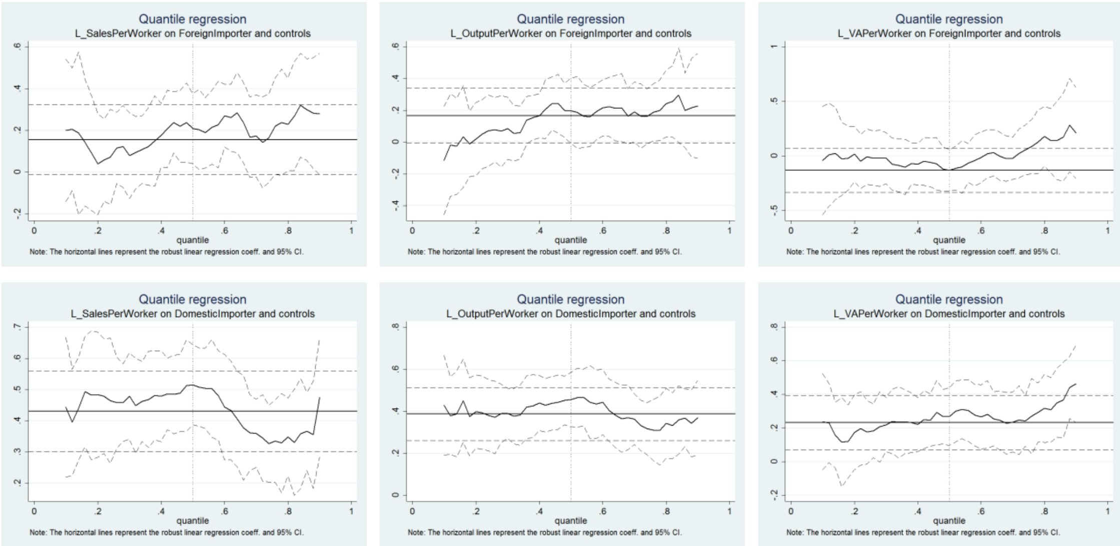
t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Country and sector dummies not shown

Figure 3

Quantile regressions of performance on ForImp/DomImp and controls



We also follow existing literature and distinguish between firms that only import (*ImpOnly*), those that only export (*ExpOnly*), and two-way traders (*Twoway*). The underlying rationale for this distinction is that firms which import (but do not export) might be affected by foreign exposure to a different extent than firms that also export their products, since learning-by-exporting may represent an additional source of productivity gains.

LAD results are reported in Table 6 and indicate that for sales and output per worker, two-way traders enjoy the highest premium (68-76 per cent) and only-exporters the lowest premium (around 47 per cent). In the case of VA per worker, the only-exporter group have the highest premium (66 per cent) and two-way traders the lowest (38 per cent). None of the differences in coefficients are significant at conventional levels however.[17] Nevertheless, the significance of the import premium when including other trade channels confirms its robustness.

Figure 4 reports the QReg coefficients for the three types of trading firms for all percentiles.[18] The results indicate that the coefficients on all three dummies vary considerably across the conditional productivity distribution. In particular, the coefficient for two-way traders tends to increase as we move to higher percentiles, while those on only-importers and only-exporters tend to drop (in the case of output and sales per worker) or increase more slowly (in the case of VA per worker) as we move to higher percentiles. Above the median, the difference between the two-way and the only-importer coefficients becomes significant, as the p-values (solid line in Figure 4) indicate.

17 Results using OLS are found to be similar, though there are usually significant differences in coefficients in this case.

18 The 95%-confidence intervals are not reported in these graphs for reasons of readability. The lower bound is above 0 except for the very lowest and highest percentiles however.

Table 6

Importer only, exporter only, two-way only, LAD-regression results

	(1) ln(Sales/Worker)	(2) ln(Output/Worker)	(3) ln(VA/Worker)
ImpOnly	0.483***	0.448***	0.306***
	(6.882)	(6.485)	(3.484)
ExpOnly	0.382***	0.376***	0.508***
	(3.704)	(3.833)	(4.706)
Twoway	0.566***	0.519***	0.320***
	(6.240)	(6.194)	(2.937)
Foreign	0.370***	0.312***	0.333***
	(5.666)	(5.481)	(4.518)
ln(Emp)	0.251**	0.225**	0.200
	(2.482)	(2.013)	(1.637)
$[\ln(Emp)]^2$	-0.020*	-0.017	-0.015
	(-1.775)	(-1.374)	(-1.087)
ln(Age)	0.400**	0.364**	0.127
	(2.386)	(2.268)	(0.788)
$[\ln(Age)]^2$	-0.055*	-0.051*	-0.008
	(-1.763)	(-1.712)	(-0.256)
HC	0.714***	0.695***	1.055***
	(5.038)	(4.813)	(5.761)
ln(K/L)	0.365***	0.367***	0.353***
	(17.962)	(18.498)	(12.944)
Constant	5.029***	5.076***	5.268***
	(8.170)	(6.329)	(5.248)
Observations	2,779	2,752	2,398
Pseudo R^2	0.307	0.299	0.235
ImpOnly=Twoway F-test	0.975	0.673	0.0183
ImpOnly=Twoway p-value	0.323	0.412	0.892

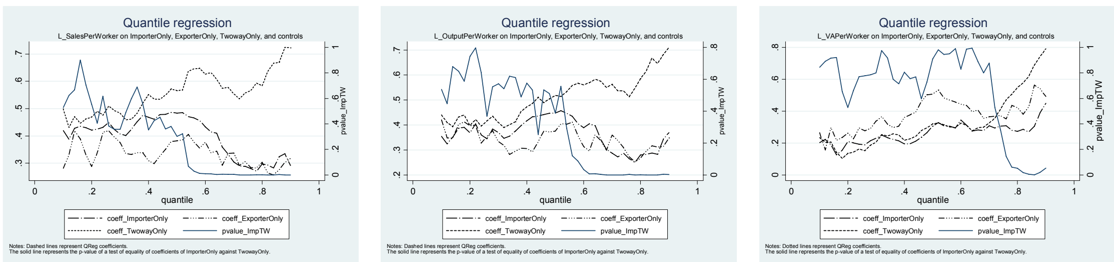
t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Country and sector dummies not shown

Figure 4

Quantile regressions of performance on one-way/two-way traders and controls



The use of dummy variables to capture differences in productivity across firms may not lead to a complete understanding of the productivity-importing nexus, especially if different intensities of importing have different productivity effects. We therefore replace the importer dummy in our regression model with the share of imported production inputs in total production inputs (whether directly or indirectly imported) (*ImpSh*).[19] We run two versions of this regression model. In the first we include all companies regardless of their import status, i.e. the share of imports in sales is in the interval $[0\%, 100\%]$, while in the second we exclude non-importers in order to concentrate on the effects of higher import intensity once a firm commits to importing, i.e. the share of imports is in the interval $(0\%, 100\%]$.

Table 7

Import intensity LAD-regression results

	(1) All firms ln(Sales/Worker)	(2) All firms ln(Output/Worker)	(3) All firms ln(VA/Worker)	(4) Only importers ln(Sales/Worker)	(5) Only importers ln(Output/Worker)	(6) Only importers ln(VA/Worker)
ImportSh	0.415***	0.375***	0.278***	0.078	0.092	0.206
	(5.921)	(5.567)	(3.415)	(0.772)	(0.835)	(1.623)
Foreign	0.436***	0.368***	0.347***	0.306***	0.286***	0.306***
	(6.832)	(6.375)	(4.388)	(4.494)	(3.996)	(3.167)
ln(Emp)	0.265**	0.224*	0.258*	0.658***	0.519***	0.514***
	(2.164)	(1.826)	(1.897)	(4.209)	(3.051)	(2.700)
$[\ln(Emp)]^2$	-0.017	-0.013	-0.021	-0.065***	-0.051***	-0.051***
	(-1.163)	(-0.920)	(-1.368)	(-4.045)	(-2.917)	(-2.775)
ln(Age)	0.453***	0.376**	0.230	0.513*	0.403*	0.357
	(2.582)	(2.360)	(1.465)	(1.947)	(1.690)	(1.206)
$[\ln(Age)]^2$	-0.065**	-0.052*	-0.027	-0.075	-0.060	-0.051
	(-1.978)	(-1.801)	(-0.871)	(-1.603)	(-1.471)	(-0.998)
HC	0.849***	0.751***	1.083***	0.881***	0.852***	1.088***
	(6.056)	(4.704)	(5.474)	(4.489)	(3.734)	(4.403)
ln(K/L)	0.361***	0.374***	0.360***	0.353***	0.359***	0.356***
	(15.542)	(18.294)	(12.485)	(13.444)	(13.187)	(9.181)
Constant	3.495**	6.094***	3.617***	3.321***	3.853***	3.078***
	(2.274)	(4.649)	(4.789)	(3.973)	(4.845)	(3.008)
Observations	2,754	2,727	2,373	1,651	1,635	1,425
Pseudo R^2	0.303	0.294	0.231	0.287	0.271	0.225

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Country and sector dummies not shown

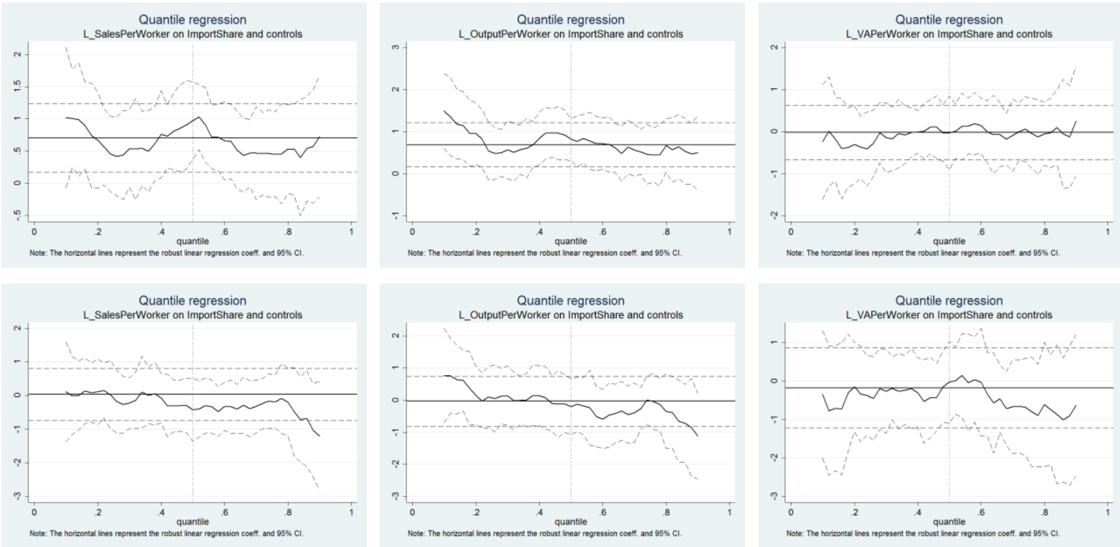
When including all firms in the LAD regression (columns 1-3 in Table 7), the coefficient on the import intensity variable is positive and significant. However, as Figure 5 (upper part) shows, this observation only seems to hold around the median and at the robust mean, as the estimated coefficients become insignificant at percentiles other the median. When estimating the model on the subsample of importers (columns 4-6 in Table 7, lower part in Figure 5) we find positive coefficients on the importer share variable, but these are never

[19] We also considered the possibility of a non-linear relationship through the inclusion of a quadratic term of import share. This term, however, is insignificant in all specifications, and is therefore excluded from the model.

significant. Combined, these results suggest that the intensity of importing does not seem to be an important determinant of productivity for importers, and that therefore our focus on a simple import status dummy variable is appropriate.

Figure 5

Quantile regressions of performance on import share and controls



(c) Quantile threshold regression results: Absorptive capacity

So far, we have shown that there exists a strong positive relationship between importing and productivity, an effect that is assumed to be constant across firms. What we have not done therefore is allow for heterogeneous effects of importing on productivity across firms. To the extent that importing enhances firm productivity by providing access to advanced technology and knowledge, we would – as mentioned above – expect that the benefits of importing would differ across firms however. In particular, we would expect that the ability of the firm to extract, understand and make use of such technology and knowledge would depend upon a number of firm-specific factors that are often described as a firm's absorptive capacity. In this context, absorptive capacity can refer to various organisational aspects of the firm, as well as relating to the firm's innovative activity and the quality of its workforce. One indicator of a firm's absorptive capacity that has been used in the literature (see for example Vinding, 2006 and Caloghirou et al., 2004) is a measure of its level of human capital.[20] We also use such a measure, testing the hypothesis that a certain abundance of human capital is necessary in order for a firm to be able to learn from importing. Thus, importing alone does not necessarily lead to higher productivity, in particular, if the right learning-enabling environment is not available.

---

[20] See Camisón and Forés (2010) for a critical review on the conceptualisation and measurement of absorptive capacity.

To examine the impact of our measure of absorptive capacity on the relationship between importing and productivity, we estimate the threshold quantile regression described above at the 25th, 50th and 75th percentiles of the performance productivity distribution using human capital as our threshold variable. The model estimated is thus:

$$\ln Y_{ijk} = \beta_{1,1} Imp_{ijk} I(HC_{ijk} \leq \lambda) + \beta_{1,2} Imp_{ijk} I(HC_{ijk} > \lambda) + \beta_2 Foreign_{ijk} + \beta_3 \ln Emp_{ijk} + \beta_4 (\ln Emp_{ijk})^2 + \beta_5 Age_{ijk} + \beta_6 (\ln Age_{ijk})^2 + \beta_7 HC_{ijk} + \beta_8 \ln(K/L)_{ijk} + \theta_{ik} + \varphi_{jk} + \varepsilon_{ijk} \quad (9)$$

where I is an indicator function.

Results for the three performance measures and the three quantiles are reported in Table 8, indicating that there exists a significant threshold. This threshold is usually found to be at a relatively high value of human capital, i.e. around the 85th percentile, with a ratio of white-collar to total workers of around 0.67, the exceptions being for output per worker and sales per worker at the 25th percentile.

Table 8

Absorptive capacity QReg
(Importer status as nonlinear variable, human capital as threshold variable)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Percentile:	25	50	75	25	50	75	25	50	75
Dependent variable:	ln(Sales/ Worker)	ln(Sales/ Worker)	ln(Sales/ Worker)	ln(Output/ Worker)	ln(Output/ Worker)	ln(Output/ Worker)	ln(VA/ Worker)	ln(VA/ Worker)	ln(VA/ Worker)
Importer_low	0.250***	0.406***	0.259***	0.180**	0.373***	0.251***	0.114	0.137*	0.194**
	(2.779)	(7.308)	(4.538)	(2.118)	(6.570)	(4.796)	(1.579)	(1.805)	(2.473)
Importer_high	0.372***	0.837***	0.691***	0.375***	0.756***	0.696***	0.531***	0.546***	0.678***
	(5.073)	(6.129)	(4.604)	(5.396)	(5.406)	(4.976)	(2.648)	(2.659)	(3.194)
Foreign	0.355***	0.385***	0.357***	0.343***	0.331***	0.356***	0.382***	0.349***	0.462***
	(5.210)	(6.885)	(6.182)	(5.315)	(5.790)	(6.716)	(5.307)	(4.598)	(5.891)
ln(Emp)	0.352***	0.298***	0.353***	0.351***	0.277***	0.411***	0.236**	0.240**	0.299**
	(3.309)	(3.411)	(3.918)	(3.484)	(3.098)	(4.957)	(2.075)	(2.004)	(2.416)
$[\ln(Emp)]^2$	-0.030**	-0.025**	-0.029***	-0.029**	-0.022**	-0.035***	-0.017	-0.016	-0.028**
	(-2.487)	(-2.542)	(-2.826)	(-2.467)	(-2.119)	(-3.727)	(-1.288)	(-1.187)	(-1.991)
ln(Age)	0.578***	0.463***	0.432***	0.514***	0.321**	0.345***	0.191	0.106	0.320
	(3.383)	(3.302)	(2.988)	(3.183)	(2.249)	(2.605)	(1.050)	(0.553)	(1.618)
$[\ln(Age)]^2$	-0.085***	-0.066**	-0.056**	-0.078**	-0.045	-0.046*	-0.021	-0.006	-0.032
	(-2.610)	(-2.480)	(-2.023)	(-2.550)	(-1.643)	(-1.818)	(-0.602)	(-0.176)	(-0.846)
HC	0.619***	0.646***	0.641***	0.326**	0.691***	0.610***	0.794***	0.864***	0.670***
	(3.566)	(4.495)	(4.376)	(1.983)	(4.718)	(4.551)	(4.353)	(4.478)	(3.358)
ln(K/L)	0.392***	0.365***	0.396***	0.405***	0.367***	0.393***	0.365***	0.370***	0.341***
	(20.381)	(23.104)	(24.299)	(22.229)	(22.771)	(26.253)	(17.644)	(16.975)	(15.147)
Constant	3.774***	4.796***	5.066***	3.896***	5.039***	5.308***	5.150***	3.662***	5.446***
	(5.279)	(8.174)	(8.369)	(5.481)	(8.009)	(9.093)	(3.302)	(3.982)	(5.724)
Threshold:									
P-value	0.190	0.007***	0.001***	0.017***	0.022***	0.000***	0.057*	0.028**	0.008***
Percentile	25	82	85	25	82	86	87	86	86
Value	.22	.65	.67	.22	.65	0.68	0.69	0.68	0.68
Obs	2779	2779	2779	2752	2752	2752	2398	2398	2398

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Turning to the estimated coefficients on the importer dummy in the low and high regime (*Importer_low* and *Importer_high*) we observe that in all cases the coefficients on the importer variable are larger for observations above the threshold, i.e. for firms with relatively high values of human capital. Moreover, the difference in coefficients tends to be larger for firms at the upper-end of the conditional productivity distribution.

Considering only significant thresholds, we find in the case of output per worker that the importer premium ranges from 47 to 55 per cent for firms in the low-regime and from 73-85 per cent for firms in the high-regime. The corresponding numbers for sales per worker are 44-53 and 54-78 per cent respectively, and for value added per worker 41-45 and 63-72 per cent respectively. Overall, the results strongly suggest that in order to maximise the productivity benefits from importing, firms need to raise their absorptive capacity by increasing their human capital. This is particularly the case for firms at the upper-end of the conditional productivity distribution.[21]

5. Conclusions

The relationship between a firm's international trade activities and its productivity has been debated intensively in recent theoretical and empirical literature. The vast majority of this literature has concentrated on the exporter-productivity relationship, with the literature on importing and productivity still in its infancy. Moreover, the literature to date has concentrated on developed countries and a small number of developing countries, with very few studies covering firms in Africa. Using a sample of 3090 firms in 19 Sub-Saharan African countries, we examine the importer-productivity relationship and find that importers are – on average – more productive than non-importers. Our results are consistent with the literature on the one hand, but our findings contribute to the discussion in various ways.

Firstly, our finding of a significant and robust correlation between importing and productivity confirms that exporting is not the only relevant form of international exchange for productivity. This focus on imports is further new in the context of SSA, where in general few studies of the trade-productivity nexus exist.

Secondly, we find that a simple importer dummy – as opposed to an import intensity measure – is sufficient for analysing the import-productivity relation. This observation goes against some critiques that using just an import status variable would be too narrow to capture the productivity premium of importers.

[21] We interpret the results such that the effects of importing on productivity are higher beyond some threshold, but if firms with higher absorptive capacity are more productive, and more productive firms are also more likely to import (i.e. due to self-selection), we would get similar results.

Thirdly, we find that the importer premium effect is large for domestic- relative to foreign-owned importers. Taken together with the large premium of being foreign-owned, we conclude that the productivity premium of foreign-owned importers largely stems from their headquarter-subsidiary relations and less from their import activities.[22] Consequently, analysing trade effects separately from ownership relations would be misleading.

Finally, we reveal a potentially crucial transmission channel of productivity gains for importers, namely the role of absorptive capacity. If there are any learning-by-importing effects, then the magnitude of the productivity premium of importers is likely to depend upon the ability to learn, which can be proxied by the firms' level of human capital. Our results show that a relatively high share of educated workers is associated with a higher importer premium.

At least two policy conclusions can be derived from our findings. In general, the positive import-productivity relation should be taken into account in firm-oriented economic policies. More specifically, if the policy goal consists of the optimisation of firms' production strategy by widening their sourcing options of intermediate goods, then the policy has to target the enhancement of firms' productivity. At the same time, the costs of importing should be reduced – e.g. by reducing trade barriers such as import quotas and duties – in order to allow also less-productive firms gain access to foreign sources. As a complementary policy, the expansion of domestic production possibilities depends on the investment into education and training in order to absorb technology from abroad via imported goods.

[22] Being foreign could open up other trade channels than importing such as better access to foreign markets.

References

Altomonte, C., & Bekes, G. (2009). Trade complexity and productivity (IEHAS Discussion Paper no. 0914). Institute of Economics, Hungarian Academy of Sciences.

Amiti, M., & Konings, J. (2007). Trade liberalization, intermediate inputs and productivity: Evidence from Indonesia. *American Economic Review*, *97*(5), 1611-1638.

Amiti, M., & Wei, S. J. (2009). Service offshoring, productivity and employment: Evidence from the US. *World Economy*, *32*(2), 203-220.

Andersson, M., Lööf, H., & Johansson, S. (2008). Productivity and international trade – Firm-level evidence from a small open economy. *Review of World Economics*, *144*(4), 774-801.

Antras, P., & Helpman, E. (2004). Global sourcing. *Journal of Political Economy*, *112*(3), 552-580.

Antras, P., & Helpman, E. (2008). Contractual frictions and global sourcing. In E. Helpman, D. Marin, & T. Verdie (Eds.), *The Organization of Firms in a Global Economy* (pp. 9-54). Cambridge: MA, Harvard University Press.

Augier, P., Caodt, O. & Dovis, M. (2009). Imports and TFP at the firm level: The role of absorptive capacity (CEPR Discussion Paper no 7218). Centre for Economic Policy Research.

Aw, B.Y., Chung, S. & Roberts, M. J. (2000). Productivity and turnover in the export market: Micro-level evidence from the Republic of Korea and Taiwan (China). *World Bank Economic Review*, 14, 65-90.

Bas, M., & Strauss-Kahn, V. (2010). Does importing more inputs raise exports? Firm level evidence from France (MPRA Paper No. 27315). University Library of Munich.

Baldwin, J. R., & Gu, W. (2003). Export-market participation and productivity performance in Canadian manufacturing. *Canadian Journal of Economics*, *36*(3), 634-657.

Bekes, G., Harasztosi, P., & Murakozy, B. (2011). Firms and products in international trade: Evidence from Hungary. *Economic Systems*, *35*(1), 4-24.

Bernard, A.B., Jensen, J.B., Redding, S.J., & Schott, P.K. (2007). Firms in international trade. *Journal of Economic Perspectives*, *21*(3), 105-130.

Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J.W., Oduro, A., Oostendorp, R., Pattillo, C., Soderbom, M., Teal, F. & Zeufack, A. (2004). Do African manufacturing firms learn from exporting. *Journal Development Studies*, *40*(3), 115-141.

Buchinsky, M. (1998). The dynamics of changes in the female wage distribution in the USA: a quantile regression approach. *Journal of Applied Econometrics*, *13*(1), 1-30.

Caloghirou, Y., Kastelli, I., & Tsakanikas, A. (2004). Internal capabilities and external knowledge sources: complements or substitutes for innovative performance? *Technovation*, *24*(4), 29-39.

Camisón, C., & Forés, B. (2010). Knowledge absorptive capacity: New insights for its conceptualization and measurement, *Journal of Business Research*, *63*(7), 707-715.

Caner, M. (2002). A note on least absolute deviation estimation of a threshold model. *Econometric Theory*, *18*(3), 800-814.

Castellani, D., Serti, F., & Tomasi, C. (2010). Firms in international trade: Importers' and exporters' heterogeneity in the Italian manufacturing industry. *The World Economy*, *33*(3), 424-457.

Chan, K. (1993). Consistency and limiting distribution of the least squares estimator of a threshold autoregressive model. *The Annals of Statistics*, *21*(1), 520-533.

Crespo-Cuaresma, J., Foster, N., & Scharler, J. (2008). Barriers to technology adoption, international R&D spillovers and growth. *Economics Bulletin*, *15*(3), 1-7.

Coe, D. T., & Helpman, E. (1995). International R&D spillovers. *European Economic Review*, *39*(5), 859-887.

Coe, D. T., Helpman, E., & Hoffmaister, A. W. (1997). North-South R&D Spillovers. *The Economic Journal*, *107*(440), 134-149.

Damijan, J., & Kostevc, C. (2010). Learning from trade through innovation: Causal link between imports, exports and innovation in Spanish microdata (LICOS Discussion Papers 264). LICOS Centre for Institutions and Economic Performance, KU Leuven.

Dovis, M., & Milgram-Baleix, J. (2009). Trade, Tariffs and Total Factor Productivity: The Case of Spanish Firms. *World Economy*, *32*(4), 575-605.

Eriksson, T., Smeets, V., & Warzynski, F. (2009). Small open economy firms in international trade: Evidence from Danish transactions-level data (Working Paper 09-7). Department of Economics, University of Arhus.

Farinas, J.C., & Martin-Marcos, A. (2010). Foreign sourcing and productivity: Evidence at the firm level. *World Economy*, *33*(3), 482-506.

Forlani, E. (2010): Irish firms' productivity and imported inputs (CORE Discussion Paper 2010015), Center for Operations Research and Econometrics, Universite catholique de Louvain.

Foster-McGregor, N., Isaksson, A., & Kaulich, F. (2012). Importing, exporting and the productivity of services firms in sub-Saharan Africa. Unpublished manuscript, Vienna Institute of International Economic Studies (wiiw).

Foster-McGregor, N., Isaksson, A., & Kaulich, F. (2014, forthcoming). Importing, Exporting and Performance in sub-Saharan African Manufacturing Firms. *Review of World Economics.*

Galvao, A.F., Montes-Rojas, G., & Olmo, J. (2010). Threshold quantile autoregressive models. *Journal of Time Series Analysis*, *32*(3), 253-267.

Goldberg, P.K., Khandelwal, A., Pavcnik, N., & Topalova, P. (2008). Multi-product firms and product turnover in the developing world: Evidence from India (CEPR Discussion Paper no. 6881). Centre for Economic Policy Research.

Girma, S., & Görg, H. (2004). Outsourcing, foreign ownership and productivity: Evidence from UK establishment-level data. *Review of International Economics*, *12*(5), 817-832.

Görg, H., Hanley, A., & Strobl, E. (2008). Productivity effects of international outsourcing: Evidence from plant level data. *Canadian Journal of Economics*, *41*(2), 320-340.

Görzig, B., & Stephan, A. (2002). Outsourcing and firm-level performance (DIW Discussion Paper no. 309). DIW Berlin, German Institute for Economic Research.

Grossman, G.M., Helpman, E., & Szeidl, A. (2005). Complementarities between outsourcing and foreign sourcing. *American Economic Review*, *95*(2), 19-24.

Hagemejer, J., & Kolassa, M. (2008). Internationalization and economic performance of enterprises: Evidence from firm-level data (MPRA Paper no. 8720). University Library of Munich.

Haller, S. A. (2012). Exporting, importing, intra-firm trade and firm performance. *Canadian Journal of Economics*, *45*(4), 1397-1430.

Halpern, L., Koren, M., & Szeidl, A. (2005). Imports and productivity (Discussion Paper no. 2005/9). Institute of Economics, Hungarian Academy of Sciences.

Hansen, B.E. (1996). Inference when a nuisance parameter is not identified under the null hypothesis. *Econometrica*, *64*(2), 413-430.

Hansen, B.E. (1999). Threshold effects in non-dynamic panels: Estimation, testing and inference. *Journal of Econometrics*, *93*(2), 345-368.

Hansen, B.E. (2000). Sample splitting and threshold estimation. *Econometrica*, *68*(3), 575-603.

Helleiner, G.K. (ed.) (1994). *Trade Policy and Industrialisation in Turbulent Times*. Routledge, London.

Huber, P. (1964). Robust Estimation of a Location Parameter. *Annals of Mathematical Statistics, 35*(1), 73-101.

IMF/OECD (2003). *Foreign direct investment statistics: how countries measure FDI 2001*. Washington, D.C.: International Monetary Fund, OECD.

Jabbour, L. (2010). Offshoring and firm performance: Evidence from French manufacturing industry. *World Economy*, *33*(3), 507-524.

Kasahara, H., & Lapham, B. (2008). Productivity and the decision to import and export: Theory and evidence (CESifo Working Paper no, 2240), CESifo, Germany.

Kasahara, H., & Rodrigue, J. (2008). Does the use of imported intermediates increase productivity? Plant-level evidence. *Journal of Development Economics*, *87*(1), 106-118.

Koenker, R., & Hallock, K. F. (2001). Quantile Regression. *Journal of Economic Perspectives*, *15*(4), 143-156.

Kraay, A. (2002). Exports and economic performance: Evidence from a panel of Chinese enterprises. In M.-F. Renard (Ed.), *China and its Regions. Economic Growth and Reform in Chinese Provinces* (pp. 278-299). Cheltenham, Edward Elgar,.

Kuan, C-M., Michalopoulos, C., & Xiao, Z. (2010). Quantile regression on quantile ranges. Mimeo.

Lööf, H., & Andersson, M. (2010). Imports, productivity and the origin of markets: The role of knowledge-intensive economies. *World Economy*, *33*(3), 458-481.

Maronna, R. A., & Yohai, V. J. (2000). Robust regression with both continuous and categorical predictors. *Journal of Statistical Planning and Inference*, *89*(1-2), 197-214.

Melitz, M. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, *71*(6), 1695-1725.

Muuls, M., & Pisu, M. (2009). Imports and exports at the level of the firm: Evidence from Belgium. *The World Economy*, *32*(5), 692-734.

Rousseeuw, P. J., & Yohai, V. (1987). Robust Regression by Means of S-estimators. In J. Franke, W. Härdle, & D. Martin (Eds.), *Robust and Nonlinear Time Series Analysis* (pp. 256-272). Berlin: Springer Verlag.

Serti, F., & Tomasi, C. (2008). Firm heterogeneity: Do destinations of exports and origins matter? (LEM Working Paper no. 2008/14). Sant'Anna School of Advanced Studies, Pisa.

Silva, A., Afonso, O., & Africano, A. P. (2011). Economic performance and international trade engagement: the case of Portuguese manufacturing firms (*GEE papers 37).* Gabinete de Estratégia e Estudos, Ministério da Economia e da Inovação.

Smeets, V., & Warzynski, F. (2010). Learning by exporting, importing or both? Estimating productivity with multi-product firms, pricing heterogeneity and the role of international trade (Working Paper 10-13). Department of Economics, University of Aarhus.

Sjöholm, F. (1999). Exports, imports and productivity: Results from Indonesian establishment data. *World Development*, *27*(4), 705-715.

Tucci, A. (2005). Trade, foreign networks and performance: A firm-level analysis for India (Working Papers no. 199). Centro Studi Luca D'Agliano Development Studies.

Verardi, V., & Croux, C. (2009). Robust regression in Stata. *Stata Journal*, *9*(3), 439-453.

Vinding, A. L. (2006). Absorptive capacity and innovative performance: A human capital approach. *Economics of Innovation and New Technology*, *15*(4-5), 507-517.

Vogel, W., & Wagner, J. (2010). Higher productivity in importing German manufacturing firms: Self-selection, learning from importing, or both? *Review of World Economics 145*(4), 641–665.

Wagner, J. (2007). Exports and productivity: A survey of the evidence from firm-level data. *World Economy*, *30*(1), 60-82.

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

UNIDO (2012). *Africa Investor Report 2011: Towards evidence-based investment promotion strategies*. Vienna: United Nations Industrial Development Organization.

Yohai, V. (1987). High Breakdown-point and High Efficiency Estimates for Regression. *The Annals of Statistics, 15*(2), 642-665.

Short list of the most recent wiiw publications (as of November 2013)

For current updates and summaries see also
wiiw's website at www.wiiw.ac.at

Importing, Productivity and Absorptive Capacity in Sub-Saharan African Manufacturing Firms

by **Neil Foster-McGregor, Anders Isaksson and Florian Kaulich**

wiiw Working Papers, No. 105, November 2013
28 pages including 8 Tables and 5 Figures
hardcopy: EUR 8.00 (PDF: free download from wiiw's website)

Auswirkungen der Arbeitsmarktöffnung am 1. Jänner 2014 auf den Wirtschafts- und Arbeitsstandort Österreich

by **Michael Landesmann, Isilda Mara, Hermine Vidovic, Helmut Hofer, Philip Schuster and Gerlinde Titelbach**

wiiw Research Papers in German language, October 2013
85 pages including 26 Tables and 28 Figures
hardcopy: EUR 8.00 (PDF: free download from wiiw's website)

A 'Manufacturing Imperative' in the EU – Europe's Position in Global Manufacturing and the Role of Industrial Policy

by **Roman Stöllinger, Neil Foster-McGregor, Mario Holzner, Michael Landesmann, Johannes Pöschl and Robert Stehrer**

wiiw Research Reports, No. 391, October 2013
69 pages including 18 Tables and 10 Figures
hardcopy: EUR 8.00 (PDF: free download from wiiw's website)

---

wiiw Monthly Report 10/13

edited by **Leon Podkaminer**

- Bulgaria: negative economic sentiment prevails
- Croatia: no upturn yet
- Czech Republic: heading for a change
- Estonia: consumers keep growth alive
- Hungary: the well-known pre-election tunes are played again
- Latvia: households push up domestic
- Lithuania: aiming for euro adoption in 2015
- Poland: keeping afloat
- Romania: growth driven only by exports
- Slovakia: export-led growth continues
- Slovenia: recovery not in sight
- Statistical Annex: Selected monthly data on the economic situation in Central, East and Southeast Europe

wiiw, October 2013
47 pages including 22 Tables
(exclusively for subscribers to the wiiw Service Package)

Structural Adjustment and Unit Labour Cost Developments in Europe's Periphery: Patterns before and during the Crisis

by **Michael Landesmann and Doris Hanzl-Weiss**

wiiw Research Reports, No. 390, September 2013
39 pages including 2 Tables and 12 Figures
hardcopy: EUR 24.00 (PDF: EUR 15.00)

The Steadiness of Migration Plans and Expected Length of Stay – Based on a Recent Survey of Romanian Migrants in Italy

by **Isilda Mara and Michael Landesmann**

wiiw Working Papers, No. 104, September 2013
41 pages including 11 Tables and 5 Figure
hardcopy: EUR 8.00 (PDF: free download from wiiw's website)

---

wiiw Monthly Report 8-9/13

edited by **Leon Podkaminer**

- The automotive industry in the New Member States: a brief review
- Migration plans and expected length of stay: the case of Romanian migrants in Italy
- Debt and financial stability
- The days of the Arab Spring are gone
- Statistical Annex: Selected data on FDI in Central, East and Southeast Europe

wiiw, August-September 2013
31 pages including 11 Tables and 4 Figures
(exclusively for subscribers to the wiiw Service Package)

Do I Stay because I am Happy or am I Happy because I Stay? Life Satisfaction in Migration, and the Decision to Stay Permanently, Return and Out-migrate

by **Isilda Mara and Michael Landesmann**

wiiw Working Papers, No. 103, August 2013
40 pages including 10 Tables and 2 Figure
hardcopy: EUR 8.00 (PDF: free download from wiiw's website)

Migration Patterns of Serbian and Bosnia and Herzegovina Migrants in Austria: Causes and Consequences

by **Isilda Mara, Hermine Vidovic and Michael Landesmann**

wiiw Research Reports, No. 389, August 2013
111 pages including 18 Tables and 9 Figures
hardcopy: EUR 24.00 (PDF: EUR 15.00)

Development Patterns of Central and East European Countries (in the course of transition and following EU accession)

by **Leon Podkaminer**

wiiw Research Reports, No. 388, July 2013
47 pages including 19 Tables
hardcopy: EUR 8.00 (PDF: free download from wiiw's website)

Animal Spirits still Dimmed: Slow Recovery Expected

by **Vladimir Gligorov, Mario Holzner, Michael Landesmann, Olga Pindyuk, Sándor Richter, Hermine Vidovic et al.**

wiiw Current Analyses and Forecasts. Economic Prospects for Central, East and Southeast Europe, No. 12, July 2013

162 pages including 36 Tables and 35 Figures

hardcopy: EUR 80.00 (PDF: EUR 65.00)

---

wiiw Monthly Report 7/13

edited by **Leon Podkaminer**

- Unit labour cost developments in the EU: a structural analysis
- The various 'faces' of the EU budget
- Ukraine: always in between
- Statistical Annex: Selected monthly data on the economic situation in Central, East and Southeast Europe

wiiw, July 2013

37 pages including 11 Tables and 6 Figures

(exclusively for subscribers to the wiiw Service Package)

Impact of Croatian EU Accession on Regional Trade Patterns

by **Mario Holzner**

wiiw Policy Notes and Reports, No. 10, June 2013
15 pages including 3 Tables and 4 Figures

PDF: free download from wiiw's website

Mittel-, Ost- und Südosteuropa von der EU-Krise voll erfasst

by **Mario Holzner und Vasily Astrov**

wiiw Research Papers in German language, June 2013

(reprinted from: WIFO-Monatsberichte, Vol. 86, No. 5, May 2013)

10 pages including 5 Tables and 4 Figures

hardcopy: EUR 8.00 (PDF: free download from wiiw's website)

---

wiiw Service Package

The Vienna Institute offers to firms and institutions interested in unbiased and up-to-date information on Central, East and Southeast European markets a package of exclusive services and preferential access to its publications and research findings, on the basis of a subscription at an annual fee of EUR 2,000.

This subscription fee entitles to the following package of **Special Services**:

– A free invitation to the Vienna Institute's **Spring Seminar**, a whole-day event at the end of March, devoted to compelling topics in the economic transformation of the Central and East European region (for subscribers to the wiiw Service Package only).

– Copies of, or online access to, ***The Vienna Institute Monthly Report***, a periodical consisting of timely articles summarising and interpreting the latest economic developments in Central and Eastern Europe and the former Soviet Union. The statistical annex to each *Monthly Report* contains, alternately, country-specific tables or graphs with monthly key economic indicators, economic forecasts, the latest data from the wiiw Industrial Database and excerpts from the wiiw FDI Database. This periodical is not for sale, it can only be obtained in the framework of the wiiw Service Package.

– Free copies of the Institute's ***Research Reports*** (including ***Reprints***), ***Current Analyses and Forecasts***, ***Country Profiles*** and ***Statistical Reports***.

– A free copy of the ***wiiw Handbook of Statistics***, published in October/November each year and containing macroeconomic and structural indicators of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Romania, Russia, Serbia, the Slovak Republic, Slovenia and Ukraine

– Free online access to the **wiiw Monthly Database**, containing more than 2000 leading indicators monitoring the latest key economic developments in ten Central and East European countries.

– **Consulting**. The Vienna Institute is pleased to advise subscribers on questions concerning the East European economies or East-West economic relations if the required background research has already been undertaken by the Institute (10 hours p.a.).

– Free access to the Institute's specialised economics **library** and documentation facilities.

There will be an new, Premium Service Package available starting in January 2014 that includes, in addition to the standard package, online access to the wiiw Annual Database and wiiw FDI Database, as well all country forecast tables in Excel format.

For detailed information about the wiiw Service Packages
please visit wiiw's website at www.wiiw.ac.at

To
The Vienna Institute
for International Economic Studies
Rahlgasse 3
A-1060 Vienna

- O Please forward more detailed information about the Vienna Institute's Service Package
- O Please forward a complete list of the Vienna Institute's publications to the following address

Please enter me for

- O 1 yearly subscription of *Research Reports* (including *Reprints*) at a price of EUR 120.00 (hardcopy, Austria), EUR 135.00 (hardcopy, Europe), EUR 155.00 (hardcopy, overseas) and EUR 48.00 (PDF download with password) respectively
- O 1 yearly subscription of *Current Analyses and Forecasts* at a price of EUR 150.00 (hardcopy, Austria), EUR 155.00 (hardcopy, Europe), EUR 170.00 (hardcopy, overseas) and EUR 120.00 (PDF download with password) respectively
- O 1 combination of both yearly subscriptions (*Current Analyses and Forecasts* and *Research Reports)* at a price of EUR 225.00 (hardcopy, Austria), EUR 250.00 (hardcopy, Europe), EUR 265.00 (hardcopy, overseas) and EUR 140.00 (PDF download with password) respectively

Please forward

- O the following issue of *Research Reports* ....
- O the following issue of *Current Analyses and Forecasts* ....
- O the following issue of *Working Papers* ....
- O the following issue of *Research Papers in German language* ....
- O the following issue of *wiiw Database on Foreign Direct Investment* ....
- O the following issue of *wiiw Handbook of Statistics* ....
- O (other) ....

....
Name

....
Address

....
Telephone Fax E-mail

....
Date Signature

Herausgeber, Verleger, Eigentümer und Hersteller:
Verein „Wiener Institut für Internationale Wirtschaftsvergleiche“ (wiiw),
Wien 6, Rahlgasse 3
ZVR-Zahl: 329995655
Postanschrift: A-1060 Wien, Rahlgasse 3, Tel: [+431] 533 66 10, Telefax: [+431] 533 66 10 50
Internet Homepage: www.wiiw.ac.at

P.b.b. Verlagspostamt 1060 Wien