

**Volume 33, Issue 4****Extensive margins of imports in the great import recovery in Germany,  
2009/2010**

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**Abstract**

This paper contributes to the literature by documenting for the first time the contribution of adding (and dropping) goods and countries of origin to the sharp increase in imports of goods in the German economy as a whole during the Great Import Recovery in 2009/2010. The empirical investigation finds that firms that imported in both 2009 and 2010 are much more important for the import dynamics than import starters and import stoppers. Firms that increased their imports (and that were the drivers of the import boom) imported on average more goods and from more countries of origin in 2009 than firms that decreased their imports, and they increased both extensive margins of imports on average while firms with decreased imports reduced both the number of goods imported and the number of countries of origin.

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All computations were done at the Research Data Centre of the German Statistical Office. I thank Rafael Beier for preparing the data, running my Stata do-files and checking the results for any violation of privacy. The enterprise level data used are confidential but not exclusive; see <http://www.forschungsdatenzentrum.de/nutzungsbedingungen.asp> for any details regarding the access to the data. To facilitate replication the Stata do-file used is available on request.

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## 1. Motivation

After the severe collapse of international trade during the Great Recession in 2009 global trade flows rebounded strongly in 2010. According to the WTO's World Trade Report 2011 world exports of merchandise dropped by 22 percent from 2008 to 2009 and increased by 22 percent from 2009 to 2010, enabling world trade to return to its pre-crisis level (World Trade Organization 2011, p. 24). Germany, one of the leading actors on the world market for goods,<sup>1</sup> is a case in point. Measured in current prices the value of total exports (imports) declined by 18.4 (17.5) percent from 2008 to 2009. This was followed by an increase in exports (imports) by 18.5 (19.9) percent in 2010 (Statistisches Bundesamt 2012, p. 414).

The dynamics of exports over this period have been investigated for several countries. While a number of studies analyze the Great Trade Collapse of 2008/2009 from a macroeconomic point of view, some studies take a microeconomic perspective and try to understand what was going on under the veil of the macroeconomic developments by looking at firm level data.<sup>2</sup> Behrens et al. (2013) match firm-level data for firm-country-product exports with balance sheet data for Belgium and decompose the trade collapse along the extensive and the intensive margins, where the extensive margin is defined as changes in exports due to firms that stop or start to export and the intensive margin refers to (negative or positive) changes in exports by firms that continue to export. They find that firm exit and the dropping of products and markets played only a small role during the trade collapse – changes in trade volumes were essentially driven by reduced quantities and unit prices. The intensive margin was much more important than the extensive margin. Similarly, based on analyses of firm-level data for France Fontagné and Gaulier (2009) report that the number of exporters has been only slightly reduced by the crisis, while the bulk of the observed decline in exports happened at the intensive margin and, more precisely, was due to the drop in the value exported by the top 1% of exporters (see also Bricongne et al. 2010, 2011). Using data for imports by Brazil, the European Union, Indonesia and the United States Haddad et al. (2011) decompose the fall in international trade during 2008-2009 into product entry and exit, price changes, and quantity changes. The evidence reported suggests that the intensive rather than the extensive margin matter the most. Wagner (2013a) shows that a very large share of the decline in exports from manufacturing firms in Germany in 2009 was due to negative changes of exports in enterprises that continued to export (i.e. at the intensive margin) while the decrease of exports due to export stoppers (at the extensive margin) was tiny. The bottom line, then, is that studies based on micro-level data show that changes at the intensive margin were much more important than changes at the extensive margin during the great trade crisis of 2008-2009.

In contrast to the Great Export Collapse of 2008/2009 the Great Export Recovery of 2009/2010 has (at least, to the best of my knowledge) been investigated with firm-level data for Germany only.<sup>3</sup> Wagner (2013b) finds that firms that exported in both 2009 and 2010 are much more important for the export dynamics than export starters and export stoppers. Firms that increased their exports (and that were the drivers of the export boom) exported on average more goods and to more destination countries in 2009 than firms that decreased their exports, and they increased both extensive margins of exports on average while firms with

<sup>1</sup> In 2010, Germany was the third-largest exporter and importer of goods, see World Trade Organization (2011, p. 33).

<sup>2</sup> An in-depth analysis of the great trade collapse can be found in Bems, Johnson and Yi (2012).

<sup>3</sup> For studies using macroeconomic data see World Trade Organization (2011) with evidence for many countries and Loschky (2011) for detailed evidence on Germany.

decreased exports reduced both the number of goods exported and the number of countries exported to.

This paper contributes to the literature by looking for the first time at the dynamics of imports (instead of exports) during the Great Import Recovery in 2009/2010.<sup>4</sup> It uses newly available comprehensive enterprise level data for Germany and documents the contribution of adding (and dropping) goods and countries of origin to the sharp increase in imports of goods in the German economy as a whole. Given that Germany is one of the leading actors on the world market for goods, the findings reported are interesting per se. Furthermore, the empirical approach used can easily be applied for other countries with suitable data, and the results could be used to learn more about the micro-structure of the recent import boom from a cross-country perspective.

To anticipate the most important results, we find that firms that imported in both 2009 and 2010 are much more important for the import dynamics than import starters and import stoppers. A more detailed classification of firms with increased (decreased) imports reveals that some of these firms decreased (increased) the number of goods imported and / or the number of countries imported from. However, the most important sub-groups are firm with increased imports that import more goods from more countries and firms with decreased imports that import a smaller number of goods from a smaller number of countries.

The rest of the paper is organized as follows. Section 2 introduces the data used and the empirical approach applied. Section 3 reports the results from the empirical investigation. Section 4 concludes.

## 2. Data and empirical method

The empirical investigation uses a newly constructed data set that is based on customs' records about goods imported from countries outside the European Union and on information delivered by firms about goods imported 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 and are now available for the reporting year 2010, too. The data have 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.

The data for 2009 and 2010 can be used to compare firms between both years. Firms that did not import in both years are ignored here. Each of the other firms belongs to one of five types:

- (1) *Import starters* (firms that did not report imports in 2009 but in 2010).
- (2) *Enterprises with increased imports* between 2009 and 2010.
- (3) *Enterprises with constant imports* in both years.
- (4) *Enterprises with decreased imports* between 2009 and 2010.
- (5) *Import stoppers* (firms that did report imports in 2009 but not in 2010).

Note that the group of import starters includes plants 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

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<sup>4</sup> Unfortunately, the data used here (that are described in detail in section 2 below) are available from reporting year 2009 onwards only, so the Great Trade Collapse cannot be investigated with these data.

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.

The net change in total imports between the two years is the sum of the positive gross changes by the first two types and the negative gross changes by the last two types of firms. The percentage rate of change in total imports can be decomposed accordingly to show the relative contribution of each of these types of firms to total import dynamics (see Wagner 2013b). Furthermore, the change in the number of goods imported and in the number of countries imported from can be documented for the types of firms to learn about the role of these extensive margins of imports in export dynamics.

### 3. Results from the empirical investigation

Results for the decomposition of import dynamics for the types of firms defined above are reported in Table I. Note that there are no firms with constant imports. This is due to the use of a deflator when transforming nominal import values reported by the enterprises into real import values (measured in constant 2005 prices) used in the calculations here.

From the first row of Table I it can be seen that imports from manufacturing enterprises rose dramatically by 11.54 percent in real terms from 2009 to 2010 during *The Great Import Recovery*. Most of this increase is due to positive changes of imports in enterprises that imported in both years; these firms form the largest group. The increase of imports due to the twenty-thousand import starters is considerably smaller. Surprisingly (at least for readers not familiar with the studies on export dynamics based on firm level panel data) even in this period of an extreme import increase there were more than thirty-five thousand enterprises with decreased imports – about one third of all firms fall into this group (see third row of Table I). The decrease of imports due to these firms is larger than the overall increase of imports. Firms that stop importing form the smallest group of firms, and their contribution to the dynamic of imports is small, too.

Note that the group of firms that increased their imports from 2009 to 2010 are the drivers of the import-boom. The share of these firms in total imports increased from 53.42 percent in 2009 to 69.17 percent in 2010.

Information on the extensive margins of imports – the number of countries of origin and the number of goods imported – in the four types of firms in both years are reported in Table II. Both import starters and import stoppers are on average less engaged in imports at both extensive margins than firms that continue to import. Firms with increased imports imported more goods from more countries in 2009 than firms that decreased their imports, and firms with increased imports increased both extensive margins from 2009 to 2010, while firms with decreased imports imported a smaller number of goods from a smaller number of countries. This is a new fact that has not been reported before, and it reveals that a change at the intensive margin (the amount of imports) goes hand in hand with a change in the same direction at both extensive margins (number of goods imported, number of countries of origin).

In the last step of the empirical investigation we look at firms with increased imports and decreased imports separately and classify firms of each type in nine groups according to both the change in the number of countries of origin (increased / constant / decreased) and the change in the number of goods imported (increased / constant/ decreased).

Table III reports results for firms with increased imports. The most important group according to both the number of firms and the share in imports in both years is made of firms with an increase at both extensive margins. These firms increased both the number of goods imported and the number of countries imported from considerably, and their share in total imports expanded by more than eight percentage points. All other groups (with the exception of firms

that simultaneously increased the number of goods imported and decreased the number of countries of origin) are far less important.

Results for firms with decreased imports are reported in Table IV. Here, the most important group according to both the number of firms and the share in imports in both years is made of firms with a decrease at both extensive margins. These firms decreased both the number of goods imported and the number of countries imported from considerably, and their share in total imports decreased by more than ten percentage points. Again, all other groups are far less important.

The results reported here may appear to suggest that imports became more concentrated in terms of importers because firms that increased their imports account for a higher share of imports in 2010 compared to 2009. This, however, is not the case. Table V reports the share of the largest firms in terms of number of products imported and of countries of origin in total imports in both years. While the share of the top 1, 5 and 10 percent of all importers are high in both years (showing once again that imports are highly concentrated in the largest firms) the degree of concentration declined from 2009 to 2010. Table VI shows why this is the case. The rate of growth of imports among the very large importers (in terms of total imports) was negative on average while it was positive for overall importers (see Table I). Note that the average number of countries of origin and the average number of goods imported was by and large the same in both years among the top importers. To state it differently, import dynamics were not shaped by the largest importers.<sup>5</sup>

#### 4. Concluding remarks

The empirical investigation finds that firms that imported in both 2009 and 2010 are much more important for the import dynamics than import starters and import stoppers. Firms that increased their imports (and that were the drivers of the import boom) imported on average more goods and from more countries of origin in 2009 than firms that decreased their imports, and they increased both extensive margins of imports on average while firms with decreased imports reduced both the number of goods imported and the number of countries imported from. A more detailed classification of firms with increased (decreased) imports reveals that some of these firms decreased (increased) one or both extensive margins. However, the most important sub-groups are firms with increased imports that import more goods from more countries and firms with decreased imports that import a smaller number of goods from a smaller number of countries.

The overall result reported here - changes at the intensive margin were much more important than changes at the extensive margin during the import recovery in 2009-2010 – is well in line with the big picture found in studies that use firm level data for Germany and for other countries to analyze the great export collapse of 2008 -2009 and the great export recovery of 2009 – 2010. Given that this is (at least, to the best of my knowledge) the first analysis of the extensive and intensive margins of imports, further evidence from other countries would contribute to our knowledge and would help to decide whether the patterns found for Germany qualify as a stylized fact.

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<sup>5</sup> Note that it is not possible to prepare a decomposition of import dynamics and the other computations reported in Table 1 – Table 4 for the largest firms due to confidentiality restrictions.

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**Table I: Decomposition of import dynamics in Germany, 2009 / 2010**

	[1] Total imports in 2009 (Million Euro; 2005 prices)	[2] Total imports in 2010 (Million Euro; 2005 prices)	[3] Rate of change of imports (percent)	
All enterprises	662,933.2	739,456.4	11.54	
	[4] Increase of imports due to import starters (% of [1])	[5] Increase of imports due to firms with increased imports (% of [1])	[6] Decrease of imports due to firms with decreased imports (% of [1])	[7] Decrease of imports due to import stoppers (% of [1])
All enterprises	6.49	23.73	-14.69	-3.99
No. of firms	20,622	41,044	35,261	12,493
Share in all firms (%)	18.85	37.51	32.23	11.42
Share in total imports in 2009 (%)	0.0	53.42	42.59	3.99
Share in total imports in 2010 (%)	5.82	69.17	25.02	0.0

Source: Research Data Center of the German Statistical Office, Foreign Trade Statistics 2009/2010, own calculations.

**Table II: Extensive margins in types of importers in Germany, 2009 / 2010**

	Import starters	Firms with increased imports	Firms with decrease imports	Import stoppers
No. of countries of origin 2009 (sd)	0 (0)	6.77 (8.53)	5.63 (7.09)	3.15 (5.14)
No. of countries of origin 2010 (sd)	2.96 (4.31)	7.54 (8.77)	5.30 (6.84)	0 (0)
No. of goods imported 2009 (sd)	0 (0)	24.46 (67.97)	20.37 (66.69)	9.12 (27.62)
No. of goods imported 2010 (sd)	9.17 (28.69)	28.30 (71.63)	19.00 (63.77)	0 (0)

Source: Research Data Center of the German Statistical Office, Foreign Trade Statistics 2009/2010, own calculations.



**Table III: Change in extensive margins in firms with increased imports in Germany, 2009 / 2010**

	<u>Number of countries of origin</u>		
	increased	constant	decreased
<u>Number of goods</u>			
increased	[1]	[2]	[3]
no. of firms	13,755	6,071	3,929
(share; %)	(33.51)	(14.79)	(9.57)
share in imports 2009 (%)	19.53	3.35	16.71
share in imports 2010 (%)	27.79	4.11	19.08
no. of goods 2009	27.05	16.17	50.12
no. of goods 2010	37.43	21.01	58.42
no. of countries 2009	7.30	4.57	13.05
no. of countries 2010	10.28	4.57	11.00
constant	[4]	[5]	[6]
no. of firms	1,712	4,445	1,143
(share; %)	(4,17)	(10.83)	(2.78)
share in imports 2009 (%)	0.85	1.27	0.68
share in imports 2010 (%)	1.19	1.64	0.88
no. of goods 2009	10.29	1.84	10.41
no. of goods 2010	10.29	1.84	10.41
no. of countries 2009	4.46	3.27	6.34
no. of countries 2010	6.16	3.27	4.74
decreased	[7]	[8]	[9]
no. of firms	2,803	3,298	3,888
(share; %)	(6.83)	(8.04)	(9.47)
share in imports 2009 (%)	3.49	1.48	6.05
share in imports 2010 (%)	4.79	1.82	7.86
no. of goods 2009	33.99	17.12	36.26
no. of goods 2010	29.30	13.99	30.19
no. of countries 2009	8.18	4.16	10.00
no. of countries 2010	10.27	4.16	7.84

Source: Research Data Center of the German Statistical Office, Foreign Trade Statistics 2009/2010, own calculations.

Note: Share is the percentage share of firms from the type in all firms with increased imports. No. of goods is the average number of different goods imported by firms from the type, no. of countries is the average number of countries of origin of imports by firms from the type.

**Table IV: Change in extensive margins in firms with decreased imports in Germany, 2009 / 2010**

	<u>Number of countries of origin</u>		
	increased	constant	decreased
<u>Number of goods</u>			
increased	[1]	[2]	[3]
no. of firms	4,916	3,414	2,582
(share; %)	(13.94)	(9.68)	(7.32)
share in imports 2009 (%)	6.06	1.88	5.44
share in imports 2010 (%)	4.34	1.38	3.53
no. of goods 2009	25.62	14.10	34.37
no. of goods 2010	32.57	17.80	40.49
no. of countries 2009	6.86	4.13	11.15
no. of countries 2010	9.15	4.13	9.06
constant	[4]	[5]	[6]
no. of firms	1,210	4,758	1,517
(share; %)	(3.43)	(13.49)	(4.30)
share in imports 2009 (%)	0.63	1.13	0.83
share in imports 2010 (%)	0.44	0.74	0.51
no. of goods 2009	9.29	3.18	7.81
no. of goods 2010	9.29	3.18	7.81
no. of countries 2009	4.18	1.69	5.62
no. of countries 2010	5.70	1.69	3.90
decreased	[7]	[8]	[9]
no. of firms	2,804	5,828	8,232
(share; %)	(7.95)	(16.53)	(23.35)
share in imports 2009 (%)	3.45	2.37	20.82
share in imports 2010 (%)	2.38	1.59	10.11
no. of goods 2009	35.45	14.79	28.14
no. of goods 2010	29.63	10.67	19.57
no. of countries 2009	6.81	2.96	7.75
no. of countries 2010	8.63	2.96	5.13

Source: Research Data Center of the German Statistical Office, Foreign Trade Statistics 2009/2010, own calculations.

Note: Share is the percentage share of firms from the type in all firms with decreased imports. No. of goods is the average number of different goods imported by firms from the type, no. of countries is the average number of countries of origin of imports by firms from the type.

**Table V: Share of largest firms in terms of number of products imported and countries of origin in total exports, Germany, 2009 and 2010**

Largest firms in terms of	Share in total imports (percent) in year	
	2009	2010
number of products imported		
top 1 percent	45.78	41.45
top 5 percent	64.32	61.42
top 10 percent	72.11	70.28
number of countries of origin		
top 1 percent	47.89	43.08
top 5 percent	64.92	63.63
top 10 percent	72.86	72.99

Source: Research Data Center of the German Statistical Office, Foreign Trade Statistics 2009/2010, own calculations.

**Table VI: On the role of the largest importers for import dynamics in Germany, 2009/2010**

	Largest 10 importers in 2009	Largest 50 importers in 2009	Largest 100 importers in 2009
Share in total imports in 2009 (percent)	25.36	38.24	44.66
Share in total imports in 2010 (percent)	18.14	30.67	37.97
Rate of change of imports 2009 / 2010 (percent)	-20.22	-10.55	-5.18
Average number of countries of origin 2009	103.3	64.7	51.3
Average number of countries of origin 2010	99.0	64.1	50.8
Average number of goods imported 2009	1678.6	776.2	525.7
Average number of goods imported in 2010	1690.9	786.6	538.2

Source: Research Data Center of the German Statistical Office, Foreign Trade Statistics 2009/2010, own calculations.

Note: The 10 (50, 100) largest importers are the 10 (50, 100) enterprises with the largest amount of imports in 2009.