Import Switching and Productivity in Spain

E. Prades and C.Villegas (2017)

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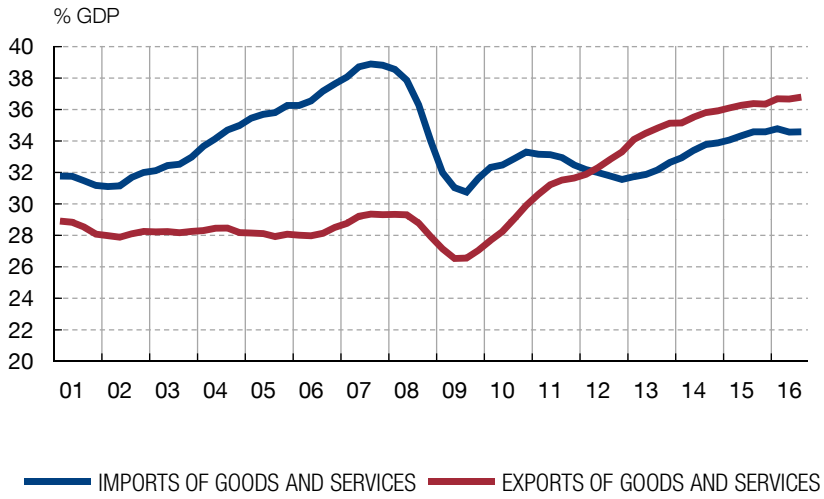
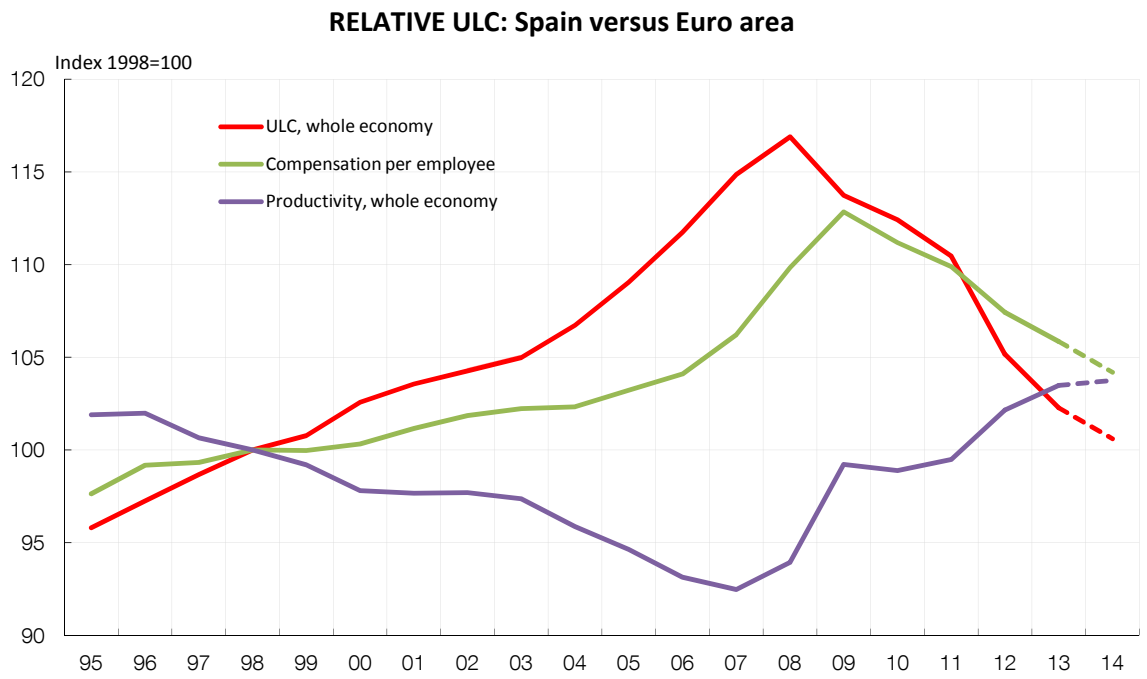
Trade imbalances in Spain

EXPORTS AND IMPORTS OVER GDP
(In real terms)



STRUCTURAL GROWTH OF EXPORTS AND IMPORTS (a)

Internal devaluation



Import switching and Internal devaluation

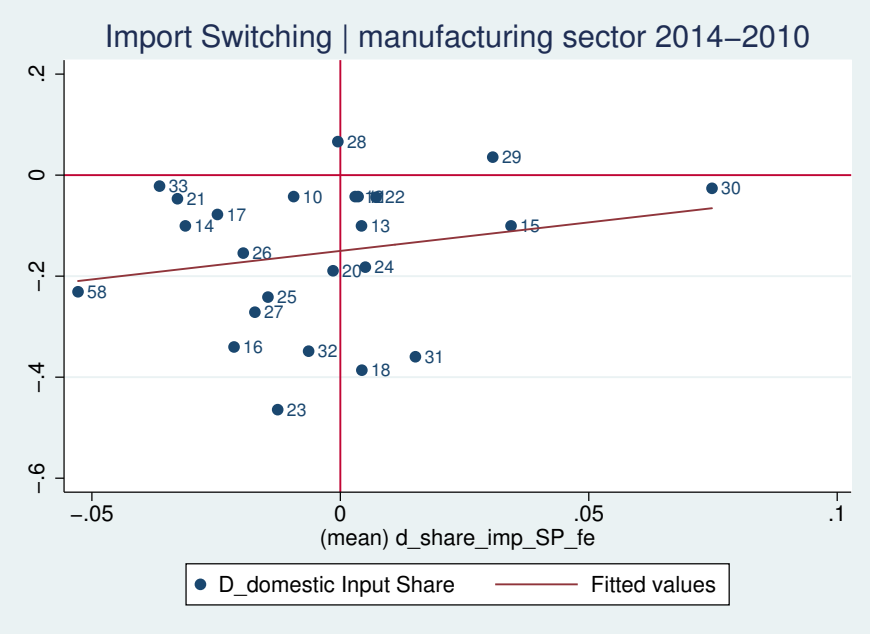


Figure: Manufacturing sector

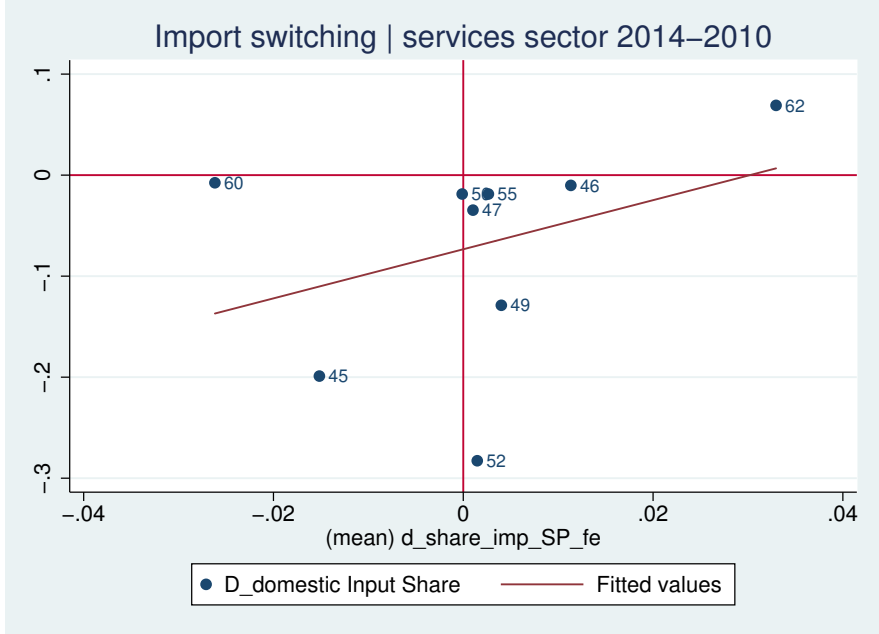


Figure: Services sector

Road map

1. Motivation
2. Data
3. Imports and Spanish importers: Stylized facts
4. Import switching
5. The role of wage adjustment
6. Summing up...
7. Appendix

Aim of this study

Using firm-level data to capture firm heterogeneity, we want to address the following issues:

- Analyze firms' import choice during the crisis
- Do we observe any import switching from foreign inputs towards domestically produced inputs?
- Can it be related to the internal devaluation process?
- How does import switching impact firm productivity?

Literature Review

Our work is based / inspired on ...

- Previous work analyzing the impact of importing to productivity
  - G. Gopinath and Neiman (2014 AER) Argentina
  - Halpern, Koren and Szeidl (2015 AER) Hungarian microdata
  - Amiti and Koning (2007) Indonesia
- Work on vertical/horizontal linkages.
  - Javorcik (1994 AER) Lithuania
- Work on consumer import switching
  - Bems and di Giovanni (2016 AER) Latvia scanner level dataset

Stylized facts on imports and importers

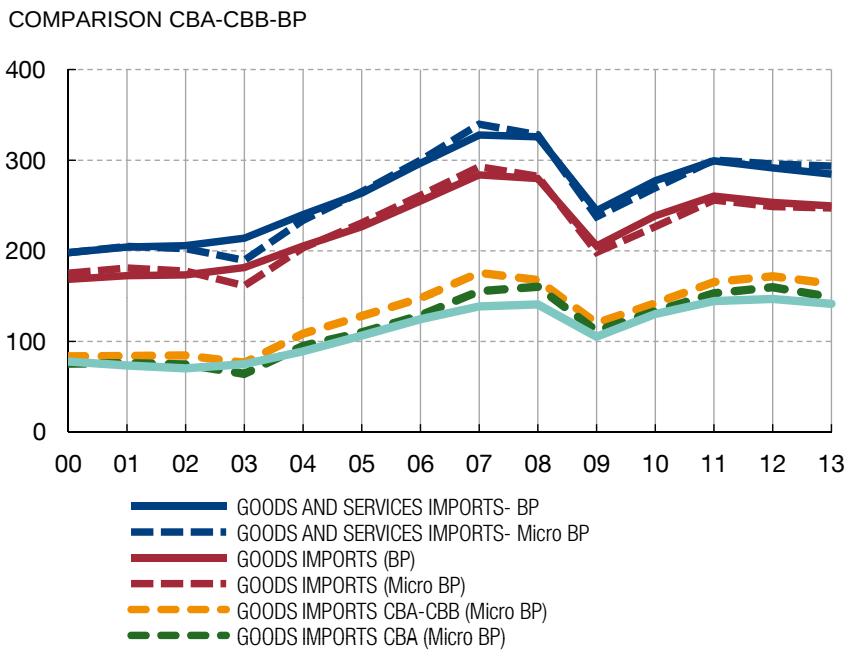
- High dependency on imports of the Spanish economy: mainly energy and high value added goods
- High elasticity to domestic demand
- At firm level, there is substantial heterogeneity in imported input usage
- Similarly to exporters: importer firms are bigger in size, register lower temporariness in employment, are more productive... table

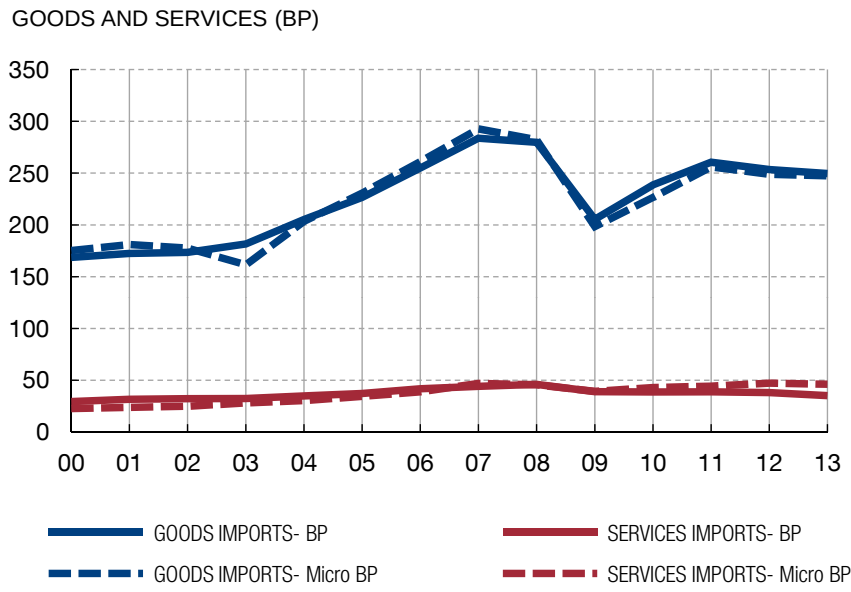
Firm level data

The analysis is based on firm-level information compiled by Banco de España:

- The BoS Central Balance Sheet Office (CBA) provides information on domestic and foreign purchases of intermediate goods by firms 1995-2014 of around 9,000 companies each year. The sample size is small and big firms are over represented.
- CBB Registros Mercantiles contains a much larger number of firms (600,000 approx), but less detailed information, in particular as regards their purchases abroad or sales abroad.
- BP micro-data used by BdE to construct the official Spanish Balance of Payments 2000-2013.

BP micro data coverage





▸ Threshold issues

Wage data and input-output tables at 4 sector digit

- UNIDO data on wages and salaries at 4 digit 1990-2014. With this data we compute the wage per employee ratio and the wage bill to output ratio (ULC).
- Input-output tables based on US information at the 4 digit SIC level provided by Bureau of Economic Analysis (BEA). We use correspondence tables to convert from SIC to our 4 digit NACE level.

Preliminary evidence on Import Switching

- Firm level input share:

$$InputSh^{IMP}_{i,s,t} = \frac{IMP_{i,s,t}}{MATERIAL_{i,s,t}}$$

- Average Import Input Share

$$InputSh^{IMP}_{i,s,t} = \beta_{0,IMP} + \alpha_i + \delta_t + u_{it}$$

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- Time dummies and firm-fixed effects

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- Time dummies and firm-fixed effects
- Error term

Time dummies

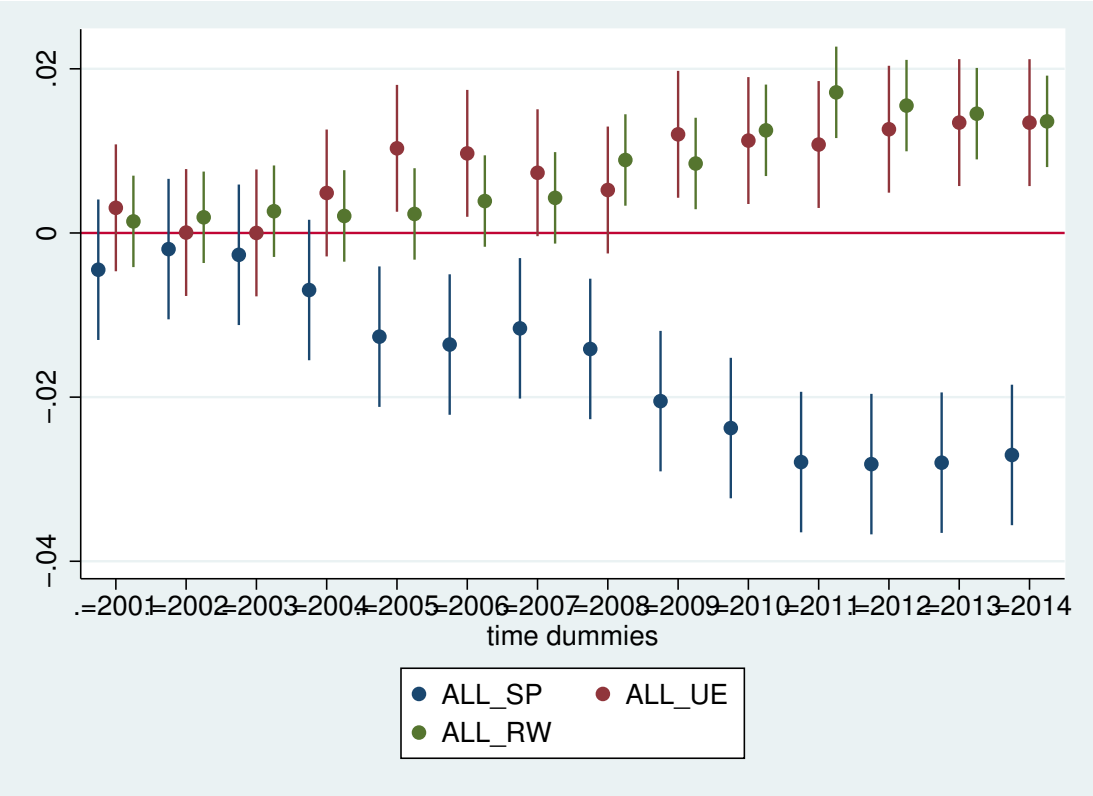

Figure: The figure provides estimated coefficients and 95 confidence intervals for the year dummies relative to 2000. The sample includes only CBA firms. Firms have been restricted to be in the sample along 2000-2013. Firms operating in certain sectors have been excluded from the regression.

▸ CBA CBB dataset

Sectoral Vertical Shocks

- Compute the wage (WageBill/Employment) in each 4 digit sector-year in each of these countries.$W^F_{s4,t} = WageBill^F_{s4,t}/L^F_{s4,t}$. $F = c1, c2, ..., c = 20$: top 20 import countries in Spain..
- Compute the average wage $\bar{W}^F_{s4,t}$ across the 20 top countries.
- Compute the relative wage to the corresponding Spanish sector $\bar{W}^F_{s4,t}/W^{ES}_{s4,t}$
- Each 4 digit sector in Spain uses inputs from other 4 digit sectors: IO matrix coefficients $(\alpha_{s4,\tilde{s}4})$
- Vertical Shock:

$$VerticalShock_{s4,t} = \sum_{s4 \neq \tilde{s}4} \alpha_{s4,\tilde{s}4} \times \frac{\bar{W}^F_{\tilde{s}4,t}}{W^{ES}_{\tilde{s}4,t}}$$

Firm Level Vertical Shocks

- Firm level share of imports from top countries (pre-crisis):

$$ShImp_i^{TOP} = \frac{1}{6} \sum_{t=2002}^{2007} ShImp_{i,t}^{TOP}$$

- Firm vertical shock:

$$VerticalShock_{i,s4,t} = ShImp_i^{TOP} \times \sum_{s4 \neq \tilde{s}4} \alpha_{s4,\tilde{s}4} \times \frac{\bar{W}^F_{\tilde{s}4,t}}{W^{ES}_{\tilde{s}4,t}}$$

Estimation strategy

- Impact on imported input share after the crisis. Expected to be negative.

$$InputSh^{IMP}_{i,s,t} = \beta_1 \times VerticalShock_{i,s4,t} \times POST + \beta_2 \times VerticalShock_{i,s4,t} + u_{it} + \alpha_i + \delta_t \quad (1)$$

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- Average effect prior to the crisis
- Time dummies and firm fixed effects

Preliminary results

	(1)	(2)	(3)	(4)	(5)
UNIDO DB	W/L	W/L	W/L	W/Y	W/Y
SAMPLE	unbalanced	balanced 13YR	balanced 14YR	balanced 13YR	balanced 14YR
VerticalShock× POST	-0.005**				
	(0.002)				
VerticalShock	0.002				
	(0.005)				
VerticalShock× POST		-0.006**	-0.005**		
		(0.002)	(0.002)		
VerticalShock		0.051**	0.041		
		(0.023)	(0.025)		
VerticalShock× POST				-0.006**	-0.005**
				(0.003)	(0.002)
VerticalShock				0.036*	0.038*
				(0.019)	(0.020)
Observations	61,035	61,035	61,035	61,035	61,035
firm	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

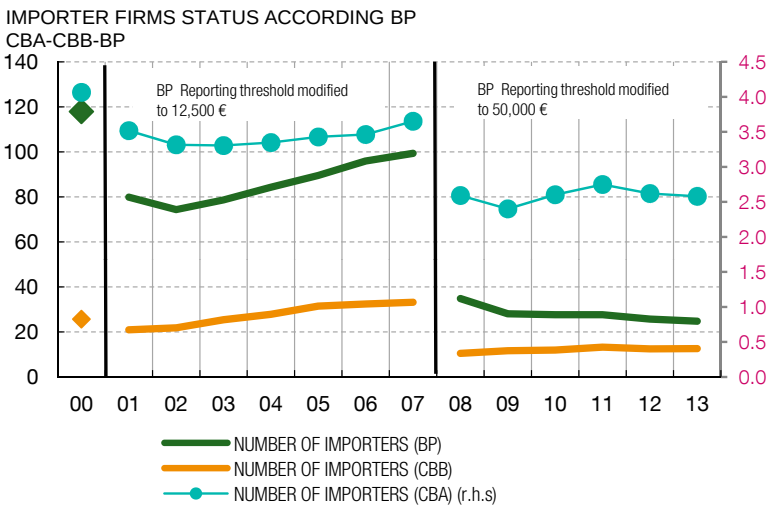
Table: This table reports the results of estimating Equation (1) for firms in the manufacturing sector. The dependent variables capture the vertical shocks that measure the initial wage differentials according to the imported input structure of firms before and after the crisis (POST).

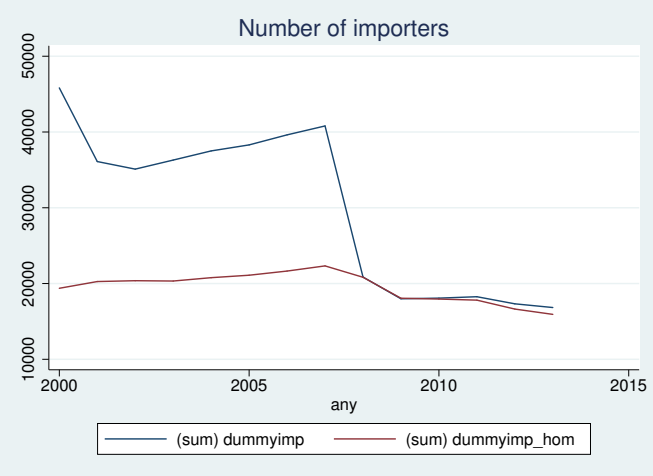
Final remarks

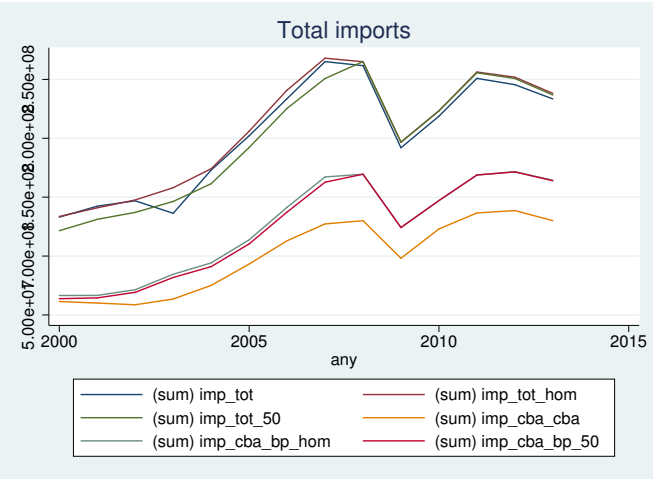
- There is tentative evidence that a proportion of firms are now producing with a higher share of domestically produced imports since 2012
- This is taking place simultaneously with an internal devaluation process
- The usage of domestic inputs has to outweigh the well-known advantages of importing: access to a wider variety of inputs, higher quality and lower costs... so as not to impact negatively on productivity
- Policy implications $\rightarrow$ Product and Labor Market Reforms are needed to boost further productivity and competitiveness gains

Thanks for your attention!

Micro data BP coverage







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Exporter/Importer premia

VARIABLES	(1) ln_empl	(2) ln_temp_empl	(3) ln_capfijo_tr	(4) ln_cn	(5) ln_endeud	(6) ln_vab_tr
dummyexport_ex	1.110***	0.0674***	0.643***	0.867***	-0.0833***	0.469***
	-0.0068	-0.00819	-0.0112	-0.00551	-0.00955	-0.0049
dummyimport_ex	1.239***	-0.0745***	0.576***	0.988***	-0.203***	0.556***
	-0.00583	-0.00748	-0.00962	-0.00474	-0.00828	-0.00424
dummy_impexp	2.288***	0.0314***	1.070***	1.377***	-0.00105	0.729***
	-0.00684	-0.00846	-0.0114	-0.00566	-0.00957	-0.00504
ln_empl	-0.240***	-0.240***	-0.202***	0.961***	-0.145***	0.0247***
	-0.000954	-0.000954	-0.00126	-0.000608	-0.00115	-0.00056
Constant	1.786***	-1.089***	3.586***	4.558***	3.970***	3.245***
	-0.00557	-0.00691	-0.00935	-0.00462	-0.00836	-0.00415
Observations	1,823,442	980,512	1,653,844	1,782,012	1,204,246	1,697,173
R-squared	0.129	0.121	0.044	0.668	0.033	0.069
FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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Time dummies

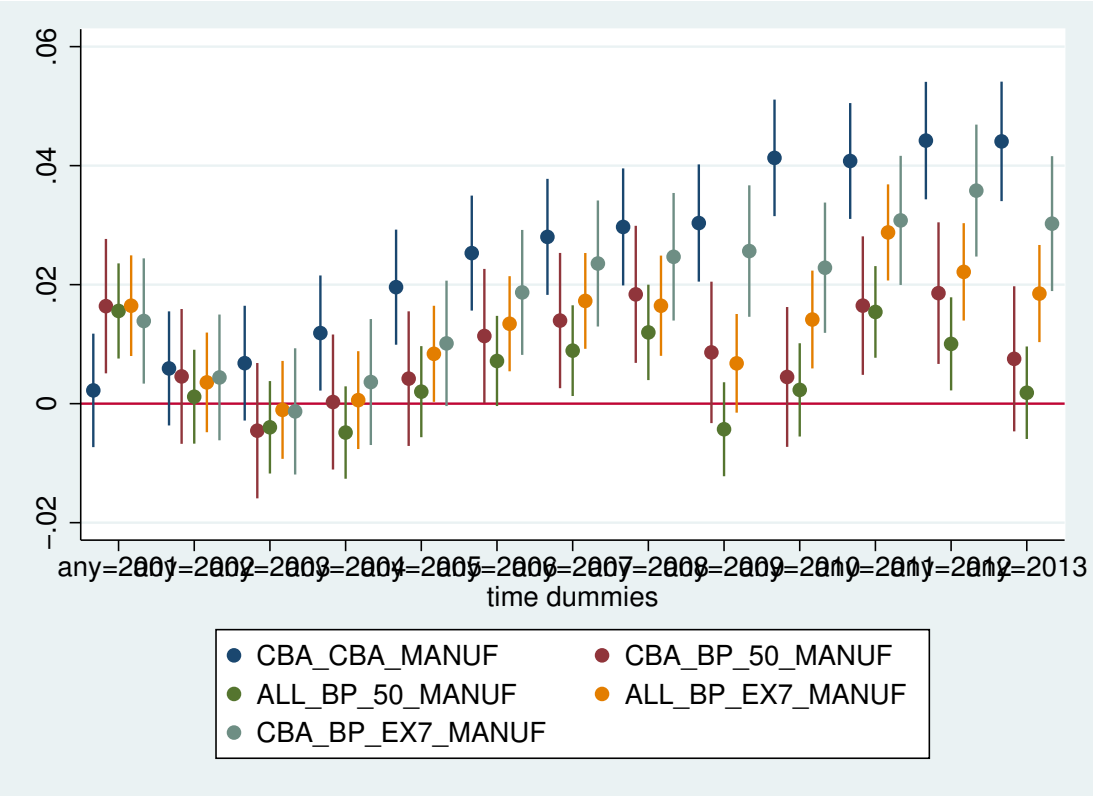

Figure: The figure provides estimated coefficients and 95 confidence intervals for the year dummies relative to 2000 for firms in the manufacturing sector. The sample includes CBA firms and CBB firms with BP data (only transactions above 50.000 and excluding machinery and equipment). Firms have been restricted to be in the sample along 2000-2013.

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