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Deregulation and growth in Italy

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**XXIV Villa Mondragone International Economic Seminar on
“PUBLIC DEBT, GLOBAL GOVERNANCE
AND ECONOMIC DYNAMISM”**

June 26th - June 28th, 2012

MINISTERO DELL'ECONOMIA E DELLE FINANZE

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Aim of the exercise

- We analyse the effects of anti-competitive service regulation on economic performance in Italy. We estimate the effects of deregulation in Italy's product market on structural value added growth during the 1996-2011 period.
- Main references on this subject: Forni, Gerali and Pisani (2010); Barone, Cingano (2010).
- To capture progresses in the reforms, we refer to the **OECD Product Market Regulation (PMR) indicator and in particular to its sectoral indicators ETCR** (Energy, Transport, Communications, Regulation Indicator) and **RBSR** (Retail trade and the Professional Services Indicators).

Literature in a nutshell

■ Empirical evidence:

- Countries with higher costs of entry experience slower growth (Klapper et al. 2006), regulation favours within-industry concentration of production, but does not affect its reallocation across industries within countries (Fisman, Sarria-Allende, 2004), countries where registering new businesses is quicker experience more entries in industries benefiting from expansionary global demand and technology shifts (Ciccone, Papaioannou, 2007).
- Regulatory reforms in sectors which are traditionally sheltered from competition had a significant positive impact on their investment levels (Alesina et al. 2005) and on employment (Bertrand and Kamartz, 2002).
- If financial development increases aggregate productivity growth by lowering the cost of external funds then growth in intensive external finance industries should be faster in financially developed countries (Rajan, Zingales 1998).

Methodological framework 1/6

Starting from the baseline of Barone, Cingano (2010) for 17 countries, 15 manufacturing sectors and 4 services in the period 1996-2002:

$$VAj,c = \alpha + \beta * \sum w_{j,s} * X_{c,s} + \varphi SHARE_{j,c} + \mu_c + \mu_j + \varepsilon_{j,c}$$

VAj,c: is the average (1996-2002) real value added (VA) growth in industry *j* and country *c*

Xc,s: are the beginning-of-period regulation indicators in the four service sectors (measured by the OECD indexes)

wj,s: are the technical coefficients obtained from the **1997 US I-O Matrix**, measuring direct industry *j* dependence on service *s* inputs

SHAREj,c: is the beginning-of-period VA share of industry *j* in country *c*

SERVREG=Σ(wj,s*Xc,s): captures within-country differences in the relevance of service sectors regulation for each manufacturing industry *j*

Methodological framework 2/6

Our model studies the effects of deregulation in Italy, for the 58 sectors of the whole economy and for the 27 manufacturing sectors and 6 services (Telecommunications, Professions, Energy, Air, Road and Rail Transport) in the periods 1998-2003-2008-2011:

$$DVAj,t = \alpha + \beta * \sum_s (wj,s, t^* Xs, t) + \varphi DSHAREj,t + \mu t + \mu j + \varepsilon j,t$$

where

DVAj,t: the average growth rate (5-term moving average) of the real VA

wj,s,t: the technical coefficients obtained from the **Italy I-O Tables**, published in 2011 (ISTAT) for the period 1995-2008.

DSHAREj,t: the variation of the share on total value-added of each sector j in 1998, 2003 and 2008.

Methodological framework 3/6

We also introduce two additional control variables: private sector credit and the CPB, World Trade Monitor:

$$DVAj,t = \alpha + \beta * \Sigma_s (wj,s, t^* Xs, t) + \varphi * DSHAREj,t + \delta * DCREDITj,t + \gamma * DCPBj,t + \mu t + \mu j + \varepsilon j, t$$

Where

DCREDITj,t: is the average growth rate (5-term moving average) of the private credit to non financial corporations for the years 1998-2003-2008-2011.

DCPBj,t: is the world trade average growth rate (5-term moving average).

Methodological framework 5/6

- **Italy I-O Matrix:** In October 2011, ISTAT released the latest Italy's I-O accounts for the period 1995-2008, which are consistent with National Account data published in April 2011. We re-constructed the I-O tables in the last 3 years of our sample, from the 2008 I-O table and the VA in the 2009-2011 period. Data are at current basic prices.
- **UK I-O Tables:** Released by the Office of National Statistics on 1999.
- **Technical coefficients ($W_{j,s}$):** For the 2009-2011 period the coefficients are based on the I-O matrix of 2008.
- **VA_{j,t}:** VA data in the period 2009-2010 are coherent with National accounts published in March 2011, while VA in 2011 is consistent with revised data released in March 2012.

Methodological framework 6/6

- We tested if the conclusions of Barone, Cingano (2010) could be achieved using the **national I-O matrices** (instead of the US or the UK matrices).
- We checked the results of our model using the UK I-O 1999 tables showing that a national I-O matrix could be adopted, **overcoming the endogeneity** between the regulatory indexes and the technical coefficients. This allows the estimation of models which are more useful to the Italian policy maker.
- There is **no correlation between the ETCR and the RBSR** indicators for Italy **and** the corresponding **technical coefficients** derived from the 2003 and 1998 I-O matrices for Italy, as for the 1999 UK I-O matrix.

Correlations – Technical Coefficients and Regulation

Correlation Matrix	UK 99 technical coefficient Energy	UK 99 technical coefficient Road	UK 99 technical coefficient Rail	UK 99 technical coefficient Air	UK 99 technical coefficient Telecom	UK 99 technical coefficient Professions
OECD Regulation Indicator Energy IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Road IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Rail IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Air IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Telecom IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Professions IT	0.00	0.00	0.00	0.00	0.00	0.00

Correlation Matrix	Italian 03 technical coefficient Energy	Italian 03 technical coefficient Road	Italian 03 technical coefficient Rail	Italian 03 technical coefficient Air	Italian 03 technical coefficient Telecom	Italian 03 technical coefficient Professions
OECD Regulation Indicator Energy IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Road IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Rail IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Air IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Telecom IT	0.00	0.00	0.00	0.00	0.00	0.00
OECD Regulation Indicator Professions IT	0.00	0.00	0.00	0.00	0.00	0.00

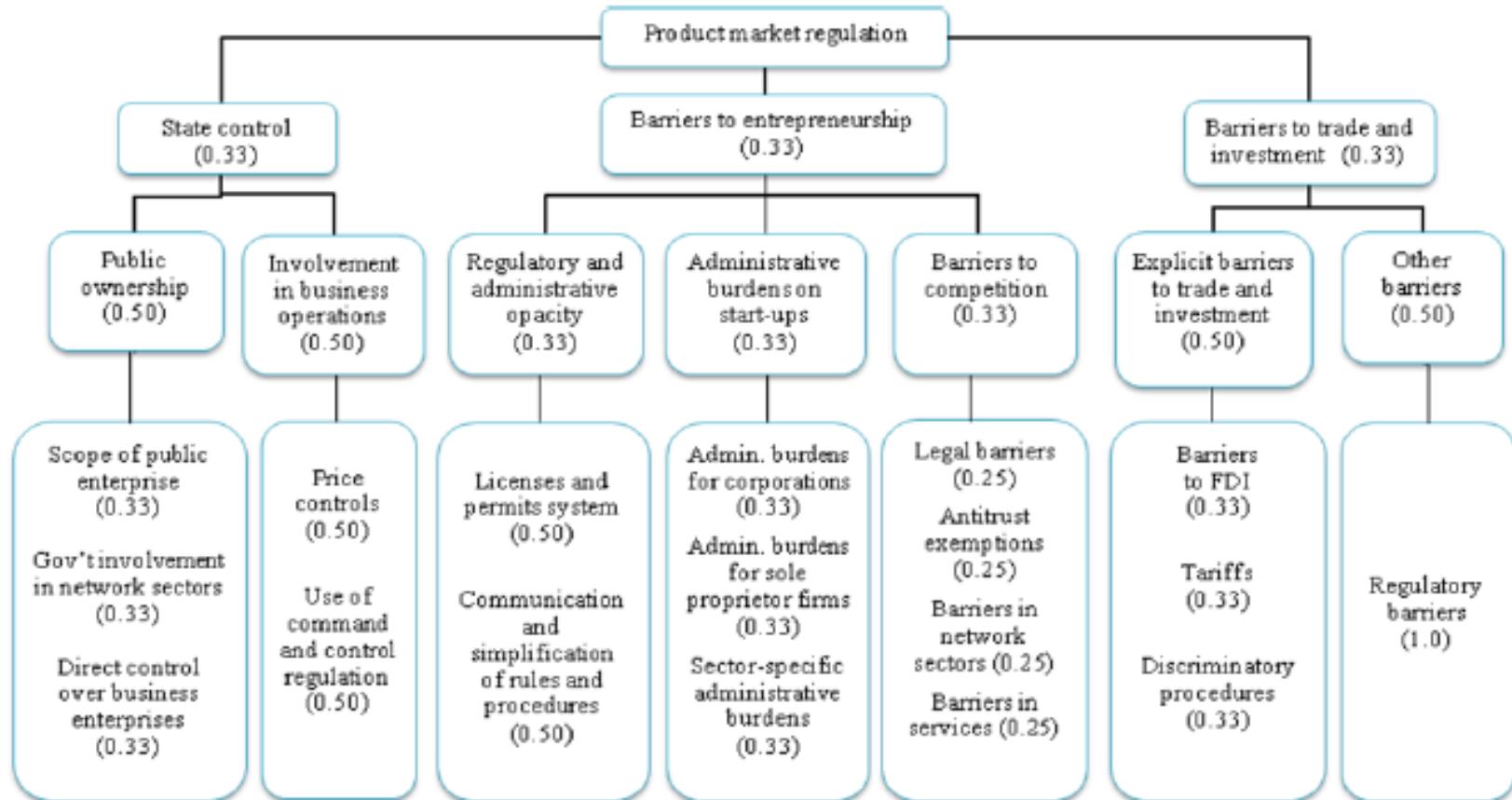
Correlation Matrix	Italian variable technical coefficient Energy	Italian variable technical coefficient Road	Italian variable technical coefficient Rail	Italian variable technical coefficient Air	Italian variable technical coefficient Telecom	Italian variable technical coefficient Professions
OECD Regulation Indicator Energy IT	0.00	-0.11	-0.11	0.18	-0.02	-0.18
OECD Regulation Indicator Road IT	0.05	-0.12	-0.12	0.16	0.04	-0.14
OECD Regulation Indicator Rail IT	0.01	-0.11	-0.11	0.17	-0.01	-0.17
OECD Regulation Indicator Air IT	0.03	-0.10	-0.10	0.15	0.02	-0.14
OECD Regulation Indicator Telecom IT	-0.01	-0.10	-0.10	0.17	-0.03	-0.17
OECD Regulation Indicator Professions IT	0.06	-0.08	-0.08	0.09	0.06	-0.07

OECD Product Market Regulation (PMR) Indicator 1/3

- In 1998, the OECD Indicator of PMR was developed, measuring regulation at the economy-wide level.
- The indicator records values on a scale from 0 to 6 where 6 represents the most restrictive-to-competition regulatory set up.
- In 2008, a new "integrated PMR indicator" was produced to join previously separated economy-wide and sectoral indicators into a single, more comprehensive measure of product market regulation.
- The new "integrated PMR indicator" is constructed on 18 low-level components.

OECD Product Market Regulation (PMR) Indicator 2/3

The structure of the integrated PMR indicator



Source: OECD, *Product Market Regulation Database*.

OECD Product Market Regulation (PMR) Indicator 3/3

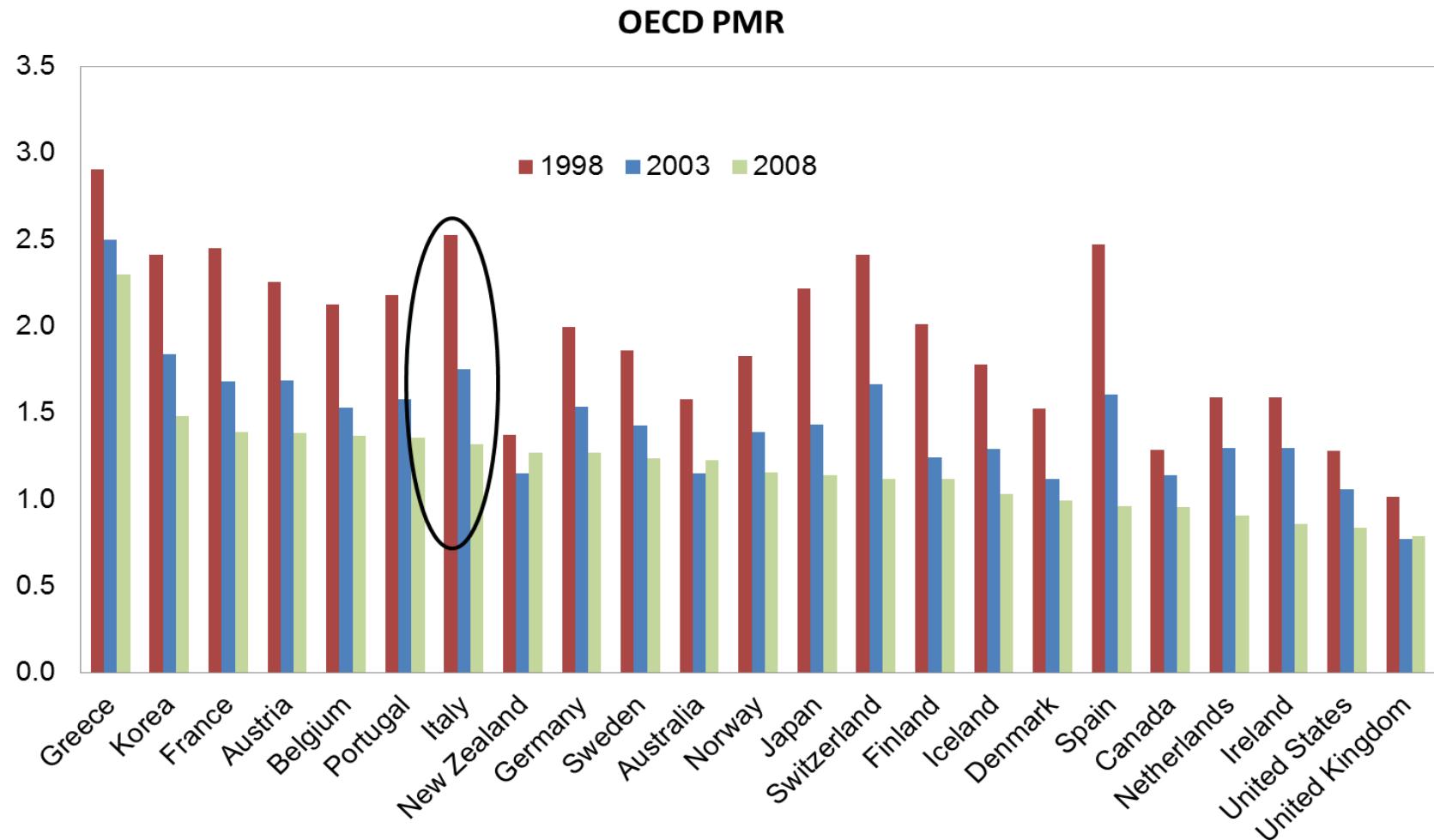
- In our analysis, we use the Energy, Transport, Communications, Regulation Indicator (**ETCR**) and the Retail trade and the Professional Services Indicators (**RBSR**).
- Both the sectoral and the general PMR indicators are compiled on the basis of a questionnaire on the regulation at the time the answers are provided. This means that the indicator does not measure the degree of “implementation” of the regulation but only the legal framework.

2012 PMR Indicator for Italy

- Preliminarily update only for Italy (end of March 2012), including the impact of measures adopted since 2008.
- Improvement by 13% of the PMR indicator as a whole.
- Higher pick up mainly in public services (17%), in professions (31%) and retail trade (11%).
- Marked reduction of barriers to trade and FDI partially filling the gap between Italy and other European countries¹.

1 Source: MEF, Economic and Financial Document 2012, National Reform Programme .

PMR Indicator: an international comparison

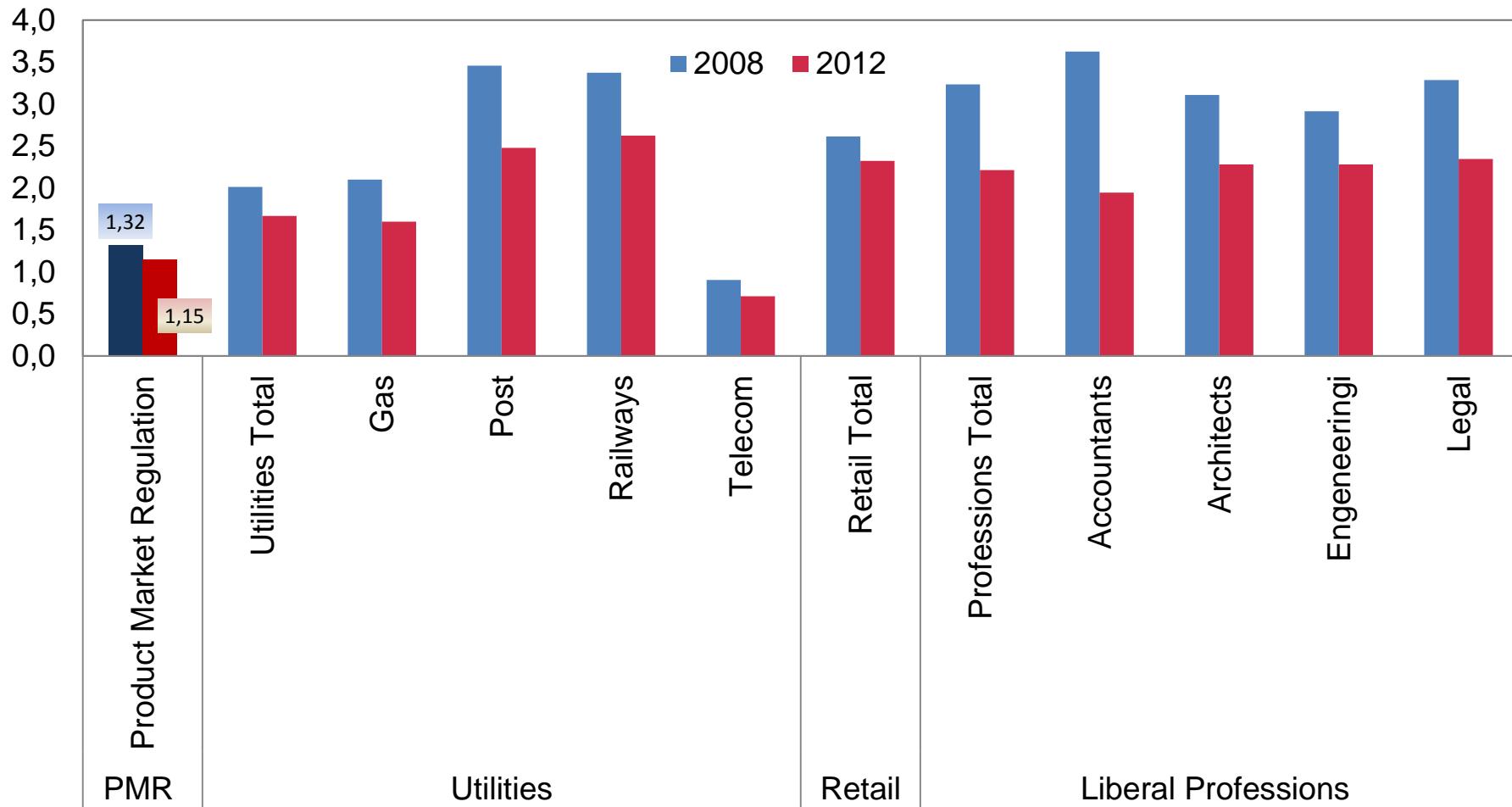


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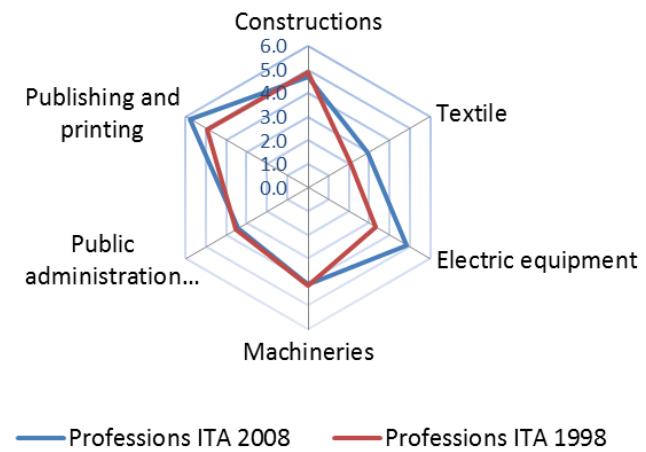
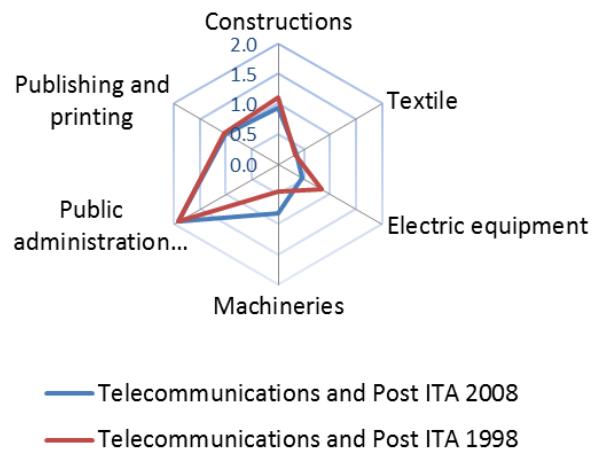
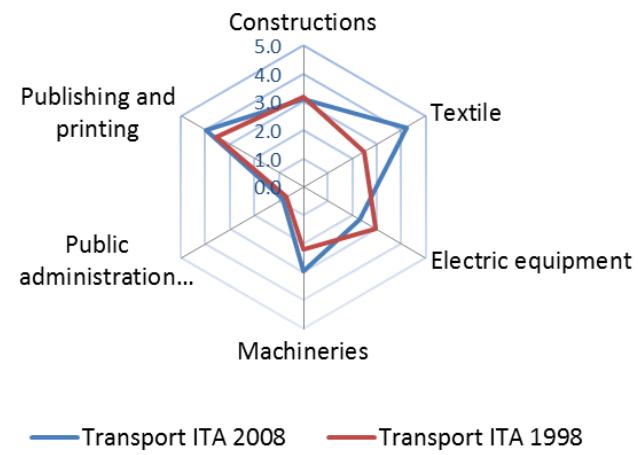
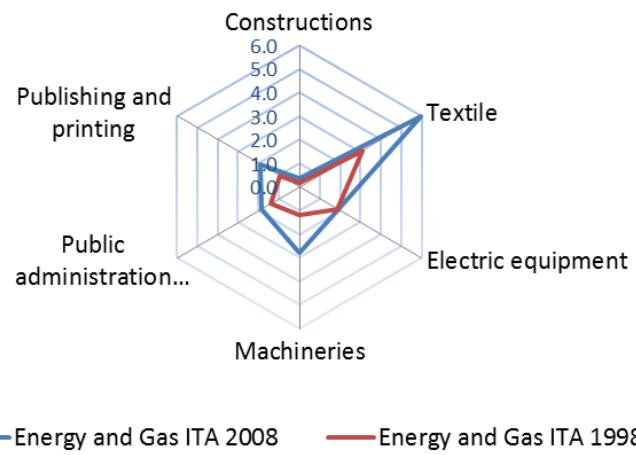


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2012 PMR Indicator for Italy



Sectoral technical coefficients



Results: Economy and Regulation

Dependent variable: real VA moving average 5 year, at sector level

Economy - 58 sectors

	Variable Technical Coefficients						Technical Coefficients 1998						Technical Coefficients 2003					
	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe
SERVREG S(wj,s*Xs,t)	-0,040* (0,024)	-0,148*** (0,051)	-0,038 (0,025)	-0,142** (0,054)	-0,041* (0,025)	-0,159*** (0,054)	0,038 (0,025)	-0,182*** (0,054)	-0,038 (0,026)	-0,216*** (0,062)	-0,039 (0,026)	-0,225*** (0,062)	-0,035* (0,020)	-0,149*** (0,041)	-0,036* (0,021)	-0,175*** (0,045)	-0,036* (0,021)	-0,178*** (0,045)
Credit	1,436*** (0,488)	2,174*** (0,609)			1,360* (0,781)	1,785** (0,871)	1,427*** (0,493)	2,454*** (0,628)			1,294* (0,780)	1,611* (0,847)	1,442*** (0,488)	2,390*** (0,595)			1,275* (0,778)	1,520* (0,838)
d SHARE	0,063*** (0,007)	0,048*** (0,009)	0,064*** (0,007)	0,051*** (0,009)	0,063*** (0,007)	0,049*** (0,009)	0,062*** (0,007)	0,042*** (0,009)	0,063*** (0,007)	0,044*** (0,009)	0,062*** (0,007)	0,043*** (0,009)	0,063*** (0,007)	0,042*** (0,009)	0,064*** (0,007)	0,044*** (0,009)	0,063*** (0,007)	0,042*** (0,009)
CPB			20,722*** (8,815)	33,436*** (11,393)	1,724 (13,990)	10,046 (16,023)			21,429*** (9,081)	46,881*** (12,684)	3,146 (14,253)	25,056 (17,001)			22,055*** (8,982)	45,355*** (11,766)	3,922 (14,224)	24,169 (16,495)
α	-6,384* (3,671)	-8,589** (4,135)	-2,143 (2,803)	-2,924 (3,149)	-6,354* (3,690)	-8,552** (4,147)	-6,504* (3,696)	-10,081*** (4,180)	-2,467 (2,834)	-5,427* (3,232)	-6,467* (3,710)	-10,517*** (4,168)	-6,562* (3,682)	-9,919*** (4,098)	-2,584 (2,828)	-5,424* (3,168)	-6,513* (3,697)	-10,160*** (4,081)
obs	174	174	174	174	174	174	174	174	174	174	174	174	174	174	174	174	174	
R-squared	0,35	0,26	0,33	0,29	0,35	0,25	0,34	0,22	0,33	0,19	0,34	0,19	0,35	0,22	0,34	0,19	0,35	0,19

* 10%, ** 5%; *** 1%

Results: Economy and Δ Regulation

Dependent variable: real VA moving average 5 year, at sector level

Economy - 58 sectors

	Technical Coefficients 1998				Technical Coefficients 2003			
	ols	fe	ols	fe	ols	fe	ols	fe
d SERVREG	-0,166*** (0,054)	-0,290*** (0,113)	-0,166*** (0,054)	-0,293*** (0,113)	-0,134*** (0,041)	-0,217*** (0,084)	-0,134*** (0,041)	-0,217*** (0,084)
S(wj,s* Δ Xs,t)	1,222** (0,522)	1,365*** (0,514)			1,159** (0,518)	1,233** (0,511)		
Credit								
d SHARE	0,069*** (0,008)	0,046*** (0,012)	0,069*** (0,008)	0,046*** (0,012)	0,067*** (0,008)	0,047*** (0,012)	0,067*** (0,008)	0,047*** (0,012)
CPB			41,905** (17,898)	46,804*** (17,607)			39,749** (17,763)	42,284** (17,529)
α	-7,825** (4,032)	-10,157** (4,191)	-11,020** (5,374)	-13,726** (5,478)	-7,254* (3,969)	-8,760** (4,019)	-10,285** (5,303)	-11,985** (5,308)
obs	174	174	174	174	174	174	174	174
R-squared	0,49	0,44	0,49	0,44	0,49	0,46	0,49	0,46

* 10%; ** 5%; *** 1%

Results: Manufacturing and Regulation

Dependent variable: real VA moving average 5 year, at sector level

Manufacturing - 27 sectors

	Variable Technical Coefficients						Technical Coefficients 1998						Technical Coefficients 2003							
	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols	fe	ols
SERVREG S(w _{j,s} *X _{s,t})	-0,160*** (0,043)	-0,065** (0,028)	-0,184*** (0,045)	-0,072** (0,029)	-0,187*** (0,045)	-0,072** (0,029)	-0,077*** (0,022)	-0,030** (0,014)	-0,089*** (0,023)	-0,032** (0,014)	-0,090*** (0,023)	-0,032** (0,015)	-0,160*** (0,033)	-0,049** (0,021)	-0,207*** (0,034)	-0,057*** (0,022)	-0,207*** (0,034)	-0,057*** (0,022)		
Credit	1,786*** (0,698)	0,910 (0,589)			0,617*** (0,979)	0,237 (0,907)	1,470** (0,670)	0,742 (0,572)			0,337 (0,988)	0,117*** (0,912)	2,068*** (0,648)	0,844 (0,576)			0,214 (0,858)	0,033 (0,902)		
d SHARE	0,074*** (0,008)	0,077*** (0,006)	0,077*** (0,007)	0,079*** (0,006)	0,076*** (0,008)	0,078*** (0,006)	0,072*** (0,008)	0,077*** (0,006)	0,075*** (0,007)	0,078*** (0,006)	0,075*** (0,008)	0,078*** (0,006)	0,066*** (0,007)	0,077*** (0,006)	0,069*** (0,007)	0,077*** (0,006)	0,068*** (0,007)	0,078*** (0,006)		
CPB				39,121*** (12,833)	19,407* (10,728)	30,836* (18,425)	16,107 (16,610)			33,310*** (12,281)	16,359 (10,420)	28,587 (18,597)	14,693 (16,685)			55,104*** (11,933)	20,199* (10,707)	52,094*** (17,168)	19,720 (16,904)	
α	-5,840 (4,840)	-2,268** (4,326)	-4,089 (3,585)	-1,410 (3,264)	-6,047 (4,758)	-2,147 (4,330)	-4,590 (4,810)	-1,610 (4,310)	-3,546 (3,598)	-1,087 (3,272)	-4,586 (4,742)	-1,446 (4,320)	-7,552* (4,551)	-2,179 (4,310)	-7,906** (3,297)	-1,990 (3,298)	-8,559** (4,236)	-2,091 (4,300)		
obs	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81		
R-squared	0,64	0,69	0,63	0,69	0,63	0,69	0,63	0,68	0,62	0,69	0,62	0,69	0,57	0,69	0,52	0,69	0,52	0,69		

* 10%; ** 5%; *** 1%



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Results: Manufacturing and Δ Regulation

Dependent variable: real VA moving average 5 year, at sector level

Manufacturing - 27 sectors

	Technical Coefficients 1998				Technical Coefficients 2003			
	fe	ols	fe	ols	fe	ols	fe	ols
d SERVREG S(wj,s* Δ Xs,t)	-0,247*** (0,059)	-0,193*** (0,026)	-0,247*** (0,059)	-0,193*** (0,026)	-0,323*** (0,084)	-0,242*** (0,038)	-0,323*** (0,084)	-0,242*** (0,038)
Credit	0,253 (0,486)	0,133 (0,433)			0,456 (0,501)	0,248 (0,467)		
d SHARE	0,049*** (0,007)	0,064*** (0,005)	0,049*** (0,007)	0,064*** (0,005)	0,048*** (0,008)	0,067*** (0,005)	0,048*** (0,008)	0,067*** (0,005)
CPB			8,670 (16,660)	4,564 (14,849)			15,642 (17,175)	8,493 (16,006)
α	-3,510 (3,703)	-1,892 (3,295)	-4,171 (4,925)	-2,240 (4,409)	-5,389 (3,961)	-2,930 (3,568)	-6,581 (5,212)	-3,577 (4,776)
obs	54	54	54	55	54	54	54	54
R-squared	0,85	0,88	0,85	0,88	0,81	0,86	0,81	0,86

* 10%; ** 5%; *** 1%

Energy and Professions Regulation

Dependent variable: real VA moving average 5 year, at sector level

	Technical Coefficients 1998				Technical Coefficients 2003			
	Economy		Manufacturing		Economy		Manufacturing	
	fe	ols	fe	ols	fe	ols	fe	ols
ENERGY	-0,241*** (0,063)	-0,055* (0,033)	-0,269*** (0,047)	-0,079** (0,031)	-0,185*** (0,046)	-0,042* (0,024)	-0,200*** (0,033)	-0,598*** (0,022)
PROFESSIONS	0,038 (0,578)	0,018 (0,046)	-1,791* (0,981)	-0,204 (0,143)	0,072 (0,514)	0,028 (0,043)	-1,474* (0,824)	0,199 (0,124)
d SHARE	0,044*** (0,009)	0,064*** (0,007)	0,068*** (0,007)	0,076*** (0,006)	0,043*** (0,009)	0,064*** (0,007)	0,068*** (0,007)	0,076*** (0,006)
CPB	33,247*** (10,083)	20,053** (8,621)	40,108*** (10,670)	16,157 (10,132)	33,094*** (9,905)	19,967** (8,570)	38,980** * (10,338)	16,083 (10,019)
α	-6,379 (7,872)	-2,569 (2,893)	8,654 (9,170)	-0,057 (3,410)	-4,780 (7,991)	-2,362 (2,892)	8,434 (9,071)	2,237 (3,400)
obs	174	174	81	81	174	174	81	81
R-squared	0,19	0,34	0,45	0,69	0,19	0,34	0,47	0,69

* 10%; ** 5%; *** 1%

Energy and Professions Δ Regulation

Dependent variable: real VA moving average 5 year, at sector level

	Technical Coefficients 1998				Technical Coefficients 2003											
	Economy		Manufacturing		Economy		Manufacturing									
	fe	ols	fe	ols	fe	ols	fe	ols								
dENERGY	-0,259*	(0,134)	-0,182***	(0,057)	-0,299***	(0,098)	-0,248***	(0,036)	-0,186*	(0,099)	-0,138***	(0,042)	-0,225***	(0,072)	-0,187***	(0,026)
dPROFESSIONS	-0,150	(0,501)	0,114	(0,479)	-1,889	(1,301)	-1,078	(1,037)	0,323	(0,461)	-0,249	(0,442)	-1,613	(1,131)	-0,890	(0,887)
d SHARE	0,048***	(0,012)	0,068***	(0,008)	0,046***	(0,007)	0,065***	(0,005)	0,046***	(0,012)	0,066***	(0,008)	0,044***	(0,007)	0,064***	(0,005)
CPB	30,184***	(31,703)	31,439	(27,933)	41,509	(50,150)	14,805	(36,222)	41,528	(32,136)	39,419	(28,718)	43,214	(50,542)	15,275	(36,167)
α	-7,083	(9,096)	-7,134	(8,253)	-12,280	(14,359)	-4,165	(10,702)	-10,339	(9,266)	-9,479	(8,496)	-12,708	(14,515)	-4,228	(10,694)
obs	116		116		54		54		116		116		54		54	
R-squared	0,47		0,49		0,84		0,87		0,48		0,50		0,85		0,88	

* 10%; ** 5%; *** 1%

Conclusions

- Our results for Italy are in line with previous literature and they are consistent for the economy as a whole and the manufacturing sector.
- We detect the **effects** of the level of regulation and of Δ regulation as an aggregate and specifically for the Energy and Professions.
- Our model, by extending the time and the sector dimensions, estimates the effect of sector regulation for Italy using both statistically exogenous and endogenous technical coefficients. In particular, the exogenous coefficients proceed from the 1998 and 2003 Italian I-O matrix.
- We show that a national I-O matrix could be adopted, **overcoming the endogeneity** between the regulatory indexes and the technical coefficients. This step allows the estimation of models which are more informative for the Italian policy maker.