

WAGE AND PRODUCTIVITY IN ARGENTINA

A structural and distributional approach in the manufacturing sector

María Celeste Gómez (*) & Maria Enrica Virgillito (**)

(*) Centro de Investigaciones en Ciencias Económicas (UNC-CONICET), Cordoba, Argentina. (**) Institute of Economics, Sant'Anna School of Advanced Studies, Pisa, Italy and Department of Economic Policy, Università Cattolica del Sacro Cuore, Milan, Italy.

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MOTIVATION

- Like most Latin American countries, Argentina faces two significant and *persistent gaps in productivity* levels under the perspective of neostructuralism (Chena, 2016):
 - External gaps (Abeles & Amar, 2017; Abeles, Lavarello & Montagu, 2018);
 - Internal gaps (Cimoli, 2005; Grazzi et al., 2016; Graña, 2018).
- *Wage inequality* (personal & functional) relates to *structural heterogeneity* (CEPAL, 2012) .
- Institutional background defining wage regulatory regimes (Mishel & Bivens, 2021) :
 - Collective bargaining system (Alejo & Casanova, 2010, Gómez, 2020).
 - Minimum wage settings (Marshall, 2013, 2019)
- Unstable macroeconomic environment undermine the chances for developing
 - Lack of sustained growth (Pritchett, 2000; Cárcamo Díaz & Pineda Zalazar, 2014).
 - Limited access to credit financing (Arza & López, 2010; Pagés, 2010).



THEORETICAL BACKGROUND

- Evolutionary & structuralist approaches to economic development deal with *structure and growth*:
 - Evolutionary theory (Dosi, 1982; Dosi et al., 1988; Nelson & Winter, 1982)
 - Structural change: accumulation of *knowledge and capabilities* (Cimoli, Dosi & Stiglitz, 2009).
- Manufacturing as the *engine of growth*:
 - Productivity growth;
 - Wage-productivity pass through (Schwellnus, Kappeler & Pionnier, 2017);
 - Employment multiplier (Bivens, 2003).
- Uneven patterns of *deindustrialization* and strategies for *specialization* or *diversification* according technological classes (Pavitt, 1984; Dosi, Riccio & Virgillito, 2021, 2022):
 - Upstream aggregates
 - Downstream aggregates



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RESEARCH QUESTIONS

- | | | |
|---|--|--|
| <ul style="list-style-type: none">• ¿What is the nexus between labour productivity and wages in the Argentinean manufacturing sector? | <ul style="list-style-type: none">• ¿Does it differ under sectoral /technological decomposition or at different wage levels? | <ul style="list-style-type: none">• ¿Which factors affect this linkage, considering Argentina as a late-industrialising middle-income country? |
|---|--|--|

Long-run trends: labour productivity vs real wage

Phase I: Coupling until 1973

Phase II: Constant decoupling until 1990

Phase III: Divergent decoupling since 1990

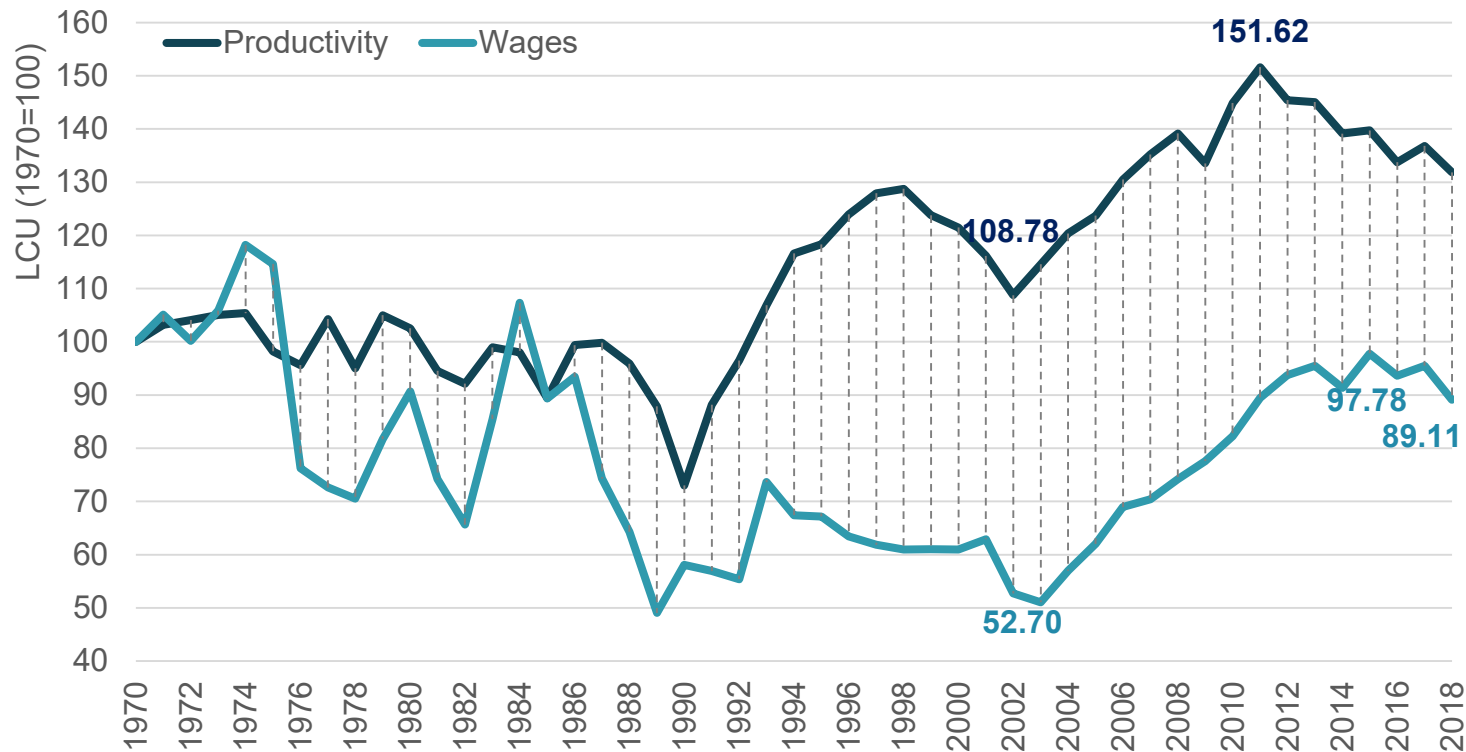


Figure A. Labour productivity and average wage in the manufacturing sector. Argentina, 1970-2018. Constant LCU (1970=100)
Source: own elaboration on Graña & Terranova (2020).

Sectoral composition: employment level and wage gaps

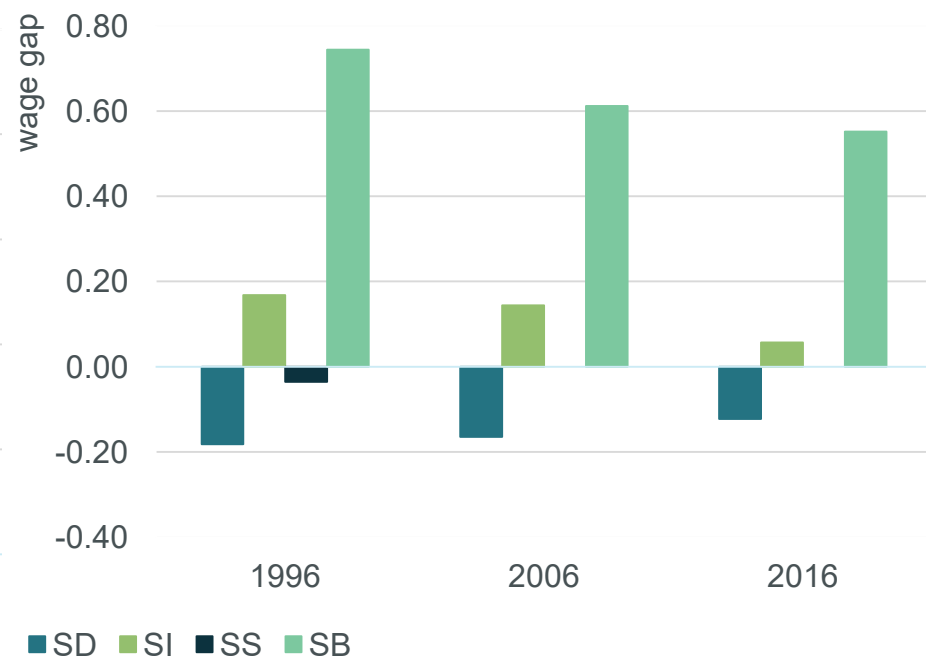
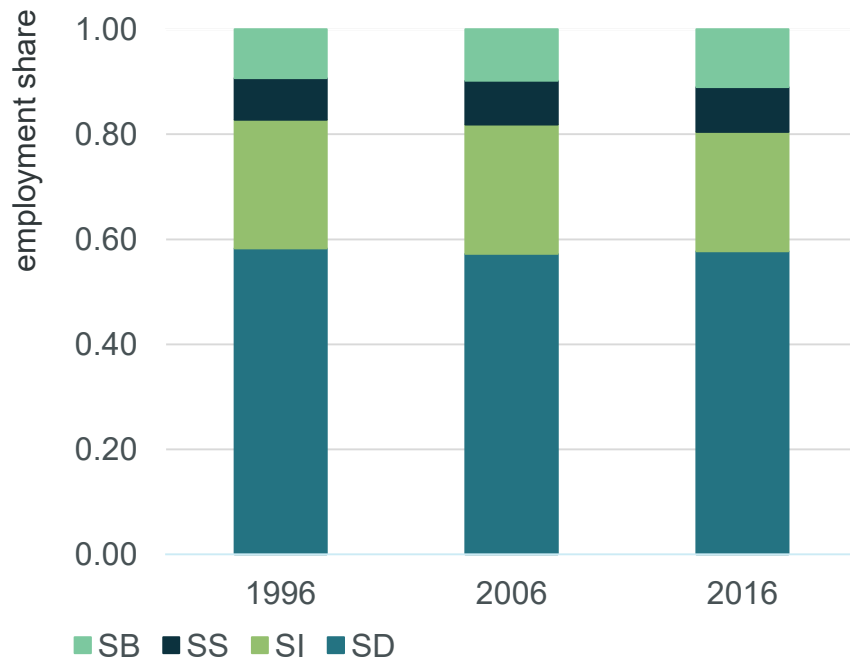


Figure B1. Total employment by Pavitt classes' in Argentina (1996-2016). Registered jobs. Source: own elaboration on MTEySS.

Figure B2. Wage gaps between class averages and industrial average. Pavitt taxonomy. Argentina (1996-2016). Registered jobs. Note: zero level represents industry level. Source: own elaboration on MTEySS.

Exporting firms by Pavitt Taxonomy

Pavitt Class	Share of exporting firms per class	Pavitt share of exporting firms
SD. Supplier dominated	21.3%	43.7%
SI. Scale intensive	29.7%	24.2%
SS. Specialised suppliers	48.0%	13.5%
SB. Science-based	49.3%	18.6%

Science-based (SB) class and the specialised suppliers (SS) class show the highest propensity to export.

Among exporting firms' group: a large share of the supplier dominated class (43.7%) followed by the scale intensive class (24.2%).

This revealed structure among the exporting firms should not yield positive results for the country (bad specialisation strategy) (Dosi et al., 2022).

Table A. Share of exporting firms by Pavitt Taxonomy and Pavitt Share of exporting firms. Source: own elaboration on ENDEI (MINCyT & MTEySS).



DATA & EMPIRICAL STRATEGY

Estimation data

- National survey on Innovation and employment (ENDEI, 2010-2016) (MINCyT & MTEySS).
- Almost 4.000 firms in the formal sector each year at the most representative sectors in manufacturing.

Empirical strategy

- We focus on the pass-through between productivity and wages (Card, Cardoso, Heining & Kline, 2018; Dosi, Virgillito, Yu, 2020) at different levels of analysis:
 - Manufacturing sectors at 2-ISIC code levels;
 - Technological classes by Pavitt taxonomy (Pavitt, 1984): supplier dominated (SD); scale intensive (SI); specialized suppliers (SS); science-based industries (SB).

BASE MODEL

$$w_{it} = \alpha + \beta_{\tau} \pi_{it} + y_t + \epsilon_{\tau it} \quad (1)$$

- w_{it} = (log) real average wage per firm, deflated by CPI (2010=100)
- π_{it} = (log) real value added per worker, deflated by PPI (2010=100)
- y_{it} = year dummies

MODEL WITH CONTROLS

$$w_{it} = \alpha + \beta_{\tau 1} \pi_{it} + \beta_{\tau 2} \text{exp} + \beta_{\tau 3} \text{for} + \dots \\ \dots + \beta_{\tau 4} \text{age} + \beta_{\tau 5} \text{size} + y_t + \epsilon_{\tau it} \quad (2)$$

- $\text{exp} = (1,0)$ if the firm exports
- $\text{for} = (1,0)$ if the firm has at least 1% of foreign capital share
- $\text{age} = (1,0)$ if the firm has at least 10 years in the market
- $\text{emp} = (\log)$ employment of the firm

Estimations using conditional quantile regressions (Koenker & Bassett, 1978) for seven quantiles (p5, p10, p25, p50, p75, p90, p95).

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RESULTS BASE MODEL

Wage – productivity nexus



BASE MODEL

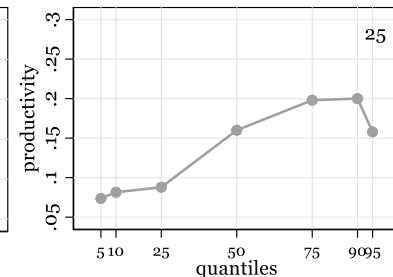
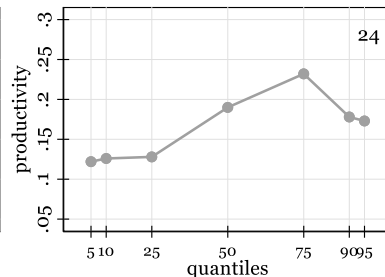
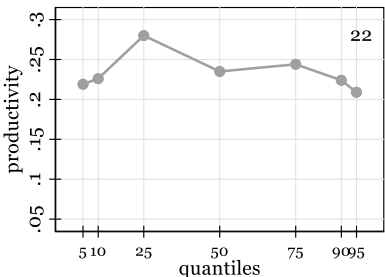
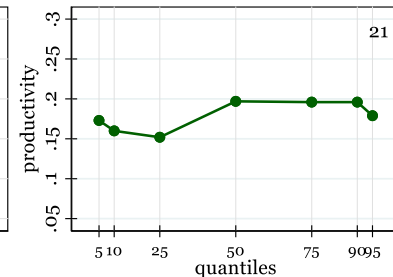
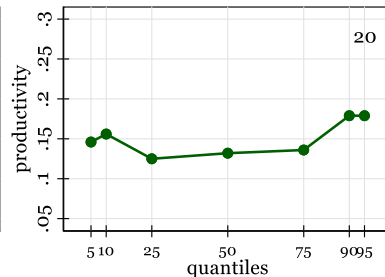
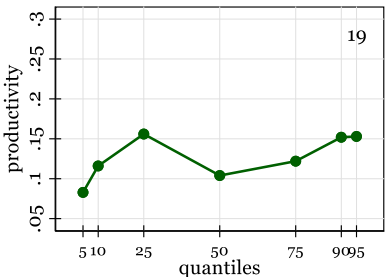
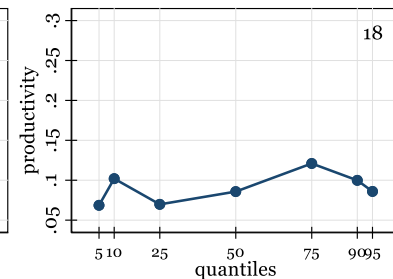
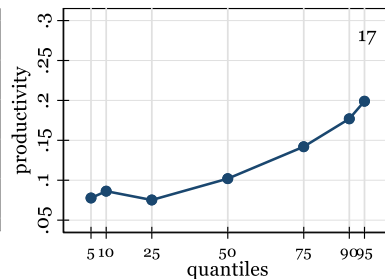
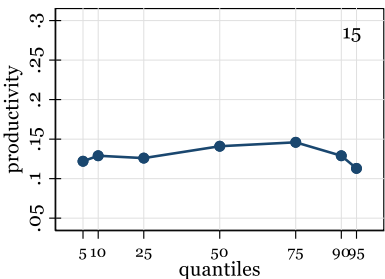
Manufacturing sectors		ISIC Code	Median coefficients across sectors	Pseudo R2 (median)
Pavitt Taxonomy	All	-	0.163	0.070
Supplier Dominated	Food products and beverages	15	0.141	0.066
	Textiles	17	0.102	0.039
	Wearing apparel and footwear	18	0.086	0.048
	Leather and leather products	19	0.104	0.040
	Wood and wood products	20	0.132	0.062
	Fabricated metal products	28	0.177	0.786
	Furniture	36	0.107	0.064
Scale intensive	Paper and paper products	21	0.197	0.073
	Printing and Publishing	22	0.235	0.107
	Rubber and plastics products	25	0.160	0.066
	Other non-metallic mineral products	26	0.164	0.762
	Basic metals	27	0.180	0.090
	Trailers, semi-trailers and automobile parts (*)	34	0.100	0.031
Specialised suppliers	Machinery and equipment	29	0.138	0.581
	Other transport equipment	35	0.214	0.090
Science Based	Chemicals and chemical products	24	0.190	0.084
	Radio, TV and communication equipment	32	0.121	0.050
	Medical precision and optical instruments	33	0.181	0.095

Table B. QR coefficients. Medians of the distributions at 2-ISIC code levels. Base model. All coefficients are statistically significant. Source: own elaboration on ENDEI (MINCyT & MTEySS).



BASE MODEL

Figure C1. Distribution of QR coefficients at 2-ISIC code levels. Base model. 99% of coefficients are statistically significant. Source: own elaboration on ENDEI (MINCyT & MTEySS).



**15=Food & beverages
19=Leather products
22=Printing & publishing**

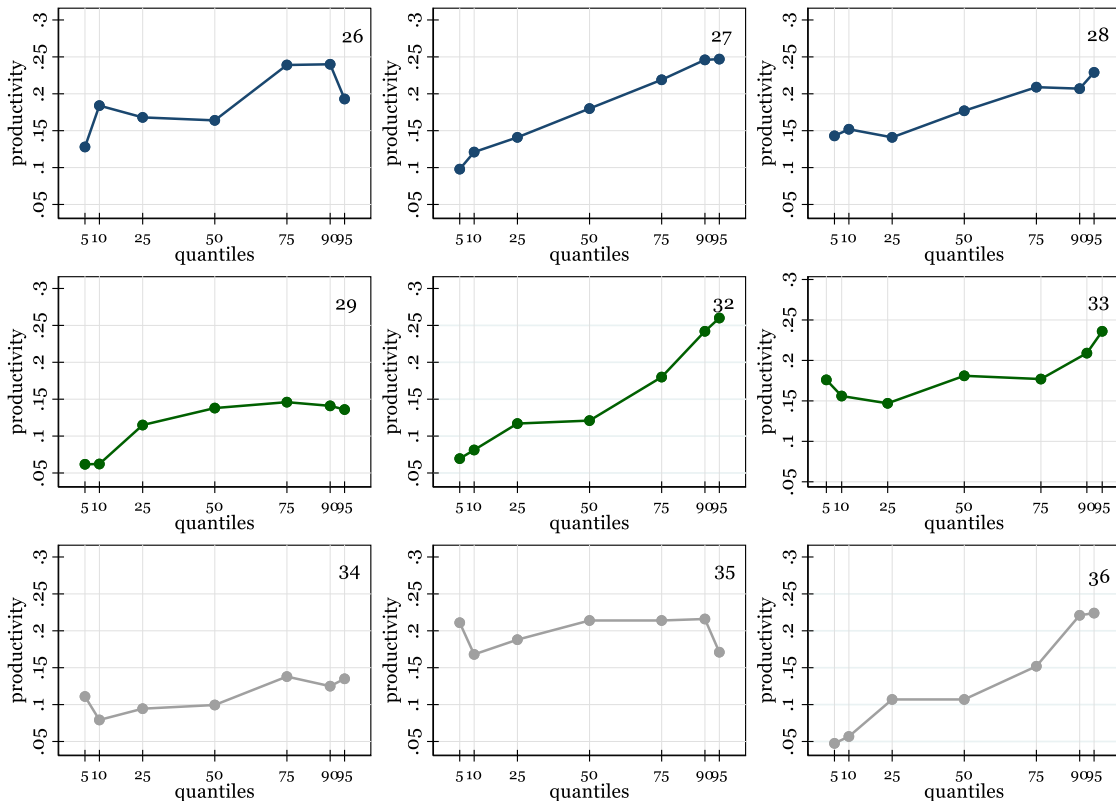
**17=Textiles
20=Wood products
24=Chemical products**

**18=Wearing apparel
21=Paper products
25=Rubber & plastic**



BASE MODEL

Figure C2. Distribution of QR coefficients at 2-ISIC code levels. Base model. 95% of coefficients are statistically significant. Source: own elaboration on ENDEI (MINCyT & MTEySS).



26=Other mineral prods.

29=Machinery & equipment

34=Trailers & autoparts

27=Basic metals

32=Radio, TV, & comm.

35=Other transport Eq.

28=Fabric. Metal prods.

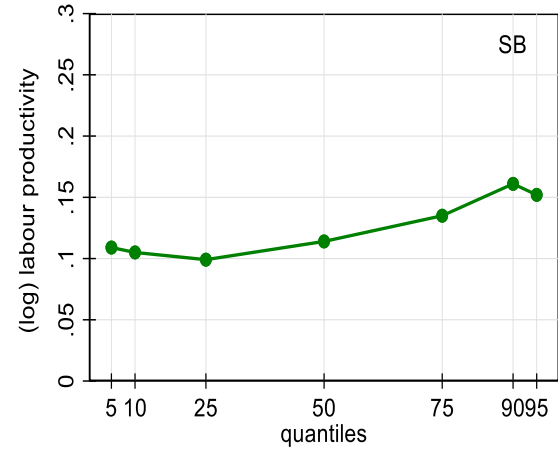
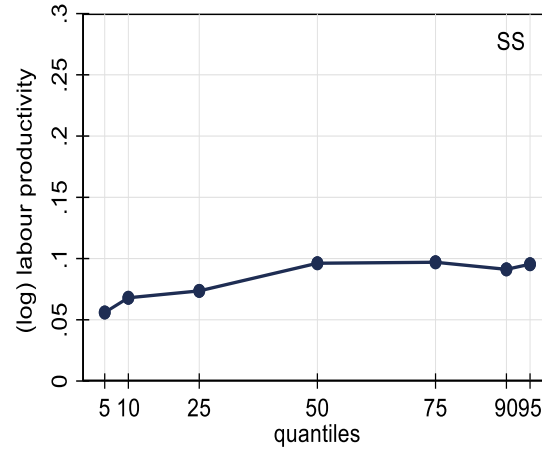
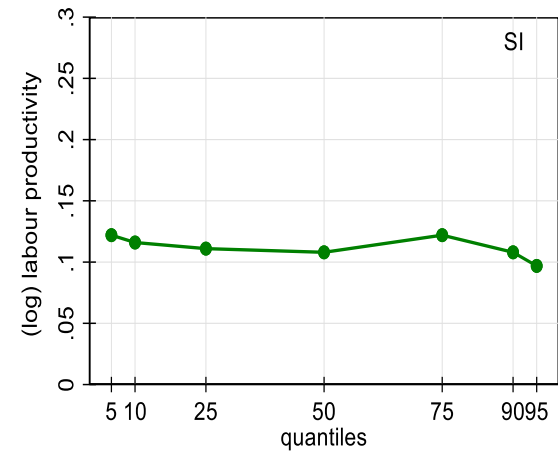
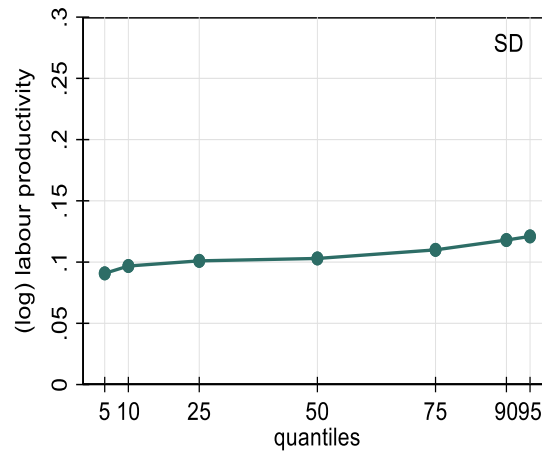
33=Medical & Optical Inst.

36=Furnitures



BASE MODEL

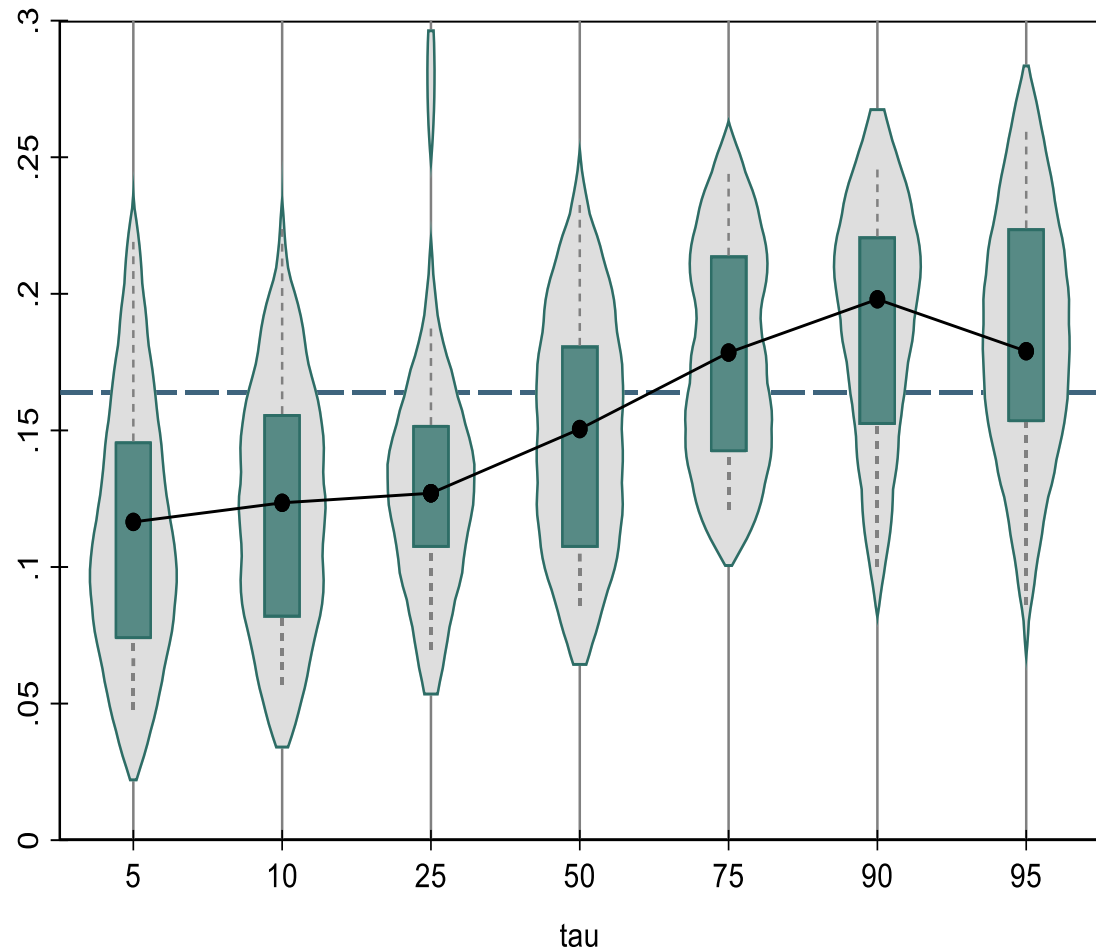
Figure D. QR coefficients. Base model.
Pavitt taxonomy. Source: own
elaboration on ENDEI (MINCyT &
MTEySS).





BASE MODEL

Figure E. Distribution of QR coefficients for (log) productivity. QR Base model
(* Violins report boxplots and kernel densities to both sides of the boxplot.
QR Base model. Source: own elaboration on ENDEI (MINCyT & MTEySS).



2

RESULTS MODEL WITH CONTROLS

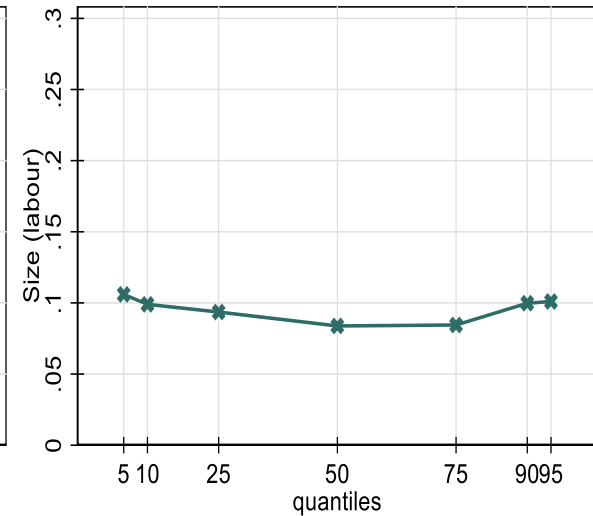
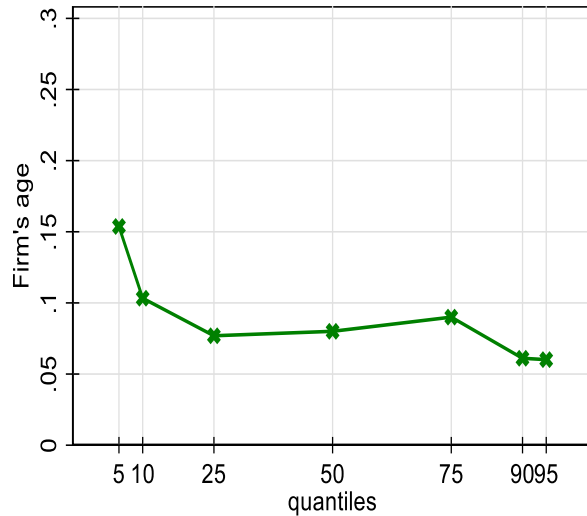
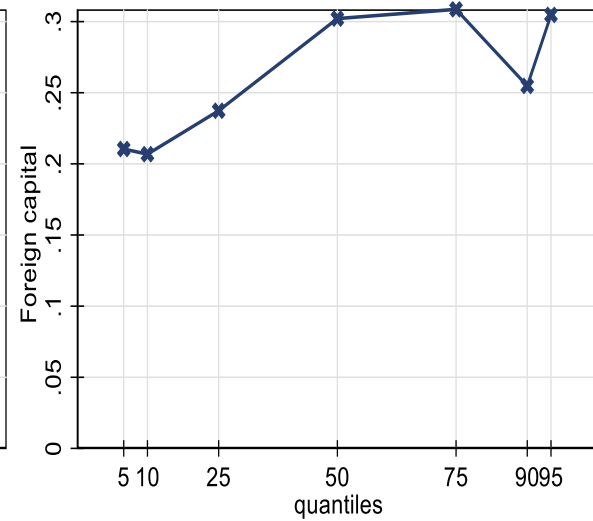
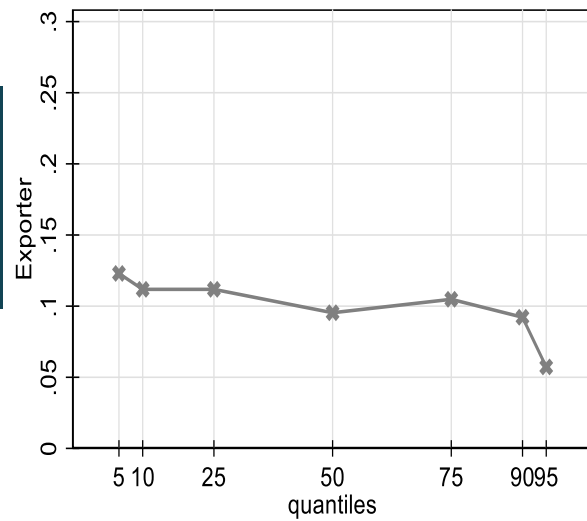
Wage – productivity nexus



MODEL WITH CONTROLS

Figure F. QR coefficients for control variables. Source: own elaboration on ENDEI (MINCyT & MTEySS).

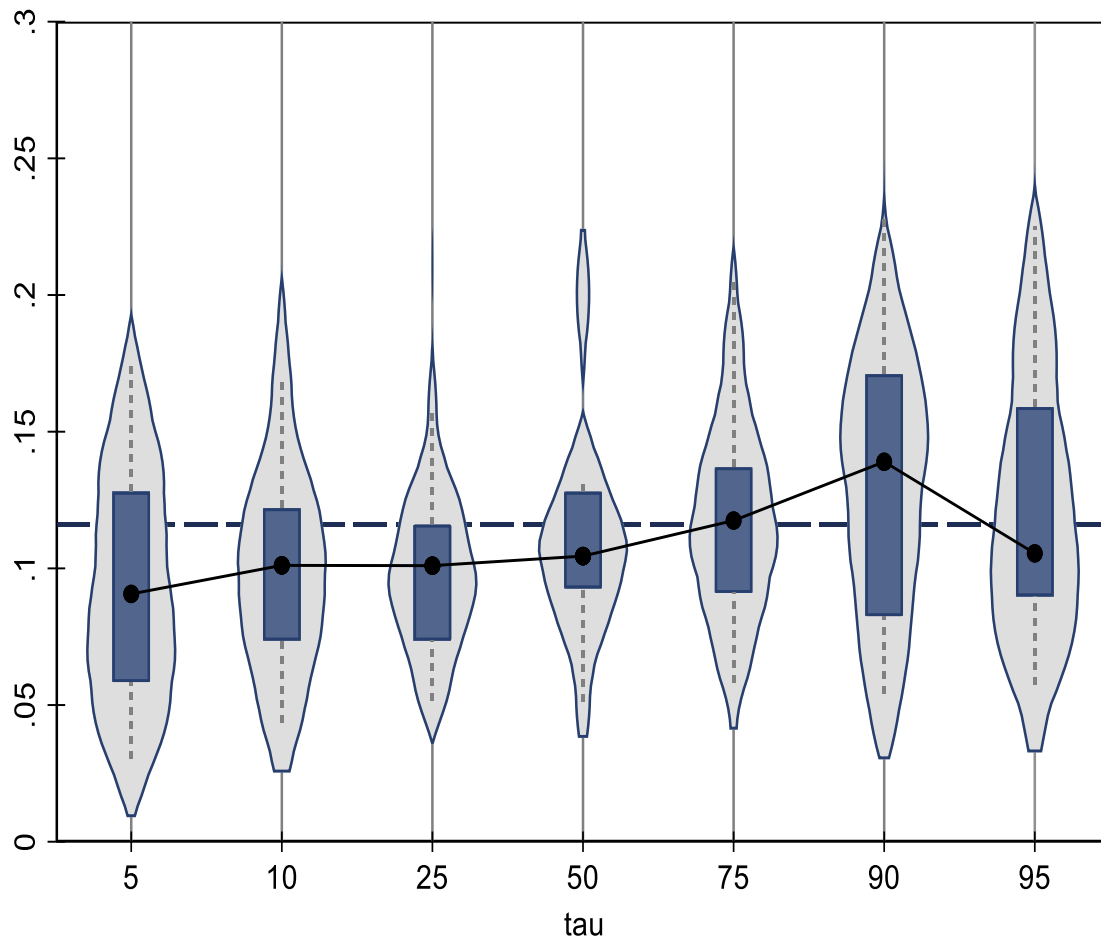
Additional exercise
By including a proxy to human capital [(log) skill ratio].
Reduces pass-through





MODEL WITH CONTROLS

Figure G. Distribution of QR coefficients for (log) productivity. QR model with controls. Source: own elaboration on ENDEI (MINCyT & MTEySS).



DISCUSSION & CONCLUSIONS

- The study confirms the existence of a positive pass-through between productivity and wage levels in Argentinean manufacturing industry (also for lagged productivity specifications).
- Manufacturing sectors and Pavitt classes' analysis confirm this nexus
- Pavitt classes reveal different patterns
- Increasing path is smoothed when inserting the controls
- Natural resources with a significant weight in sectoral and technological composition (SD and SI classes). Small scope for structural change (Mc Millan & Rodrik, 2011).
- Labour institutions (collective bargaining system/minimum wage) affects pass through
- The role of quality of specialization and trade composition (next to evaluate).

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Thanks

mcelestegomez@unc.edu.ar

mariaenrica.virgillito@unicatt.it

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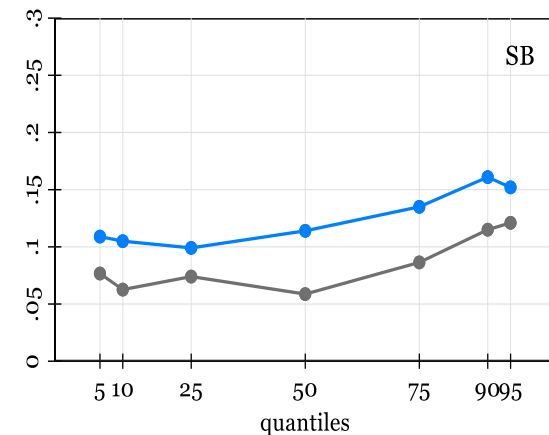
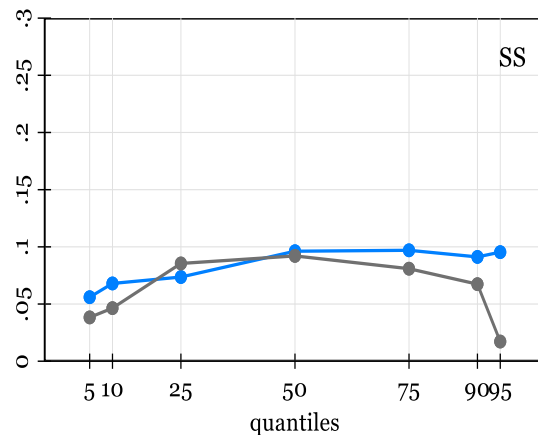
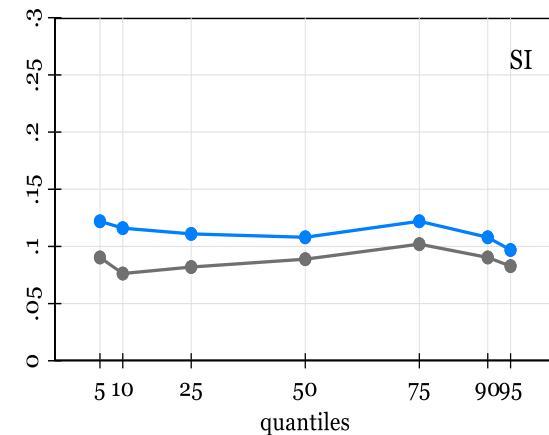
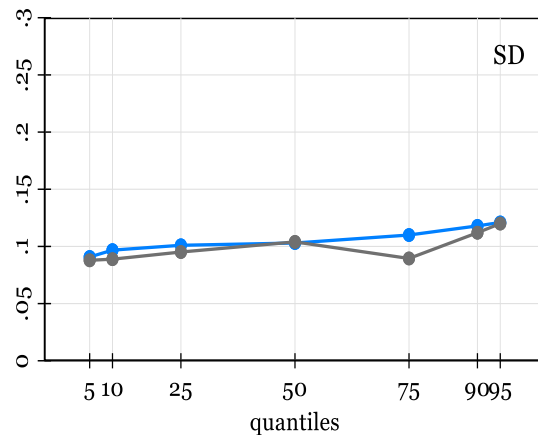
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ADDITIONAL CONTROL (HC)

Figure H. QR coefficients for productivity (pass through). Model 1 without HC proxy. Model 2 – with HC proxy. Source: own elaboration on ENDEI (MINCyT & MTEySS).



● Model 1 ● Model 2