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Profit-led and export-led accumulation regimes in Chinese manufacturing firms

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Abstract

By means of a fine-grained dataset linking exported product-level and firm-level data, this paper reconstructs the Chinese accumulation regimes at the microlevel in the period 2000-2013. After documenting a few macro stylized facts on the Chinese export-led accumulation regime in terms of the trend of Chinese exports in international markets, and the appreciation in the terms of trade in manufacturing products, the paper gives evidence of a process of restructuring of exporting firms towards more complex products and sectors, against any hypothesis of a purported price dumping in international markets. The positive relationship between technological content of the exported product and pricing markup strategies confirms the Sylos-Labini hypothesis linking prices and technological advantage, yielding the formation of international oligopolies able to exercise forms of market power and setting prices well-above any competitive level. As such, the trend in export prices has signalled the progressive capacity of the Chinese firms to orient the patterns of international market penetration, particularly in most complex productions.

JEL codes: P00, E24, F14

Keywords: Chinese exports, product/firm level export prices, pass-through, international oligopolies, profitabilities

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1. Introduction

China has been one of the countries mostly exposed to anti-dumping trade measures since its accession into the WTO (Lu et al., 2018). The growing role of Chinese import penetration in production of goods and the corresponding increasing share of China exports in international markets has also fostered the recent "trade war" launched by the US in 2018 (Jiang et al., 2023). But, is dumping really the case? Has Chinese export activity been led by price dumping strategies? Or, alternatively, has the country experienced a progressive dominant position in international markets because of quality upgrading and product specialization? This work is meant to contribute to the analysis of the micro-level process of Chinese accumulation regime in the period 2000-2013. This paper, while contributing to the literature on micro-level processes of internal capability restructuring, productivity upgrading, gains from trade and from catching up (Dosi et al., 2023), provides novel evidence on firm-price strategies in international markets, and the profit-accumulation regime resulting from the export expansion. Notably, as we shall show, technological composition and type of products, together with labour productivity, are the attributes mostly influencing heterogeneous firm-pricing strategies.

After documenting a few macro stylised facts on the Chinese export-led accumulation regime in terms of the trend of Chinese exports in international markets, and of the terms of trade in manufacturing products, the paper gives evidence of a process of restructuring of export composition towards more complex products and sectors, rather than any purported price dumping in international markets. Chinese firms have undertaken a quite articulated price setting strategy of internationally traded goods: while internally they enormously gained in terms of productivity growth, the firm-level export price elasticity to unit labour costs, i.e., the pass-through of such gains, has been *negative*. Such negative pass-through is informative about a markup setting, well above any competitive price setting regime. However, the productivity pass-through has been robustly *positive* for profitability, showing how gains in productivity have largely been transferred into profits. While results for the price-productivity elasticity hold until the Great Recession, profitability gains are maintained throughout the whole period. As such this paper mainly contributes to two streams of literature.

The first stream relates to the micro-level process of internal productive restructuring, productivity upgrading and its relationship with international trade. In that, it enquiries into the microeconomics patterns of export-led regimes. As such, it contributes to the technology-gap perspective on technological trade. Results on the impact of productivity gains upon domestic industry prices were recorded in Brandt et al. (2017) for the period 1999-2007. In addition, the authors found that reduction in input tariff increased markup, showing that trade liberalization, as in the case of India (De Loecker et al., 2016), brought higher opportunities for profit accumulation. Evidence of reduction in markup dis-

persion among firms is found in Lu and Yu (2015), who however rely on the construction of markup following the procedure proposed by De Loecker and Warzynski (2012). The reduction in markup dispersion according to this study derives from the left-side of markup distribution, that is firms in the lower quantiles increased markup, while firms in the upper quantiles reduced them. This stream of literature however does not concern export prices, but rather input tariff markup elasticity, and even more important, constructs markup on the basis of production functions, and on the assumption that markups are the wedge between input revenue share and output elasticity of this input. On the contrary, in this work we shall use the same of markup which management scholars and firms themselves use, that is *margins upon unit variable costs*.

The pre-and-post crisis estimation is of pivotal importance given that after 2007 export growth has been lower and also the articulation of the geography of the country of destination has changed, with a progressive shift from North-American and developed countries toward South East Asia, Eastern Europe and Russia, and Africa. The recomposition of the trading partners further contributes to the explanation of the heterogeneity of firm pricing strategies pre- and post-crisis (Brandt and Lim, 2024). In the latter, the authors, rather than focusing on the consequences of Chinese penetration in international markets for advanced economies, the so called *China syndrome* (Autor et al., 2013), try to single out a series of drivers behind Chinese upgrading into the export patterns, including both internal (firm-level) and external (market-level) channels, i.e., improved quality of imported inputs, productivity growth, firm entry, capital and labour accumulation were all considered drivers of higher export growth. All these channels have been documented as relevant for export growth. However less attention has been devoted to the interaction between productivity growth, the process of quality upgrading, the technological positioning of the firms and quality of the goods.

While heterogeneity in terms of export-destination and the ownership structures of firms have been recorded as factors relevant to the heterogeneous export dynamics of firm, the link between pricing strategies and technological characteristics of the industry and of the ensuing products, have received less attention. However, our analyses conducted in terms of Pavitt taxonomy (Pavitt, 1984), markup dynamics are driven to a good extent by Science Based firms, the latter representing the core of more technologically advanced firms. The positive relationship between technological content of the exported product and pricing markup strategies is in line with those theories of oligopolistic pricing such as the Sylos-Labini (Sylos Labini, 1969) linking price and technological advantages, leading to the formation of international oligopolies able to exercise forms of market power and price setting well-above unit labour cost. As such, the overall trend in export prices is evidence of the progressive capacity of the Chinese firms to orient their positioning in international markets, particularly in most complex productions, fast filling their technology gaps.

The second stream of literature regards the link of the firm-level export-led accumulation regime and drivers of functional income inequality. Although micro-level evidence on the gains from trade have been largely acknowledged in the literature, the distributional patterns and the ensuing accumulation regimes at the micro-level have been hardly under the spotlight. In particular, how the gains from trade, stemming from productivity (Brandt et al., 2012; Yu et al., 2015), translate in terms of distribution patterns between profits and wages has not been given much of attention so far. While Dosi et al. (2020) document that the wage-productivity pass-through has been enormously low, the profitability gains out of export markup strategies have not been documented so far.

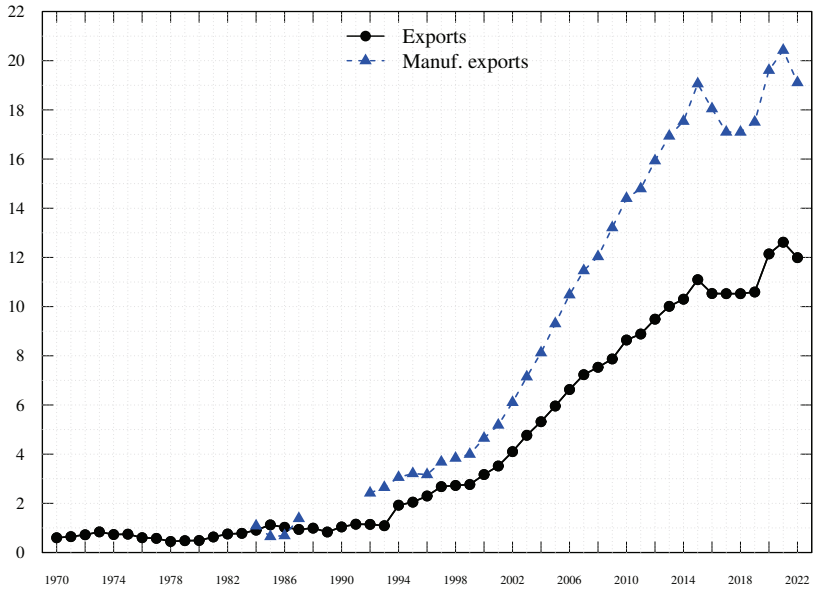
Our results contribute to the study of the micro-level process of firm-level functional inequality, robustly showing that the gains from trade, independently from the specialization patterns, have been largely appropriated by growing profit shares. Our evidence on the micro-accumulation regime based on such growing share complements the evidence in the literature discussing the overall increase of the Gini coefficient in China since the economic reform period (Zhou and Song, 2016), that usually have associated growing functional income inequality to urban-rural divides and regional variation (Xie and Zhou, 2014). New sociological evidence is putting forward the importance of the class structure in order to explain inequality (Liu, 2020), looking at the distribution of property rights and capital-labour relations, well in line with the results that we discuss at the firm-level.

The remainder of the paper is organized as follows: in Section 2 we present macro- and micro-level stylised facts on terms of trade, export quality and composition, while in Section 3 we estimate the micro-level markup on unit labour cost (ULC) and its contribution to export price formation. The relationship between the dynamics in ULC vis-à-vis the profit share is explored in Section 4, while Section 5 distinguishes for pre- and post-crisis periods. Technological specialization as a driving channel behind our results is shown in Section 6, while our conclusions are laid out in Section 7.

2. Stylised facts on export quality and composition

We start by documenting the macro-level evidence on Chinese exports growth (Baldwin and Freeman, 2022) in Figure 1, that shows the increasing penetration of China's exports to the world, from 1.15% in 1992 to 12.62% in 2021. Comparing total vis-à-vis manufacturing exports reveals an even more remarkable growing penetration of China's manufacturing exports, from 2.42% in 1992 to 20.42% in 2021, with a steeper trend after 2001 and just temporary decline between 2015-17. Figure 2 shows the long run dynamics of the terms of trade (TOT), defined as the ratio of export prices to import prices, for the whole Chinese economy and for the manufacturing sector, respectively. The dynamics of the two long-run time series show a striking contrast. The terms of trade for the overall China's economy has steadily deteriorated in the long run since 1982, with the decline slowing down since 2004. However,

Figure 1: Percentage contributions of Chinese (manufacturing) exports to the world (manufacturing) exports, 1970-2022. Source: World Development Indicators, World Bank.



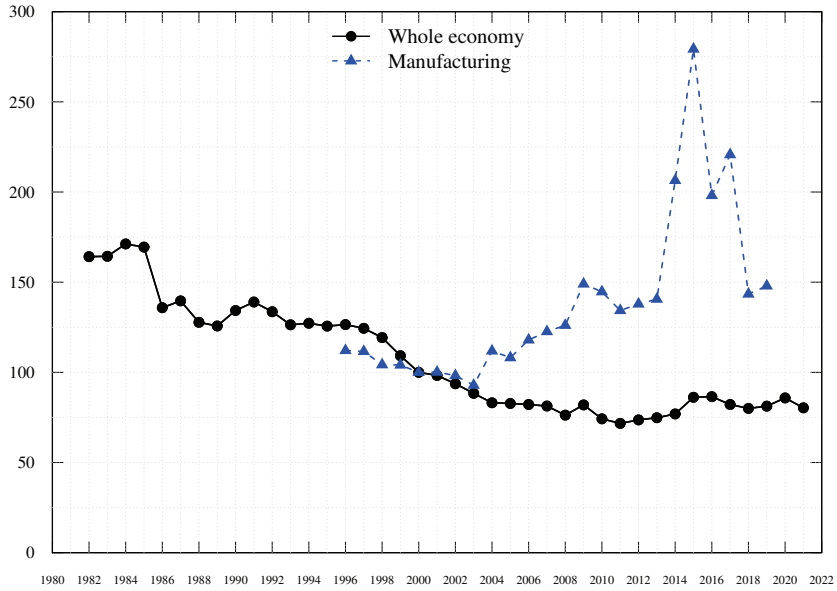
Note: a) Percentage contribution of Chinese exports of goods and services to the world's exports. Calculated using indicator Exports of goods and services (current US$). b) Percentage contribution of Chinese manufacturing exports to the world's manufacturing exports. Calculated using two indicators: Manufactures exports (% of merchandise exports), Merchandise exports (current US$).

the terms of trade for manufacturing deteriorated until 2003, but it then improved steadily, just two years after the entry of China into the WTO with a remarkable break in 2015-17.[1] While the decline of TOT for the overall economy may reflect increases in the import price of primary products (e.g., raw materials), the corresponding increasing in the TOT for manufacturing may reflect a relatively increasing export price of industrial products also due to quality upgrading of the exported industrial goods.

In order to investigate the extent to which a process of product upgrading has been a carrier of increasing export vis-à-vis import prices, in the following we focus upon the micro-level evidence, both at the firm-level and product-level. The analysis of micro-level production upgrading in exported products is conducted by using two different integrated micro-data. The original firm-level production dataset we use is often referred to as Annual Survey of Industrial Enterprises database (ASIE), consisting of State-owned and non-state-owned enterprises with annual sales greater than a threshold

[1]Notably, the period 2015-2017 has been marked by a steep increase in the average export price. This behaviour might be a retardation effect of the transmission of the devaluation initiated in 2015, which might have translated into reduced export prices with some delays (J effect). However, this investigation is beyond the scope of our analysis.

Figure 2: Terms of trade for the overall economy and for the manufacturing sector (2000=100). Source: China Statistical Yearbook.



Note: a) TOT for the overall economy is calculated based on two long run time series: import and export price indexes. Then TOT is calculated as the ratio of export price index to import price index. b) TOT for manufacturing sector is calculated based on four long run time series: exports - main product volume and value, imports - main product volume and value. See details about how the TOT for manufacturing is constructed in the Appendix A.

for 1998-2013.[2] [3] [4] It is the result of a repeated annual survey of Chinese firms conducted by the National Bureau of Statistics of China (NBSC). The dataset contains extensive firm-level financial and operational information, including firm value added, sales, employment, ownership type, and new product sales. We select manufacturing firms from the whole dataset and cleaned the sample in order to eliminate apparent misreporting errors, within the manufacturing sample yielding what we call "Chinese Manufacturing Micro" (CMM) database.[5] [6]

Data on the detailed exporting and importing activities of Chinese firms come from the product-level trade datasets collected by the Customs General Administration of China (CGAC). The CGAC database includes all international trade transactions since 2000. It reports, for each transaction, the 8-digit Harmonized System (HS) product code, whether it was an importing or exporting, the origin or destination country, quantity, price, the total value of the goods, and the name, location, and contact information of the Chinese firms involved.

The above two databases and the matched dataset are downloaded from EPS China Microeconomics Data Searching System, which provides the matched firm ID in ASIE and Customs databases for the period 2000-2013.[7] The details on the resulting data bank are outlined in Appendix B.

A process of product upgrading coupled with manufacturing structural change and fast productivity growth

The matched dataset allows to get fine-grained evidence on the price distribution of a product across a variety of markets (i.e. countries). In order to analyse the price distribution, we aggregate the product-level trade data (i.e. matched CMM-CUSTOMS sample) at the firm-product (HS 8-digit)-destination country level for each year. In this respect, the support of the price distribution derives from the heterogeneity of the export price when the unit of analysis is the firm-product-destination country level information. Then, we calculate the export price or unit value, that is the ratio of the product's total

[2]The sample selection criteria published by NBSC changed twice in 2007 and 2011. All State-owned enterprises and non-state-owned enterprises with annual sales above 5 million RMB are included in ASIE for the period 1998-2006. The SOEs with annual sales below 5 million RMB are excluded by ASIE during 2007-2010. All enterprises with annual sales above 20 million RMB are included in ASIE for the period 2011-2013.

[3]The USD/RMB exchange rate declined from 8.279 in 2000 to 6.831 in 2010. The 5 million RMB threshold is around 0.6 million USD in 2000 and 0.73 million USD in 2010.

[4]The USD/RMB exchange rate declined from 6.461 in 2011 to 6.196 in 2013. The 20 million RMB threshold is around 2.95 million USD in 2011 and 3.23 million USD in 2013.

[5]We considered firms with Chinese Industrial Classification (CIC) code between 13 and 43 as manufacturing firms.

[6]We dropped firms with missing or negative age, output, value-added, sales, original value of fixed assets, exports, total wage costs, total welfare payable, unemployment insurance and also firms with a number of employees less than 8, since below that threshold they operate under another legal system (Brandt et al., 2012). Since NBSC adjusted its industrial classification code in 2003 and 2011, disaggregating some sectors while making integration for some other sectors. In order to make the industry classification consistent over the entire period, we follow Brandt et al. (2012) to harmonize classification codes before and after 2003 and 2011. Our firm-level production data set spans over 28 two-digit sectors.

[7]EPS matched the two databases based on three steps: 1) matching based on the name of enterprise and year; 2) matching based on zip code, the last 7 digits of telephone number and year; and 3) manual checks. This matching procedure referred Yu (2015).

export value (in USD) to quantity.[8] Notice that, in the product-level trade data, the product classification (HS 8-digit codes) in different years follows different version of the Harmonized System, which has been periodically updated and entered into force in 1996, 2002, 2007 and 2012 by World Customs Organization (WCO) and United Nations Statistics Division (UNSD). UNSD provides the concordance table between different versions of HS classification system. To get a consistent HS classification over years, we convert the HS codes for years 2000-2011 to HS2012 standard.[9] The concordance tables provided by WCO and UNSD are only available at HS 6-digit level.

As a result of the product-firm information, Figure 3 shows the kernel density distribution of (log-) export price (or unit value) for years 2000, 2007 and 2013 (pooling all product-country observations). The support of the 2013 distribution appears to be much wider and the tails flatter. However, the distinction between the distributions does not appear to be striking.

Next, move to analyse the export price distribution by three distinct products category in order to understand whether the price distribution shows distinct traits by product. Figure 4 shows the export price distributions for intermediate goods, consumption goods and capital goods.[10] We start observing that the export price distributions for each of the product categories are all widely distributed, showing significant heterogeneity of export prices across destination countries. Notably, the support of the distribution of capital goods is much wider than those of the other two types of goods, signalling a higher variety in the quality of the same good, or alternatively, customized price strategies of quality-differentiated goods. The support of the export price distribution of intermediate goods is wider than consumption goods. Finally, the right tail of the export price distribution for capital goods is much wider than intermediate goods and consumption goods as price-product composition link.

In order to link the price dynamics with the patterns of specialization of firms in the exported products, Table 1 shows the within-manufacturing structural change of the product composition for Chinese exports. In order to detect whether a firm is specialized in the production of a given product category, we define product specialization on the basis of a prevalence of product-type export. Therefore, a firm i mainly exports capital goods in year t, when the ratio of capital goods in its total exports is greater than both the ratio of intermediate goods and that of consumption goods.

According to this classification, an evident process of specialization upgrading is evident. The share of firms specialized in exporting final goods declined dramatically from 45.3% in 2000 to 26.8% in 2013 (decreased by 18.5%), while the share of firms specialized in exporting intermediate goods increased from 44.2% in 2000 to 56% in 2013 (increased by 11.8%) and that of firms specialized in

[8] Notice that, sometimes quantity equals to 0 in the data, we just delete these observations.

[9] The HS codes in years 2000-01, 2002-06 and 2007-11 follow HS1996, HS2002, and HS2007 standard respectively.

[10] The broad types of goods are categorized based on the Classification by Broad Economic Categories (BEC) Rev4 provided by the United Nations. UN also provides the concordance table between HS 6-digit codes and BEC codes, and between BEC codes and System of National Accounts (SNA) codes. The SNA framework categories goods into three basic classes of goods: capital, intermediate and consumption goods.

Figure 3: Kernel density distribution of (log-) export unit value for 2000 (black), 2007 (blue) and 2013 (red). Unit: 1 USD. Source: matched CMM-CUSTOMS data.

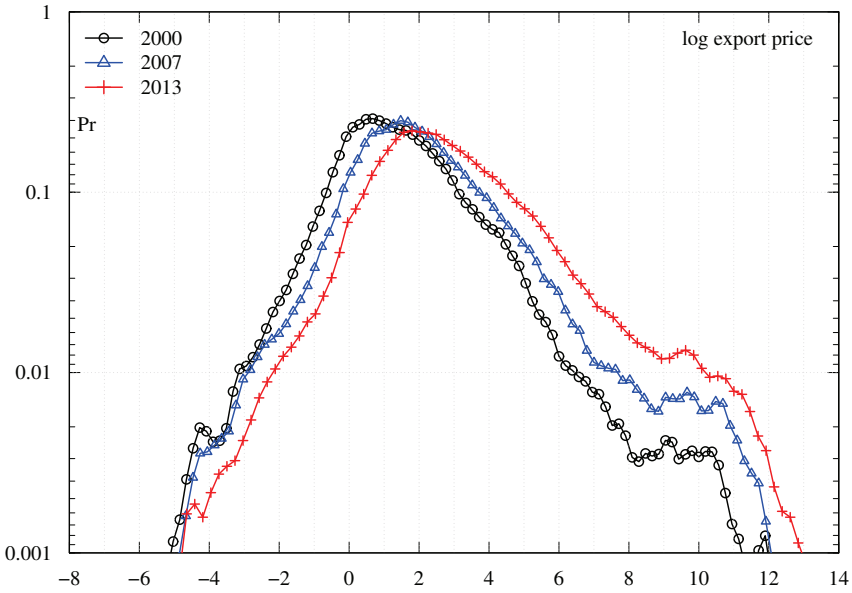


Figure 4: Kernel density distribution of (log-) export unit value, for intermediate (black), consumption (blue) and capital goods (red) and for 2000, 2007 and 2013. Unit: 1 USD. Source: matched CMM-CUSTOMS data.

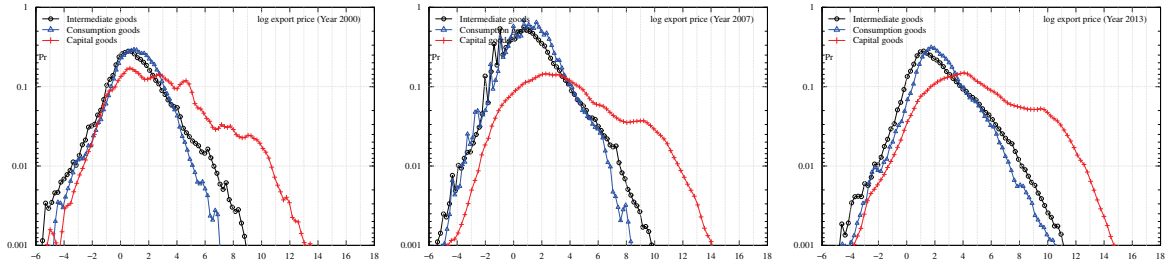
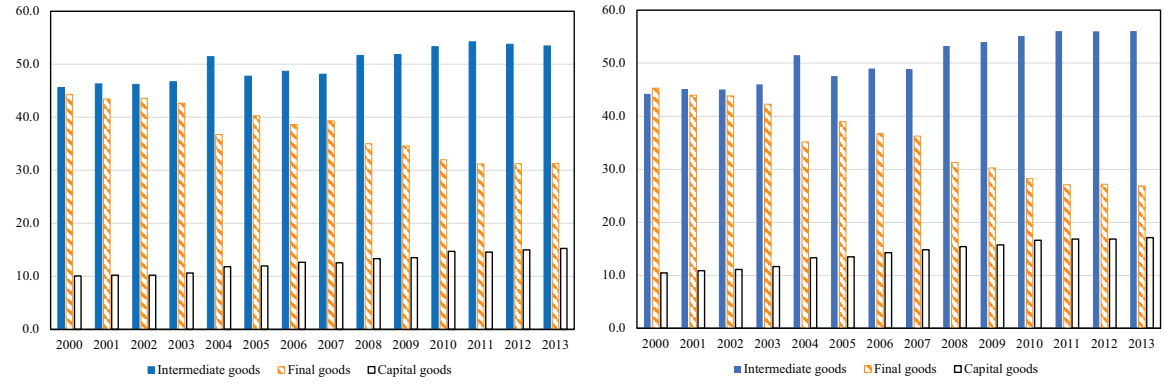


Table 1: Distribution of the number of firms specialized in exporting intermediate, final and capital goods. Note: panel A is for exporting firms sample; panel B is for firms both with export and import records (the ones used in the regression). Column (1) report total number of firms in the sample. Columns (2)-(4) report the number of firms by exporting product types. Column (5)-(7) report the percentage share.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Panel A: Firms in the exporting firms sample				
Year	Exp firms	Interm. goods	Final goods	Capital goods	Interm. goods (%)	Final goods (%)	Capital goods (%)
2000	17,417	7,949	7,719	1,749	45.64	44.32	10.04
2001	21,606	10,005	9,391	2,210	46.31	43.46	10.23
2002	23,478	10,846	10,230	2,402	46.20	43.57	10.23
2003	29,083	13,580	12,417	3,086	46.69	42.70	10.61
2004	31,318	16,109	11,509	3,700	51.44	36.75	11.81
2005	48,730	23,279	19,629	5,822	47.77	40.28	11.95
2006	54,320	26,456	20,993	6,871	48.70	38.65	12.65
2007	70,352	33,858	27,666	8,828	48.13	39.33	12.55
2008	48,601	25,111	17,015	6,475	51.67	35.01	13.32
2009	41,006	21,269	14,197	5,540	51.87	34.62	13.51
2010	54,117	28,849	17,299	7,969	53.31	31.97	14.73
2011	54,362	29,495	16,952	7,915	54.26	31.18	14.56
2012	53,404	28,722	16,681	8,001	53.78	31.24	14.98
2013	56,681	30,301	17,741	8,639	53.48	31.30	15.24
			Panel B: Firms in the exporting and importing firms sample				
Year	Exp&Imp firms	Interm. goods	Final goods	Capital goods	Interm. goods (%)	Final goods (%)	Capital goods (%)
2000	13,303	5,883	6,028	1,392	44.22	45.31	10.46
2001	15,864	7,164	6,974	1,726	45.16	43.96	10.88
2002	16,752	7,548	7,339	1,865	45.06	43.81	11.13
2003	19,882	9,152	8,408	2,322	46.03	42.29	11.68
2004	18,936	9,757	6,660	2,519	51.53	35.17	13.30
2005	30,633	14,566	11,934	4,133	47.55	38.96	13.49
2006	33,433	16,386	12,274	4,773	49.01	36.71	14.28
2007	35,908	17,556	13,029	5,323	48.89	36.28	14.82
2008	20,014	10,655	6,268	3,091	53.24	31.32	15.44
2009	16,101	8,693	4,875	2,533	53.99	30.28	15.73
2010	26,057	14,372	7,355	4,330	55.16	28.23	16.62
2011	25,279	14,164	6,854	4,261	56.03	27.11	16.86
2012	26,254	14,702	7,134	4,418	56.00	27.17	16.83
2013	27,342	15,328	7,339	4,675	56.06	26.84	17.10

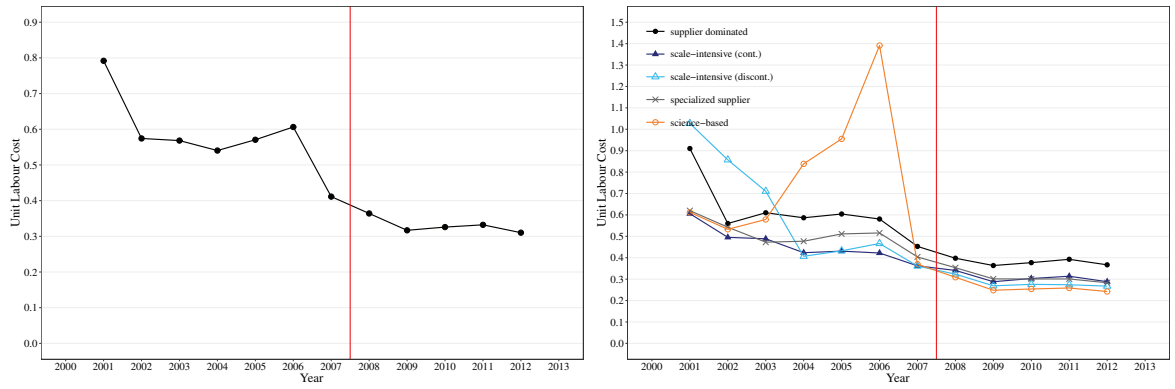
Figure 5: Percentage share of firms specialized in exporting intermediate, final and capital goods. Left panel: exporting sample. Right panel: firms both exporting and importing. Source: Table 1.



exporting capital goods increased from 10.5% to 17.1% (increased by 6.6%) (see Panel B). Figure 5 visualizes the dynamics of share of firms.

We use similar method to categorize firms by their major exporting destination areas. The number

Figure 6: The dynamics of unit labour cost 2000-2013, three-year moving average and unweighted average across firms. Left panel: all manufacturing firms. Right panel: sub-sample of firms by Pavitt taxonomy. Source: matched CMM-CUSTOMS data.



of firms and the percentage shares are reported in Table B.4 (in the Appendix). The most popular export destination areas include Asia, North America and Europe: 56-66% firms primarily export to other Asian areas; 17-20% firms primarily export to North America; 13-22% firms primarily export to Europe. It is observed a declining share of firms primarily exporting to Asia (declined by 9.34%) over the whole period during 2000-2013, while an increasing share of firms primarily exporting to Europe (increased by around 6.9%), and a relatively stable share of firms primarily exporting to North America. There has been a change of the exporting pattern after the global financial crisis: a declining share of firms primarily exporting to Europe (from 22.07% in 2008 to 19.57% in 2013) and to North America (from 20.16% in 2006 to 17.90% in 2013), and a growing share of firms primarily exporting to Asia (from 55% in 2008 to 56.39% in 2013).

The years under analysis have been characterized by dramatic productivity growth but also by major wage increases. Below (Figure 6) we present the dynamics of unit labour costs, both in the aggregate (left panel) and in the sub-classes of Pavitt taxonomy (right panel) showing declining dynamics, with a notable similarity across classes.[11] Such evidence confirms the well-documented catching up process, in our case regarding in particular exporting firms. In essence, all classes recorded a dramatic decline in the unit labour costs, from 0.8 in 2000 to 0.3 in 2013.

In order to appreciate the composition of exporting firms by classes, Table 2 shows the number of firms by Pavitt taxonomy and the percentage shares. Panel B shows the results for firms both exporting and importing (the sample used in regression analysis). A clear process of structural change is

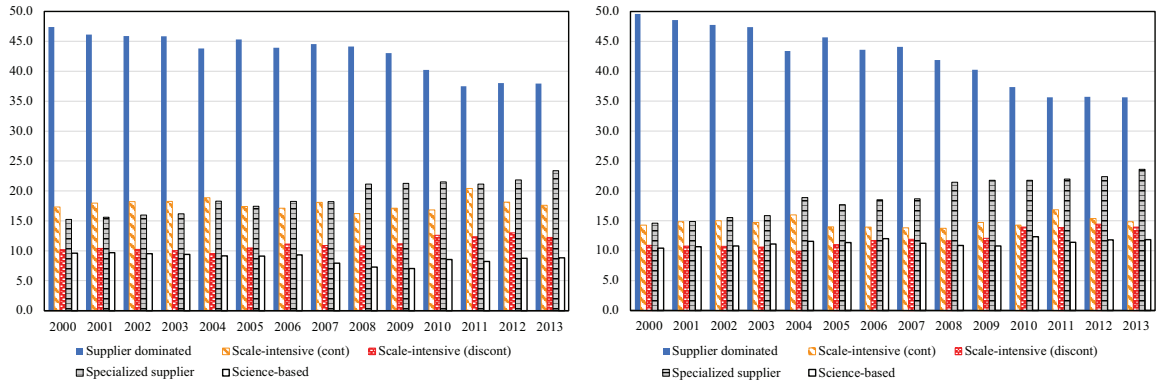
[11]Pavitt (1984) distinguishes industries into four types based on different patterns of industrial dynamics and specific regimes of technological learning, namely: (i) "supplier dominated" sectors (e.g. textile, clothing, metal products), whose innovative opportunities primarily come from the acquisition of machines and new intermediate inputs; (ii) "scale-intensive" sectors (e.g. food processing, chemical raw materials processing, automobile manufacturing), which can be further distinguished into "continuous" and "discontinuous" sectors; (iii) "specialized suppliers" (e.g. machine tools); (iv) "science-based" sectors (e.g., microelectronics, drugs), whose learning opportunities coevolve with advances in basic and applied sciences.

Table 2: Distribution of the number of firms by Pavitt taxonomy. Note: panel A is for exporting firms sample; panel B is for firms both with export and import records (the ones used in the regression). Column (1) report total number of firms in the sample. Columns (2)-(6) report the number of firms by Pavitt taxonomy. Column (7)-(11) report the percentage share. Supplier dominated (SD), Scale-intensive continuous process (SI cont.), Scale-intensive discontinuous process (SI discon.), Specialized supplier (SS), Science-based (SB). The annual average growth rate of the number of firms are shown in the last three rows of both Panel A and B.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
				Panel A: Firms in the exporting firms sample							
Year	Exp firms	SD	SI(cont.)	SI(disc.)	SS	SB	SD %	SI(cont.) %	SI(disc.) %	SS %	SB %
2000	17,432	8,265	3,018	1,779	2,659	1,673	47.4	17.3	10.2	15.3	9.6
2001	21,615	9,974	3,883	2,246	3,370	2,091	46.1	18.0	10.4	15.6	9.7
2002	23,492	10,781	4,280	2,403	3,749	2,239	45.9	18.2	10.2	16.0	9.5
2003	29,098	13,342	5,314	2,915	4,706	2,730	45.9	18.3	10.0	16.2	9.4
2004	31,330	13,720	5,906	2,992	5,731	2,860	43.8	18.9	9.5	18.3	9.1
2005	48,753	22,092	8,476	5,102	8,503	4,436	45.3	17.4	10.5	17.4	9.1
2006	54,332	23,879	9,291	6,039	9,909	5,068	44.0	17.1	11.1	18.2	9.3
2007	70,482	31,382	12,739	7,672	12,838	5,577	44.5	18.1	10.9	18.2	7.9
2008	48,642	21,477	7,883	5,249	10,288	3,535	44.2	16.2	10.8	21.2	7.3
2009	41,042	17,660	7,017	4,589	8,730	2,890	43.0	17.1	11.2	21.3	7.0
2010	54,144	21,779	9,114	6,820	11,644	4,615	40.2	16.8	12.6	21.5	8.5
2011	54,389	20,396	11,110	6,709	11,506	4,466	37.5	20.4	12.3	21.2	8.2
2012	53,424	20,306	9,675	6,935	11,657	4,674	38.0	18.1	13.0	21.8	8.7
2013	56,699	21,503	9,968	6,919	13,263	5,002	37.9	17.6	12.2	23.4	8.8
	Annual average growth (%)										
00-13	17.3	12.3	17.7	22.2	30.7	15.3					
00-07	43.5	40.0	46.0	47.3	54.7	33.3					
08-13	3.3	0.0	5.3	6.4	5.8	8.3					
				Panel B: Firms in the exporting and importing firms sample							
Year	Exp&Imp firms	SD	SI(cont.)	SI(disc.)	SS	SB	SD %	SI(cont.) %	SI(disc.) %	SS %	SB %
2000	13,315	6,601	1,902	1,453	1,946	1,388	49.6	14.3	10.9	14.6	10.4
2001	15,870	7,707	2,360	1,713	2,363	1,696	48.6	14.9	10.8	14.9	10.7
2002	16,764	8,003	2,516	1,802	2,608	1,814	47.7	15.0	10.7	15.6	10.8
2003	19,895	9,425	2,929	2,115	3,160	2,211	47.4	14.7	10.6	15.9	11.1
2004	18,947	8,219	3,030	1,879	3,579	2,190	43.4	16.0	9.9	18.9	11.6
2005	30,652	13,996	4,285	3,379	5,429	3,490	45.7	14.0	11.0	17.7	11.4
2006	33,440	14,577	4,671	3,919	6,189	4,016	43.6	14.0	11.7	18.5	12.0
2007	35,922	15,834	4,963	4,289	6,710	4,036	44.1	13.8	11.9	18.7	11.2
2008	20,022	8,388	2,758	2,338	4,299	2,175	41.9	13.8	11.7	21.5	10.9
2009	16,107	6,486	2,374	1,948	3,509	1,741	40.3	14.7	12.1	21.8	10.8
2010	26,070	9,740	3,729	3,641	5,677	3,224	37.4	14.3	14.0	21.8	12.4
2011	25,290	9,015	4,257	3,509	5,559	2,889	35.6	16.8	13.9	22.0	11.4
2012	26,268	9,389	4,045	3,792	5,881	3,109	35.7	15.4	14.4	22.4	11.8
2013	27,353	9,747	4,068	3,816	6,457	3,246	35.6	14.9	14.0	23.6	11.9
	Annual average growth (%)										
00-13	8.1	3.7	8.8	12.5	17.8	10.3					
00-07	24.3	20.0	23.0	27.9	35.0	27.3					
08-13	7.3	3.2	9.5	12.6	10.0	9.8					

well evident: the percentage share of supplier dominated (SD) firms significantly declined from 49.6% in 2000 to 35.6% in 2013. On the contrary, the shares of firms in other Pavitt sectors increased: particularly, firms in specialized supplier (SS) sector increased by 9%, in scale-intensive (discontinuous process) sector increased by 3%, in science-based sector increased by 1.5%, in scale-intensive (continuous process) sector increased by 0.6%. Figure 7 plots the dynamics of the percentage share of firms by Pavitt taxonomy. Over time, the quality of exporting firms in terms of technological content has dramatically increased, with SD firms loosing export shares and particularly SS firms gaining.

Figure 7: Percentage share of firms by Pavitt taxonomy. Left panel: exporting sample. Right panel: firms both exporting and importing. Source: Table 2.

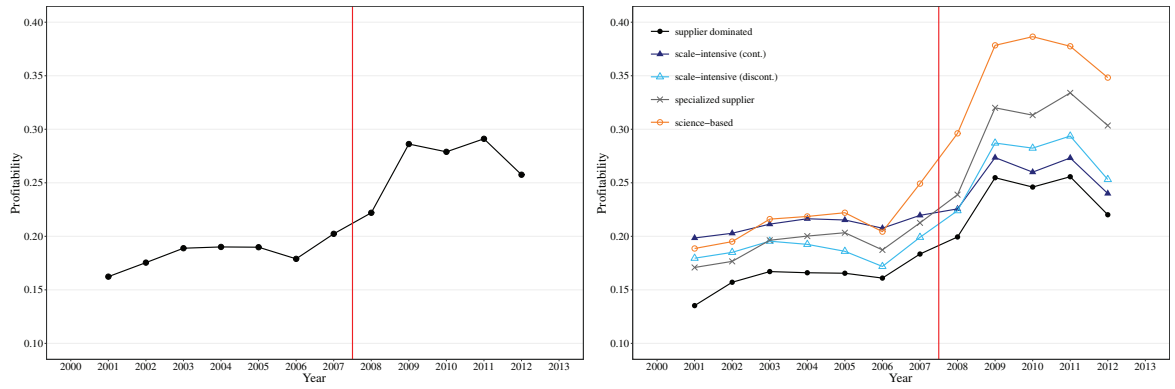


The evidence presented so far, put together, tells us a story of increasing export prices, mediated by product quality; upgrading patterns of exporting firm specialization, with a growing share of firms specialized in more complex and more variegated set of products, from final, to intermediate, to capital goods, massive decline in unit labour costs, independently from technological-industry characteristics, with labour productivity increases spectacular higher then labour cost increases. Note that under a setting of competitive price setting, declining labour costs should translate directly into lower prices. In addition, in presence of setting of product homogeneity and lack of structural change, the type of exported product and the level of technological specialization should not exert an influence on the overall export price dynamics. In the following, we shall explore the link between export prices, productivity and product upgrading. Far from strictly competitive markets, the evidence is in tune with interpretational oligopolistic market structure, see the classic Sylos Labini (1969) according to which firms located at the technological frontier are price makers, while at the opposite, laggard firms are bounded to be price takers.

Granted that, gains from productivity can go into three channels: lower prices, higher wages, higher profits. In Dosi et al. (2020, 2023) we have shown that wages in contemporary China were not the major beneficiary in terms of pass-through of the productivity gains: the micro-level empirical evidence suggests very low degrees of the coefficient, both with reference to all firms (with the relative exception of state-owned enterprises) and to exporting firms in particular. In the following, we intend to analyse the other channels, that is gains going into lower prices or alternatively into higher profits.

The dynamics of profitability is presented in Figure 8 for the whole economy and by Pavitt classes. Over thirteen years the three-year moving average almost doubled from 0.15 to 0.3. Profitability reaches a peak in 2009-2011 and then goes down. Notably, the higher the level of technological complexity of the industry, the higher profitability is.

Figure 8: The dynamics of profitability 2000-2013, three-year moving average and the unweighted average across firms. Left panel: all manufacturing firms. Right panel: sub-sample of firms by Pavitt taxonomy. Source: matched CMM-CUSTOMS data.



3. Costs, export prices and firm strategies: the productivity channel

In the following, first we analyse who benefited from the impressive productivity gains and the massive decline in the unit labour cost, as documented in the previous Section, whether international markets, hence consumers, via lower prices, or alternatively employers, via higher profits. Therefore, we start to estimate the degree of pass-through from productivity gains to international prices for Chinese manufacturing firms, according to the following specification:

$$\begin{aligned}\Delta\text{Export Price}_{it} = \alpha + \beta_1\,\Delta\text{ULC}_{it} + \beta_2\,\Delta\text{Import Costs}_{it} + \beta_3\,\Delta\text{Exchange Rate}_{t} \\ + \text{Export Product Specialization}_{it} + \text{Export Destination Specialization}_{it} + \epsilon_{it}\end{aligned} \tag{1}$$

where Export Price$_{it}$ is the *mean* export price of firm i in year t across products and destination countries (i.e. firms may export many different products and export to different destination countries).[12] As a proxy for non-labour unit intermediate input costs, we use Import Costs$_{it}$ i.e., the mean import cost per unit of production.[13] To calculate export and import price at the firm-level, we first aggregate the data at firm-product (HS 8-digit) level for each year, and then calculate unit value for each product (which equals to $\frac{\text{total export value of product p in firm i}}{\text{total quantity of product p in firm i}}$). The *mean* export price (or unit value) of the firm is calculated as the product's export value weighted price. Import costs per unit of product is calculated using the same method. ULC$_{it}$ represents the unit labour cost (the ratio between nominal wage and productivity) of firm i in year t. We include a specialization variable to control for firm's export product specialization: a categorical variable distinguishes firms into three categories, i.e., exporting

[12]Exports prices in the product-level trade dataset are the free-on-board (FOB) prices, including the transportation and related expenses and insurance fees before the goods are shipped to the export location in China for loading.

[13]The import prices in the product-level trade dataset are the Cost, Insurance and Freight (CIF) prices, including the transportation and related expenses and insurance before the goods arriving at the import location in China. The price is determined by the deal price (transaction price).

primarily capital, intermediate and final goods, named "Export Product Specialization". Export destination is controlled by means of a firm-level categorical variable which distinguishes firms into six categories, i.e., exporting primarily to Asia, Africa, Europe, Latin America, North America, and Oceania, named "Export Destination Specialization". Finally, we include the exchange rate, in order to neat any effect of the currency appreciation/depreciation channel. Export and import prices are in USD. The exchange rate here is the USD to Chinese yuan rate: than a decrease in the exchange rate indicates an appreciation of Chinese yuan (a negative growth rate).

Table 3 shows the estimates for the pass-through from the growth rate of ULC to the growth of export price (alternative model specifications include 2-digit sectoral dummies, year-sectoral dummies, or year trend). Notably, contrary to any marginalist pricing strategy, 1% *decrease* in the growth rate of ULC is associated with 0.015% *increase* in the growth rate of export price (see column 2 Panel A), meaning that the higher the degree of internal firm competitiveness and efficiency the higher the average price on the export markets. The estimates are robust to alternative specifications. If we consider the estimation controlling for unobserved firm fixed effects, 1% decrease in the growth of ULC is associated with 0.014% increase in the growth rate of export price (see column 2 Panel B) significant at 1% level. If we control for the time trend, the latter is significant and associated with increases in the growth rate of export prices.[14] Including the time trend and excluding the exchange rate growth, as the two latter variables are highly correlated, 1% decrease in the growth rate of ULC is associated with 0.012% increase in the growth rate of export price (see columns 5-6). The estimates for the models including export destination dummies confirm the previous findings (see columns 7-9). The overall results are very similar if we consider within-firm variation (Panel B). The product specialization control variable already highlights a distinct pattern by product category, particularly in Panel B estimations, where the omitted control variable is the export of intermediate goods, the latter being the most widespread category. Notably, firm specialization in the export of capital goods, in line with our descriptive evidence presented above, present a price-premium in the average export price. When accounting for country destination, the only significant categorical variables relate to advanced countries, like Europe and the U.S. Notably, the growth rate of export price is lower for firms primarily exporting to Europe and North America relative to firms primarily exporting to other Asian areas. The result, against the common wisdom of dumping strategies, reveals that the lower the control over export markets, the least aggressive the pricing strategy is.

This first ensemble of evidence militates in favour of the lack of any purported dumping strategy, and shows an overall positive markup over unit labour cost, in contrast with any competitive price setting strategies. Notably, the reliability of our estimation is also confirmed by the sign of the average

[14]Notice that the decreased number of observations in Panel B with firm-fixed effects is due to the drop of singletons (i.e. with only one observation in the group/firm), as explained in Correia (2015).

price of firm imported goods, showing the latter a positive coefficient, therefore exercising a positive association with exported price, as expected on the grounds of standard firm cost accounting practices.

Table 3: Estimate the degree of pass-through from productivity gains to international prices, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.0104**	−0.0154***	−0.0120**	−0.0123**	−0.0122**	−0.0124**	−0.0155***	−0.0123**	−0.0125**
	(0.0039)	(0.0039)	(0.0039)	(0.0039)	(0.0039)	(0.0039)	(0.0039)	(0.0039)	(0.0039)
ΔImport Costs$_{it}$	0.0052***	0.0047***	0.0049***	0.0049***	0.0049***	0.0049***	0.0047***	0.0049***	0.0049***
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)
ΔExchange Rate$_{it}$	−1.1204***	4.7772	−0.2867*	−0.2894*			4.6922	−0.2958*	
	(0.1190)	(5.7722)	(0.1379)	(0.1380)			(5.7752)	(0.1380)	
Consumption goods	0.0171**	0.0108	0.0294***	0.0124	0.0296***	0.0126	0.0127	0.0139	0.0140
	(0.0057)	(0.0073)	(0.0057)	(0.0072)	(0.0057)	(0.0072)	(0.0074)	(0.0074)	(0.0074)
Capital goods	0.1962***	0.2241***	0.1948***	0.2224***	0.1950***	0.2225***	0.2249***	0.2232***	0.2233***
	(0.0113)	(0.0135)	(0.0113)	(0.0134)	(0.0113)	(0.0134)	(0.0135)	(0.0135)	(0.0135)
Africa							−0.0626	−0.0696	−0.0700
							(0.0426)	(0.0427)	(0.0427)
Europe							−0.0213**	−0.0201*	−0.0195*
							(0.0082)	(0.0082)	(0.0082)
Latin America							−0.0301	−0.0294	−0.0296
							(0.0252)	(0.0252)	(0.0252)
North America							−0.0065	−0.0040	−0.0037
							(0.0075)	(0.0075)	(0.0075)
Oceania							−0.0528	−0.0519	−0.0520
							(0.0318)	(0.0319)	(0.0320)
Year trend			0.0142***	0.0144***	0.0150***	0.0152***		0.0147***	0.0154***
			(0.0011)	(0.0011)	(0.0009)	(0.0009)		(0.0011)	(0.0009)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	173,599	173,599	173,599	173,599	173,599	173,599	173,599	173,599	173,599
R^2	0.0035	0.0148	0.0049	0.0056	0.0049	0.0056	0.0149	0.0057	0.0057
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.0099*	−0.0139**	−0.0110*	−0.0112*	−0.0112*	−0.0114*	−0.0140**	−0.0113*	−0.0115*
	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)
ΔImport Costs$_{it}$	0.0051***	0.0048***	0.0051***	0.0051***	0.0050***	0.0050***	0.0048***	0.0051***	0.0050***
	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)
ΔExchange Rate$_{it}$	−1.0048***	8.4648	−0.7036***	−0.6895***			8.4076	−0.7037***	
	(0.1427)	(7.3705)	(0.1564)	(0.1565)			(7.3653)	(0.1569)	
Consumption goods	0.0704	0.0684	0.0711	0.0714	0.0702	0.0706	0.0706	0.0735	0.0726
	(0.0380)	(0.0381)	(0.0380)	(0.0380)	(0.0380)	(0.0380)	(0.0381)	(0.0380)	(0.0380)
Capital goods	1.0852***	1.0805***	1.0817***	1.0818***	1.0824***	1.0824***	1.0804***	1.0817***	1.0823***
	(0.0658)	(0.0657)	(0.0658)	(0.0658)	(0.0658)	(0.0658)	(0.0657)	(0.0658)	(0.0658)
Africa							−0.0686	−0.0616	−0.0621
							(0.0818)	(0.0821)	(0.0821)
Europe							−0.0530*	−0.0511*	−0.0482*
							(0.0216)	(0.0216)	(0.0216)
Latin America							−0.0574	−0.0503	−0.0508
							(0.0462)	(0.0460)	(0.0460)
North America							−0.0516*	−0.0462*	−0.0453*
							(0.0208)	(0.0207)	(0.0207)
Oceania							−0.1151	−0.1205	−0.1206
							(0.0641)	(0.0642)	(0.0642)
Year trend			0.0086***	0.0088***	0.0104***	0.0106***		0.0090***	0.0109***
			(0.0013)	(0.0013)	(0.0012)	(0.0012)		(0.0013)	(0.0012)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	158,181	158,181	158,181	158,181	158,181	158,181	158,181	158,181	158,181
R^2	0.1559	0.1648	0.1562	0.1564	0.1561	0.1563	0.1649	0.1565	0.1564

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or primarily export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

4. The profit-led accumulation regime

Given the above evidence of a growing markup of export prices vis-à-vis unit labour cost, we now intend to investigate the ensuing profit channels, that is how the gains from productivity increases might have translated into firm profitability. Therefore, this section estimates the degree of pass-through from productivity gains to profitability in order to detect the extent to which employers have appropriated productivity gains via higher profits. We estimate therefore the following model specification:

$$\begin{aligned}\Delta\text{Profitability}_{it} = \alpha + \beta_1\,\Delta\text{ULC}_{it} + \beta_2\,\Delta\text{Import Costs}_{it} + \beta_3\,\Delta\text{Exchange Rate}_{t} \\ + \text{Export Product Specialization}_{it} + \text{Export Destination Specialization}_{it} + \epsilon_{it}\end{aligned} \tag{2}$$

where $\text{Profitability}_{it}$ is defined as the ratio of the difference between value added and the cost of labour over the value of output that is the profit margin, while the other explanatory variables remain in essence the same.

Our results are presented in Table 4. A 1% decrease in the growth rate of ULC is associated with 0.89% increase in the growth rate of profitability (see column 2 Panel A). OLS and FE estimates present very similar results: under the latter a 1% decrease in the growth of ULC is associated with 0.91% increase in the growth rate of profitability. Controlling for time trend, 1% decrease in the growth of ULC is associated with 0.90% increase in profitability (see columns 5-6 Panel A) and similar coefficients are retrieved in case of FE estimation. The estimation results confirm the previous findings when including export destination specialization dummies (see columns 7-9). The growth rates of profitability are not significantly different across destination areas.

Regarding the other explanatory variables, import costs loose significance in both specification, the exchange rate now turns to be negative, meaning that a depreciation in the exchange rate is associated with a negative coefficient for profitability, while product specialization tends to loose any significant level in terms of profitability. Here, let us recall that the evidence by Pavitt Taxonomy showed above presents similar declining pattern in the unit labour cost independently from the technological class of belonging. The year time trend shows a positive relationship, highlighting a long term feature of the accumulation regime. Note also that the explanatory power of this model vis-à-vis the previous one is by far higher, with much larger R^2. In that, the value of the coefficient ranges from 0.8 to 0.9 according to the specifications, documenting an impressive process of productivity appropriation, with an elasticity quite close to the unitary pass-through.

Finally, note that the influence of product specialization upon the dynamics of markups, discussed above, coexists with a generalized increase in profitability which applies across all product categories.

Table 4: Estimate the degree of pass-through from productivity gains to profitability, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.8954***	−0.8936***	−0.8954***	−0.8955***	−0.8957***	−0.8958***	−0.8936***	−0.8955***	−0.8958***
	(0.0052)	(0.0053)	(0.0052)	(0.0052)	(0.0052)	(0.0052)	(0.0053)	(0.0052)	(0.0052)
ΔImport Costs$_{it}$	−0.0002	-0.0000	−0.0002	−0.0002	−0.0003	−0.0003	-0.0000	−0.0002	−0.0003
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
ΔExchange Rate$_{it}$	−1.2129***	−3.3824	−1.1815***	−1.1814***			−3.4028	−1.1836***	
	(0.0624)	(2.1258)	(0.0629)	(0.0630)			(2.1258)	(0.0630)	
Consumption goods	0.0066*	0.0029	0.0070*	0.0027	0.0077*	0.0035	0.0035	0.0034	0.0038
	(0.0033)	(0.0044)	(0.0033)	(0.0044)	(0.0033)	(0.0044)	(0.0044)	(0.0044)	(0.0044)
Capital goods	0.0081*	0.0068	0.0080	0.0075	0.0086*	0.0078	0.0071	0.0078	0.0081
	(0.0041)	(0.0046)	(0.0041)	(0.0046)	(0.0041)	(0.0046)	(0.0046)	(0.0046)	(0.0046)
Africa							−0.0291*	−0.0237	−0.0245
							(0.0128)	(0.0129)	(0.0129)
Europe							−0.0045	−0.0044	−0.0018
							(0.0039)	(0.0038)	(0.0038)
Latin America							−0.0049	−0.0008	−0.0012
							(0.0094)	(0.0094)	(0.0095)
North America							−0.0027	−0.0034	−0.0021
							(0.0041)	(0.0041)	(0.0041)
Oceania							−0.0130	−0.0117	−0.0115
							(0.0133)	(0.0133)	(0.0133)
Year trend			0.0006	0.0006	0.0034***	0.0034***		0.0007	0.0035***
			(0.0004)	(0.0004)	(0.0004)	(0.0004)		(0.0004)	(0.0004)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	164,739	164,739	164,739	164,739	164,730	164,739	164,739	164,730	164,739
R2	0.4903	0.4940	0.4903	0.4904	0.4893	0.4894	0.4940	0.4904	0.4894
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.9137***	−0.9127***	−0.9137***	−0.9142***	−0.9136***	−0.9141***	−0.9127***	−0.9143***	−0.9141***
	(0.0076)	(0.0077)	(0.0076)	(0.0076)	(0.0076)	(0.0076)	(0.0077)	(0.0076)	(0.0076)
ΔImport Costs$_{it}$	−0.0003	−0.0001	−0.0003	−0.0003	−0.0004	−0.0004	−0.0001	−0.0004	−0.0004
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
ΔExchange Rate$_{it}$	−1.2725***	−3.8516	−1.2620***	−1.2624***			−3.8871	−1.2624***	
	(0.0682)	(2.8498)	(0.0691)	(0.0691)			(2.8501)	(0.0692)	
Consumption goods	−0.0019	−0.0025	−0.0019	−0.0021	−0.0029	−0.003	−0.0024	−0.002	−0.003
	(0.0144)	(0.0144)	(0.0144)	(0.0144)	(0.0144)	(0.0144)	(0.0144)	(0.0144)	(0.0144)
Capital goods	0.0110	0.0128	0.0108	0.0108	0.0117	0.0117	0.0129	0.0109	0.0118
	(0.0120)	(0.0120)	(0.0121)	(0.0121)	(0.0121)	(0.0121)	(0.0120)	(0.0121)	(0.0121)
Africa							−0.0457*	−0.0382	−0.0385
							(0.0222)	(0.0224)	(0.0225)
Europe							−0.0007	−0.0027	0.0024
							(0.0078)	(0.0078)	(0.0078)
Latin America							−0.0136	−0.01	−0.0102
							(0.0157)	(0.0157)	(0.0157)
North America							0.0004	−0.0014	0.0006
							(0.0091)	(0.0091)	(0.0091)
Oceania							−0.0196	−0.0199	−0.0196
							(0.0264)	(0.0264)	(0.0264)
Year trend			0.0003	0.0004	0.0034***	0.0034***		0.0004	0.0035***
			(0.0005)	(0.0005)	(0.0005)	(0.0005)		(0.0005)	(0.0005)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	148,194	148,194	148,194	148,194	148,194	148,194	148,194	148,194	148,194
R2	0.5770	0.5807	0.5770	0.5772	0.5761	0.5763	0.5807	0.5772	0.5763

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or primarily export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

5. Patterns in the post-crisis phase

Our time span includes the financial crisis period, that has been identified as a demarcation point for international trade flows (Baldwin, 2009; Gong et al., 2022). Thus, it is relevant in our estimatation strategy to account for the patterns before and after the crisis. Therefore, this section shows the estimation results of equations (1)-(2) separately for pre-crisis period (2000-2007) and post-crisis period (2008-2013), marked by the contraction in trade flows in 2008. The impact of such episode on Chinese export in 2008 has been larger on the extensive rather than the intensive margins, recording a reduction in the growth of the number of exporting firms, after the massive increase in 2001, but an increase in the growth of trade volume per unit of firm. This trend is also recorded in our dataset as shown in Table B.1. In addition, according to the evidence shown in Brandt and Lim (2024), after 2008 the destination countries have changed, with a reorientation toward the eastern-Asia and African countries, and with a progressive decline of the role played by European and US firms.

Table 5 show the estimates for the pass-through from the growth rate of ULC to the growth of export price for the pre-crisis (2000-2007) and post-crisis (2008-2013) periods respectively. For the pre-crisis period, 1% decrease in the growth rate of ULC is associated with 0.0145% increase in the growth rate of export price (see column 2 Panel A). The result is very similar if we look at the within-firm variation (Panel B).

Interestingly, for the post-crisis period, the coefficient estimates for the growth of ULC is negative but statistically insignificant (both OLS and controlling for firm-fixed effects). This indicates that the generalized negative pass-through from productivity gain to export price growth disappeared during 2008-2013 period. This finding is confirmed by the results of within-firm regression shown in Table 5 (see Panel B) and the results of models involving export destination specialization dummies shown in Table C.5 (in the Appendix). A strategy of growing markup, after the 2008, loses significance, although capital-goods remain a positive driver for higher prices.

Notably, while markup strategies appear to have changed, this is not the case for the appropriation of the gains by the employers (see Table 6). Indeed, the regime of accumulation with very high level of profit-ULC pass-through, almost close to the unitary elasticity value persist in the pre- and post-crisis period, signalling that the accumulation regime has not suffered from the crisis. At the same time, the distinct behaviour of the elasticity of export prices to ULC pre- and post-crisis highlights the changed relative importance of export price increases for the overall profitability of the firm, being profits the outcome of the whole activities of the firm, not just of exports. Interestingly, the growth rate of profitability is significantly lower for firms primarily exporting to Africa (relative to the firms primarily exporting to Asia) and for the pre-crisis period (see Table C.6 in the Appendix).

Table 5: Estimate the degree of pass-through from productivity gains to international prices for periods 2000-2007 and 2008-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
						Panel A: OLS estimates						
	2000-2007						**2008-2013**					
ΔULC$_{it}$	−0.0139***	−0.0145***	−0.0142***	−0.0144***	−0.0142***	−0.0143***	0.0013	−0.0196	−0.0069	−0.0077	−0.0078	−0.0085
	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0100)	(0.0103)	(0.0101)	(0.0101)	(0.0101)	(0.0101)
ΔImport Costs$_{it}$	0.0033**	0.0032**	0.0033**	0.0033**	0.0033**	0.0033**	0.0078***	0.0070***	0.0076***	0.0075***	0.0075***	0.0074***
	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0020)	(0.0020)	(0.0020)	(0.0020)	(0.0020)	(0.0020)
ΔExchange Rate$_{it}$	−1.4290***	−1.3998	0.6176	0.6643			−0.0078	−3.5693*	−1.8833***	−1.8592***		
	(0.1799)	(0.9944)	(0.4201)	(0.4200)			(0.1843)	(1.7046)	(0.2318)	(0.2319)		
Consumption goods	0.0091	0.0098	0.0110	0.0089	0.0107	0.0086	0.0587***	0.0125	0.0648***	0.0163	0.0655***	0.0163
	(0.0064)	(0.0082)	(0.0064)	(0.0082)	(0.0064)	(0.0082)	(0.0111)	(0.0140)	(0.0111)	(0.0140)	(0.0111)	(0.0140)
Capital goods	0.2003***	0.2236***	0.2002***	0.2230***	0.2001***	0.2229***	0.1891***	0.2247***	0.1886***	0.2248***	0.1885***	0.2248***
	(0.0143)	(0.0168)	(0.0143)	(0.0168)	(0.0143)	(0.0168)	(0.0181)	(0.0221)	(0.0181)	(0.0222)	(0.0181)	(0.0222)
Year trend			0.0212***	0.0217***	0.0161***	0.0162***			0.0446***	0.0449***	0.0266***	0.0272***
			(0.0038)	(0.0038)	(0.0016)	(0.0017)			(0.0040)	(0.0040)	(0.0031)	(0.0031)
Sectoral dummies				yes		yes				yes		yes
Year-sectoral dummies		yes						yes				
Num. of obs.	106,723	106,723	106,723	106,723	106,723	106,723	66,876	66,876	66,876	66,876	66,876	66,876
R2	0.0044	0.0079	0.0047	0.0056	0.0047	0.0056	0.0024	0.0192	0.0042	0.0056	0.0035	0.0049
						Panel B: estimates when controlling unobserved time invariant firm fixed effects						
	2000-2007						**2008-2013**					
ΔULC$_{it}$	−0.0135**	−0.0144**	−0.0139**	−0.0139**	−0.0139**	−0.0139**	−0.0031	−0.0177	−0.0052	−0.0082	−0.0071	−0.0100
	(0.0051)	(0.0052)	(0.0051)	(0.0051)	(0.0051)	(0.0051)	(0.0139)	(0.0143)	(0.0140)	(0.0140)	(0.0140)	(0.0140)
ΔImport Costs$_{it}$	0.0029*	0.0028*	0.0029*	0.0030*	0.0029*	0.0029*	0.0080**	0.0076**	0.0079**	0.0080**	0.0079**	0.0079**
	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0026)	(0.0025)	(0.0026)	(0.0026)	(0.0026)	(0.0026)
ΔExchange Rate$_{it}$	−1.0619***	−1.6528	0.5098	0.5072			−0.9375***	−6.3698**	−1.7243***	−1.7611***		
	(0.2154)	(1.0124)	(0.4621)	(0.4635)			(0.2341)	(2.0277)	(0.2852)	(0.2852)		
Consumption goods	0.1167*	0.1162*	0.1160*	0.1148*	0.1164*	0.1151*	−0.0307	−0.0395	−0.0314	−0.0386	−0.0324	−0.0396
	(0.0513)	(0.0514)	(0.0513)	(0.0513)	(0.0513)	(0.0513)	(0.0969)	(0.0968)	(0.0968)	(0.0965)	(0.0969)	(0.0967)
Capital goods	1.0055***	1.0054***	1.0046***	1.0051***	1.0045***	1.0050***	2.0130***	1.9992***	2.0076***	2.0062***	2.0099***	2.0085***
	(0.0899)	(0.0897)	(0.0899)	(0.0899)	(0.0899)	(0.0899)	(0.1542)	(0.1545)	(0.1543)	(0.1541)	(0.1543)	(0.1542)
Year trend			0.0176***	0.0176***	0.0134***	0.0134***			0.0258***	0.0279***	0.0082*	0.0099*
			(0.0042)	(0.0042)	(0.0019)	(0.0019)			(0.0050)	(0.0050)	(0.0041)	(0.0041)
Sectoral dummies				yes		yes				yes		yes
Year-sectoral dummies		yes						yes				
Num. of obs.	94,930	94,930	94,930	94,930	94,930	94,930	55,704	55,704	55,704	55,704	55,704	55,704
R2	0.1829	0.1860	0.1830	0.1833	0.1830	0.1833	0.2014	0.2157	0.2017	0.2027	0.2012	0.2021

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Finally, pre- and post-crisis the exchange rate kept a negative coefficient for both variables, while the import costs show a positive and a negative coefficient, for export prices and profitability respectively, in line with ex-ante theoretical expectations.

Table 6: Estimate the degree of pass-through from productivity gains to profitability for periods 2000-2007 and 2008-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
						Panel A: OLS estimates						
	2000-2007						**2008-2013**					
ΔULC$_{it}$	−0.9061***	−0.9066***	−0.9062***	−0.9064***	−0.9062***	−0.9064***	−0.8644***	−0.8558***	−0.8626***	−0.8623***	−0.8612***	−0.8608***
	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0101)	(0.0106)	(0.0101)	(0.0102)	(0.0101)	(0.0101)
ΔImport Costs$_{it}$	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	−0.0014**	−0.0009	−0.0014*	−0.0014*	−0.0015**	−0.0015**
	(0.0006)	(0.0007)	(0.0007)	(0.0006)	(0.0007)	(0.0006)	(0.0006)	(0.0005)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
ΔExchange Rate$_{it}$	−0.5456***	−3.0653***	−0.1148	−0.1036			−1.4828***	−0.0690	−1.1475***	−1.1495***		
	(0.1116)	(0.8944)	(0.2549)	(0.2552)			(0.0756)	(0.6070)	(0.0898)	(0.0898)		
Consumption goods	0.0112*	0.0006	0.0116*	0.0011	0.0117*	0.0011	0.0019	0.0076	0.0009	0.0069	0.0011	0.0069
	(0.0047)	(0.0063)	(0.0047)	(0.0063)	(0.0047)	(0.0063)	(0.0041)	(0.0053)	(0.0041)	(0.0053)	(0.0041)	(0.0053)
Capital goods	0.0015	0.0028	0.0015	0.0033	0.0015	0.0034	0.0173***	0.0121*	0.0175***	0.0122*	0.0174***	0.0123*
	(0.0063)	(0.0070)	(0.0063)	(0.0070)	(0.0063)	(0.0070)	(0.0048)	(0.0053)	(0.0048)	(0.0054)	(0.0048)	(0.0054)
Year trend			0.0045	0.0048*	0.0055***	0.0057***			−0.0079***	−0.0079***	−0.0188***	−0.0187***
			(0.0025)	(0.0025)	(0.0011)	(0.0011)			(0.0012)	(0.0012)	(0.0010)	(0.0010)
Sectoral dummies				yes		yes				yes		yes
Year-sectoral dummies		yes						yes				
Num. of obs.	96,869	96,869	96,869	96,869	96,869	96,869	67,870	67,870	67,870	67,870	67,870	67,870
R2	0.4886	0.4901	0.4886	0.4888	0.4886	0.4888	0.4962	0.5054	0.4965	0.4970	0.4951	0.4956
						Panel B: estimates controlling unobserved time invariant firm fixed effects						
	2000-2007						**2008-2013**					
ΔULC$_{it}$	−0.9117***	−0.9124***	−0.9119***	−0.9122***	−0.9119***	−0.9122***	−0.9012***	−0.9015***	−0.9001***	−0.9029***	−0.8994***	−0.9021***
	(0.0096)	(0.0096)	(0.0096)	(0.0096)	(0.0096)	(0.0096)	(0.0148)	(0.0158)	(0.0148)	(0.0149)	(0.0148)	(0.0149)
ΔImport Costs$_{it}$	0.0009	0.0010	0.0010	0.0010	0.0010	0.0010	−0.0019**	−0.0013*	−0.0018**	−0.0019**	−0.0019**	−0.0019**
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)
ΔExchange Rate$_{it}$	−0.2673	−3.4466***	0.1985	0.1894			−1.4482***	−0.6241	−1.1071***	−1.1135***		
	(0.1379)	(1.2348)	(0.2911)	(0.2922)			(0.0875)	(0.7806)	(0.1053)	(0.1053)		
Consumption goods	−0.0089	−0.0098	−0.0090	−0.0100	−0.0089	−0.0100	0.0000	−0.0042	−0.0001	−0.0019	−0.0005	−0.0023
	(0.0236)	(0.0237)	(0.0236)	(0.0236)	(0.0236)	(0.0236)	(0.0220)	(0.0219)	(0.0220)	(0.0220)	(0.0220)	(0.0221)
Capital goods	0.0183	0.0206	0.0180	0.0185	0.0180	0.0184	−0.0112	−0.0091	−0.0089	−0.0078	−0.0079	−0.0068
	(0.0205)	(0.0205)	(0.0205)	(0.0205)	(0.0205)	(0.0205)	(0.0194)	(0.0191)	(0.0193)	(0.0193)	(0.0193)	(0.0194)
Year trend			0.0053	0.0051	0.0036**	0.0035**			−0.0111***	−0.0108***	−0.0223***	−0.0221***
			(0.0027)	(0.0028)	(0.0013)	(0.0013)			(0.0016)	(0.0016)	(0.0013)	(0.0013)
Sectoral dummies				yes		yes				yes		yes
Year-sectoral dummies		yes						yes				
Num. of obs.	84,157	84,157	84,157	84,157	84,157	84,157	56,262	56,262	56,262	56,262	56,262	56,262
R2	0.5760	0.5778	0.5761	0.5764	0.5761	0.5764	0.6325	0.6415	0.6329	0.6338	0.6316	0.6325

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

6. The missing channel: technological specialization

Given the above evidence on the process of technological upgrading and export recomposition, our last battery of analyses is meant to account for the role of firm-level technological specialization, in order to study its relationships with both export price strategies and patterns of profitability accumulation. We run therefore our estimations, both using OLS and FE estimators, for each Pavitt category, replicating equations (1)-(2).

Below in Table 7 is a summary of the regression results.[15] According to such an evidence, the growing markup strategy holds only for the highest technological class, that is Science Based. On the contrary, the profitability appropriation of gains from the reduction of ULC holds in all Pavitt sectors (see Table 8).[16] How can we link this evidence on the different pricing strategy with the technological content of the exported goods?

On the theoretical side, the interpretation that mostly adheres to our findings is the Sylos Labini (1969) approach, linking pricing strategies to technological asymmetries among firms and market con-

[15]The coefficients summarized in Table 7 are from column (6) in Table D.7, D.9, D.11, D.13 and D.15.
[16]The coefficients summarized in Table 8 are from column (6) in Table D.8, D.10, D.12, D.14 and D.16.

Table 7: Summary of regression results. Estimate the degree of pass-through from productivity gains to international prices by Pavitt taxonomy. Asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

		Supplier dominated	Scale-intensive (conti.)	Scale-intensive (discon.)	Specialized supplier	Science-based
Coef. of ΔULC	OLS	insig.	insig.	insig.	insig.	-0.0290*
	FE	insig.	insig.	insig.	insig.	-0.0310*

Table 8: Summary of regression results. Estimate the degree of pass-through from productivity gains to profitability by Pavitt taxonomy. Asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

		Supplier dominated	Scale-intensive (conti.)	Scale-intensive (discon.)	Specialized supplier	Science-based
Coef. of ΔULC	OLS	-0.9767***	-0.7857***	-0.8472***	-0.8846***	-0.8820***
	FE	-0.9971***	-0.7900***	-0.8619***	-0.9101***	-0.9193***

Table 9: Summary of regression results. Estimate the degree of pass-through from productivity gains to international prices by Pavitt taxonomy and by period. Asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

		Supplier dominated	Scale-intensive (conti.)	Scale-intensive (discon.)	Specialized supplier	Science-based
2000-2007						
Coef. of ΔULC	OLS	insig.	-0.0167*	insig.	insig.	-0.0375**
	FE	insig.	insig.	insig.	insig.	-0.0367**
2008-2013						
Coef. of ΔULC	OLS	insig.	insig.	insig.	insig.	insig.
	FE	insig.	insig.	insig.	insig.	insig.

Table 10: Summary of regression results. Estimate the degree of pass-through from productivity gains to profitability by Pavitt taxonomy and by period. Asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

		Supplier dominated	Scale-intensive (conti.)	Scale-intensive (discon.)	Specialized supplier	Science-based
2000-2007						
Coef. of ΔULC	OLS	-0.9731***	-0.7582***	-0.8834***	-0.9352***	-0.8998***
	FE	-0.9832***	-0.7518***	-0.8905***	-0.9399***	-0.9227***
2008-2013						
Coef. of ΔULC	OLS	-0.9821***	-0.8604***	-0.7585***	-0.7664***	-0.8165***
	FE	-1.0333***	-0.9074***	-0.7597***	-0.8219***	-0.8720***

centration. Consider a general pricing rule applied to a generic product by firm i (Dosi, 2023):

$$P_i(t) = \big(INT_i(t) + \frac{w_i}{\pi_i}\big)(1 + \mu_i(t)) \tag{3}$$

where INT_i are intermediated costs (in our setting defined only with reference to imported inputs), w_i/π_i corresponds to the definition of ULC, and μ_i the markup. This yields an empirical estimation of

the form:

$$P_i(t) = \alpha INT_i(t) + \beta\left(\frac{w_i}{\pi_i}\right) \tag{4}$$

that is, where α and β are the coefficients of pass-through on intermediate (non domestic) inputs and on unit labour costs. Note that variable μ_i in equation (3) does not exert any restriction on the parameters α and β in equation (4). According to the empirical estimation, the two different elasticities over intermediate and labour costs account for the overall firm-level mark-up. In all export price specifications, we have found a positive coefficient for α, and a negative coefficient for β. The negative sign for β implies not only the existence of a markup strategy in the pricing setting, but also a negative pass-through, meaning a pricing strategy of growing markups. The results collected in the last battery of exercises have shown that the effect is mediated by the technological specialization of the firm, and particularly the sectoral technological regimes of the producing industry. In that, there might be industry specific factors that influence the way in which the pricing strategy is articulated. In particular, the markup is likely to depend upon (i) the capital intensity of the industry; (ii) the barriers to entry into the industry itself; (iii) the relative competitiveness of a firm i vis-à-vis the leaders of the industry.

In terms of these conditions, Science Based industries are certainly among the least capital (tangible) intensive industries when compared to others, while for sure there are high barriers to entry, although we have seen an increasing number of Chinese SB firms entering international markets. More probably, condition (iii) is the most appropriate candidate to explain our results. Indeed, the position that a firm occupies in the market landscape is pivotal to understand its pricing strategy, that is *autonomous* markup pricing is just a prerogative of the market and technological leader(s) of the industry, while laggards approximately anchor their prices on the latter and calculate their markups residually. The case is illustrated below (see Figure 9). Firm 1 is the technological (i.e. productivity) leader and n is the marginal one. Suppose further that the industry produces a (quality differentiated) commodity and price p (the horizontal line) is the average price by the leader (Firm 1) according to the markup rule. In such a set-up the followers are price takers — from the leader — and their markup is calculated residually.

Now, consider that under the period of analysis in which growing markup strategies were found to hold (2000-2007), Chinese firms in Science Based industry where clearly not at the technological frontier, but were instead in the process of catching-up. In that, when accessing international markets, they were quite likely to act as price-takers of the international prices defined by western oligopolies, benefiting of the markup strategy imposed by the leaders, although with reduced margins (the case of Firm n which has a still a portion of markup over unit labour costs but much lower vis-à-vis Firm 1). This type of pricing strategy notably was occurring in all industries in which China had higher

Figure 9: Markup pricing strategy. Leaders versus followers. Source: Dosi (2023), pag. 241.

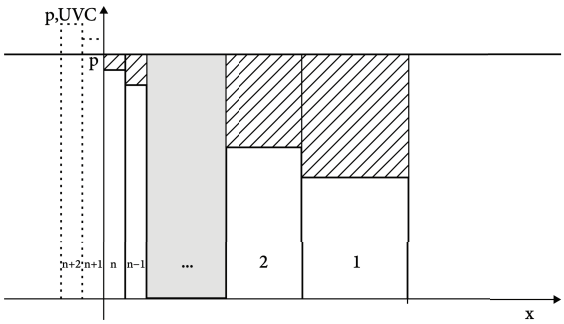


Figure 4.1 Relationship between production efficiencies, price, and market shares

initial technology-gaps, but were experiencing a dramatic productivity growth in the last period (see evidence in Figure 6).

Things partially changed with the collapse of international trade in 2008 which seems to have marked the end of generalized strategies of growing markups. This is probably due to a few complementary reasons. The first concerns the rearticulation of international trade towards different markets and countries of destination, particularly African and East Asian ones, with clearly less capacity to afford highly priced goods.

Second, the fact that China fast caught-up with the technological frontiers left less room for upward adjustments in markups. Third, the 2008 shock is associated also with a deep restructuring of the composition of the exporting firms, with a reduction of new entrants, associated with an increase of the intensive margins of exported products. What is striking, however, is the difference between the pass-through ULC to prices and that from ULC to profits, with the latter with values not so far from one. Note that profits, from an interpretative point of view, ought to be considered as a residual variable – the joint outcome of ULC dynamics and pricing behaviour. The evidence robustly suggests that the *profit share* has been constantly increasing, considering the negative correlation with the declining unit labour cost.

The high level of the coefficient, robust across industries and quite invariant over time, even after the trade collapse, is a confirmation that those that have benefited the most from the impressive growth in ULC have not been either international consumers or workers, but corporate profits. In that and ultimately, while the export-led regime of growth has experienced changing phases (pre- and post-crisis), the profit accumulation regime has been quite stable over time and across industries. Therefore, the benefits from labour productivity gains were largely appropriated by profits.

7. Conclusions

This paper has contributed to the understanding of the product/firm export pricing and of the associated micro-level accumulation regime in the Chinese manufacturing sector. By means of a firm-level analysis, we have shown that the export-led strategy of Chinese manufacturing firms has not been characterized by any dumping strategy, contrary to a widespread "common wisdom". Take the canonic definition of dumping as stated by the Article VI, comma 1 of the GATT (1994): "[...] dumping, by which it occurs when a product of one country is introduced into the commerce of another country at less than the normal value of the product [...]".[17] Of course, what is a "normal value" of a good is quite disputable. However, we know from the data that over the period 2000-2013 Chinese firms did not even passed-through to prices their decreases in unit labour costs, as such the result of impressive increases in labour productivity. Not only that: the evidence reveals that at least for a few industries and for the pre-2008 period, the elasticity of prices to ULC has been negative, meaning that falling ULC have been significantly matched with an increases in prices, highlighting growing markups.

These findings have little to do with the possibility that the Chinese Government offered to their firms various kinds of subsidies (e.g., for R&D, Girma et al. (2009)) as most other Governments have done the same, as shown very recently with reference to Evenett et al. (2024). However, this does not concern any purported price dumping. On the contrary, the observed pricing dynamics are well consistent with the functioning of oligopolistic markets, characterized by markup pricing by the international technological leaders, where Chinese firms originally entered marked by large technology gaps which they progressively succeeded in filling up, with both product upgrading and a spectacular growth in labour productivity. This applies in general but especially to those firms belonging to the industries that Pavitt (1984) calls Science Based, i.e., largely the most technologically sophisticated activities. And it is toward these industries that Chinese patterns of specialization has been moving. Our findings, therefore, bear important implications on the design and effectiveness of industrial policies as drivers of catching-up of ladder countries.

The foregoing analysis, however, has striking implications in terms of income distribution. In fact, our analysis also revealed the presence of a strong micro-level elasticity transferring gains from productivity into profitability. In fact, independently from the degree of technological specialization, all firms, from the least to the most technological advanced ones record micro-level degrees of pass-through close to the unity. This implies that the gainers from productivity upgrading have actually been mainly capitalists and firm owners.

This evidence, coupled with previous ones reporting a very low degree of pass-through of produc-

[17] See https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art6_e.pdf

tivity gains to wages (Dosi et al., 2020), both for exporting and non exporting firms (Dosi et al., 2023), shows the firm-level mechanisms of amplifying micro-level functional income inequalities in contemporary China. While the growing functional inequality has been largely acknowledged (Zhang, 2021), our evidence highlights the micro mechanism of accumulation of a profit-led regime guided by a largely unbalanced and unfair distribution of gains at the firm-level between capital and labour. The precise link between macro- and micro-functional inequality is a new avenue of research which we mean to address in future studies.

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A. Construct long-run terms of trade for manufacturing

To calculate the long-run time series of the terms of trade (TOT) for the manufacturing sector, we resort to four time series available in China Statistical Yearbook: exports - main product volume and value; imports - main product volume and value (1994-2020). We calculate the TOT index for manufacturing as follows:

First, we select industrial products out of all main products available. The main products include both primary products and industrial/manufacturing products. Based on Standard International Trade Classification (SITC) Rev3, primary products include food and live animals (0), beverages and tobacco (1), crude materials inedible (except fuels) (2), mineral fuels lubricants and related materials (3) and animal and vegetable oils fats and waxes (4); industrial products include chemical and related products (5), manufactured goods (6), machinery and transport equipment (7), miscellaneous

manufactured articles (8), and unclassified goods. To construct the export and import price indexes for manufacturing, we only resort to the product volume and value time series of these industrial products.

Second, following the same methodology adopted by the Statistics Division of China's General Administration of Customs that has been used to construct the import and export price indexes available in China Statistical Yearbook (CSY), we employ the same methodology - Fisher's Ideal Index method - to construct the export and import price indexes for industrial products. Fisher's Ideal price index is the geometric mean of the Laspeyres and Paasche price indices

$$F_p = \sqrt{L_p \times P_p} \tag{5}$$

where F_p represents Fisher's ideal price index, L_p represents Laspeyres price index and P_p represents Paasche price index. And,

$$F_p = \sqrt{\frac{\sum p_{i,t} q_{i,0}}{\sum p_{i,0} q_{i,0}} \times \frac{\sum p_{i,t} q_{i,t}}{\sum p_{i,0} q_{i,t}}} \tag{6}$$

where $p_{i,t}$ represents the price of the product i at the current year t, $p_{i,0}$ represents the price of the product i at the base year 0, $q_{i,t}$ represents the quantity of the product i at the current year t, and $q_{i,0}$ represents the quantity of the product at the base year 0.

We then construct export price index and import price index for the industrial products, respectively, for each year. Finally, we calculate the TOT for manufacturing as the ratio of export price index to import price index

B. CMM database construction

The result of the matching process is reported in Table B.1 that shows the number of firms in the original datasets and matched datasets by year. Columns (6) reports the number of matched manufacturing firms with either exporting or importing customs records. As expected, over time, due to the combined interaction of the entry in the WTO and the process of internal development, the number of matched manufacturing firms increased from 21,155 (2000) to 81,054 (2013). Exporting manufacturing firms reporting exported products are the sample of firms that will be investigated in our paper. Expanding the investigation not only to exporting but also importing firms, the matched manufacturing firms with both export and import transactions (see column 9 in Table B.1) increased from 13,313 in 2000 to 35,922 in 2007, then declined to 27,353 in 2013. Notice that value added is not available in our dataset for the period 2008-2013. Value added can be calculated using the "income approach"

provided by NBSC (see equation 7):

$$\begin{aligned}\text{Value added} = {} & \text{total wage costs + (main operating business revenue - main operating business costs)} \\ & \text{+ fixed assets depreciation (current year)} \\ & \text{+ value added tax payable + main operating business (product sales) tax and surcharges}\end{aligned} \tag{7}$$

The variables on the right hand side of equation (7) are available for the period 2011-2013. Therefore, in the following analysis, we use equation (7) to calculate value added for the period 2011-2013. In addition, some of the variables on the right hand side of equation (7) are missing for the period 2008-2010. We proxied the missing values using linear interpolation: wage costs and fixed assets depreciation (current year) are interpolated for the years 2008-2010; main operating business costs, value added tax payable, and main operating business (product sales) tax and surcharges are interpolated for 2010.[18]

In order to validate the quality of the matched dataset, we recall that trade transactions in our matched sample account for 45.9% of the total trade value in the original customs database (see Table B.2 in the Appendix). Export transactions in the matched sample account for 51.2% of export value, which is comparable to the proportion reported in Fan et al. (2015). Let us further focus on manufacturing firms only both from ASIE database (CMM) and our matched data. ASIE database also records firms' annual export value, so we can compare the matched export value with the original export value reported in ASIE (see Table B.3 in the Appendix). Our matched manufacturing firms account for 64.3% of exporting firms and 79.9% of exports reported in CMM. The proportion of matched exporters and matched export value is comparable and even higher than that reported by Yu (2015).[19] [20]

[18]Linear interpolation is applied to calculate the unknown values of a certain variable in a specific year in terms of other years by using linear polynomials to plot unknown data points which lie in the range of a discrete set of known data points. For example, values of value added tax payable in 2010 are missing. In this case, because we have values of value added tax payable in other years, we can use linear interpolation to calculate the values in 2010. The Formula of Linear Interpolation is provided below: $y = y1 + (x - x1) \times (y2 - y1)/(x2 - x1)$. It is using the coordinates of two given points to find the best fit curve as a straight line. Then it will give us any required value of y at a known value of x.

[19]Yu (2015) reports that the matched dataset accounts for 40% of full-sample firm-level production dataset in terms of the number of exporters, and account for around 53% in terms of export value.

[20]Notice that value added is not available in our dataset for the period 2008-2013. Value added can be calculated using the "income approach" provided by NBSC (see equation 7) in the Appendix.

Table B.1: Number of firms in original datasets and matched data.

Year	Customs data		Production data		Matched data		Matched data (exporting firms only)		Matched data (exp&imp firms)
	Transactions (1)	Firms (2)	Firms in full ASIE data (3)	Firms in manuf. sample (4)	Firms in full ASIE data (5)	Firms in manuf. sample (6)	Firms in full ASIE data (7)	Firms in manuf. sample (8)	Firms in manuf. sample (9)
2000	4,676,447	80,822	162,885	148,279	21,361	21,155	18,217	18,126	13,313
2001	5,109,241	88,167	171,256	156,816	25,914	25,687	22,322	22,203	15,870
2002	6,084,974	102,477	181,557	166,868	29,172	28,950	25,298	25,175	16,764
2003	7,238,841	122,323	196,222	181,186	33,901	33,678	29,780	29,641	19,895
2004	8,603,754	151,903	229,092	211,837	54,116	53,992	47,568	47,372	18,947
2005	10,215,820	180,802	270,043	250,037	55,699	55,418	49,878	49,696	30,652
2006	11,789,620	208,235	301,961	279,282	61,770	61,477	55,592	55,406	33,440
2007	10,616,946	236,357	336,768	313,046	87,767	86,341	72,700	71,671	35,922
2008	11,230,440	251,756	412,212	385,594	90,596	90,014	79,245	78,794	20,022
2009	11,340,445	262,794	366,130	341,087	78,117	77,595	69,022	68,690	16,107
2010	13,347,066	285,387	414,814	388,187	92,225	92,142	81,903	81,582	26,070
2011	14,283,297	309,630	302,593	280,405	84,319	82,918	73,829	72,839	25,290
2012	15,004,536	326,402	324,604	301,335	77,849	77,595	70,188	70,034	26,265
2013	15,655,958	341,783	344,875	321,165	81,064	81,054	73,296	73,159	27,353

Note: Column (1) reports number of observations of 8-digit HS transaction-level trade data from Customs General Administration of China by year. Column (2) reports number of unique firms covered in Customs data by year. Column (3) reports number of firms in the raw ASIE data complied by the National Bureau Statistics of China. Column (4) reports number of firms in the manufacturing sector after cleaning ASIE. Column (5) reports number of matched firms in raw ASIE dataset. Column (6) reports number of matched manufacturing firms in the cleaned ASIE dataset. Column (7) reports number of matched firms with exporting customs record in ASIE dataset. Column (8) reports number of matched manufacturing firms with exporting customs record in the cleaned ASIE dataset. Column (9) reports the number of manufacturing firms with both export and import transaction records.

Table B.2: Comparison of total trade and export value in full-sample customs data and matched data.

Year	Customs data		Matched data	
	Total trade value (1)	Export value (2)	Total trade value (3)	Export value (4)
2000	474.32	249.23	161.80 (34.11%)	85.72 (34.39%)
2001	510.23	266.66	200.10 (39.22%)	108.47 (40.68%)
2002	634.10	338.95	252.54 (39.83%)	138.47 (40.85%)
2003	851.57	438.47	356.98 (41.92%)	194.87 (44.44%)
2004	1154.46	593.65	580.07 (50.25%)	318.24 (53.61%)
2005	1421.73	761.62	673.89 (47.40%)	386.21 (50.71%)
2006	1756.85	968.51	880.45 (50.12%)	518.10 (53.49%)
2007	2174.39	1218.82	1007.08 (46.35%)	610.76 (50.11%)
2008	2563.25	1430.69	1192.06 (46.51%)	744.58 (52.04%)
2009	2207.38	1201.59	932.70 (42.25%)	579.02 (48.19%)
2010	2972.70	1577.37	1477.90 (49.72%)	884.25 (56.06%)
2011	3640.33	1897.74	1772.10 (48.68%)	1055.31 (55.61%)
2012	3867.12	2048.71	1721.41 (44.51%)	1048.25 (51.17%)
2013	4158.99	2209.00	1811.53 (43.56%)	1114.30 (50.44%)
All years	28387.42	15201.01	13020.61 (45.87%)	7786.55 (51.22%)

Note: 1) Unit: billion USD. 2) Column (1) reports total trade value in Customs database; column (2) reports total exports in Customs database; 3) Data in parentheses in column (3) and (4) are the percentage of matched trade value to the total trade value in customs dataset, and the percentage of matched export value to the total export value in customs dataset.

Table B.3: Comparison of number of exporting firms and export value in CMM data and matched data, manufacturing firms only.

Year	Production data		Matched data	
	Number of exporting firms (1)	Total exports (2)	Number of exporting firms (3)	Total exports (4)
2000	36,887	1.42	15,872 (43.03%)	0.87 (61.27%)
2001	40,497	1.59	19,250 (47.53%)	1.08 (67.92%)
2002	45,008	1.97	21,677 (48.16%)	1.39 (70.56%)
2003	50,594	2.65	25,195 (49.80%)	1.81 (68.30%)
2004	57,955	2.70	43,797 (75.57%)	3.01 (53.61%)
2005	74,338	4.71	41,192 (55.41%)	3.47 (73.67%)
2006	78,206	5.99	45,273 (57.89%)	4.76 (79.47%)
2007	78,801	7.29	50,804 (64.47%)	5.37 (73.66%)
2008	87,865	7.98	59,128 (67.29%)	6.09 (76.32%)
2009	74,395	6.51	48,355 (65.00%)	4.78 (73.43%)
2010	-	-	-	-
2011	61,833	9.75	49,444 (79.96%)	8.37 (85.85%)
2012	63,958	10.17	51,703 (80.84%)	8.62 (84.76%)
2013	65,926	11.04	52,872 (80.20%)	9.29 (84.15%)
All years	816,263	73.77	524,562 (64.26%)	58.91 (79.86%)

Note: 1) Unit for exports: billion RMB. 2) Column (1) reports number of exporting firms in CMM (i.e. manufacturing sample of ASIE database); column (2) reports total exports in CMM; 3) Data in parentheses in column (3) and (4) are the percentage of matched number of exporting firms and exports value to the total number of firms and total exports value in CMM database; 4) Export is missing for 2010 in ASIE database.

Table B.4: Distribution of the number of firms primarily exporting to Asia, Africa, Europe, Latin America, North America and Oceania.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Panel A: Firms in the exporting firms sample												
Year	Exp firms	Asia	Africa	Europe	Latin America	North America	Oceania	Asia	Africa	Europe	Latin America	North America	Oceania
								%	%	%	%	%	%
2000	17,427	11,193	210	2,467	292	3,024	241	64.23	1.21	14.16	1.68	17.35	1.38
2001	21,615	13,745	324	3,166	391	3,710	279	63.59	1.50	14.65	1.81	17.16	1.29
2002	23,490	14,778	350	3,530	414	4,119	299	62.91	1.49	15.03	1.76	17.54	1.27
2003	29,097	17,844	462	4,650	562	5,208	371	61.33	1.59	15.98	1.93	17.90	1.28
2004	31,328	19,236	698	5,336	768	4,840	450	61.40	2.23	17.03	2.45	15.45	1.44
2005	48,746	27,460	911	9,350	1,128	9,281	616	56.33	1.87	19.18	2.31	19.04	1.26
2006	54,328	29,852	1,102	10,861	1,397	10,362	754	54.95	2.03	19.99	2.57	19.07	1.39
2007	70,368	38,350	1,707	14,980	1,968	12,334	1,029	54.50	2.43	21.29	2.80	17.53	1.46
2008	48,612	24,625	1,564	11,949	1,934	7,749	791	50.66	3.22	24.58	3.98	15.94	1.63
2009	41,015	20,988	1,597	9,678	1,614	6,390	748	51.17	3.89	23.60	3.94	15.58	1.82
2010	54,133	27,905	1,793	12,432	2,257	8,806	940	51.55	3.31	22.97	4.17	16.27	1.74
2011	54,379	28,471	1,858	12,296	2,523	8,297	934	52.36	3.42	22.61	4.64	15.26	1.72
2012	53,421	27,824	1,700	11,612	2,545	8,798	942	52.08	3.18	21.74	4.76	16.47	1.76
2013	56,699	29,555	1,969	12,233	2,688	9,280	974	52.13	3.47	21.58	4.74	16.37	1.72
	Panel B: Firms in the exporting and importing firms sample												
Year	Exp&Imp firms	Asia	Africa	Europe	Latin America	North America	Oceania	Asia	Africa	Europe	Latin America	North America	Oceania
								%	%	%	%	%	%
2000	13,311	8,749	79	1,685	159	2,477	162	65.73	0.59	12.66	1.19	18.61	1.22
2001	15,870	10,473	123	1,999	191	2,897	187	65.99	0.78	12.60	1.20	18.25	1.18
2002	16,762	10,963	126	2,160	202	3,116	195	65.40	0.75	12.89	1.21	18.59	1.16
2003	19,894	12,700	156	2,697	255	3,858	228	63.84	0.78	13.56	1.28	19.39	1.15
2004	18,945	12,590	196	2,651	255	3,024	229	66.46	1.03	13.99	1.35	15.96	1.21
2005	30,647	18,463	260	4,948	417	6,202	357	60.24	0.85	16.15	1.36	20.24	1.16
2006	33,439	19,855	266	5,668	504	6,742	404	59.38	0.80	16.95	1.51	20.16	1.21
2007	35,916	20,892	343	6,611	556	7,068	446	58.17	0.96	18.41	1.55	19.68	1.24
2008	20,021	11,012	290	4,418	470	3,567	264	55.00	1.45	22.07	2.35	17.82	1.32
2009	16,106	9,003	315	3,413	363	2,780	232	55.90	1.96	21.19	2.25	17.26	1.44
2010	26,067	14,606	378	5,392	639	4,637	415	56.03	1.45	20.69	2.45	17.79	1.59
2011	25,290	14,336	370	5,231	759	4,217	377	56.69	1.46	20.68	3.00	16.67	1.49
2012	26,265	14,699	397	5,170	832	4,754	413	55.96	1.51	19.68	3.17	18.10	1.57
2013	27,353	15,425	435	5,352	849	4,895	397	56.39	1.59	19.57	3.10	17.90	1.45

Note: Panel A is for exporting firms sample; panel B is for firms both with export and import records (the ones used in the regression). Column (1) report total number of firms in the sample. Columns (2)-(7) report the number of firms by exporting destination. Column (8)-(13) report the percentage share.

C. Estimates by two periods, controlling export destination specialization

Table C.5: Estimate the degree of pass-through from productivity gains to international prices for periods 2000-2007 and 2008-2013.

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: OLS estimates					
	2000-2007			**2008-2013**		
ΔULC$_{it}$	−0.0145***	−0.0144***	-0.0144***	−0.0193	−0.0074	-0.0082
	(0.0042)	(0.0042)	(0.0042)	(0.0103)	(0.0101)	(0.0101)
ΔImport Costs$_{it}$	0.0032**	0.0033**	0.0033**	0.0070***	0.0075***	0.0073***
	(0.0011)	(0.0011)	(0.0011)	(0.002)	(0.002)	(0.002)
ΔExchange Rate$_{it}$	−1.4108	0.6456		−3.5670*	−1.8433***	
	(0.9942)	(0.4201)		(1.7042)	(0.2318)	
Consumption goods	0.0132	0.0122	0.012	0.0126	0.0163	0.0164
	(0.0083)	(0.0083)	(0.0083)	(0.0142)	(0.0142)	(0.0143)
Capital goods	0.2241***	0.2236***	0.2234***	0.2272***	0.2273***	0.2274***
	(0.0168)	(0.0168)	(0.0168)	(0.0222)	(0.0222)	(0.0222)
Africa	0.0498	0.0529	0.0532	−0.1487**	−0.1523**	-0.1577**
	(0.0642)	(0.0643)	(0.0643)	(0.0569)	(0.0568)	(0.0568)
Europe	−0.0085	−0.0073	−0.0075	−0.0365**	−0.0365**	-0.0368**
	(0.01)	(0.01)	(0.01)	(0.0136)	(0.0137)	(0.0137)
Latin America	−0.027	−0.0247	−0.0246	−0.0328	−0.0265	-0.0268
	(0.0333)	(0.0333)	(0.0333)	(0.0365)	(0.0366)	(0.0366)
North America	−0.0219**	−0.0213**	−0.0216**	0.0202	0.0217	0.0214
	(0.0082)	(0.0082)	(0.0082)	(0.0148)	(0.0149)	(0.0149)
Oceania	−0.0296	−0.0292	−0.0294	−0.0823	−0.0785	-0.0801
	(0.0386)	(0.0387)	(0.0387)	(0.053)	(0.0534)	(0.0534)
Year trend		0.0217***	0.0164***		0.0447***	0.0270***
		(0.0039)	(0.0017)		(0.004)	(0.0031)
Sectoral dummies		yes	yes		yes	yes
Year-sectoral dummies	yes				yes	
Num. of obs.	106,723	106,723	106,723	66,876	66,876	66,876
R2	0.0080	0.0057	0.0056	0.0195	0.0060	0.0053
	Panel B: estimates controlling unobserved time invariant firm fixed effects					
	2000-2007			**2008-2013**		
ΔULC$_{it}$	−0.0145**	−0.0140**	−0.0140**	−0.0178	−0.0084	-0.0103
	(0.0052)	(0.0051)	(0.0051)	(0.0143)	(0.014)	(0.0141)
ΔImport Costs$_{it}$	0.0028*	0.0030*	0.0030*	0.0076**	0.0079**	0.0079**
	(0.0014)	(0.0014)	(0.0014)	(0.0025)	(0.0026)	(0.0026)
ΔExchange Rate$_{it}$	−1.7072	0.5009		−6.3676**	−1.7667***	
	(1.0106)	(0.4636)		(2.0251)	(0.2854)	
Consumption goods	0.1196*	0.1181*	0.1184*	−0.036	−0.0354	-0.0364
	(0.0513)	(0.0513)	(0.0512)	(0.0969)	(0.0966)	(0.0968)
Capital goods	1.0047***	1.0042***	1.0041***	1.9980***	2.0050***	2.0074***
	(0.0897)	(0.0899)	(0.0899)	(0.1543)	(0.1539)	(0.154)
Africa	0.0729	0.076	0.0761	−0.1271	−0.1162	-0.121
	(0.1451)	(0.1455)	(0.1455)	(0.1257)	(0.1255)	(0.1254)
Europe	−0.0619*	−0.0572	−0.0576	−0.0842	−0.0812	-0.0774
	(0.0306)	(0.0305)	(0.0305)	(0.0473)	(0.0474)	(0.0475)
Latin America	−0.0825	−0.0802	−0.0801	−0.0693	−0.053	-0.0509
	(0.0755)	(0.0753)	(0.0753)	(0.0737)	(0.0733)	(0.0732)
North America	−0.0906**	−0.0872**	−0.0872**	−0.0684	−0.0614	-0.0606
	(0.0278)	(0.0277)	(0.0277)	(0.0501)	(0.0501)	(0.0502)
Oceania	−0.1376	−0.1442	−0.1442	−0.1151	−0.1181	-0.1227
	(0.0773)	(0.0773)	(0.0773)	(0.1607)	(0.1603)	(0.1606)
Year trend		0.0182***	0.0140***		0.0279***	0.0098*
		(0.0042)	(0.002)		(0.005)	(0.0041)
Sectoral dummies		yes	yes		yes	yes
Year-sectoral dummies	yes				yes	
Num. of obs.	94,930	94,930	94,930	55,704	55,704	55,704
R2	0.1863	0.1836	0.1836	0.2159	0.2028	0.2022

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table C.6: Estimate the degree of pass-through from productivity gains to profitability for periods 2000-2007 and 2008-2013.

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: OLS estimates					
	2000-2007			**2008-2013**		
ΔULC$_{it}$	−0.9066***	−0.9064***	−0.9064***	−0.8559***	−0.8623***	-0.8609***
	(0.0061)	(0.0061)	(0.0061)	(0.0106)	(0.0102)	(0.0101)
ΔImport Costs$_{it}$	0.0006	0.0006	0.0006	−0.0009	−0.0014*	-0.0015**
	(0.0007)	(0.0006)	(0.0006)	(0.0005)	(0.0006)	(0.0006)
ΔExchange Rate$_{it}$	−3.0813***	−0.107		−0.0691	−1.1502***	
	(0.8945)	(0.2552)		(0.6069)	(0.0898)	
Consumption goods	0.0014	0.002	0.002	0.0074	0.0067	0.0066
	(0.0064)	(0.0063)	(0.0063)	(0.0054)	(0.0054)	(0.0054)
Capital goods	0.0035	0.0041	0.0041	0.0121*	0.0121*	0.0123*
	(0.007)	(0.007)	(0.007)	(0.0054)	(0.0054)	(0.0054)
Africa	−0.0788***	−0.0788***	−0.0789***	0.0086	0.0125	0.0091
	(0.0214)	(0.0213)	(0.0213)	(0.0156)	(0.0157)	(0.0157)
Europe	−0.0119*	−0.0123*	−0.0122*	0.0038	0.0042	0.0041
	(0.006)	(0.006)	(0.006)	(0.0046)	(0.0046)	(0.0046)
Latin America	0.0057	0.0063	0.0063	−0.0113	−0.0097	-0.0095
	(0.0184)	(0.0184)	(0.0184)	(0.0094)	(0.0095)	(0.0095)
North America	−0.0028	−0.0031	−0.003	−0.0023	−0.0011	-0.0013
	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Oceania	0.0021	0.0023	0.0024	−0.0296*	−0.0275	-0.0282
	(0.021)	(0.021)	(0.021)	(0.0146)	(0.0148)	(0.0147)
Year trend		0.0049*	0.0058***		−0.0078***	-0.0187***
		(0.0025)	(0.0011)		(0.0012)	(0.0010)
Sectoral dummies		yes	yes		yes	yes
Year-sectoral dummies	yes				yes	
Num. of obs.	96,869	96,869	96,869	67,870	67,870	67,870
R2	0.4902	0.4889	0.4889	0.5054	0.4970	0.4956
	Panel B: estimates controlling unobserved time invariant firm fixed effects					
	2000-2007			**2008-2013**		
ΔULC$_{it}$	−0.9124***	−0.9122***	−0.9122***	−0.9015***	−0.9030***	-0.9022***
	(0.0096)	(0.0096)	(0.0096)	(0.0158)	(0.0149)	(0.0149)
ΔImport Costs$_{it}$	0.001	0.0009	0.0009	−0.0013*	−0.0019**	-0.0019**
	(0.0009)	(0.0009)	(0.0009)	(0.0007)	(0.0007)	(0.0007)
ΔExchange Rate$_{it}$	−3.4585**	0.1922		−0.6131	−1.1154***	
	(1.2341)	(0.2926)		(0.7807)	(0.1054)	
Consumption goods	−0.0097	−0.0099	−0.0099	−0.0045	−0.0023	-0.0027
	(0.0237)	(0.0236)	(0.0236)	(0.0219)	(0.0221)	(0.0221)
Capital goods	0.0212	0.0191	0.0191	−0.0091	−0.0078	-0.0068
	(0.0205)	(0.0205)	(0.0205)	(0.0191)	(0.0193)	(0.0194)
Africa	−0.1200**	−0.1188**	−0.1188**	0.0012	0.0122	0.009
	(0.0419)	(0.0417)	(0.0417)	(0.0272)	(0.0274)	(0.0274)
Europe	0.0068	0.0031	0.003	−0.0121	−0.0096	-0.0071
	(0.0138)	(0.0138)	(0.0138)	(0.011)	(0.0111)	(0.0111)
Latin America	−0.0103	−0.0086	−0.0085	−0.0064	−0.0032	-0.0016
	(0.0324)	(0.0322)	(0.0322)	(0.0201)	(0.0202)	(0.0203)
North America	−0.0009	−0.0032	−0.0032	0.0086	0.0118	0.0123
	(0.0156)	(0.0156)	(0.0156)	(0.0142)	(0.0143)	(0.0144)
Oceania	−0.0165	−0.0158	−0.0158	−0.0338	−0.0317	-0.034
	(0.0529)	(0.0529)	(0.0529)	(0.0305)	(0.0306)	(0.0305)
Year trend		0.0051	0.0035**		−0.0109***	-0.0221***
		(0.0028)	(0.0013)		(0.0016)	(0.0013)
Sectoral dummies		yes	yes		yes	yes
Year-sectoral dummies	yes				yes	
Num. of obs.	84,157	84,157	84,157	56,262	56,262	56,262
R2	0.5779	0.5764	0.5764	0.6415	0.6338	0.6325

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

D. Estimates by Pavitt taxonomy

Table D.7: Estimate the degree of pass-through from productivity gains to international prices for supplier dominated firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.0048	−0.0084	−0.0068	−0.0068	−0.0068	−0.0069	−0.0084	−0.0068	−0.0069
	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0047)	(0.0046)
ΔImport Costs$_{it}$	0.0034**	0.0026*	0.0028*	0.0028*	0.0028*	0.0028*	0.0026*	0.0028*	0.0028*
	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
ΔExchange Rate$_{it}$	−1.2824***	−3.7564	−0.0393	−0.0409			−3.7882	−0.0369	
	(0.1307)	(2.5882)	(0.1648)	(0.1649)			(2.5917)	(0.1648)	
Consumption goods	0.0089	0.0203*	0.0230**	0.0228*	0.0230**	0.0229*	0.0189*	0.0207*	0.0207*
	(0.0075)	(0.0089)	(0.0075)	(0.0089)	(0.0074)	(0.0089)	(0.0091)	(0.0091)	(0.0091)
Capital goods	0.3285***	0.3355***	0.3309***	0.3341***	0.3310***	0.3342***	0.3346***	0.3330***	0.3330***
	(0.0355)	(0.0377)	(0.0355)	(0.0378)	(0.0355)	(0.0378)	(0.0378)	(0.0379)	(0.0379)
Africa							−0.0451	−0.0529	−0.0529
							(0.0493)	(0.0505)	(0.0505)
Europe							−0.0052	−0.0031	−0.003
							(0.0094)	(0.0094)	(0.0095)
Latin America							−0.0804*	−0.0759*	−0.0759*
							(0.0342)	(0.0346)	(0.0346)
North America							0.003	0.0064	0.0065
							(0.0091)	(0.0091)	(0.009)
Oceania							−0.1069**	−0.1098**	−0.1098**
							(0.0347)	(0.0349)	(0.0349)
Year trend			0.0197***	0.0197***	0.0198***	0.0198***		0.0198***	0.0200***
			(0.0014)	(0.0014)	(0.0011)	(0.0011)		(0.0014)	(0.0012)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	74,592	74,592	74,592	74,592	74,592	74,592	74,592	74,592	74,592
R2	0.0055	0.0263	0.0099	0.0100	0.0099	0.0100	0.0266	0.0103	0.0103
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.0061	−0.0087	−0.0077	−0.0077	−0.0078	−0.0078	−0.0088	−0.0078	−0.0079
	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)
ΔImport Costs$_{it}$	0.003	0.0027	0.0028	0.0029	0.0028	0.0028	0.0027	0.0029	0.0029
	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)
ΔExchange Rate$_{it}$	−0.7115***	−6.0901	−0.1587	−0.1369			−6.224	−0.1413	
	(0.162)	(3.2163)	(0.1866)	(0.1868)			(3.2187)	(0.1865)	
Consumption goods	0.0326	0.0374	0.0358	0.037	0.0357	0.0369	0.0397	0.0395	0.0393
	(0.0489)	−0.049	−0.0489	−0.0489	−0.0489	−0.0489	−0.0491	−0.049	−0.049
Capital goods	1.1317***	1.1361***	1.1249***	1.1275***	1.1250***	1.1275***	1.1354***	1.1268***	1.1269***
	(0.1564)	(0.1562)	(0.1565)	(0.1566)	(0.1565)	(0.1566)	(0.1561)	(0.1565)	(0.1565)
Africa							−0.0088	0.007	0.0073
							(0.0891)	(0.0908)	(0.0908)
Europe							−0.027	−0.0287	−0.0279
							(0.0253)	(0.0251)	(0.0251)
Latin America							−0.0974	−0.0845	−0.0845
							(0.069)	(0.0692)	(0.0692)
North America							−0.0354	−0.034	−0.0335
							(0.0272)	(0.027)	(0.027)
Oceania							−0.2759**	−0.2859***	−0.2859***
							(0.0858)	(0.0868)	(0.0869)
Year trend			0.0149***	0.0149***	0.0153***	0.0153***		0.0152***	0.0157***
			(0.0017)	(0.0017)	(0.0015)	(0.0015)	(0)	(0.0018)	(0.0015)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	67,437	67,437	67,437	67,437	67,437	67,437	67,437	67,437	67,437
R2	0.1622	0.1788	0.1634	0.1637	0.1633	0.1637	0.1792	0.1641	0.1641

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.8: Estimate the degree of pass-through from productivity gains to profitability for supplier dominated firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.9760***	−0.9761***	−0.9760***	−0.9760***	−0.9767***	−0.9767***	−0.9761***	−0.9760***	−0.9767***
	(0.0073)	(0.0074)	(0.0073)	(0.0073)	(0.0073)	(0.0073)	(0.0074)	(0.0073)	(0.0073)
ΔImport Costs$_{it}$	0.0001	0.0001	0.0001	0.0001	−0.0001	−0.0002	0.0001	0.0001	−0.0002
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0007)
ΔExchange Rate$_{it}$	−1.2549***	−1.5655	−1.2686***	−1.2713***			−1.6383	−1.2748***	
	(0.0973)	(1.275)	(0.0992)	(0.0992)			(1.2769)	(0.0994)	
Consumption goods	−0.0002	0.0003	−0.0004	−0.0005	0.0007	0.0007	0.0011	0.0006	0.0013
	(0.0047)	(0.0058)	(0.0046)	(0.0057)	(0.0047)	(0.0057)	(0.0059)	(0.0059)	(0.0059)
Capital goods	0.0185	0.0106	0.0184	0.0113	0.0194	0.0122	0.0108	0.0116	0.0123
	(0.0114)	(0.0119)	(0.0114)	(0.0119)	(0.0114)	(0.0119)	(0.0119)	(0.0119)	(0.012)
Africa							−0.022	−0.0172	−0.0169
							(0.024)	(0.0241)	(0.0241)
Europe							−0.0028	−0.0034	0.0002
							(0.0063)	(0.0063)	(0.0063)
Latin America							−0.0087	−0.0059	−0.0056
							(0.0189)	(0.0188)	(0.0189)
North America							−0.006	−0.0072	−0.0052
							(0.0062)	(0.0062)	(0.0062)
Oceania							−0.0053	−0.0064	−0.0059
							(0.0181)	(0.0181)	(0.0181)
Year trend			−0.0002	−0.0003	0.0033***	0.0032***		−0.0002	0.0033***
			(0.0006)	(0.0006)	(0.0006)	(0.0006)		(0.0006)	(0.0006)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	68,258	68,258	68,258	68,258	68,258	68,258	68,258	68,258	68,258
R2	0.4905	0.4929	0.4905	0.4906	0.4894	0.4895	0.4929	0.4906	0.4895
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.9968***	−0.9976***	−0.9968***	−0.9969***	−0.9970***	−0.9971***	−0.9976***	−0.9969***	−0.9971***
	(0.0105)	(0.0106)	(0.0105)	(0.0105)	(0.0105)	(0.0105)	(0.0106)	(0.0105)	(0.0106)
ΔImport Costs$_{it}$	0.0007	0.0008	0.0008	0.0008	0.0005	0.0005	0.0008	0.0008	0.0005
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
ΔExchange Rate$_{it}$	−1.3522***	−0.5889	−1.3715***	−1.3730***			−0.5735	−1.3739***	
	(0.111)	(1.7513)	(0.1122)	(0.1123)			(1.7522)	(0.1127)	
Consumption goods	−0.0107	−0.012	−0.0108	−0.0105	−0.0116	−0.0111	−0.0125	−0.0107	−0.0115
	(0.0178)	(0.0179)	(0.0178)	(0.0178)	(0.0178)	(0.0178)	(0.0179)	(0.0178)	(0.0179)
Capital goods	−0.0308	−0.0306	−0.0304	−0.0304	−0.0302	−0.0301	−0.0309	−0.0306	−0.0305
	(0.0318)	(0.0318)	(0.0318)	(0.0319)	(0.0319)	(0.0319)	(0.0318)	(0.0319)	(0.0319)
Africa							−0.0385	−0.0316	−0.0285
							(0.0511)	(0.0514)	(0.0517)
Europe							−0.0003	−0.004	0.004
							(0.0139)	(0.0139)	(0.0139)
Latin America							−0.0028	−0.0012	−0.0013
							(0.0324)	(0.0323)	(0.0323)
North America							0.0049	−0.0003	0.0049
							(0.0153)	(0.0153)	(0.0153)
Oceania							−0.0298	−0.0349	−0.0342
							(0.0368)	(0.0369)	(0.0368)
Year trend			−0.0006	−0.0005	0.0031***	0.0032***		−0.0004	0.0032***
			(0.0009)	(0.0009)	(0.0009)	(0.0009)		(0.0009)	(0.0009)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	60,644	60,644	60,644	60,644	60,644	60,644	60,644	60,644	60,644
R2	0.5819	0.5844	0.5819	0.5820	0.5809	0.5810	0.5844	0.5820	0.5810

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.9: Estimate the degree of pass-through from productivity gains to international prices scale-intensive (continuous process) firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.0136	−0.0173*	−0.014	−0.0147	−0.0133	−0.014	−0.0175*	−0.0149	−0.0142
	(0.0077)	(0.0078)	(0.0077)	(0.0078)	(0.0077)	(0.0078)	(0.0078)	(0.0078)	(0.0078)
ΔImport Costs$_{it}$	0.0028	0.0029	0.0028	0.0028	0.0028	0.0028	0.0029	0.0028	0.0028
	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)
ΔExchange Rate$_{it}$	−1.5215***	4.6023	−1.1867***	−1.2118***			4.4777	−1.2286***	
	(0.2963)	(5.7911)	(0.3424)	(0.3435)			(5.7988)	(0.3428)	
Consumption goods	−0.0014	0.0068	0.0035	0.0033	0.004	0.0039	0.0064	0.0032	0.0036
	(0.014)	(0.0225)	(0.0145)	(0.0223)	(0.0144)	(0.0223)	(0.0227)	(0.0226)	(0.0226)
Capital goods	0.9766***	0.9546***	0.9770***	0.9730***	0.9777***	0.9739***	0.9553***	0.9737***	0.9744***
	(0.1703)	(0.1661)	(0.1703)	(0.1698)	(0.1704)	(0.1699)	(0.1659)	(0.1696)	(0.1697)
Africa							0.0516	0.0538	0.0509
							(0.0869)	(0.0849)	(0.0848)
Europe							−0.0362	−0.0389	−0.0361
							(0.0204)	(0.0203)	(0.0204)
Latin America							−0.1410**	−0.1395**	−0.1410**
							(0.0475)	(0.0475)	(0.0476)
North America							0.0005	−0.0028	−0.0019
							(0.0215)	(0.0214)	(0.0215)
Oceania							−0.0404	−0.0338	−0.0346
							(0.0924)	(0.0927)	(0.0927)
Year trend			0.0055*	0.0056*	0.0085***	0.0086***		0.0058*	0.0089***
			(0.0024)	(0.0025)	(0.0021)	(0.0022)		(0.0025)	(0.0022)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	24,871	24,871	24,871	24,871	24,871	24,871	24,871	24,871	24,871
R2	0.0093	0.0269	0.0096	0.0099	0.0091	0.0093	0.0272	0.0102	0.0096
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.0107	−0.0113	−0.0111	−0.0111	−0.0095	−0.0096	−0.0113	−0.0111	−0.0096
	(0.0102)	(0.0102)	(0.0102)	(0.0102)	(0.0102)	(0.0102)	(0.0102)	(0.0102)	(0.0102)
ΔImport Costs$_{it}$	0.0025	0.0026	0.0025	0.0025	0.0025	0.0025	0.0025	0.0024	0.0024
	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)
ΔExchange Rate$_{it}$	−2.2576***	8.9297	−2.1174***	−2.1179***			8.9153	−2.1502***	
	(0.319)	(7.4263)	(0.3476)	(0.3477)			(7.4247)	(0.3492)	
Consumption goods	0.0582	0.0335	0.0586	0.0585	0.0556	0.0555	0.0265	0.0517	0.049
	(0.1132)	(0.114)	(0.1132)	(0.1133)	(0.1133)	(0.1133)	(0.114)	(0.1134)	(0.1134)
Capital goods	2.5148***	2.3658***	2.5141***	2.5324***	2.5139***	2.5322***	2.3623***	2.5285***	2.5283***
	(0.4789)	(0.4546)	(0.479)	(0.4775)	(0.48)	(0.4785)	(0.4534)	(0.4764)	(0.4775)
Africa							0.1357	0.1378	0.128
							(0.1434)	(0.1401)	(0.1409)
Europe							−0.0841	−0.0916	−0.0828
							(0.0549)	(0.054)	(0.0541)
Latin America							−0.1332	−0.1174	−0.1203
							(0.0821)	(0.0817)	(0.0824)
North America							−0.0257	−0.0325	−0.0319
							(0.0464)	(0.0458)	(0.046)
Oceania							−0.081	−0.0754	−0.0772
							(0.0812)	(0.0814)	(0.0816)
Year trend			0.0041	0.0039	0.0094**	0.0092**		0.0039	0.0093**
			(0.0031)	(0.0031)	(0.0029)	(0.0029)		(0.0031)	(0.0029)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	22,139	22,139	22,139	22,139	22,139	22,139	22,139	22,139	22,139
R2	0.1516	0.1726	0.1516	0.1520	0.1502	0.1506	0.1729	0.1524	0.1509

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.10: Estimate the degree of pass-through from productivity gains to profitability scale-intensive (continuous process) firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.7871***	−0.7805***	−0.7871***	−0.7868***	−0.7861***	−0.7857***	−0.7804***	−0.7868***	−0.7857***
	(0.013)	(0.0132)	(0.013)	(0.013)	(0.0129)	(0.013)	(0.0132)	(0.013)	(0.013)
ΔImport Costs$_{it}$	−0.0003	0.0001	−0.0003	−0.0003	−0.0003	−0.0003	0.0001	−0.0003	−0.0003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ΔExchange Rate$_{it}$	−0.9453***	−2.7484	−0.9322***	−0.9198***			−2.7741	−0.9190***	
	(0.1611)	(2.1325)	(0.1654)	(0.1659)			(2.1332)	(0.1661)	
Consumption goods	0.0097	0.0122	0.0099	0.0114	0.0099	0.0118	0.0115	0.0106	0.0109
	(0.0076)	(0.0125)	(0.0077)	(0.0124)	(0.0077)	(0.0124)	(0.0124)	(0.0123)	(0.0123)
Capital goods	−0.0218	−0.0258	−0.0219	−0.02	−0.0212	−0.0191	−0.025	−0.019	−0.0182
	(0.0323)	(0.0322)	(0.0323)	(0.0324)	(0.0323)	(0.0324)	(0.0322)	(0.0324)	(0.0323)
Africa							−0.0299	−0.0303	−0.0321
							(0.0313)	(0.0316)	(0.0315)
Europe							−0.0025	−0.0038	−0.0016
							(0.0101)	(0.0101)	(0.0101)
Latin America							−0.0217	−0.0162	−0.0164
							(0.0261)	(0.0263)	(0.0263)
North America							0.0093	0.0111	0.012
							(0.0126)	(0.0125)	(0.0125)
Oceania							0.0117	0.0104	0.01
							(0.0352)	(0.0357)	(0.0357)
Year trend			0.0002	0.0002	0.0025**	0.0024**		0.0002	0.0024**
			(0.0009)	(0.0009)	(0.0009)	(0.0009)		(0.0009)	(0.0009)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	24,694	24,694	24,694	24,694	24,694	24,694	24,694	24,694	24,694
R2	0.5113	0.5175	0.5113	0.5115	0.5107	0.5109	0.5176	0.5116	0.5109
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.7913***	−0.7856***	−0.7913***	−0.7915***	−0.7898***	−0.7900***	−0.7855***	−0.7914***	−0.7899***
	(0.0203)	(0.0206)	(0.0203)	(0.0203)	(0.0202)	(0.0202)	(0.0206)	(0.0203)	(0.0202)
ΔImport Costs$_{it}$	−0.0013	−0.0008	−0.0013	−0.0013	−0.0013	−0.0013	−0.0008	−0.0013	−0.0012
	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
ΔExchange Rate$_{it}$	−1.0949***	−2.6774	−1.1045***	−1.1042***			−2.7443	−1.1022***	
	(0.1853)	(2.8377)	(0.1882)	(0.1882)			(2.84)	(0.1885)	
Consumption goods	0.0106	0.0172	0.0106	0.0098	0.0092	0.0084	0.0195	0.0119	0.0107
	(0.0467)	(0.0475)	(0.0467)	(0.0468)	(0.0468)	(0.0468)	(0.0477)	(0.047)	(0.047)
Capital goods	0.0087	−0.0024	0.0088	0.0047	0.0081	0.004	−0.0022	0.0057	0.005
	(0.0649)	(0.0651)	(0.0649)	(0.0653)	(0.0643)	(0.0648)	(0.065)	(0.0652)	(0.0647)
Africa							−0.071	−0.0801	−0.0834
							(0.0461)	(0.0455)	(0.0453)
Europe							0.0085	−0.0013	0.0032
							(0.0214)	(0.0211)	(0.0212)
Latin America							−0.0449	−0.0427	−0.0424
							(0.0398)	(0.0399)	(0.0399)
North America							0.0233	0.0225	0.0235
							(0.0247)	(0.0245)	(0.0246)
Oceania							0.1036	0.095	0.095
							(0.0825)	(0.0828)	(0.0827)
Year trend			−0.0003	−0.0001	0.0024	0.0025*		−0.0001	0.0025*
			(0.0012)	(0.0012)	(0.0012)	(0.0012)		(0.0012)	(0.0012)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	21,764	21,764	21,764	21,764	21,764	21,764	21,764	21,764	21,764
R2	0.5881	0.5938	0.5881	0.5884	0.5873	0.5876	0.5940	0.5885	0.5878

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.11: Estimate the degree of pass-through from productivity gains to international prices for scale-intensive (discontinuous process) firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	0.003	−0.0077	0.0004	0.0008	0.0005	0.0008	−0.0078	0.0007	0.0007
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
ΔImport Costs$_{it}$	0.0055	0.0042	0.0054	0.0051	0.0054	0.0051	0.0042	0.0051	0.0051
	(0.0033)	(0.0032)	(0.0033)	(0.0033)	(0.0033)	(0.0033)	(0.0032)	(0.0033)	(0.0033)
ΔExchange Rate$_{it}$	−0.7806*	−10.8741	0.0564	0.0485			−11.0155	0.0388	
	(0.3632)	(17.1925)	(0.4019)	(0.4029)			(17.1849)	(0.4032)	
Consumption goods	−0.0151	0.0148	−0.0037	0.0106	−0.0037	0.0105	0.0176	0.0138	0.0137
	(0.0198)	(0.0212)	(0.0197)	(0.0213)	(0.0197)	(0.0213)	(0.0214)	(0.0215)	(0.0215)
Capital goods	0.1814***	0.2248***	0.1864***	0.2246***	0.1863***	0.2245***	0.2277***	0.2283***	0.2283***
	(0.0302)	(0.0355)	(0.0302)	(0.0354)	(0.0302)	(0.0354)	(0.0356)	(0.0355)	(0.0355)
Africa							−0.0838	−0.1157	−0.1157
							(0.0986)	(0.101)	(0.101)
Europe							−0.0215	−0.0269	−0.027
							(0.0262)	(0.0264)	(0.0263)
Latin America							0.0016	0.0054	0.0054
							(0.0615)	(0.0614)	(0.0614)
North America							0.0051	0.0098	0.0097
							(0.022)	(0.0222)	(0.0222)
Oceania							−0.0326	−0.0268	−0.0268
							(0.097)	(0.0978)	(0.0978)
Year trend			0.0155***	0.0144***	0.0154***	0.0143***		0.0146***	0.0145***
			(0.0032)	(0.0033)	(0.003)	(0.0031)		(0.0033)	(0.0031)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	20,678	20,678	20,678	20,678	20,678	20,678	20,678	20,678	20,678
R2	0.0028	0.0240	0.0042	0.0060	0.0042	0.0060	0.0241	0.0061	0.0061
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	0.002	−0.0086	0.0007	0.0011	0.0004	0.0009	−0.0087	0.0009	0.0006
	(0.0141)	(0.0142)	(0.0141)	(0.0141)	(0.0141)	(0.0141)	(0.0142)	(0.014)	(0.014)
ΔImport Costs$_{it}$	0.0071	0.0057	0.0071	0.0070	0.0071	0.0070	0.0057	0.0069	0.0069
	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)
ΔExchange Rate$_{it}$	−0.9081	−1.6998	−0.6919	−0.6595			−1.4963	−0.7028	
	(0.4658)	(23.7278)	(0.4842)	(0.4866)			(23.8602)	(0.4885)	
Consumption goods	0.3756**	0.3696**	0.3740**	0.3725**	0.3749**	0.3734**	0.3724**	0.3748**	0.3757**
	(0.1314)	(0.1308)	(0.1314)	(0.1314)	(0.1313)	(0.1313)	(0.1305)	(0.1311)	(0.131)
Capital goods	1.2464***	1.2491***	1.2428***	1.2394***	1.2434***	1.2400***	1.2493***	1.2399***	1.2405***
	(0.1681)	(0.1681)	(0.1682)	(0.168)	(0.168)	(0.1679)	(0.1681)	(0.1681)	(0.1679)
Africa							−0.3272	−0.371	−0.3703
							(0.2072)	(0.2136)	(0.2134)
Europe							−0.1269	−0.1226	−0.1206
							(0.0716)	(0.0714)	(0.0713)
Latin America							−0.0889	−0.0826	−0.0833
							(0.1191)	(0.1183)	(0.1181)
North America							−0.0608	−0.0377	−0.0377
							(0.062)	(0.0624)	(0.0624)
Oceania							0.0696	0.0801	0.0784
							(0.1698)	(0.1681)	(0.1684)
Year trend			0.0076	0.0083	0.0091*	0.0097*		0.0088*	0.0104*
			(0.0043)	(0.0044)	(0.0042)	(0.0042)		(0.0044)	(0.0042)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	18,163	18,163	18,163	18,163	18,163	18,163	18,163	18,163	18,163
R2	0.1688	0.1875	0.1689	0.1693	0.1688	0.1692	0.1881	0.1700	0.1699

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.12: Estimate the degree of pass-through from productivity gains to profitability for scale-intensive (discontinuous process) firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.8461***	−0.8422***	−0.8463***	−0.8473***	−0.8463***	−0.8472***	−0.8422***	−0.8473***	−0.8472***
	(0.0144)	(0.0145)	(0.0144)	(0.0144)	(0.0143)	(0.0144)	(0.0145)	(0.0144)	(0.0144)
ΔImport Costs$_{it}$	−0.0014	−0.0012	−0.0014	−0.0013	−0.0014	−0.0014	−0.0012	−0.0014	−0.0014
	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
ΔExchange Rate$_{it}$	−1.0419***	5.1233	−0.9607***	−1.0300***			5.0962	−1.0291***	
	(0.1753)	(7.3838)	(0.1747)	(0.1752)			(7.3867)	(0.1752)	
Consumption goods	0.0029	−0.0101	0.0039	−0.0093	0.0041	−0.0082	−0.0095	−0.0089	−0.008
	(0.0111)	(0.0126)	(0.0111)	(0.0126)	(0.0111)	(0.0126)	(0.0127)	(0.0127)	(0.0127)
Capital goods	0.0004	−0.0005	0.0008	−0.0002	0.0016	0.0009	0.001	0.0011	0.0021
	(0.0112)	(0.0116)	(0.0112)	(0.0116)	(0.0112)	(0.0117)	(0.0117)	(0.0117)	(0.0117)
Africa							−0.0575*	−0.0484	−0.0486
							(0.0279)	(0.0284)	(0.0285)
Europe							−0.0002	0.0006	0.0022
							(0.0104)	(0.0105)	(0.0105)
Latin America							−0.0003	0.0006	0.0008
							(0.0186)	(0.0186)	(0.0186)
North America							0.0033	0.0024	0.0029
							(0.0103)	(0.0103)	(0.0103)
Oceania							−0.0188	−0.0154	−0.0142
							(0.0286)	(0.0284)	(0.0285)
Year trend			0.0016	0.0017	0.0035***	0.0038***		0.0017	0.0038***
			(0.001)	(0.0011)	(0.001)	(0.0011)		(0.0011)	(0.0011)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	20,261	20,261	20,261	20,261	20,261	20,261	20,261	20,261	20,261
R2	0.4895	0.4974	0.4896	0.4901	0.4888	0.4893	0.4975	0.4902	0.4894
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.8614***	−0.8572***	−0.8617***	−0.8621***	−0.8616***	−0.8619***	−0.8575***	−0.8623***	−0.8621***
	(0.0222)	(0.0224)	(0.0222)	(0.0223)	(0.0222)	(0.0223)	(0.0224)	(0.0223)	(0.0223)
ΔImport Costs$_{it}$	−0.0014	−0.0013	−0.0014	−0.0014	−0.0014	−0.0014	−0.0013	−0.0014	−0.0014
	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)
ΔExchange Rate$_{it}$	−1.1121***	5.54	−1.0665***	−1.0831***			5.4021	−1.0766***	
	(0.1967)	(9.4709)	(0.1976)	(0.1981)			(9.4972)	(0.1986)	
Consumption goods	−0.0131	−0.0101	−0.0136	−0.0134	−0.0114	−0.011	−0.01	−0.0131	−0.0109
	(0.0445)	(0.0444)	(0.0445)	(0.0445)	(0.0446)	(0.0445)	(0.0445)	(0.0446)	(0.0446)
Capital goods	0.0204	0.0286	0.0194	0.0191	0.0192	0.0189	0.0293	0.0198	0.0197
	(0.0268)	(0.0271)	(0.0269)	(0.027)	(0.0271)	(0.0271)	(0.027)	(0.027)	(0.0271)
Africa							−0.0546	−0.0415	−0.0392
							(0.0356)	(0.0356)	(0.0357)
Europe							0.0194	0.0174	0.0207
							(0.0189)	(0.0189)	(0.0189)
Latin America							−0.0233	−0.0209	−0.0214
							(0.0326)	(0.032)	(0.0319)
North America							0.0107	0.0055	0.0059
							(0.0232)	(0.023)	(0.023)
Oceania							−0.0209	−0.0234	−0.0240
							(0.0454)	(0.0454)	(0.0451)
Year trend			0.0017	0.0016	0.0038**	0.0038**		0.0017	0.0038**
			(0.0014)	(0.0014)	(0.0014)	(0.0014)		(0.0014)	(0.0014)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	17,664	17,664	17,664	17,664	17,664	17,664	17,664	17,664	17,664
R2	0.5769	0.5841	0.5770	0.5773	0.5763	0.5766	0.5842	0.5774	0.5767

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.13: Estimate the degree of pass-through from productivity gains to international prices for specialized suppliers, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.0162	−0.0241	−0.0176	−0.0183	−0.0185	−0.0191	−0.0241	−0.0183	−0.0192
	(0.0131)	(0.0131)	(0.013)	(0.013)	(0.013)	(0.013)	(0.0131)	(0.013)	(0.013)
ΔImport Costs$_{it}$	0.0101**	0.0096**	0.0100**	0.0099**	0.0099**	0.0099**	0.0097**	0.0100**	0.0100**
	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0032)
ΔExchange Rate$_{it}$	−1.2705**	−3.9983	−0.8740*	−0.8570*			−3.9463	−0.8654*	
	(0.3862)	(7.0111)	(0.4168)	(0.4189)			(7.0021)	(0.4192)	
Consumption goods	0.0582**	0.0206	0.0679**	0.0255	0.0675**	0.0263	0.0272	0.0325	0.0332
	(0.0217)	(0.0272)	(0.0219)	(0.0272)	(0.0219)	(0.0272)	(0.0275)	(0.0276)	(0.0276)
Capital goods	0.2547***	0.2717***	0.2526***	0.2711***	0.2528***	0.2712***	0.2722***	0.2716***	0.2718***
	(0.0208)	(0.0223)	(0.0209)	(0.0222)	(0.0209)	(0.0222)	(0.0224)	(0.0224)	(0.0224)
Africa							−0.1086	−0.118	−0.1196
							(0.1208)	(0.1212)	(0.1212)
Europe							−0.0256	−0.0288	−0.0277
							(0.0237)	(0.0237)	(0.0237)
Latin America							0.0273	0.0253	0.0239
							(0.0675)	(0.0674)	(0.0674)
North America							−0.0345	−0.0351	−0.0349
							(0.0231)	(0.0231)	(0.0231)
Oceania							0.0607	0.0637	0.063
							(0.1056)	(0.1058)	(0.1058)
Year trend			0.0081**	0.0099**	0.0100***	0.0117***		0.0100**	0.0118***
			(0.003)	(0.0031)	(0.0028)	(0.0029)		(0.0031)	(0.0029)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	32,800	32,800	32,800	32,800	32,800	32,800	32,800	32,800	32,800
R2	0.0056	0.0122	0.0059	0.0065	0.0058	0.0063	0.0123	0.0066	0.0065
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	0.002	−0.0086	0.0007	0.0011	0.0004	0.0009	−0.0087	0.0009	0.0006
	(0.0141)	(0.0142)	(0.0141)	(0.0141)	(0.0141)	(0.0141)	(0.0142)	(0.014)	(0.014)
ΔImport Costs$_{it}$	0.0071	0.0057	0.0071	0.0070	0.0071	0.0070	0.0057	0.0069	0.0069
	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0037)
ΔExchange Rate$_{it}$	−0.9081	−1.6998	−0.6919	−0.6595			−1.4963	−0.7028	
	(0.4658)	(23.7278)	(0.4842)	(0.4866)			(23.8602)	(0.4885)	
Consumption goods	0.3756**	0.3696**	0.3740**	0.3725**	0.3749**	0.3734**	0.3724**	0.3748**	0.3757**
	(0.1314)	(0.1308)	(0.1314)	(0.1314)	(0.1313)	(0.1313)	(0.1305)	(0.1311)	(0.131)
Capital goods	1.2464***	1.2491***	1.2428***	1.2394***	1.2434***	1.2400***	1.2493***	1.2399***	1.2405***
	(0.1681)	(0.1681)	(0.1682)	(0.168)	(0.168)	(0.1679)	(0.1681)	(0.1681)	(0.1679)
Africa							−0.3272	−0.371	−0.3703
							(0.2072)	(0.2136)	(0.2134)
Europe							−0.1269	−0.1226	−0.1206
							(0.0716)	(0.0714)	(0.0713)
Latin America							−0.0889	−0.0826	−0.0833
							(0.1191)	(0.1183)	(0.1181)
North America							−0.0608	−0.0377	−0.0377
							(0.062)	(0.0624)	(0.0624)
Oceania							0.0696	0.0801	0.0784
							(0.1698)	(0.1681)	(0.1684)
Year trend			0.0076	0.0083	0.0091*	0.0097*		0.0088*	0.0104*
			(0.0043)	(0.0044)	(0.0042)	(0.0042)		(0.0044)	(0.0042)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	18,163	18,163	18,163	18,163	18,163	18,163	18,163	18,163	18,163
R2	0.1688	0.1875	0.1689	0.1693	0.1688	0.1692	0.1881	0.1700	0.1699

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.14: Estimate the degree of pass-through from productivity gains to profitability for specialized suppliers, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.8830***	−0.8825***	−0.8836***	−0.8839***	−0.8842***	−0.8846***	−0.8827***	−0.8841***	−0.8847***
	(0.0144)	(0.0146)	(0.0144)	(0.0144)	(0.0144)	(0.0144)	(0.0146)	(0.0144)	(0.0145)
ΔImport Costs$_{it}$	−0.0012	−0.001	−0.0012	−0.0012	−0.0013	−0.0013	−0.001	−0.0012	−0.0013
	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)
ΔExchange Rate$_{it}$	−1.2387***	3.488	−1.1141***	−1.0968***			3.4773	−1.1025***	
	(0.142)	(3.6146)	(0.1411)	(0.1413)			(3.6157)	(0.1413)	
Consumption goods	−0.0018	−0.0004	0.0010	−0.0016	0.0009	0.0000	0.0019	0.0005	0.002
	(0.013)	(0.0162)	(0.0130)	(0.0163)	(0.0130)	(0.0164)	(0.0163)	(0.0165)	(0.0165)
Capital goods	0.0093	0.0071	0.0086	0.0072	0.0089	0.0073	0.0068	0.0069	0.007
	(0.0065)	(0.0067)	(0.0065)	(0.0067)	(0.0065)	(0.0067)	(0.0067)	(0.0067)	(0.0067)
Africa							−0.0321	−0.0276	−0.0288
							(0.0246)	(0.0248)	(0.0248)
Europe							−0.0176*	−0.0155*	−0.0139
							(0.0078)	(0.0079)	(0.0079)
Latin America							0.0084	0.0117	0.0107
							(0.0176)	(0.0177)	(0.0177)
North America							−0.0089	−0.0088	−0.0086
							(0.0094)	(0.0094)	(0.0094)
Oceania							−0.0299	−0.0269	−0.0277
							(0.0404)	(0.0406)	(0.0406)
Year trend			0.0027**	0.0032***	0.0049***	0.0053***		0.0033***	0.0054***
			(0.0009)	(0.0009)	(0.0009)	(0.0009)		(0.0009)	(0.0009)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	31,594	31,594	31,594	31,594	31,594	31,594	31,594	31,594	31,594
R2	0.4807	0.4864	0.4808	0.4809	0.4798	0.4800	0.4865	0.4810	0.4800
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.9092***	−0.9102***	−0.9095***	−0.9098***	−0.9098***	−0.9101***	−0.9102***	−0.9098***	−0.9101***
	(0.0192)	(0.0195)	(0.0192)	(0.0192)	(0.0192)	(0.0192)	(0.0195)	(0.0192)	(0.0192)
ΔImport Costs$_{it}$	−0.0015	−0.0013	−0.0015	−0.0016	−0.0015	−0.0015	−0.0013	−0.0016	−0.0015
	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
ΔExchange Rate$_{it}$	−1.1338***	2.6761	−1.0912***	−1.0797***			2.7168	−1.0851***	
	(0.1477)	(4.1996)	(0.1475)	(0.1477)			(4.1985)	(0.1478)	
Consumption goods	−0.0281	−0.0262	−0.0278	−0.0283	−0.027	−0.0275	−0.0245	−0.0266	−0.0257
	(0.0452)	(0.0455)	(0.0452)	(0.0453)	(0.0455)	(0.0456)	(0.0456)	(0.0455)	(0.0458)
Capital goods	0.0121	0.0115	0.0112	0.0117	0.0128	0.0133	0.0111	0.0114	0.0131
	(0.0177)	(0.0175)	(0.0176)	(0.0176)	(0.0176)	(0.0176)	(0.0175)	(0.0176)	(0.0176)
Africa							−0.0481	−0.0448	−0.0489
							(0.0448)	(0.0456)	(0.0457)
Europe							−0.0238	−0.02	−0.0157
							(0.0157)	(0.0157)	(0.0156)
Latin America							0.004	0.0045	0.0038
							(0.0328)	(0.0327)	(0.0328)
North America							−0.0092	−0.0078	−0.0082
							(0.0178)	(0.0178)	(0.0178)
Oceania							−0.0465	−0.0469	−0.0456
							(0.0784)	(0.0784)	(0.0787)
Year trend			0.0019	0.0021	0.0039**	0.0041***		0.0021	0.0041***
			(0.0012)	(0.0012)	(0.0012)	(0.0012)		(0.0012)	(0.0012)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	27,553	27,553	27,553	27,553	27,553	27,553	27,553	27,553	27,553
R2	0.5868	0.5925	0.5868	0.5870	0.5861	0.5863	0.5925	0.5871	0.5863

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.15: Estimate the degree of pass-through from productivity gains to international prices for science-based firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.0277*	−0.0314**	−0.0291*	−0.0296*	−0.0285*	−0.0290*	−0.0313**	−0.0294*	−0.0288*
	(0.012)	(0.0119)	(0.012)	(0.012)	(0.012)	(0.012)	(0.0119)	(0.012)	(0.012)
ΔImport Costs$_{it}$	0.0071*	0.0072*	0.0067	0.0067	0.0068*	0.0068*	0.0072*	0.0066	0.0068
	(0.0035)	(0.0035)	(0.0035)	(0.0035)	(0.0035)	(0.0035)	(0.0035)	(0.0035)	(0.0035)
ΔExchange Rate$_{it}$	−0.0227	4.1757	0.9071*	0.9203*			4.1531	0.9139*	
	(0.4139)	(3.6426)	(0.4602)	(0.4621)			(3.6441)	(0.4621)	
Consumption goods	−0.0141	−0.0126	−0.0127	−0.008	−0.0108	−0.0069	−0.0116	−0.0068	−0.0057
	(0.0316)	(0.0335)	(0.0316)	(0.033)	(0.0316)	(0.033)	(0.0337)	(0.0332)	(0.0332)
Capital goods	0.0342	0.0356	0.0364	0.0336	0.0358	0.0331	0.0377	0.0357	0.0352
	(0.0208)	(0.0217)	(0.0208)	(0.0217)	(0.0208)	(0.0217)	(0.0218)	(0.0218)	(0.0218)
Africa							−0.0837	−0.0815	−0.0794
							(0.1721)	(0.1709)	(0.1708)
Europe							−0.0476	−0.047	−0.0474
							(0.0257)	(0.0257)	(0.0257)
Latin America							0.0622	0.0625	0.0637
							(0.0745)	(0.0747)	(0.0748)
North America							0.0008	−0.001	−0.0015
							(0.0265)	(0.0265)	(0.0265)
Oceania							0.074	0.0673	0.0683
							(0.075)	(0.0758)	(0.0756)
Year trend			0.0159***	0.0158***	0.0137***	0.0135***		0.0158**	0.0135***
			(0.0032)	(0.0033)	(0.0029)	(0.0029)		(0.0033)	(0.0029)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	20,585	20,585	20,585	20,585	20,585	20,585	20,585	20,585	20,585
R2	0.0006	0.0111	0.0021	0.0022	0.0019	0.0020	0.0113	0.0024	0.0022
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.0295*	−0.0316*	−0.0305*	−0.0312*	−0.0302*	−0.0310*	−0.0317*	−0.0313*	−0.0311*
	(0.0141)	(0.0141)	(0.0141)	(0.0141)	(0.0141)	(0.0141)	(0.0141)	(0.0141)	(0.0141)
ΔImport Costs$_{it}$	0.0091*	0.0099*	0.0091*	0.0092*	0.0092*	0.0093*	0.0099*	0.0091*	0.0092*
	(0.0044)	(0.0043)	(0.0044)	(0.0044)	(0.0044)	(0.0044)	(0.0043)	(0.0044)	(0.0044)
ΔExchange Rate$_{it}$	0.3307	8.1083	0.6034	0.5681			7.993	0.5734	
	(0.4988)	(5.049)	(0.5238)	(0.5258)			(5.0444)	(0.5264)	
Consumption goods	−0.0612	−0.0725	−0.0637	−0.061	−0.0605	−0.058	−0.0732	−0.0585	−0.0555
	(0.1018)	(0.1065)	(0.1018)	(0.1019)	(0.1015)	(0.1017)	(0.1062)	(0.1014)	(0.1012)
Capital goods	0.2333*	0.2172*	0.2305*	0.2284*	0.2305*	0.2285*	0.2184*	0.2300*	0.2301*
	(0.0928)	(0.0924)	(0.0929)	(0.0926)	(0.0929)	(0.0925)	(0.0926)	(0.0927)	(0.0926)
Africa							−0.3253	−0.2634	−0.2636
							(0.284)	(0.2824)	(0.2821)
Europe							−0.1398*	−0.1290*	−0.1290*
							(0.0578)	(0.0579)	(0.0579)
Latin America							0.0777	0.087	0.0858
							(0.1516)	(0.1517)	(0.1517)
North America							−0.0435	−0.0405	−0.0399
							(0.0622)	(0.063)	(0.0629)
Oceania							−0.0301	−0.0246	−0.0243
							(0.1836)	(0.1836)	(0.1831)
Year trend			0.0084	0.0075	0.0067	0.006		0.0076	0.006
			(0.0044)	(0.0044)	(0.0042)	(0.0042)		(0.0044)	(0.0042)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	18,461	18,461	18,461	18,461	18,461	18,461	18,461	18,461	18,461
R2	0.1560	0.1654	0.1562	0.1568	0.1561	0.1567	0.1659	0.1572	0.1572

Note: Panel A shows OLS estimates of Eq. 1; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).

Table D.16: Estimate the degree of pass-through from productivity gains to profitability for science-based firms, 2000-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					Panel A: OLS estimates				
ΔULC$_{it}$	−0.8807***	−0.8780***	−0.8806***	−0.8812***	−0.8815***	−0.8820***	−0.8780***	−0.8813***	−0.8821***
	(0.0124)	(0.0126)	(0.0124)	(0.0124)	(0.0124)	(0.0124)	(0.0126)	(0.0124)	(0.0124)
ΔImport Costs$_{it}$	0.0021	0.0024	0.0021	0.002	0.0019	0.0018	0.0024	0.002	0.0018
	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)
ΔExchange Rate$_{it}$	−1.2755***	−0.7771	−1.3326***	−1.3599***			−0.7938	−1.3577***	
	(0.1773)	(1.6028)	(0.1774)	(0.1776)			(1.6009)	(0.1776)	
Consumption goods	0.0307	0.0215	0.0307	0.0244	0.0276	0.0224	0.0217	0.0243	0.0223
	(0.016)	(0.0171)	(0.016)	(0.0169)	(0.016)	(0.0169)	(0.0171)	(0.0169)	(0.017)
Capital goods	0.0098	0.007	0.0096	0.0067	0.0104	0.0074	0.0065	0.0061	0.0067
	(0.0097)	(0.0101)	(0.0097)	(0.0101)	(0.0097)	(0.0101)	(0.0101)	(0.0101)	(0.0101)
Africa							0.0074	0.0152	0.0136
							(0.0394)	(0.0398)	(0.0397)
Europe							0.0089	0.0087	0.0095
							(0.0114)	(0.0114)	(0.0115)
Latin America							−0.0156	−0.0126	−0.0141
							(0.0267)	(0.0268)	(0.0268)
North America							0.0036	0.0048	0.0057
							(0.0142)	(0.0142)	(0.0143)
Oceania							−0.0639	−0.0571	−0.0572
							(0.0461)	(0.0462)	(0.0461)
Year trend			−0.001	−0.0013	0.002	0.0019		−0.0013	0.0019
			(0.0011)	(0.0011)	(0.0011)	(0.0011)		(0.0011)	(0.0011)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	19,873	19,873	19,873	19,873	19,873	19,873	19,873	19,873	19,873
R2	0.5061	0.5118	0.5062	0.5065	0.5049	0.5052	0.5119	0.5065	0.5053
					Panel B: estimates controlling unobserved time invariant firm fixed effects				
ΔULC$_{it}$	−0.9184***	−0.9151***	−0.9188***	−0.9187***	−0.9194***	−0.9193***	−0.9152***	−0.9188***	−0.9194***
	(0.0164)	(0.0167)	(0.0164)	(0.0164)	(0.0165)	(0.0165)	(0.0167)	(0.0164)	(0.0165)
ΔImport Costs$_{it}$	0.0001	0.0006	0.0001	0.0001	0.0000	0.0000	0.0005	0.0001	0.0000
	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)	−0.0018
ΔExchange Rate$_{it}$	−1.4194***	−4.5076*	−1.3305***	−1.3593***			−4.5367*	−1.3604***	
	(0.1914)	(1.9667)	(0.1922)	(0.1924)			(1.9672)	(0.1924)	
Consumption goods	0.0147	0.0037	0.0137	0.0128	0.0072	0.0062	0.0049	0.0125	0.0059
	(0.0504)	(0.0527)	(0.0504)	(0.0504)	(0.0503)	(0.0504)	(0.0528)	(0.0505)	(0.0504)
Capital goods	0.0116	0.0145	0.0106	0.0101	0.0111	0.0105	0.0143	0.0097	0.0101
	(0.0292)	(0.0293)	(0.0291)	(0.0293)	(0.0292)	(0.0293)	(0.0294)	(0.0293)	(0.0293)
Africa							0.0161	0.0347	0.037
							(0.0717)	(0.0718)	(0.0722)
Europe							0.0023	−0.0003	−0.0005
							(0.0229)	(0.0227)	(0.0227)
Latin America							−0.0476	−0.0397	−0.0371
							(0.0448)	(0.0446)	(0.0445)
North America							0.006	0.0105	0.0104
							(0.0269)	(0.0269)	(0.0269)
Oceania							−0.127	−0.1133	−0.1141
							(0.1031)	(0.0998)	(0.1007)
Year trend			0.0029	0.0024	0.0062***	0.0058***		0.0024	0.0059***
			(0.0016)	(0.0016)	(0.0016)	(0.0016)		(0.0016)	(0.0016)
Sectoral dummies				yes		yes		yes	yes
Year-sectoral dummies		yes					yes		
Num. of obs.	17,629	17,629	17,629	17,629	17,629	17,629	17,629	17,629	17,629
R2	0.6030	0.6089	0.6031	0.6037	0.6021	0.6027	0.6090	0.6037	0.6027

Note: Panel A shows OLS estimates of Eq. 2; Panel B shows the estimates when controlling for firm-fixed effects. Firms primarily export intermediate goods (or export to Asia) is the reference group. Robust standard errors in parentheses: asterisks denote significance levels (***$p < 0.1\%$; **$p < 1\%$; *$p < 5\%$).