Increasing Market Power in Slovenia: Role of Diverging Trends between Exporters and Non-exporters

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Abstract

This paper documents the evolution of markups in a small open economy, Slovenia, using a comprehensive dataset covering the full population of firms. It makes three novel contributions to the literature. First, in contrast to other work for Europe, we find that markups have increased from 1.05 to 1.19 between 1994 and 2015. Second, while other research so far found exporters typically to have higher markups, we find the opposite in Slovenia. Though the rise in markups occurs both with exporters and non-exporters, there is a consistent diverging trend in markups in favor of non-exporters since 1999. This can be attributed to increased competitive pressure faced by exporters following the comprehensive trade liberalization after 1999 and their increased participation in global value chains. Third, we decompose aggregate markups and show that the increase in markups, for both exporters and non-exporters, is mainly driven by the within component rather than the reallocation effect. This suggests that all firms were increasing their markups, rather than high markup firms increasing their market share over time.

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1 Introduction

In the past few years, there has been a vivid discussion about a general rise in markups in the United States (De Loecker, Eeckhout and Unger, 2019, Hall, 2018, Autor et al., 2017). This general trend of rising markups occurs at the same time of, and has been linked to, a slowdown in business dynamism and entrepreneurship (Haltiwanger et al., 2015, Decker et al., 2016, Bijnens and Konings, 2018), the decline in the labor share (Autor et al., 2017) and a slowdown in productivity growth (Syverson, 2017). This raises concerns by policy makers about the emergence of global superstar firms distorting the competitiveness of markets. This also suggests that increased market power may have detrimental effects going beyond a single industry, affecting the overall economy (Syverson, 2019).

However, while the long-run trend of rising markups in the U.S. has been well documented, it is still not clear whether this trend can also be observed in European countries, where markets are more fragmented than in the U.S. For instance, recently, Cavalleri et al (2019) show that aggregate markups in the Euro area remain relatively stable, suggesting that the rise in market power is not a big issue in Europe.

This paper contributes to this debate in various ways. First, we study the evolution of markups for a small open economy, Slovenia. This is of particular interest as exporters, which are relatively more important in such setting, have been documented to have higher markups and productivity than non-exporters (e.g. De Loecker and Warzynski, 2012). Second, unlike other papers we cover the entire size distribution and population of unconsolidated firms in Slovenia (in contrast to large consolidated firms in other countries), which offers a more comprehensive analysis of markups in all firms. This allows us to analyze in more detail the channels driving the evolution of the aggregate markup. In particular, we will decompose the aggregate markup into the within (changes in average markup) and between (reallocation of market share towards high-markup firms) components.

Third, Slovenia went through a transition period, being a rather closed economy with little exports in the early nineties. By ratifying the association agreement with the EU in 1999, it started to open up to trade with fast growing exports throughout the second half of the 1990s. Our data set covers this period as we observe firms between 1994 and 2015. Over this period, real exports in the country doubled, whereas the number of exporters almost tripled. We therefore link markups to the firm's export status capturing the degree of internationalization and explore the contribution of exporters and non-exporters to understand how aggregate markups have evolved in Slovenia.

In contrast to Cavalleri et at (2019) who find stable markups in the Europe, we find that aggregate markups in Slovenia have increased from 1.05 in 1994 to 1.19 in 2015. This increase is

observed in different percentiles of the markup distribution, where firms in the top decile have experienced a more pronounced rise over time. Second, we find that this rise in markups occurs both for exporters and non-exporters, whereby a consistent diverging trend in markups in favor of non-exporters can be observed since 1999. We attribute this surprising finding to increased competitive pressure faced by exporters following the comprehensive trade liberalization after 1999 and their increased participation in global value chains. Third, the rise in aggregate markups is driven by all firms increasing their markups, rather than the firms with the highest markups becoming more dominant by increasing their market share.

The rest of this paper is organized as follows. The next section discusses the empirical framework and estimation strategy. Section 3 describes the data, descriptive statistics and discusses the increasing role of exporters in the economy of Slovenia over the period 1994-2015. Section 4 presents the results. Section 5 concludes.

2 Empirical Framework

Our empirical methodology follows a supply-side approach proposed by De Loecker and Warzynski (2012). The framework is based on the insight of Hall (1988) and relies on a panel of firm-level input and output data. In this approach, markups are obtained by leveraging cost minimization on a variable input without imposing assumptions on demand and market structure.

Consider a firm i at time t that produces Q_{it} units of output with productivity ω_{it}, and relies on dynamic input factor capital, K_{it}, and a set of variable input factors, $X_{it}^1, \dots, X_{it}^V$:

$$Q_{it} = Q_{it}\left(K_{it}, X_{it}^1, \dots, X_{it}^V\right)\omega_{it}. \qquad (1)$$

Assuming that firms are cost minimizers, we define the Lagrangian function of firm's optimization problem as:

$$\mathcal{L}\left(K_{it}, X_{it}^1, \dots, X_{it}^V, \lambda_{it}\right) = r_{it}K_{it} + \sum_{v=1}^{V} P_{it}^v X_{it}^v - \lambda_{it}(Q_{it}(\cdot) - Q_{it}), \qquad (2)$$

where r_{it} is the rental price of capital, and P_{it}^v is the price for a variable input v and λ_{it} is the marginal cost of producing a given level of output. The first-order condition with respect to any variable input is then:

$$\frac{\partial \mathcal{L}}{\partial X_{it}^v} = P_{it}^v - \lambda_{it}\frac{\partial Q_{it}(\cdot)}{\partial X_{it}^v} = 0. \qquad (3)$$

Rearranging equation (3) and multiplying both sides by $\frac{X_{it}}{Q_{it}}$, we obtain:

$$\frac{\partial Q_{it}(\cdot)}{\partial X_{it}^{v}} \frac{X_{it}^{v}}{Q_{it}} = \frac{P_{it}^{v} X_{it}^{v}}{Q_{it}} \frac{1}{\lambda_{it}}. \quad (4)$$

Cost minimization implies that the optimal input demand is to equate the output elasticity of any variable input, $\frac{\partial Q_{it}(\cdot)}{\partial X_{it}^{v}} \frac{X_{it}^{v}}{Q_{it}}$, to its cost share, $\frac{P_{it}^{v} X_{it}^{v}}{Q_{it}} \frac{1}{\lambda_{it}}$. Recalling from the definition of markup $\mu_{it} \equiv \frac{P_{it}}{\lambda_{it}}$, where P_{it} is the output price, substituting λ_{it} into equation (4), and solving for firm-specific markups yields:

$$\mu_{it} = \theta_{it}^{v} \frac{P_{it} Q_{it}}{P_{it}^{v} X_{it}^{v}} = \frac{\theta_{it}^{v}}{\alpha_{it}^{v}}. \quad (5)$$

Firm's expenditure share on a variable input, α_{it}^{v}, is readily observed from the data, however its output elasticity, θ_{it}^{v}, needs to be obtained via the production function estimation. Since we have two variable inputs in production, namely labor and intermediate inputs, we could obtain two estimates of markups. However, the labor is not freely chosen in Slovenia due to the presence of some adjustment costs[2], which makes it less variable than the intermediate inputs. Hence, we focus on estimating markups via the intermediate inputs.

To obtain the output elasticities of intermediate inputs, we assume that each firm's production technology operating within 2-digit NACE industry[3] is given by the following translog production function[4]:

$$y_{it} = \beta_l l_{it} + \beta_k k_{it} + \beta_m m_{it} + \beta_{ll} l_{it}^2 + \beta_{kk} k_{it}^2 + \beta_{mm} m_{it}^2 + \beta_{lk} l_{it} k_{it} + \beta_{lm} l_{it} m_{it} + \beta_{km} k_{it} m_{it} + \beta_{lkm} l_{it} k_{it} m_{it} + \omega_{it} + \epsilon_{it}. \quad (6)$$

[2] According to the OECD (2015), Slovenia scores above the average for the Employment Protection Legislation (EPL) index among the OECD economies.

[3] The following NACE 2-digit industries were combined because the number of observations was too small: 1-3, 5-9, 10-12, 13-15, 19-21, 31-32, 36-39, 50-53, 55-56, 59-60, 64-66, 69-75, 80-82. All public sectors starting from NACE Section 'O' are dropped.

[4] We deviate from the standard Cobb-Douglas (C-D) functional form since every variation in markups in C-D is solely due to the variation in input shares. Conversely, the translog specification provides the variation in firm-level output elasticities, as it permits the second order approximation to all inputs in the production function. Nonetheless, the results are robust for both functional forms of production technology. Moreover, to account for the technological changes we estimate production functions using five year rolling window approach similar to De Loecker et al. (2018) and Diez et al. (2019).

where y_{it}, l_{it}, $k_{it}$and m_{it}represent the logarithmic transformation of firm i's sales, labor, capital, and intermediate inputs in year t, respectively.[5] ω_{it} refers to a productivity term, and ϵ_{it} denotes the unanticipated productivity shock or measurement error. In order to consistently estimate the output elasticities, one has to control for the simultaneity bias, arising from the correlation between the input demands and unobserved productivity. We follow Ackerberg et al. (2015) to account for the unobserved productivity using the control function, $\omega_{it} = h_t(l_{it}, k_{it}, m_{it})$.

We further modify the control function to account for firm's export status similar to Van Biesebroeck (2005), Amiti and Konings (2007), De Loecker and Warzynski (2012). According to Melitz (2003), the most productive firms are able to access the foreign markets as their profits are sufficiently elevated to cover a fixed sunk cost of exporting. Hence, the decision to start exporting may be endogenously given to the firm. Thus, the control function can be re-written as $h_t(l_{it}, k_{it}, m_{it}, e_{it})$, where e_{it} refers to a dummy equal to one if the firm is an exporter[6].

The estimation algorithm of Ackerberg et al. (2015) consists of two steps. In the first stage, we purge a measurement error, $\widehat{\epsilon_{it}}$, and retrieve an estimate for the composite function, $\widehat{\phi_{it}}$, by substituting the productivity term with the control function[7]:

$$y_{it} = \beta_l l_{it} + \beta_k k_{it} + \beta_m m_{it} + \beta_{ll} l_{it}^2 + \beta_{kk} k_{it}^2 + \beta_{mm} m_{it}^2 + \beta_{lk} l_{it} k_{it} + \beta_{lm} l_{it} m_{it} + \beta_{km} k_{it} m_{it} + \beta_{lkm} l_{it} k_{it} m_{it} + h_t(l_{it}, k_{it}, m_{it}, e_{it}) + \epsilon_{it} = \phi(l_{it}, k_{it}, m_{it}, e_{it}) + \epsilon_{it}. \quad (7)$$

From the estimate of the composite function, $\widehat{\phi_{it}}$, the productivity is purged for any value of β (where $\beta = \beta_l, \beta_k, \beta_m, \beta_{ll}, \beta_{kk}, \beta_{mm}, \beta_{lk}, \beta_{lm}, \beta_{km}, \beta_{lkm}$ using $\omega_{it}(\beta) = \widehat{\phi_{it}} - \beta_l l_{it} - \beta_k k_{it} - \beta_m m_{it} - \beta_{ll} l_{it}^2 - \beta_{kk} k_{it}^2 - \beta_{mm} m_{it}^2 - \beta_{lk} l_{it} k_{it} - \beta_{lm} l_{it} m_{it} - \beta_{km} k_{it} m_{it} - \beta_{lkm} l_{it} k_{it} m_{it}$.

The second stage relies on the timing assumptions of inputs and the law of motion for productivity. The productivity is assumed to follow a first order Markov process, i.e. $\omega_{it}(\beta) = g\big(\omega_{it-1}(\beta)\big) + \xi_{it}$,

[5] The data on capital have been deflated using Gross Fixed Capital Formation at economy level. Similar to Grubljesic and Damijan (2011), other data on sales and intermediate inputs have been deflated using a producer price index at 2-digit NACE industry level.

[6] We form two mutually exclusive groups with domestic firms as the reference group.

[7] In the estimation procedure, the proxy function is approximated by the fourth order polynomial in intermediate inputs, labor and capital where each term is interacted with the export dummy.

where ξ_{it} refers to the unexpected innovation in productivity.[8] We employ the moment conditions[9] to estimate the production functions using a non-parametric GMM estimator with block-bootstrapping. The output elasticity with respect to the intermediate inputs is then computed as follows:

$$\widehat{\theta_{it}^{v}} = \widehat{\beta_m} + 2\widehat{\beta_{mm}} m_{it} + \widehat{\beta_{lm}} l_{it} + \widehat{\beta_{km}} k_{it} + \widehat{\beta_{lkm}} l_{it} k_{it}. \quad (8)$$

Finally, we apply equation (5) to (8) to estimate the firm-specific markup:

$$\mu_{it} = \frac{\widehat{\theta_{it}^{v}}}{\widehat{\alpha_{it}^{v}}}, \quad (9)$$

where $\widehat{\alpha_{it}^{v}} = \frac{P_{it}^{v} X_{it}^{v}}{P_{it} \frac{Q_{it}}{e_{it}}}$ is the corrected expenditure share of intermediate inputs from the presence of measurement error in output or prices. This correction eliminates any variation in expenditure share from output changes that is not related to $\phi(l_{it}, k_{it}, m_{it}, e_{it})$. The aggregate markup, M_t, is then defined as the sum of the sales weighted markup over the entire sample:

$$M_t = \sum_{i \in \Pi_t} s_{it}\, \mu_{it} \qquad \text{s.t.} \qquad \sum_{i \in \Pi_t} s_{it} = 1, \quad (10)$$

where $s_{it} = \frac{y_{it}}{\sum_{i \in \Pi_t} y_{it}}$ is the market share of sales and Π_t is the set of all active firms in every year.

3 Data

We use an unique firm-level panel dataset drawn from the Agency of the Republic of Slovenia for Public Legal Records and Related Services (Ajpes) over the period 1994 and 2015. The Ajpes manages the Slovenian Business Register and compiles the annual balance sheet and income statements from all private firms registered in Slovenia.[10] The sample is representative at the aggregate level, except public

[8] Similar to Aw et al. (2011) and Cassiman and Vanormelingen (2013), we allow for the flexible productivity evolution: $\omega_{it}(\beta) = g(\omega_{it-1}(\beta), e_{it-1}) + \xi_{it}$, where e_{it-1} represents the lagged export dummy. The reasoning behind is that past experience from exporting activity may affect current productivity (Van Biesebroeck (2005), De Loecker and Goldberg (2014)).

[9] We form the following moment conditions:
$E\left[\xi(\beta)\left(l_{it-1}, k_{it}, m_{it-1}, l_{it-1}^2, k_{it}^2, m_{it-1}^2, l_{it-1}k_{it}, l_{it-1}m_{it-1}, k_{it}m_{it-1}, l_{it-1}k_{it}m_{it-1}\right)\right] = 0$.We exploit the fact that capital stock is determined a period ahead and therefore should not be correlated with the innovation shock in productivity. Labor and intermediate inputs are chosen after the realization of ξ_{it}, and therefore we use their lagged values.

[10] Due to the less stringent reporting standards, the sample does not contain self-employed, which according to the Statistical office cover around 17 percent of total employment in Slovenia in 2015. This should not affect our results if we assume self-employment as a constant fraction of total employment over time.

sectors such as education, healthcare as well as public defense[11] and covers between 50 and 55 percent of total employment in any given year and 80 percent of total sales in 2015[12].

For our markup estimates, we use firm-level information on sales, physical capital, intermediate inputs, the number of employees in full-time equivalents as well as 2-digit NACE Rev.2 industry code. Besides the typical financial and operational data, we also retrieve market entry and exit[13] as well as information on a firm-level export status. Table 1 reports summary statistics on firm dynamics in our sample. The annual average entry rate is 3.5 percent and it is higher than the exit rate (annual average is 2.1 percent). At the beginning of the period, entry rates are especially high reflecting the new opportunities for firms during the transition period. We note the increasing role of globalization in the economy of Slovenia: the number of exporters grew dramatically, taking up a larger share of firms in the market.

Table 1. Firm dynamics and exporters in Slovenia, 1994-2015

Year	Firms	Entry rate	Exit rate	Exporters
1994	18 949	-	0.025	5 419
1995	21 168	0.073	0.021	6 069
1996	22 345	0.046	0.020	6 374
1997	22 951	0.034	0.017	6 666
1998	23 511	0.030	0.018	6 748
1999	23 787	0.031	0.022	7 006
2000	24 139	0.035	0.019	7 327
2001	24 153	0.031	0.020	7 668
2002	23 928	0.032	0.020	7 943
2003	24 192	0.032	0.018	8 028
2004	24 841	0.038	0.018	8 480
2005	25 794	0.034	0.022	8 934
2006	26 431	0.034	0.013	9 470
2007	27 500	0.038	0.018	10 115
2008	28 856	0.040	0.022	10 712
2009	29 024	0.031	0.026	10 771
2010	29 161	0.033	0.025	11 109
2011	29 043	0.029	0.025	11 502
2012	28 287	0.032	0.026	11 892
2013	28 695	0.032	0.024	12 634
2014	29 916	0.034	0.024	13 743
2015	31 383	0.030	-	14 877

Source: AJPES; own calculations.

[11] These government organizations have to report separately to their respective agencies and, thus, are not included in our dataset.

[12] https://pxweb.stat.si/pxweb/dialog/statfile1.asp

[13] Since the dataset does not contain information on incorporation dates, entry is defined as the first year a firm is observed in the data. Similarly, exit is defined as the last year a firm appears in the data.

Since Slovenia is a small open economy, the foreign market is quite relevant for Slovenian firms. Therefore, we find it useful to provide some summary statistics that compares firms that are active only domestically (non-exporters) and active both domestically and in the export market or solely in the export market (exporters). Table 2 displays the results. In terms of the number of observations, non-exporting firms are almost twice as many as exporting firms, but still exporters account for a sizable 68 percent in total tangible fixed assets, 73 percent in total employment, 83 percent in total sales and 80 percent in total value added. Accordingly, exporters are substantially larger than non-exporters in terms of the number of employees, sales, and value added. In particular, if non-exporters employ on average 7 employees, exporters on average sustain 34 employees. Moreover, exporters are more productive (measured by labor productivity) than non-exporters. These patterns are consistent with the theoretical framework of Melitz (2003), where firms choose to become exporters if their productivity or profitability is sufficiently high to cover the fixed cost of entry to the foreign market.

Table 2. Average sample statistics for domestic and exporting firms.

	Non-exporters	Exporters
Employees (FTE)	6.97	34.27
Tangible fixed assets (TFA)	335.75	1286.83
Sales	262.75	2267.88
Value added	73.42	511.27
Labor productivity (LP)	11.79	16.24
Observations	364 567	203 487

Notes: Labor productivity = value added/worker
TFA, sales, value added and LP are presented in real terms in thousand euros.
Source: AJPES; own calculations.

4 Results

In this section, we first discuss the results of aggregate markup evolution. We then assess the markup dispersion and heterogeneity in markup evolution in terms of firm's export involvement. Then, based on augmented Olley and Pakes decomposition, we analyze the markup components in detail.

4.1 Markup evolution

Figure 1 shows the evolution of markups across the economy where we have weighted firm level markups with firm-level sales.[14] We see an uptake in markups from the second half of the 1990s.[15] In the beginning of the 1990s after the collapse of former Yugoslavia, Slovenia went through a massive restructuring towards a market-based economy with a large scale enterprise sector reform. This led to the creation of new firms and a transformation of public companies into commercial ones and opening up to trade. As a result of an increase in firms and the opening up to trade, we would expect a tougher competitive environment and hence lower prices and markups. The rise in markups is therefore remarkable. As shown in Figure 1, this result is persistent when we exclude entry and exit and only focus on continuing firms, suggesting that the markup evolution is not driven by the entry or exit process of firms in Slovenia, but by the within-firm change in markups.

Figure 1: Evolution of estimated sales-weighted average markups, 1994-2015

[14] The trend of increasing markups is robust across the weights by firm-level value added and employment.

[15] The rise is robust to a choice of alternative empirical strategies of production function estimations. Moreover, as an alternative measure of market power, we compute an accounting markup, derived from the price-cost margin, $PCM_{acc} = \frac{P_{it}Q_{it} - \sum_v P_{it}^v X_{it}^v}{P_{it}Q_{it}}$. Figure A1 in the Appendix shows the evolution of markups based on these alternative specifications.

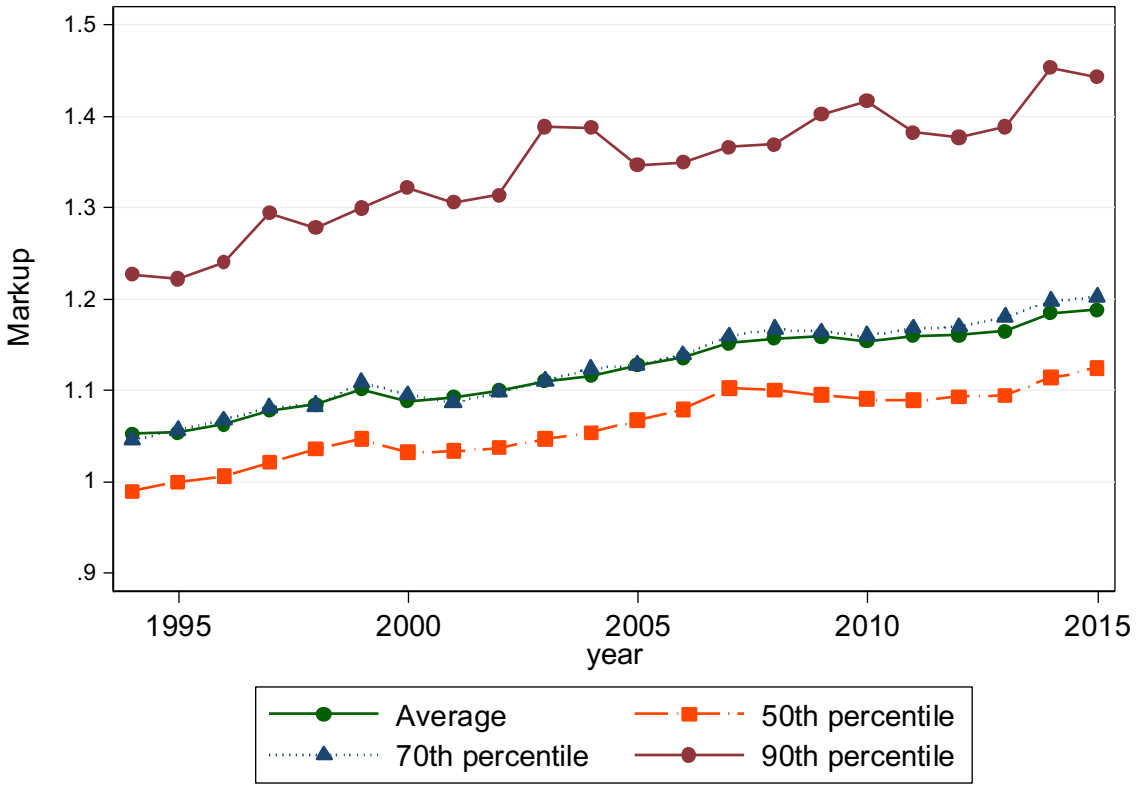
In addition to the private sector development, Slovenia has undertaken massive trade liberalization policies since its independence. For instance, the country joined the World Trade Organization in 1995 and the Central European Free Trade Agreement (CEFTA) in 1996 along with other Southeastern European economies. In 1999, Slovenia ratified the 'Europe Agreement', which provided a key institutional framework to access the European Union in 2004 and a massive trade liberalization and re-orientation of trade towards the European market. This makes it even more surprising to see such steady upward trend in markups since 1995.

While the markups have increased a lot in this relatively short time frame, this increase is far more moderate than the one found for the U.S. economy, where the aggregate markup went up from 1.18 to 1.67 between 1980 and 2014. Interestingly the markup in Slovenia increased to 1.19, which is roughly the number at which U.S. firms were in 1980. However, compared to other European countries where aggregate markups remain relatively stable (Cavalleri et al. 2019), a rise in markups for Slovenia is still surprising. In fact, the aggregate markup of 1.19 is similar to the level in Belgium which increased from 1985 to 1995 and stagnated at around 1.20 during 1995-2016 (Konings, Van Cayseele and Warzynski, 2001; De Loecker et al., 2018). This suggests that the increase in markups might reflect the transition process in Slovenia that might currently be over, where markups reached the same level as in other advanced European countries, like Belgium.

4.2 Dispersion in Markups

In this section we analyze to what extent the increase in markups is driven by different parts of the distribution in markups. We do this in Figure 2 where we plot the evolution of the average, median, 70th and 90th percentiles of the markup distribution. Note that the rise in markups is prevalent across the entire distribution, i.e. across all of the different percentiles, but it is more pronounced in the top decile. In particular, firms in the top decile have experienced an increase in markups from 1.23 to 1.44, whereas firms at the 70th percentile of the distribution have experienced an increase from 1.05 to 1.20. In other words, dispersion in markups has gone up. These results are consistent with the recent findings for the U.S. (De Loecker, Eeckhout and Unger, 2019), OECD economies (Calligaris et al. 2018) and other regions (Diez et al. 2018).

Figure 2: Dispersion of estimated markups by percentiles, 1994-2015



Note: Figure contains average of sales-weighted markups.

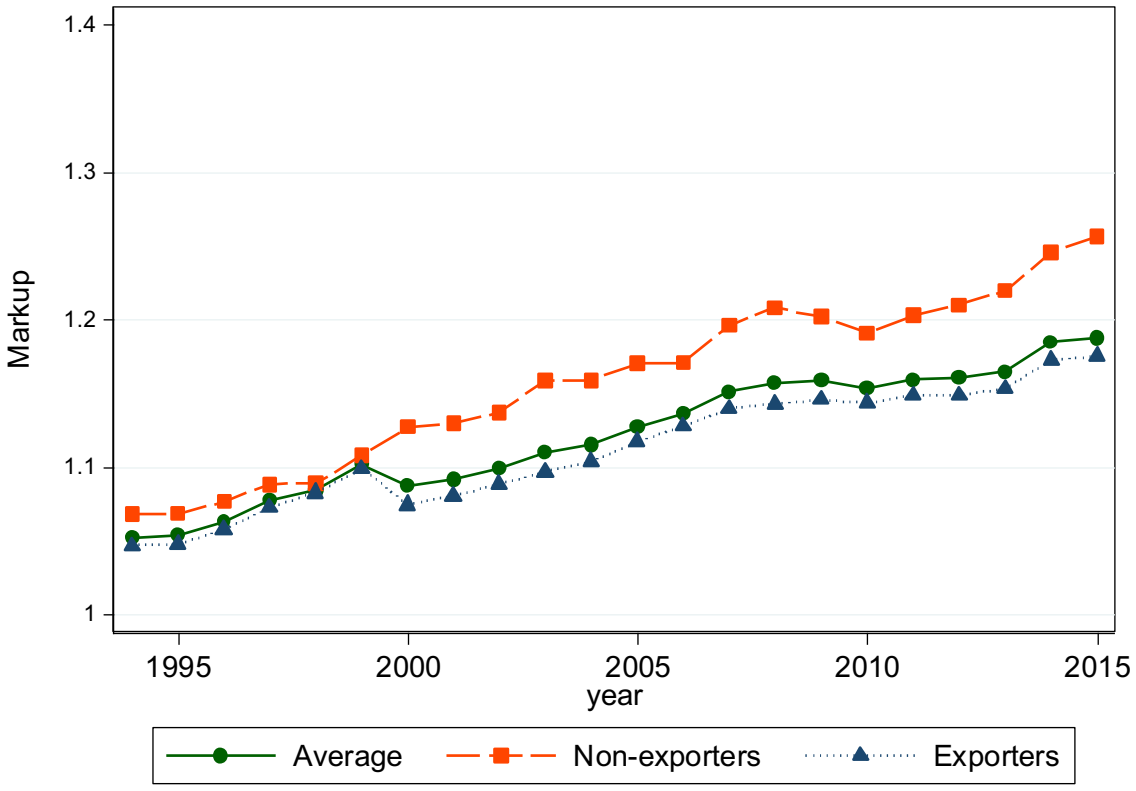
Interestingly, within each decile of the markup distribution, we observe both exporting and non-exporting firms. This suggests that the upward trend of the aggregate markup results from the coexistence of both groups of firms. Furthermore, at every decile of the distribution, we note that the revenue share of exporters accounts for more than 70 percent of total revenue. This is in line with the observed data (Section 3), where exporters, on average, are found to be larger than non-exporters consistent with the model of Melitz (2003) that describes additional fixed costs of entry to the export market. A recent study by Domadenik et al. (2018) suggests that in Slovenia, exporters experienced stronger growth in total factor productivity (TFP) than other firms over the same sample period. They refer to the following exporter characteristics: better corporate governance, higher expenditures for research and development and a stronger presence in global value chains. Thus, the ability of exporters to convert inputs into output efficiently suggests that they are facing lower marginal cost over time. This, in turn, might reflect markup differences between exporters and non-exporters, we will tune into this in more detail in the next section.

4.3 Markup evolution and export involvement

To further investigate the importance of exporting behavior, we explore whether markup evolution differs between the groups of exporters and non-exporters. To do so, we study the markup dynamics of exporting and non-exporting firms. Depending on whether a firm switches its export status, the composition of both exporters and non-exporters can change over time.

Figure 3 shows the average of sales-weighted markups by exporting and non-exporting firms and compares them with the markups for the aggregate economy. While we note an increase in the aggregate markup for both types of firms, the non-exporter markup is higher than those of exporters. This is surprising as most papers in the literature have documented higher firm level (unweighted) markups for exporters. Furthermore, note that that the dynamics of the aggregate markup of exporters is different than that of non-exporters, in particular, they start to diverge after the start of comprehensive trade liberalization with the EU, brought by the ratification of the "Europe agreement" with the EU in 1999.

Figure 3: Evolution of markups for exporters and non-exporters

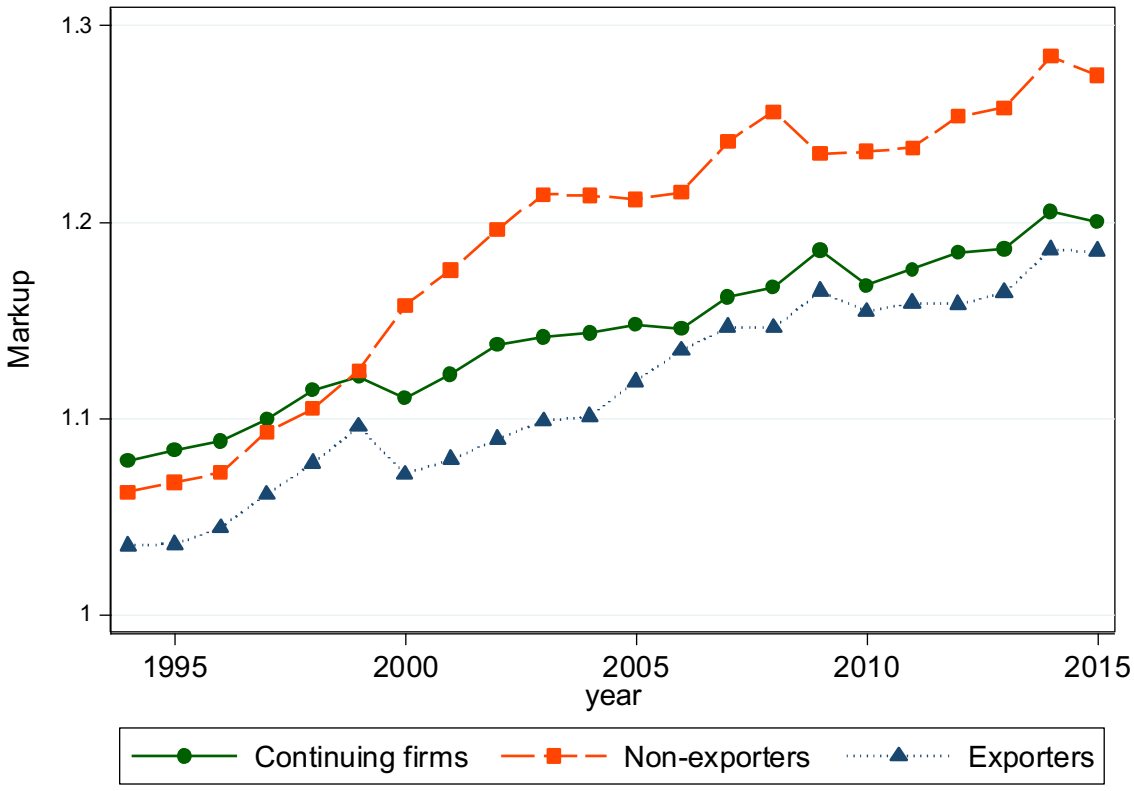


Note: Figure contains average of sales-weighted markups.

Note that firms can change their export status in Figure 3, suggesting that we can only compare the markup contribution of the individual categories at each cross section. In Figure 4, we keep only those

continuing exporters and non-exporters throughout the entire sample period and plot their individual contribution to the aggregate markup. We note that the contribution from individual groups by export status is not driven by the change in export status as the trends remain similar in both Figure 3 and Figure 4. This result seems to suggest that the increasing markup dynamics from exporters and non-exporters may not be explained by the firm switching its export status. The finding hints on the relevance of other factors, such as the structural transformation of the Slovenian economy during the transition period. We therefore next analyze to what extent the nature of sectors and hence technology can explain this pattern of markups.

Figure 4: Evolution of markups for exporters and non-exporters, continuing firms only



Note: Figure contains average of sales-weighted markups. Figure contains only markups for continuing exporters and non-exporters.

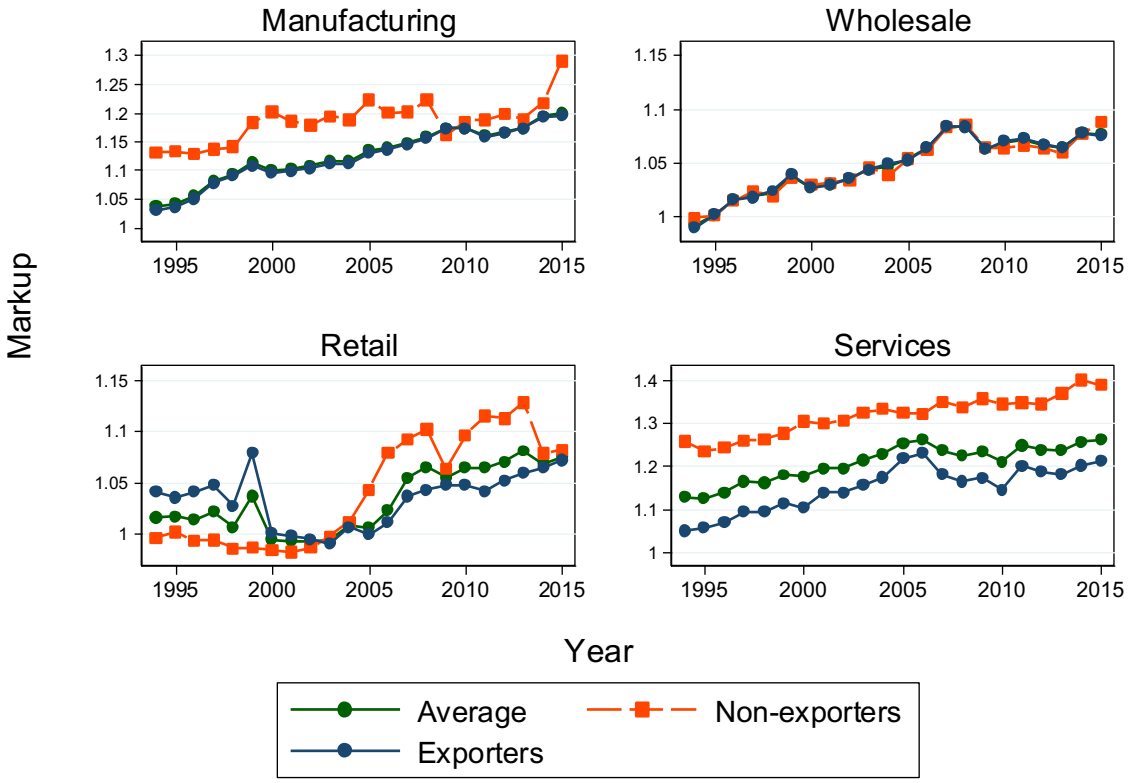
4.4 Sectoral analysis

Figure 5 depicts the evolution of aggregate markups by firm's export status and major NACE sectors. There is an upward trend in markup dynamics in all sectors, however its magnitude varies by sector. Furthermore, a non-exporter has a higher markup than exporter in manufacturing and services sectors. In services sector, the gap in markups between exporters and non-exporters is bigger than in

manufacturing sector. This might reflect lower competition in services sector that has been less liberalized and is less open to trade as compared to manufacturing sector.

We also note that the diverging trend in markup dynamics can be explained by manufacturing sector, which drops for exporters and increases for non-exporters after 1999. Figure 5 also shows that the gap in markups between non-exporters and exporters closed in the period 2009-2014, but opened again in 2015 to the previous level. This can be explained by the effect of the financial crisis and a sizable drop in domestic aggregate demand (by about 10 percent) that took toll in particular among manufacturing firms serving domestic market only. As it can be seen from Table 1, in the period 2009-2012 the exit rate accelerated from previous average of 2 percent annually to 2.5 percent. In this period, total number of firms decreased by more than 700, while the number of exporters increased by more than 1,100. Hence, while non-exporters were hit by dramatic decline in domestic demand, forcing them either to lower markups or exit, exporting firms were able to maintain their demand and markups in foreign markets.

Figure 5: Evolution of markups for exporters and non-exporters, by sectors

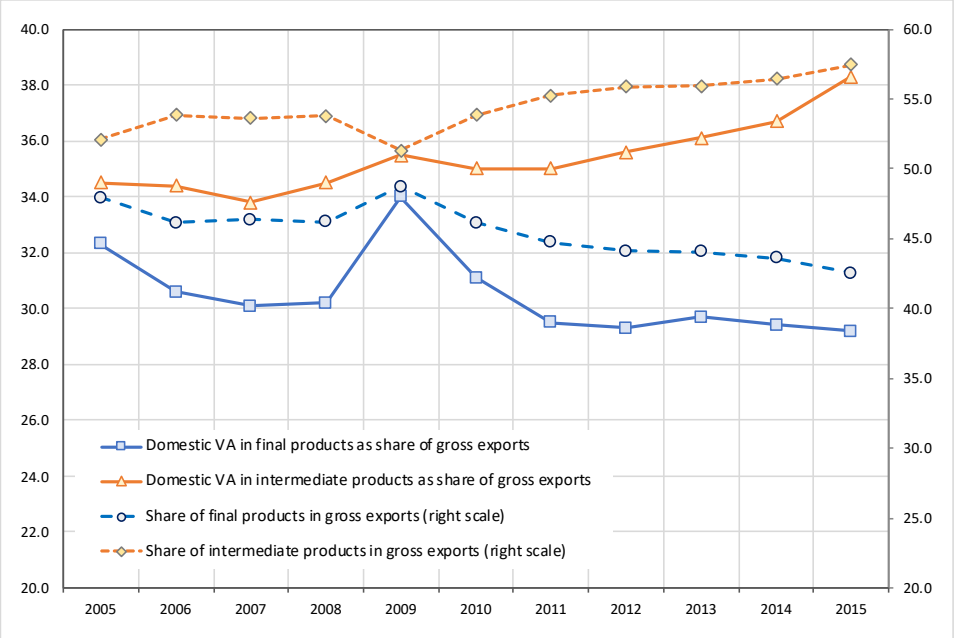


Note: Figure contains average of sales-weighted markups.

It is important to note the role of exporting for manufacturing sector in Slovenia as it on average, accounts for 81 percent of total export sales in the economy. The graph suggests that the export market could become more competitive after opening up to trade and that exporters in Slovenia might have no markup advantage as a result of tougher foreign market competition. This is consistent with the findings of Garcia-Marin and Voigtländer (2019), who show that although Chilean firms experience a significant drop in marginal costs after export entry, they keep relatively constant markups as they pass on most of the gains to customers in the form of lower prices.

For Slovenian firms, this characteristic might be even more pronounced. According to the Global Value Chain Development Report 2019 (WTO, OECD, WB, IDE-JETRO, UIBE, 2019), the Slovenian economy is one of the 8 most integrated OECD economies into global value chains (GVCs) in terms of both backward and forward integration. This means that Slovenian exporters may benefit from lower import prices, but also pass gains in terms of lower prices to foreign customers. As shown by Figure 6, between 2005 and 2015 the share of final products in gross exports declined from 47.9 to 42.5 per cent, while share of intermediate products in gross exports increased to 57.5 per cent. In the same period, domestic value added as a share of gross exports for final goods steadily decreased from 32.3 to 29.2 per cent, while domestic value added for intermediate products increased from 34.5 to 38.3 per cent of gross exports. This indicates a structural shift in Slovenian exports away from final goods to intermediate products where markups are traditionally smaller. This might also explain why markups of non-exporters largely sheltered from foreign competition are increasing faster than those of exporters that are operating in increasingly competitive foreign markets for intermediate products.

Figure 6: Evolution of export shares and share of domestic value added in Slovenia, by type of exported products



Source: OECD Trade statistics.

An alternative explanation is provided by Fishman and Rob (2003) who proposed a 'demand building' behavior, which states that when consumers have different search costs, firms will charge lower prices to attract new customers. In the case of exporters, the Fishman and Rob model implies lower prices charged by exporters to attract foreign buyers and explains why markups did not change significantly following export entry. Given the high participation of Slovenian exporters in foreign GVCs and given their increasingly stronger reliance on exporting intermediate products, this explanation could partly explain the slower growth in markups of exporters.

4.5 Markup decomposition

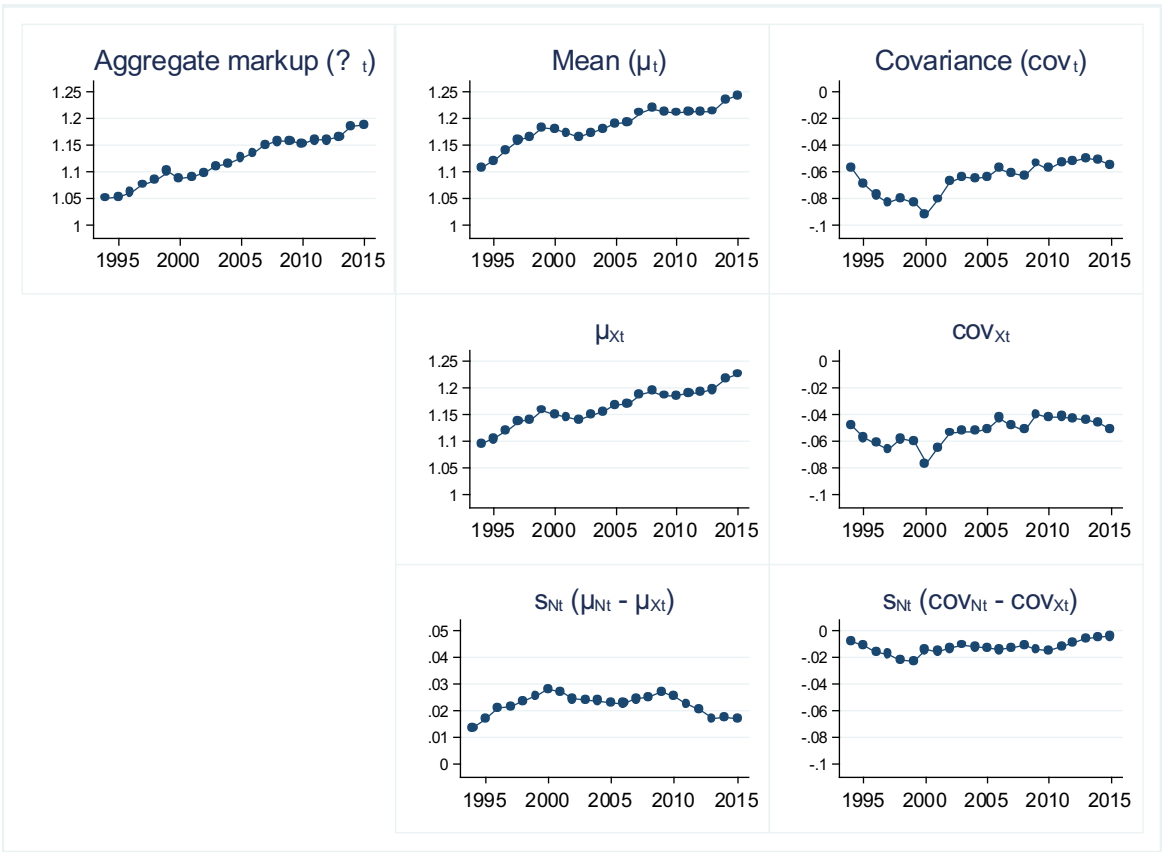
To provide an insight into the relative importance of different factors behind the aggregate markup development, we decompose markup into the within (changes in average markup) and between (reallocation of market share towards high-markup firms) components. Since we have two groups of firms (exporters and non-exporters), we employ an augmented Olley and Pakes (OP) decomposition developed by Maliranta and Määttänen (2015) to understand whether these changes in markup components occur relative to the reference group:

$$M_t = \overline{\mu_t^X} + cov_t^X(s_{it}, \mu_{it}) + s_t^N\left(\overline{\mu_t^N} - \overline{\mu_t^X}\right) + s_t^N\left(cov_t^N(s_{it}, \mu_{it}) - cov_t^X(s_{it}, \mu_{it})\right), \quad (11)$$

where superscripts *N* and *X* indicate non-exporting and exporting firms, respectively. $\overline{\mu_t}$ is the average unweighted markup at time t and cov_t is the covariance between market share and markups: $cov_t(s_{it}, \mu_{it}) = \sum_i (s_{it} - \overline{s_t})(\mu_{it} - \overline{\mu_t})$. Here, the group of exporting firms is taken as the reference group. The first two terms of the right hand of equation (11) represent the change in markups due to the average markup increase (within component) and reallocation of market share to high markup firms (between component) for exporting firms. Thus, the within and between components (the last two terms) of aggregate markup of non-exporting firms are computed relative to exporting firms.

Figure 7 presents the evolution of aggregate markup components based on augmented OP decomposition over the period 1994-2015. The first column of the first row contains panel for the aggregate markup, while the second and third columns of the same row contain within and between components of OP decomposition for the whole economy similar to the original Olley and Pakes (1996) decomposition. The second and third rows show the aggregate markup components of augmented OP decomposition: the group of exporting firms is taken as the basis (second row), whereas non-exporting firms are shown relative to exporting firms (third row). The sum of all components of the markup decomposition, i.e. mean (second column) and covariance (third column) for groups of exporting and non-exporting firms gives the aggregate markup (first column).

Figure 7: Augmented Olley and Pakes decomposition



The first panel indicates that most of the increase in aggregate markup is explained by the within-firm effects. In other words, the evolution of markups is driven by the average firm-level increase in markups. The reallocation effect (between) is consistently negative, suggesting that there is a negative relation between the evolution of the firm level markup and its market share. In other words, it suggests that high-markup firms grow their sales at a slower pace.

The middle panel shows that the upward trend of the aggregate markup is mostly explained by the upward trend of the (unweighted) average markup of exporters (μ_{xt}), and not by high markup exporters increasing their market share over time (cov_{xt}). The final row indicates a steady positive contribution of non-exporting firms to the aggregate markup relative to exporting firms. This suggests that both groups of firms experience an increase in markups, which started to follow a diverging path since the year 1999. Moreover, in the absence of non-exporters, the aggregate markup would have been on average 1.2 percentage points lower, indicating that the presence of non-exporters actually pulls aggregate markup up. This is because the current aggregate markup of exporters is, on average, lower compared to the group of non-exporting firms. The sectoral decomposition indicates very similar results and is presented in the Appendix.

5 Conclusions

In this paper, we provide new evidence on the evolution of market power for a small open economy, Slovenia. Using comprehensive firm-level dataset for the full population of non-public firms, we find that aggregate markups increased from 1.05 to 1.19 over the period 1994 and 2015.

However, there is sizable heterogeneity concealed in this aggregate rise. Specifically, we show that the rise in markups is observed in different percentiles of the markup distribution, where firms at the top decile have experienced a slightly more pronounced rise over time. Furthermore, the rise in markups is observed for both exporters and non-exporters with a consistent diverging path in favor of non-exporters since 1999. While in 1999 markups of exporters and non-exporters were tied, the gap in favor of non-exporters steadily increased to about 7% by 2015. The sectoral analysis shows consistently higher markups of non-exporters both in services and manufacturing, whereby the diverging trend in markup dynamics in favor of non-exporters comes from the manufacturing sector after 1999.

Given the predominant role of high-markup and exporting firms we explore the relationship between firm markup and size using augmented Olley and Pakes decomposition. We find that the

evolution of markups is driven by the average firm-level increase in markups, and not by high markup firms increasing their market share over time. There is a positive contribution of non-exporting firms to the aggregate markup relative to exporting firms. This suggests that both groups of firms follow an upward trend in markups, which starts to diverge since the year 1999. Moreover, we find that in the absence of non-exporters, the aggregate markup would have been on average 1.2 percentage point lower, indicating that markups of non-exporters are higher than of exporters. These findings point towards substantial differences in the intensity of competition between domestic and export markets, and, consequently, emphasize the importance of non-participation in exports for the rise of aggregate market power. We offer two explanations for these surprising findings. First, consistently lower markups of exporters in manufacturing sector can be attributed to increased competition faced by exporters following the comprehensive trade liberalization with EU after 1999 and increased participation of exporters in GVCs. Slovenian exporters serve mainly as suppliers of intermediate products and one can argue that this is a deliberate strategy of exporters of accepting lower markup as the price to pay to have access to GVCs. This implies that exporters prefer maximizing volume of sales over markups, which enables them to maximise volume of profits in larger extent than it would be possible by serving the small domestic market only. And second, bigger gap in markups between exporters and non-exporters in services sector as compared to manufacturing might reflect lower competition in services sector. While trade in goods was completely liberalized starting after 1999, liberalization of trade in services was only partial, which gives local firms a significant shelter from foreign competition.

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Appendix

Figure A1: The evolution of weighted average markups: alternative measures.

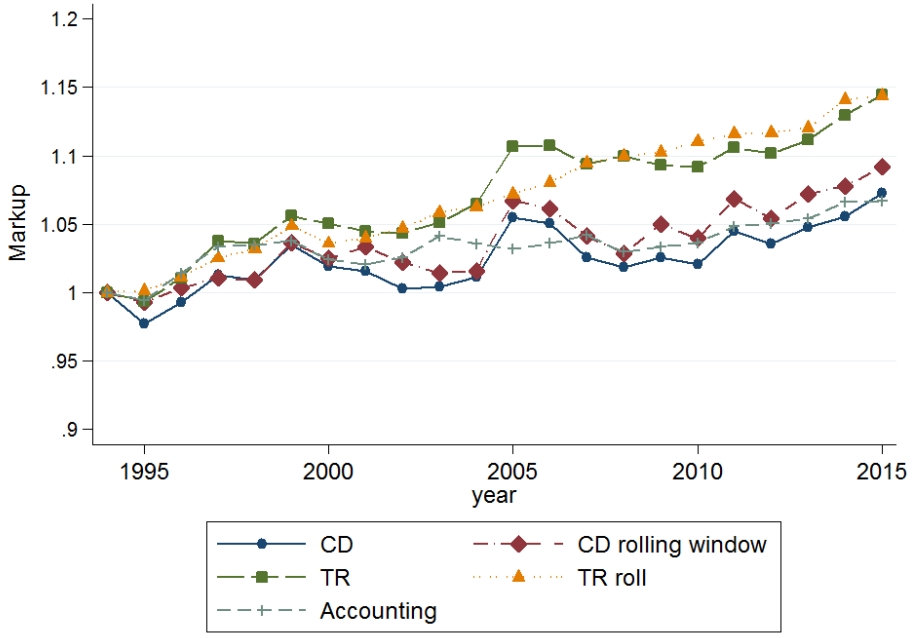

Figure A2: Sectoral decomposition: Manufacturing

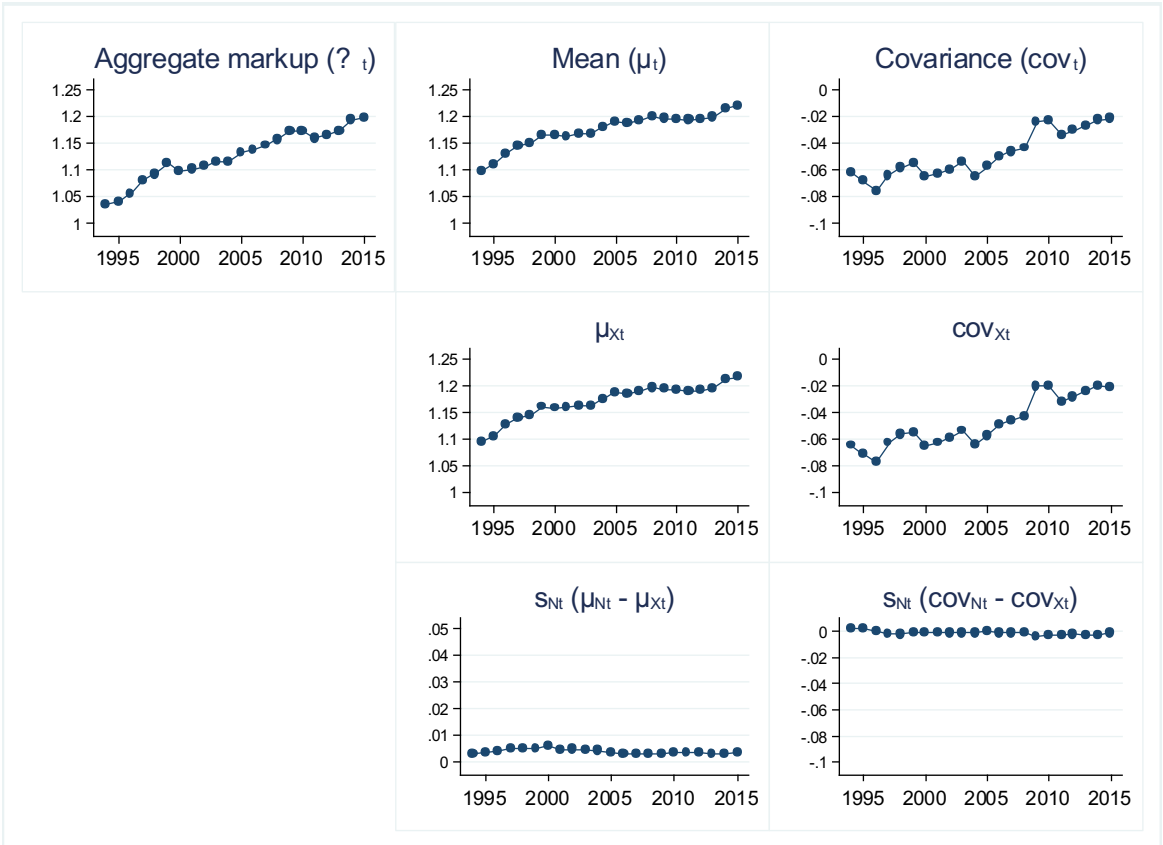

Figure A3: Sectoral decomposition: Wholesale

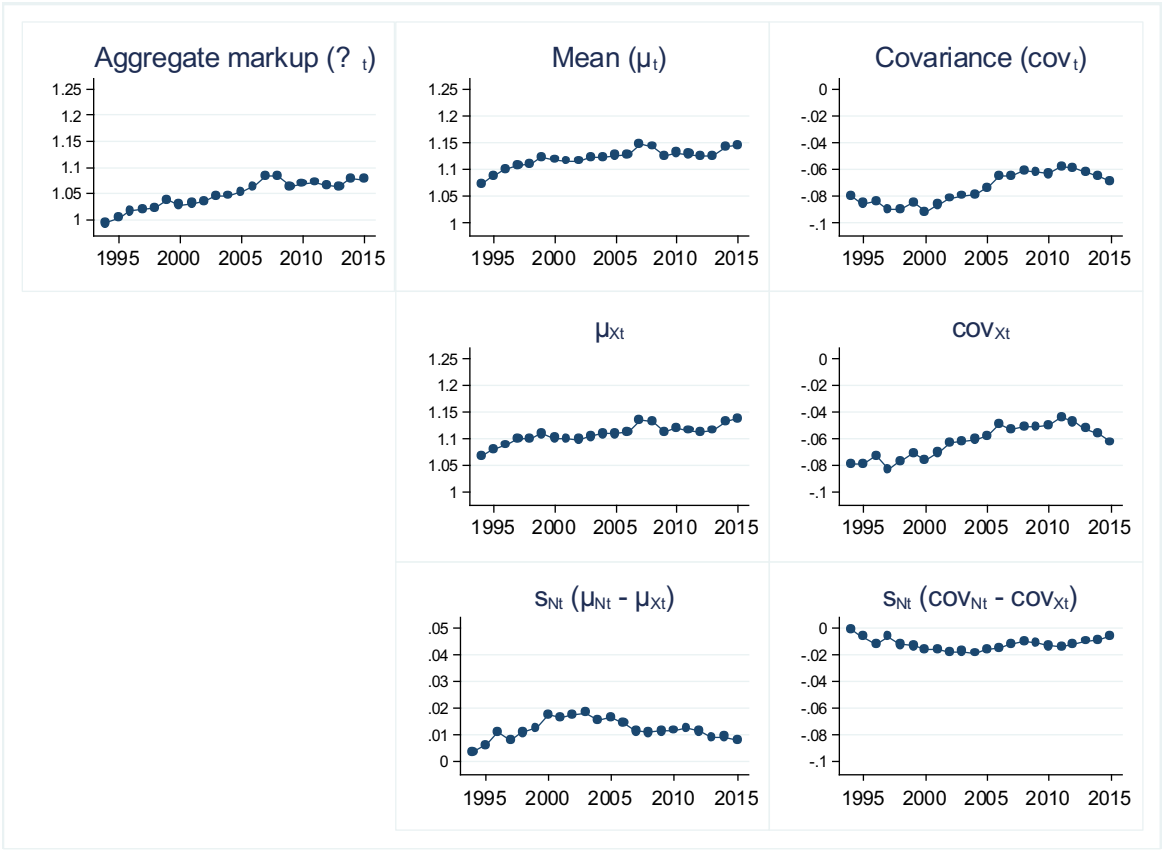

Figure A4: Sectoral decomposition: Retail

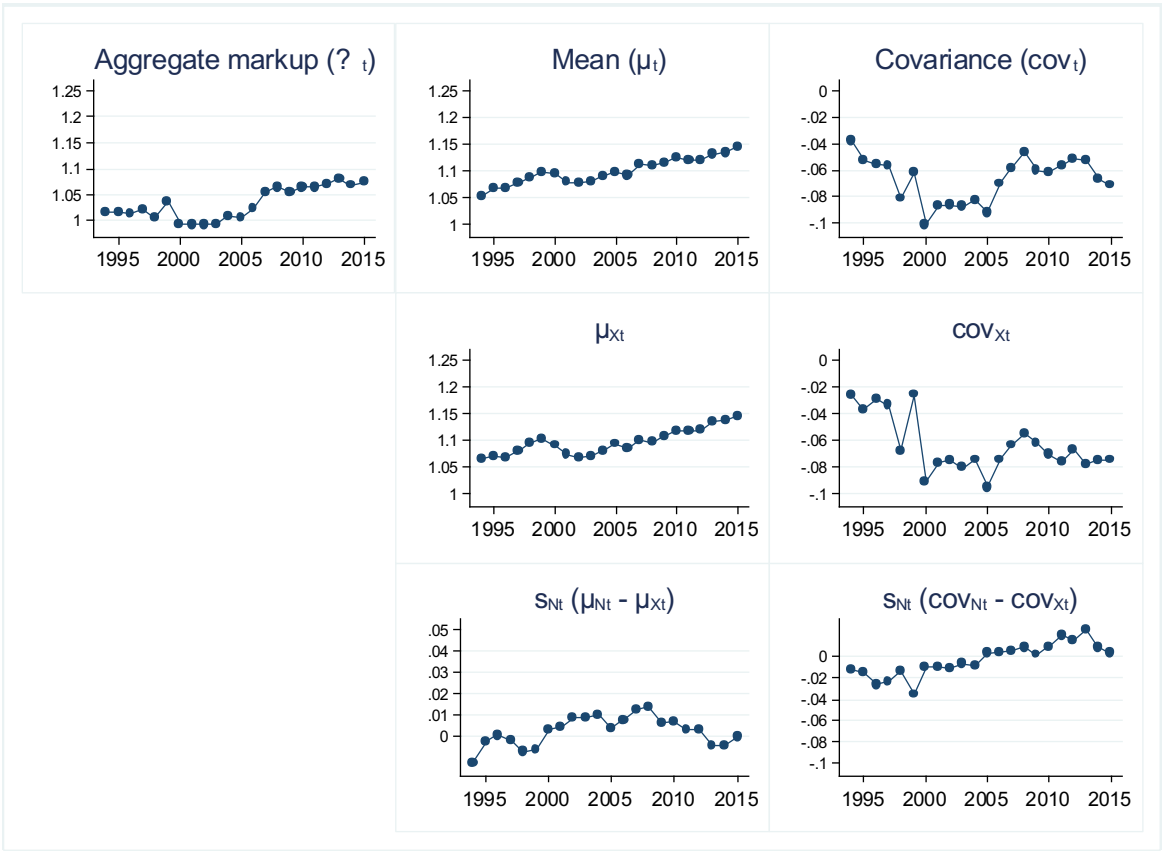

Figure A5: Sectoral decomposition: Services