MARKUPS IN THE ECONOMY OF THE REPUBLIC OF NORTH MACEDONIA

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Introduction

- Market power can have negative effects on the economy by causing **inefficient allocation of resources, limiting output and constraining innovation** (De Loecker, Fuss, & Van Biesebroeck, 2018)
- An often employed method of studying market power is by using the concept of **markups** (the ratio of the selling price and the marginal cost of the firm)
- A higher markup indicates greater market power
- **Market power and concentration** have **risen** on a global scale (De Loecker, Fuss, & Van Biesebroeck, 2018)
- De Loecker and Eeckhout (2018) find that **markups** have substantially risen in **advanced regions**, such as North America and Europe
- Evidence from the U.S. points to a significant increase in markups from 1980 onwards (De Loecker, Eeckhout, & Unger, 2020)
- The goal of this research is to analyze the **markups** in the economy of the Republic of North Macedonia from both a **macroeconomic** and a **microeconomic** perspective

Deriving an expression for markups

- Markups are notoriously **difficult to measure** because, by definition, they rely on data for marginal costs which are generally not directly observed
- An intuitive approach to arrive to an initial approximation of economy-wide markups is to use **macro data**, such as **output, employment, wages and price**
- Following De Loecker and Warzynski (2012), we start by solving the **constrained cost minimization problem of the firm**
- Inspired by the **Cobb-Douglas production function**, we assume that a firm uses two inputs in its production process, **labor (L)** and **capital (K)**, and the prices which the firm pays for these inputs are the **wages (w)** and the **price of capital (r)** respectively
- The constraint of the firm is given by the **output (Y)** it produces

Deriving an expression for markups

- The problem of the firm:

$$\min C = wL + rK$$

$$\text{s.t. } Y = Y(L, K)$$

$\mathcal{L}(L, K, \lambda) = wL + rK + \lambda(Y - Y(L, K))$, λ is the **marginal cost** of the firm

$$\text{FOC 1: } \frac{\partial \mathcal{L}}{\partial L} = w - \lambda \frac{\partial Y(L,K)}{\partial L} = 0$$

$$\frac{w}{\lambda} = \frac{\partial Y(L, K)}{\partial L}$$

$$\frac{w}{\lambda}\frac{L}{Y} = \frac{\partial Y(L, K)}{\partial L}\frac{L}{Y}$$

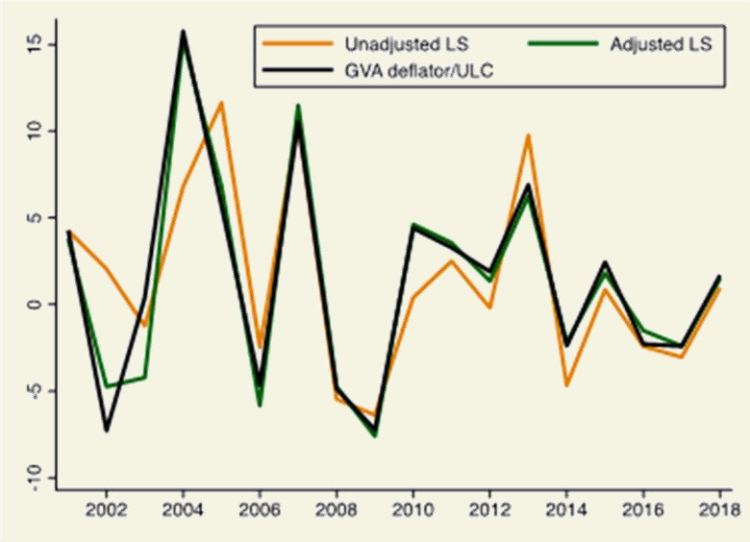
- The left-hand term is in fact the **cost share of labor (α_l)**, while the right-hand term is the **elasticity of output with respect to labor (θ_l)**
- Defining **markup** (μ) as simply p/MC (the ratio of the firm's selling price (p) and its marginal cost (MC), which in this case is λ), we obtain the expression for the markup:

$$\mu = \frac{\theta_l}{\alpha_l}$$

Markups from a macroeconomic perspective

- Markup indicators:
  - The **elasticity of output with respect to labor** is set as the average value (0.573) of the suggested options in Jovanovic and Kabashi (2011); the **share of compensation of employees in GDP** in denars (at current prices), using the income approach;
  - As in Batini et al. (2000), an **adjustment** of the labor share is made through a correction factor to reflect that part of the income of the self-employed represents a payment for their labour supply
  - Ratio between a proxy for prices (**gross value-added deflator**) and for marginal costs (**unit labour costs**) in the domestic economy

Figure 1: Markup indicators, y-o-y



Markups from a macroeconomic perspective

- The growth rate of employee **compensation** is substantially **higher** compared to the **productivity** growth rate in most of the time
- Given the divergent trends of labor productivity and employee compensation in the domestic economy, the associated rise in labor costs might lead to a **constant cycle of price increases**, in line with the infamous wage-price spiral

Figure 2. Productivity and compensation of employees, y-o-y

Markups from a macroeconomic perspective

- Changes in unit labor costs are **not directly passed on to prices**, indicating the presence of an overall **low pass-through** of costs to prices
- A similar pattern is observed for selected countries from the **Euro Area** (Germany, France, Italy and Spain) (Bank of Spain, Quarterly report on the Spanish economy (2019))
- Changes in markups are **not associated** with changes in consumer prices in the same time period - in some instances, markups increase after a price increase in the preceding period; thus, in setting their prices, firms seem to take a **variety of factors** into consideration

Figure 3: Core inflation and ULC, y-o-y

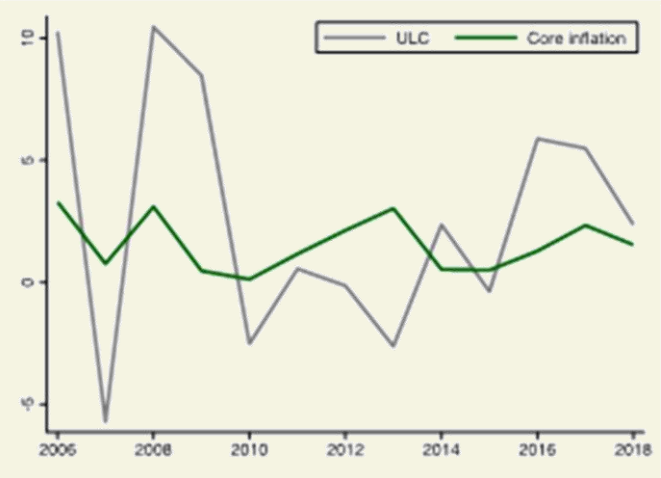
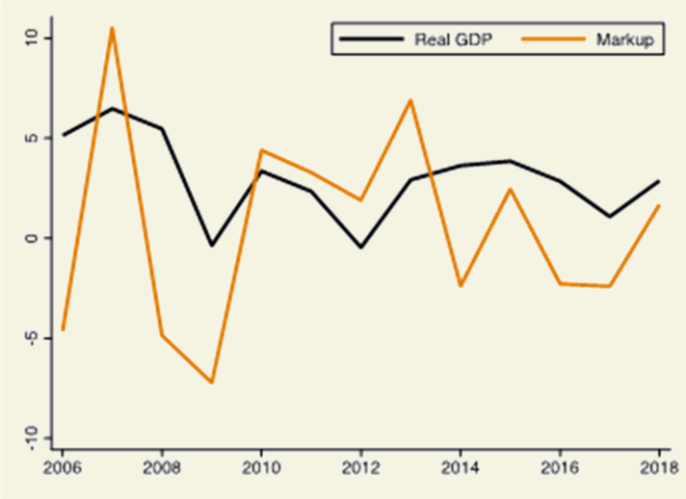


Figure 4: Markups and total inflation, y-o-y

Markups from a macroeconomic perspective

- The variation in markups is substantially **higher** than the variation in real GDP; nonetheless, the increase in real domestic activity is often accompanied with an increase in markups, thereby highlighting the **procyclical** properties of markups

Figure 5: Markups and Real GDP, y-o-y



Markups from a macroeconomic perspective

- Markups are most **volatile** in the Baltic countries and least volatile in **CEE countries**; interestingly, all of the country groups markups seem to converge to a rather similar value in the more recent period
- Changes in markups are much more **frequent** in North Macedonia relative to the CESEE average

Figure 6. Selected country groups, y-o-y

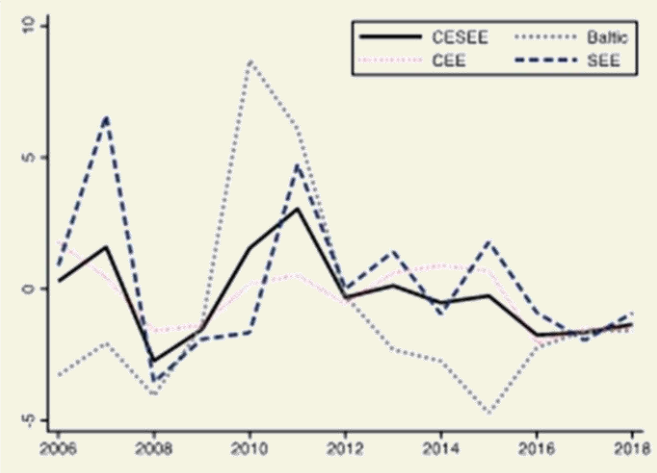
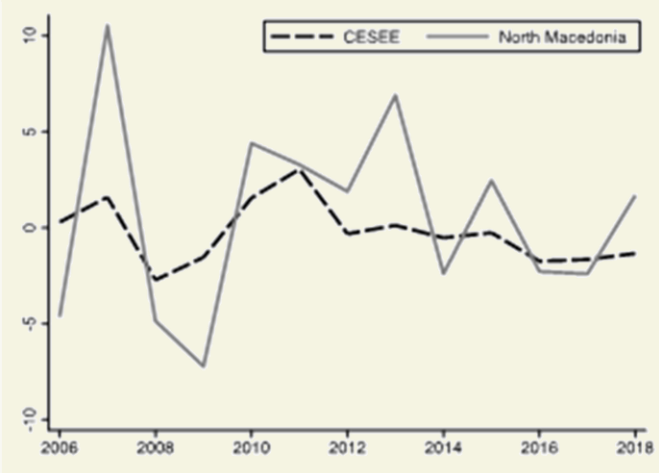


Figure 7. CESEE/North Macedonia, y-o-y



Data and estimation procedure

- Our **sample** of firms includes all the firms that submitted their financial accounts (balance sheet and income statement) to the Central Registry of the Republic of North Macedonia in the period 2013-2020
- We **exclude** the "financial and insurance activities" and the "public administration and defense; compulsory social security" , "activities of households as employers; undifferentiated goods and services-producing activities of households" and "activities of extraterritorial organizations and bodies"
- We exclude all **micro** firms from our sample, because very often there are errors in the data found in the financial statements submitted by micro firms

Data and estimation procedure

- Descriptive statistics

Table 1: Number of firms per size and year

Size	Year 2013	2014	2015	2016	2017	2018	2019	2020	Total
large	86	86	73	70	73	74	84	78	624
medium	127	127	101	100	103	103	119	107	887
small	1,009	1,009	1,148	1,252	1,399	1,425	1,600	1,279	10,121
Total	1,222	1,222	1,322	1,422	1,575	1,602	1,803	1,464	11,632

Table 2: Number of firms per sector and year

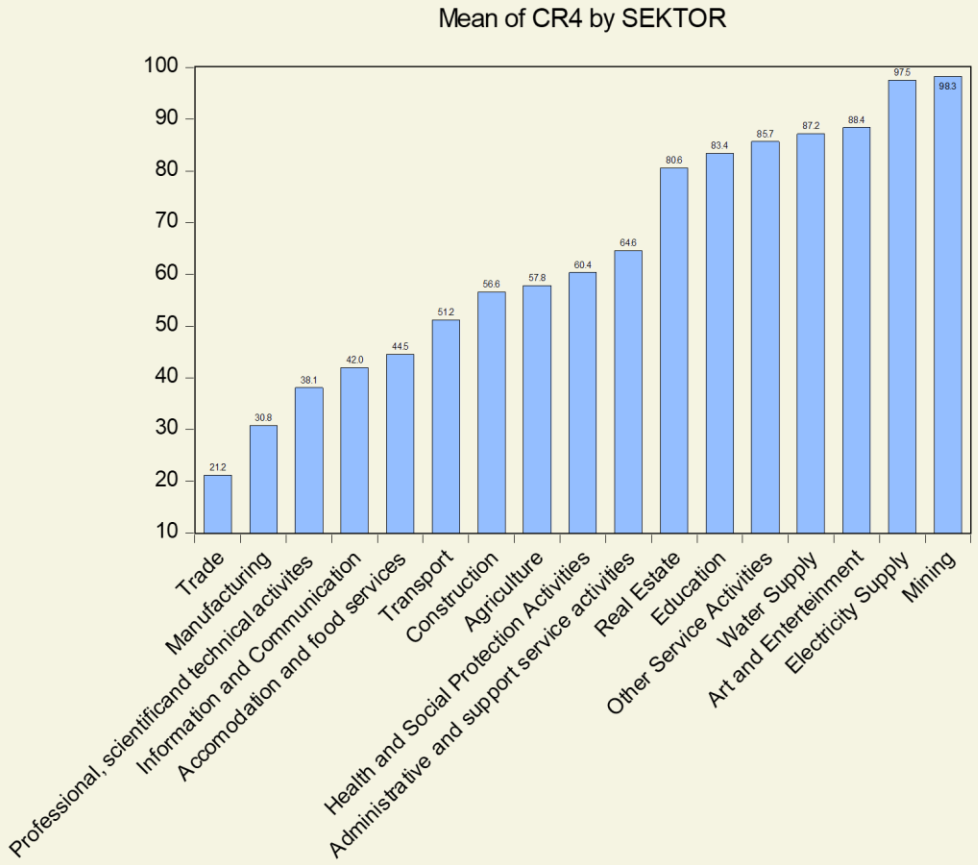
Sector	Year 2013	2014	2015	2016	2017	2018	2019	2020	Total
Accomodation and fo..	50	50	80	83	87	101	118	82	651
Administrative and ..	37	37	32	34	44	41	44	31	300
Agriculture	46	46	57	66	75	88	95	81	554
Art, entertainment ..	9	9	4	8	9	11	11	11	72
Construction	104	104	109	132	139	131	159	144	1,022
Education	3	3	2	7	9	9	10	7	50
Electricity supply	5	5	6	8	8	5	9	9	55
Health and social p..	10	10	13	18	29	35	46	30	191
Information and com..	24	24	30	45	58	45	63	54	343
Manufacturing	347	347	330	331	341	343	380	321	2,740
Mining	3	3	6	9	11	9	11	10	62
Other service activ..	4	4	6	7	8	8	9	8	54
Professional, scien..	48	48	56	58	80	84	95	70	539
Real estate	19	19	14	12	17	15	12	10	118
Trade	426	426	479	502	560	567	610	509	4,079
Transport	75	75	89	92	90	100	122	78	721
Water supply	12	12	9	10	10	10	9	9	81
Total	1,222	1,222	1,322	1,422	1,575	1,602	1,803	1,464	11,632

Data and estimation procedure

- The cost share of labor is **observable** from the dataset, but the elasticity of labor is **not**, and therefore we need to **estimate it**
- Although estimations of the production function have existed for a long time, very often, these estimations have suffered from certain econometric **issues** that are related to potential **bias** and **inconsistency** of the parameters in question
- Several **methods** for estimating output elasticity with respect to labor (Olley and Pakes (1996); Levinsohn and Petrin (2003); Ackerbeg, Caves, and Frazer (2015))
- We use the **ACF** method which overcomes the "collinearity" problem in the OP and LP methods and obtain an estimate of output elasticity with respect to labor equal to 0.7953022

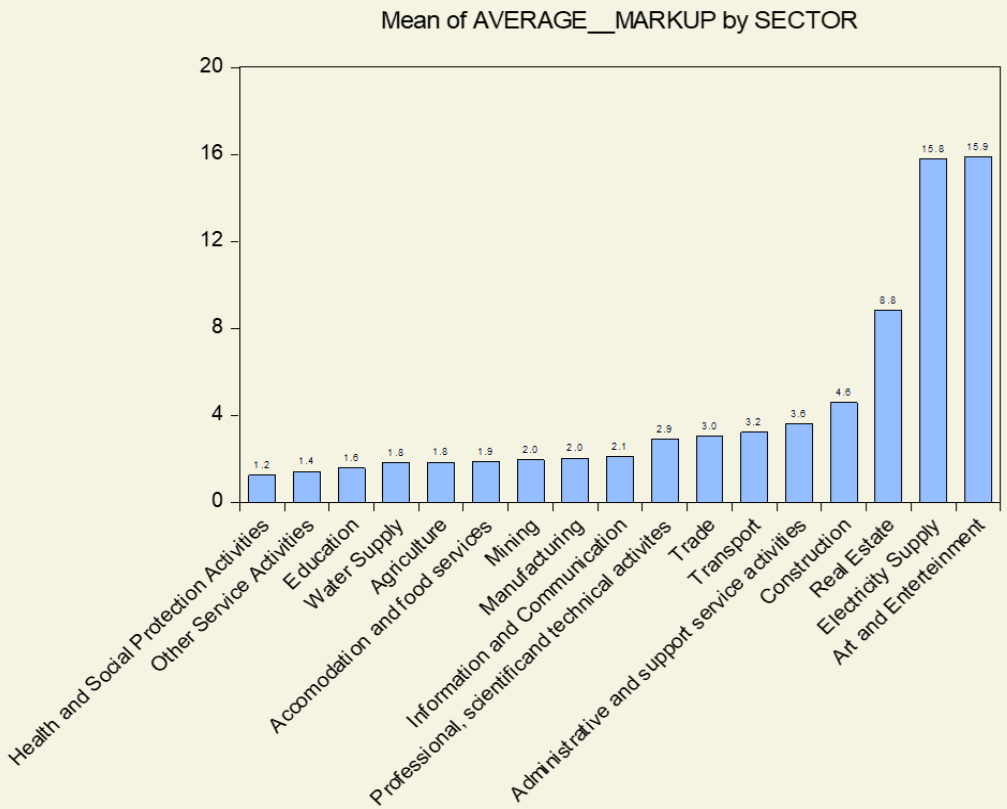
Markups from a microeconomic perspective

- The business sectors in the domestic economy are generally **highly concentrated**: 7 out of 17 sector activities have a concentration ratio (CR4) of 80.6% - 98.3%, and 5 out of 17 sector activities are **moderately concentrated** and have a CR4 of 51.2% -64.6%



Markups from a microeconomic perspective

- **Average markups** at the sector-level, over the period 2013-2020 range from **1.2** (in health and social protection activities) to **15.9** (art and entertainment)
- For comparison, in the **Slovenian manufacturing sector** the median markup is estimated to be in the range from **1** to **1.30** (De Loecker and Warzynski, 2012)
- Initial results suggest that the Macedonian economy has **insufficient product market competition with high CR4 and high levels of average markups**



Future research

- Evaluate sector-specific **determinants** on markup behavior
- Analyzing the effect of **financial pressure** (profitability, liquidity, solvency, etc.) on the markups
- Specific **policy recommendations** for lowering market power

Conclusion

- Markups in North Macedonia are **less volatile** and **more stable** in recent years
- Generally, they are **higher,** but also more **volatile** than in the CESEE countries
- **Highly concentrated** business sectors in the domestic economy, with generally high markups
- The Macedonian economy should focus on policies that would **increase** market competition and **lower** market power

Thank you!