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# Ownership structure and firm performance – The case of Slovenia

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## ABSTRACT

The article studies the relationship between ownership structure and performance of the Slovenian joint stock companies, with special focus on the comparison of performance of state- and privately-owned joint stock companies and ownership concentration. The empirical analysis employs firm-level annual financial reports data and data on ownership structure of all Slovenian joint stock companies for the 2005–2017 period. Using panel regression analyses we find that Slovenian state-owned joint stock companies are less profitable than their privately-owned counterparts. In contrast, we do not observe statistically significant relationship between ownership concentration and firm performance. The empirical findings point on the need of further actions in improvement of corporate governance of state-owned firms in Slovenia.

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## JEL CLASSIFICATIONS

G32; L25; O16; P31

## 1. Introduction

State-owned firms have an important share in economic activity of the Central, Eastern and South-eastern European countries, though with large variation across countries and sectors (Richmond et al., 2019). There is an extensive body of empirical research comparing performance of state-owned and privately-owned firms, mostly showing that state-owned firms are, on average, less efficient and profitable than their private counterparts (Lazzarini & Musacchio, 2018).<sup>1</sup> Several factors can explain underperformance of state-owned relative to privately-owned firms, including poor corporate governance, insufficient monitoring and lack of high-powered incentives for managers of the state-owned firms (Lazzarini & Musacchio, 2018). In addition, state-owned firms have different strategic objectives, being more oriented towards better public services with lower risk of failure, better infrastructure, positive effects on employment with favourable effects on lowering social transfers and dependence of market failures. Pursuing other objectives than efficiency and profitability usually leads to lower financial performance.

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An important issue in the corporate governance literature is, beside the effects of ownership type, also the effects of ownership concentration on firm performance. Ownership concentration is namely a widely used strategy of investors to ensure return on their investment (Shleifer & Vishny, 1997). Although this issue has drawn considerable attention in theoretical and empirical literature, there is no consensus on the direction of the effect. Ownership concentration can alleviate the conflict of interest between owners and managers with positive effects on firm's performance (Jensen & Meckling, 1976), whereas, on the other hand, it could also be associated with agency problems which might result in lower firm performance. An overview of empirical studies on the effects of ownership concentration is available in Heugens et al. (2009) and Iwasaki and Mizobata (2020).

Slovenia's model for economic growth has suffered from both corporate governance weaknesses and heavy reliance on state involvement in the economy (OECD, 2015). Slovenia's degree of state ownership in the economy is one of the highest in the OECD – for example, in 2012 state-owned firms employed 11% of all workers, which is more than triple the OECD average. Last available data for 2017 show that there were 84 state-owned firms (out of these 23 inactive) with the value of equity of 10.9 billion Euros and the average rate of return on equity (ROE) of 6.5% (Slovenian Sovereign Holding, 2019). The inward stock of FDI was just above 30% of gross domestic product in 2012, which was less than half the share in Estonia, Hungary or Czechia (OECD, 2015). Moreover, Richmond et al. (2019) showed that during the 2014–2016 period only 40% of Slovenian state-owned firms recorded higher median revenues per employee as privately-owned counterparts in the same sector and about 65% of state-owned firms had higher cost share in operating revenue than the private sector median. Besides, authors found that the wage premium in Slovenian state-owned firms was about 20% higher than in the private sector.

Above evidence imply that state-owned firms, despite the privatisation process, still have an important role in the economy, yet they are poorly managed. Although Slovenian state-owned firms, on average, perform significantly better than most of other state-owned firms in Central, Eastern, and South-eastern European countries (for overview see Richmond et al., 2019), their performance still seems to be lower than of the Slovenian privately-owned firms. This presents a strong motivation for further and detailed empirical research, as the results can give important policy implications in the field.

This article aims to study the relationship between ownership structure and performance of the Slovenian joint stock companies, by which both the effects of ownership type (comparison of state and private ownership) and ownership concentration are analysed. The empirical analysis employs the firm-level annual reports and ownership structure data of the Slovenian joint stock companies for the 2005–2017 period. The effects of the state ownership and ownership concentration on firm performance were studied by applying the panel regression analyses with fixed effects.

The article adds to the literature in several ways. First, the analysis is performed on firm-level data including all Slovenian joint stock companies for the 2005–2017 period, i.e., focusing on the post-transition period, and studying both the effects of ownership structure and ownership concentration on firms' performance. There are

only few studies that deal with these issues for Slovenia, most of them not using recent available data or focusing on the post-transition period. Second, an important novelty of our empirical approach applies to measuring ROE, as one of the important measures of firm performance. When measuring ROE, we also account for risk (using the industry-specific risk measures), which enables us to observe the return relative to the amount of risk involved. This not only gives us a clearer and realistic measure of return, but it also enables better comparison of return across firms (independent of the industry). Not accounting for the risk is one of the limitations of other empirical studies in the field, which mostly rely on standard performance measures, and, usually, control for differences between industries using dummy variables for industries. Third, as a measure of ownership concentration, the study, beside Herfindahl index (a measure that is being used by most of the studies in the field), uses also the share of first owner and cumulative share of first five owners, which is not often the case in studies for other countries. Empirical results are important both for asset managers of state-owned companies and policymakers in shaping ownership strategies. They will also be an important tool in policy directions and decisions about potential future sales of majority stakes in important Slovene state-owned companies, which is in Slovenia an ongoing topic for all governments since independence.

The article structure is as follows. [Section 2](#) presents the theoretical background on ownership structure, overviews empirical studies on the effects of state ownership and ownership concentration on firm performance and sets the main hypotheses. [Section 3](#) gives an overview of data and methodology applied, followed by presentation of empirical results in [Section 4](#). The final section concludes.

## **2. Literature review and main hypotheses**

### ***2.1. Theoretical background on ownership structure***

In theory, ownership structure is one of the important factors affecting firm performance. According to the agency theory, separation of ownership and management causes costs, which detract firms from optimal performance and maximum potential shareholder value, which is the main purpose of firms. Stubelj et al. (2017) showed that the perception of firm's purpose significantly differs among Slovenian firms according to the type of ownership. Thus, the type of ownership and concentration of ownership may affect mechanisms that attempt to align management interests/behaviour to owners' interests. The right combination of the two may increase the chances of implementing good corporate governance. This consequently improves firms' performance, efficiency, their access to funds, cost of capital and value (Claessens & Yurtoglu, 2013).

According to Alchian and Demsetz (1972) and Jensen and Meckling (1976), a firm is a series of contracts between production factors. Production factors act in their own interest in the awareness that their success depends on the performance of the team, in which they operate, and of competition with other teams/firms (Fama, 1980). Therefore, the firm's performance is a result of firm's operations on which all interest groups in a firm have an impact. The main objective of the firms' stakeholders (i.e., owners, management, employees, suppliers, customers, local community, the state and others) is increase in firm's performance and by that in their return which

is positively correlated with the risk they bear. Their return therefore depends on the extent of their involvement in the firm and their ability to diversify the risk.

As regards involvement, suppliers and customers can work also for or with other firms, whereas employees and management can transfer their work to other firms through the labour market. On the other hand, owners earn residual, which depends on a firm's performance. To be successful, they, therefore, need to develop tools for effective supervision of firm's operation (Fama, 1980).

Firm owners can also reduce their risk through diversification in the capital market, where they can transfer their assets between firms with relatively low transaction costs (Fama, 1980). Scattered owners have no interest in carefully supervising every activity of the firm in which they have allocated their capital. Thus, more diversification of assets implies more separation between ownership and control of firms (Fama, 1980). According to Demsetz (1983), a major cost of monitoring firms with dispersed ownership is compensated by lowering the required rate of return due to owners' diversification effect on lowering risk. By increasing the number of owners an individual owner becomes less dependent on performance of specific firm. Consequently, it is very difficult to organise various ownership interests in an effective management supervision tool. Not every owner wishes to supervise management, but each owner assumes that there are owners with significant ownership shares with interest and power to control management (Demsetz, 1983). Dispersed ownership reduces the owners' risk, but it can also reduce their interest in controlling the firm, resulting in a negative impact on firm's performance. Small ownership stakes are not necessarily related to diversification, as large investors can allocate their capital in a way that has significant stakes in firms in which they invest. In the case of high state-ownership concentration, corporate governance has a potential to be effective in controlling management. But the active role of the state could lead to bad corporate governance due to different political interests in the firm. In such cases management might try to satisfy various, sometimes contradictory interests of owners, which can lead to poor business results. OECD (2018) states that also a passive style of ownership, such as lack of participation in shareholders meetings, ad hoc dividend policies, inadequate disclosure, and weak financial controls, may weaken incentives for management to maximise value for the state.

## **2.2. Review of empirical studies**

There is a growing empirical evidence that ownership affects firm's performance, although only few for Slovenia and most of them focusing on the transition period. Much of this evidence is based on the analyses of the privatisation effects, by which we divide studies into two groups. The first group of studies observes the 'before-and-after' performance differences in the firms that underwent partial or total privatisation (Lazzarini & Musacchio, 2018). They mostly report that privatisation significantly improved the financial and operating performance of firms (see, for example, Megginson et al. (1994), Boubakri and Cosset (1998), D'souza and Megginson (2002), Marthue and Banchuenvijit (2004) for multi-national analyses; Earle et al. (1994) for Central European countries; Pohl et al. (1997) and Claessens and

Djankov (2002) for Eastern European countries; Frydman et al. (1999) for Czechia, Hungary, and Poland; Claessens et al. (1997) for Czechia, Barberis et al. (1996) for Russia; Grygorenko and Lutz (2007) for Ukraine). These findings were also confirmed by meta-analyses. For example, Megginson and Netter (2001) examined studies on privatisation in Central Eastern European countries and the Commonwealth of Independent States and showed that privatisation contributes to firms to become more efficient, more profitable, and financially healthier. Estrin et al. (2009) reported of mostly positive significant effects of privatisation in Central Europe, being higher in case of privatisation to foreign owners and greater in the later than earlier transition period. For the Commonwealth of Independent States authors found positive or insignificant effect in case of privatisation to foreign owners, while privatisation to domestic owners generated a negative or insignificant effect. Djankov and Murrell (2002) studied the firm restructuring in transition. They found that in transition countries privatisation is strongly associated with more firm restructuring. Important for our study are their findings that the economic effects of restructuring are quite often very large, as such firms record several percentage points' higher growth rates.

The second group of studies focuses on the period after the privatisation process and analyses how different type of ownership affects firms' performance.<sup>2</sup> A large number of studies in this group analyses the effects of state ownership on firms' performance (and compares them to privately-owned firms), using data for listed firms (i.e., firms that were at least partially privatised). This is an important advantage compared to the first group of studies, as it overcomes the problem of finding the appropriate benchmarks for comparison of state-owned firms with privately-owned firms and assures better data quality (see Wang & Shailer, 2018). Although the empirical evidence on the relationship between state ownership and firm performance are mixed (a recent overview of studies is available in Megginson, 2017; Iwasaki et al., 2018; Yu, 2013), studies mostly show that private ownership is more efficient than state ownership. In the meta-analysis of 54 empirical studies on the relations between ownership identity and financial performance for listed firms in emerging market Wang and Shailer (2018) showed that this relation is negative for state-owned firms and positive for privately-owned firm, with the difference between the two being significant. Moreover, authors found that positive private ownership-performance relation is stronger for institutional/foreign ownership compared to family/management ownership. Further analysis also showed that the negative (positive) effects of state (private) ownership and performance have weakened (strengthened) over time.

Another important aspect of the relationship between ownership and firm performance is the issue of concentrated ownership. This issue has been a subject of numerous empirical studies with diverse empirical results and it is still getting academic attention, which can be attributed to the fact that the effect of ownership concentration on firm performance is *'theoretically complex and empirically ambiguous'* (Earle et al., 2005, p. 254). Heugens et al. (2009) performed a meta-analysis of the relationship between concentrated ownership and firm financial performance in Asia and found small but significant positive association between both variables, yet there was a high heterogeneity in the size of the effect. The effect was stronger for foreign than for domestic owners and for pure 'market' investors than for 'stable' or 'inside'

owners. Iwasaki and Mizobata (2020) have done a similar meta-analysis including studies for Central and Eastern Europe and the former Soviet Union. The results point on the positive effect of ownership concentration on firm performance, yet the size of the effect is modest. The small effect size could be attributed to the choice of target industries, estimation period, data sources and design of empirical models. An important issue in this research is also a publication selection bias, because of which, according to Iwasaki and Mizobata (2020), existing studies cannot provide genuine evidence regarding the effect of ownership concentration on firm performance in European emerging economies.

The empirical evidence on the relationship between ownership and firm performance in Slovenia is scarce. Smith et al. (1997) studied the relationship between employee and foreign ownership, controlling for simultaneity between privatisation and firm performance. Authors found that both types of ownership are positively associated with firm performance with elasticities ranging from 3.9% for foreign ownership and 1.4% for employee ownership. Simoneti et al. (2003) compared mass privatisation programs for listed and non-listed companies with government led pre-privatisation restructuring program. Authors found that firms owned/sold by mass privatisation institutions experienced better economic performance in comparison to companies owned/sold by the state. Damijan et al. (2004) found that firms controlled by domestic non-financial owners and insider owners, when aggregately holding dominant ownership blocks, perform better than firms controlled by state-controlled funds. Kostevc (2015) found that ownership concentration is associated with export performance, as firms with concentrated ownership being more likely to become first-time exporters.

### **2.3. Hypotheses**

Considering theoretical and empirical framework, we will test the following two main hypotheses:

*H1: State-owned firms record lower performance than privately-owned firms in Slovenia.*

We expect to consolidate findings of scarce research in Slovenia that directly or indirectly show that privately-owned firms are more profitable than state-owned firms. The matter is important for Slovenia's economic development that has suffered from both corporate governance weaknesses and heavy reliance on state involvement in the economy.

*H2: Ownership concentration is positively associated with firm performance in Slovenia.*

Dispersed ownership reduces owners' interest in controlling the firm, resulting in a negative impact on firm's performance. Nevertheless, as discussed in previous section, empirical evidence does not provide solid evidence on the direction of the effect.

## **3. Data and methodology**

### **3.1. Data**

The empirical analysis uses exceptionally rich data on Slovenian joint stock companies for the 2005–2017 period, obtained from two administrative databases:

- *Annual financial reports*, including profit and loss statements and balance sheets for all Slovenian firms. Data were obtained from the Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES, 2019).
- *Ownership structure data*, consisting of data on top 100 owners of all Slovenian joint stock companies at the end of each year. Based on this data stock owners were classified to several categories, i.e., individual persons, legal entities (private firms), institutional investors, foreign investors, co-operatives, and the state. The data were prepared by the Central Securities Clearing Corporation (2019).

The two data sets were merged using the unique firm identifier.

Note that the AJPES data set consists of significantly more observations compared to the ownership structure data set. The later namely comprises only data on joint stock companies (for them we can obtain a detailed data on ownership structure), while the AJPES data set includes data for all Slovenian firms. Nevertheless, data for joint stock companies have several advantages, including increased data reliability and consistency (see Wang and Shailer (2018) for a discussion). An overview of sample size after merging the data by firm's type of ownership and year is in [Table 1](#) (see [Section 4.1](#)).

### 3.2. Methodology

The empirical analysis is divided in two parts. First, we study the relationship between state ownership and firm's performance employing panel regression analyses with fixed effects and standard errors clustered at the firm level.<sup>3</sup> The econometric model, which was applied on data for Slovenian joint stock companies over the 2005–2017 period, is specified as follows:

$$Perf_{it} = \alpha_0 + \beta S_{it} + \gamma X_{it} + \varepsilon_{it}, \quad (1)$$

where  $Perf_{it}$  presents dependent variables measuring performance for firm  $i$  in year  $t$ . Variable  $S_{it}$  is a categorical dummy variable differentiating between three groups of firms with regard to the state ownership share: privately-owned firms, firms with minority state ownership share (i.e., 50% or lower) and firms with majority state ownership share (i.e., more than 50%).  $X_{it}$  is a vector of explanatory variables, including debt-to-equity ratio as a measure of firm's financial leverage, natural logarithm of total assets to account for firm's size, natural logarithm of net sales to account for firm's operation and dummy variable for foreign ownership to account for potential differences in management styles. Both value of total assets and sales were deflated with the CPI and are presented in terms of the 2005 prices. All explanatory variables, except dummy variable for foreign ownership, include one-year lag. In addition, we include dummy variables for years to control for time specific effects and dummy variables for industries to control for industry specific effects and economic policy shocks. Parameter  $\varepsilon_{it}$  presents random error. The econometric model was applied both for all firms in the sample and at the level of industries.



As dependent variables we use three profitability measures: risk-adjusted ROE, Return on Assets (ROA) and Return on Sales (ROS).<sup>4</sup> All these variables are commonly used in the corporate governance literature (see, for example, Megginson, 2017; Iwasaki et al., 2018; Wang & Shailer, 2018).

An important novelty of our empirical approach is that we consider also risk by adjusting ROE with tailored industry-specific risk measures. Namely, the state holds shares in firms with various business activities and different levels of risk. For example, in Slovenia majority state ownership can be observed in regulated business activities (such as electricity and gas distribution and transmission), which are characterised with lower risk (they have a granted regulated return), and, according to the risk and return relationship, lower regulated returns.

To adjust the ROE for risk we firstly calculate measure of risk. For the measure of risk we use betas (i.e., market risk measures) of the EU firms, which can be accessed at Damodaran (2019). The betas are estimated by regressing weekly returns on stock against the local index using five years of data. Damodaran (2019) uses a composite of the two-year regression beta and the five-year regression beta, weighting the former  $2/3^{\text{rd}}$  and the latter  $1/3^{\text{rd}}$ . In this analysis we apply sector-level data for unlevered betas, calculated in 2011 and 2017, by which we translated the industries used by Damodaran (2019) to the NACE Rev. 2 industry classification. Using this classification, we calculated the average unlevered betas for each industry. In the next step we used average unlevered industry betas to calculate firm-level leveraged beta by applying the Hamada equation and adapting beta for relevant tax rates on profit and to firm's debt-to-equity ratio. To calculate the firm's risk-adjusted ROE we thereafter applied Capital Asset Pricing Model (CAPM), taking into account the following assumptions: (1) ROE and market returns are equal in a long-term; and (2) investors can avoid the specific risk of ROE with diversification and only the systematic risk matters. The following equation was applied:

$$r_{i, \text{ Adjusted}} = \frac{r_i}{\beta_i} + r_f \cdot \left(1 - \frac{1}{\beta_i}\right), \quad (2)$$

where  $r_{i, \text{ Adjusted}}$  is firm's ROE, adjusted for the risk,  $r_i$  is the firm's ROE,  $\beta_i$  is the measure of the market risk for a firm, and  $r_f$  is the risk free rate of return. For the latter we used long-term equilibrium risk free rate of return calculated as the average of monthly yields of a German 10-year government bond for the 2005–2017 period. The data were obtained from FRED (2019).

In the second part of empirical analysis we study the relationship between ownership concentration and firms' performance. For each performance measure (see above) we use three panel regression models that differ in the measure of concentration. The regression model is specified as follows:

$$\text{Perf}_{it} = \alpha_0 + \beta \text{concentration}_{it} + \gamma X_{it} + \varepsilon_{it}, \quad (3)$$

where  $\text{Perf}_{it}$  presents measure of performance for firm  $i$  in year  $t$  (i.e., risk-adjusted ROE, ROA and ROS), variable  $\text{concentration}_{it}$  refers to the selected measure of concentration. We use three measures of ownership concentration, Herfindahl index of

ownership concentration ( $HI$ ),<sup>5</sup> ownership share of the first owner ( $C1$ ) and cumulative ownership share of top five owners ( $C5$ ).  $X_{it}$  is a vector of explanatory variables, including debt-to-equity ratio, natural logarithm of total assets, natural logarithm of net sales (as in Equation 1, we use deflated data with a one-year lag) and ownership shares by different categories of owners (state, foreign, institutional investors, private firms and individuals). In addition, we include dummy variables for years and industries. Parameter  $\varepsilon_{it}$  presents random error. As in the case of Equation 1, the models were estimated using the panel regression models with fixed effects and standard errors clustered at the firm level, both for all firms in the sample and at the level of industry sectors over the 2005–2017 period.

Comparison of several statistical parameters pointed on the issue of large variability of financial ratios data. Some of them even had theoretically unexpected and unacceptable values, which may be related to the fact that accounting data may refer to the periods shorter than one year (for newly established and closed firms) or mistakes in data. In order to avoid potential biases, we removed 5% of observations at each tail of the distribution for each performance variable included in the analysis.

## 4. Empirical results

### 4.1. Descriptive statistics

The number of firms with state ownership in Slovenia has significantly decreased over the 2005–2017 period. As shown in Table 1, in 2005 the state had its shares in 294 firms and in 30 of those each share was greater than 50%. The number of firms with state ownership has decreased to 80 in 2017, of which in 21 the state had a majority share. The decrease in state-owned firms is associated with the range of policy reforms, including the establishment of the Slovenian Sovereign Holding, aimed to consolidate management and sale of its assets, and continuation of privatisation efforts (see OECD, 2015). The process of privatisation is, nevertheless, not finished and remains an important (political) issue.

A closer overview of characteristics of the state-owned firms shows that several operate in financial and insurance sectors (16 in 2017; note that banks and insurance companies are not included in the panel regression analyses, presented in the continuation of the article), followed by manufacturing (15 in 2017) and construction (seven in 2017). Among firms with controlling state ownership most of them are involved in electricity and gas distribution and transmission and other public utilities. For example, in the electricity supply sector the state has a majority share in five firms that control the entire distribution network and important shares in two firms that control the infrastructure for electricity distribution and transmission. These regulated activities are characterised with relatively stable ROE, and consequently much lower risk than the market average. This is also associated with the fact that the regulation framework grants these firms the repayment of all eligible costs and rate of return. Moreover, in the 2010–2014 period the median ROE of these firms exceeded the median ROE of other Slovenian firms.

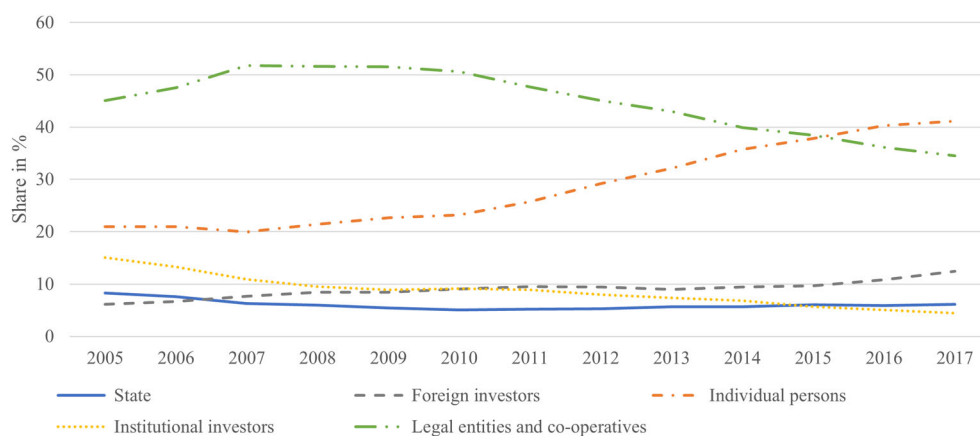
Figure 1 presents the ownership structure of all Slovenian joint stock companies in the 2005–2017 period by type of owner. Consistent with the above findings, the state ownership share has decreased – in 2005, the average state ownership was 8.3% and

**Table 1.** Number of joint stock companies with private, minority state or majority state ownership, 2005–2017.

Year	Privately-owned firms	Firms with minority state ownership	Firms with majority state ownership
2005	417	264	30
2006	439	226	29
2007	477	169	29
2008	481	153	29
2009	479	139	25
2010	483	128	23
2011	462	118	23
2012	436	106	23
2013	413	106	24
2014	410	95	25
2015	380	93	25
2016	352	76	21
2017	337	59	21

Note: Firms with minority state ownership include firms with state's ownership share ranging between 1% and 50%, whereas in firms with majority state ownership the state's share is higher than 50%.

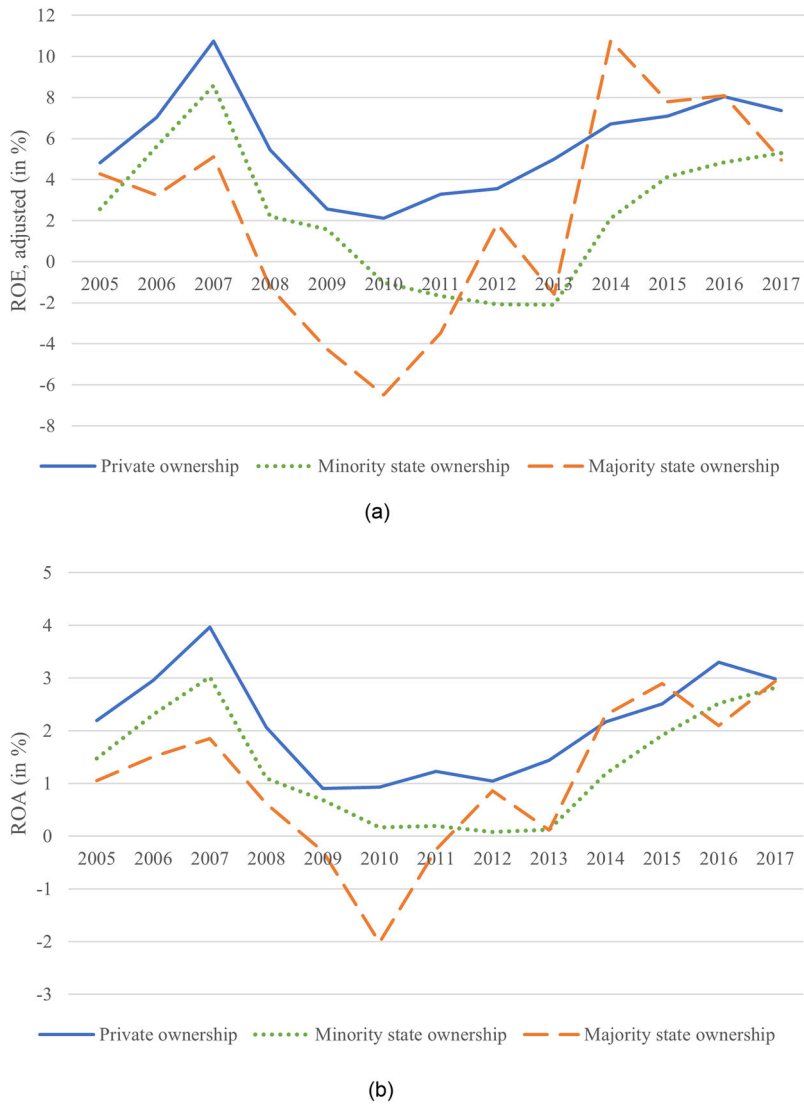
Source: own calculations based on the merged AJPES data and ownership structure data set.

**Figure 1.** Ownership structure by type of owners, 2005–2017, in %.

Source: Authors' calculations based on the merged AJPES data and ownership structure data set.

it declined to 6.1% in 2017. With regard to other types of owners, a similar declining trend can be observed for institutional investors. After 2010 we also observe a very sharp decline in ownership share of legal entities and co-operatives – in 2010 they presented 49.8% in total ownership structure and this share decreased to 34.1% in 2017 – which was taken over by individual investors.

Privately-owned firms tend to be, on average, more profitable than state-owned firms. Figure 2 presents the mean values for the selected firm performance indicators during the 2005–2017 period for privately-owned, minority state-owned and majority state-owned firms. By 2013 privately-owned firms outperformed minority and majority state owned firms in terms of different profitability measures (ROE, ROA, ROS). After that we can observe an important increase in profitability of majority state-owned firms, which might be attributed to a more consolidated state ownership portfolio, relative high rate of return of regulated activities relative to the risk and improved corporate governance. The indebtedness of all types of firms is, after it has

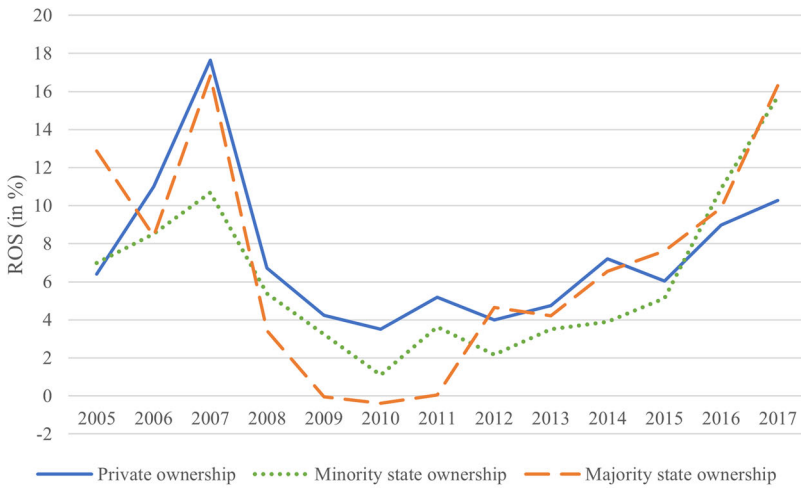


**Figure 2.** Mean values for firm performance indicators, 2005–2017.

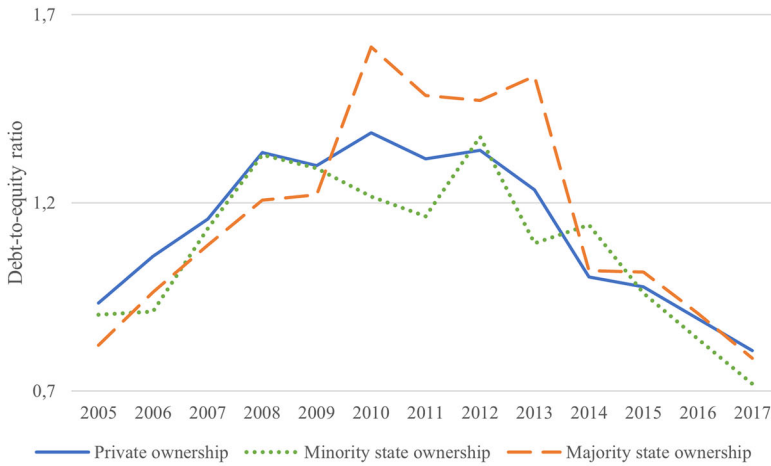
Source: Authors' calculations based on the merged AJPES data and ownership structure data set.

reached its peak in years of economic crisis, declining in last years with the debt-to-equity ratio being at the similar levels (see Figure 2[d]). The observed groups of firms significantly differ in the real value of total assets (see Figure 2[e]), which relates to considerable differences in size of the firms. As regards revenues (see Figure 2[f]), all three groups of firms predominantly record an increasing trend with exception of 2013 and 2016.

The concentration of ownership is slowly increasing over the 2005–2017 period (see Figure 3). Interestingly, in 2017, the ownership share of one owner was, on average, 64.2% and of top five owners 89%, which is 12 and 8.6 percentage points, respectively, higher than in 2005. The Herfindahl index of concentration has increased from 40% to 54.7% during the same period.



(c)



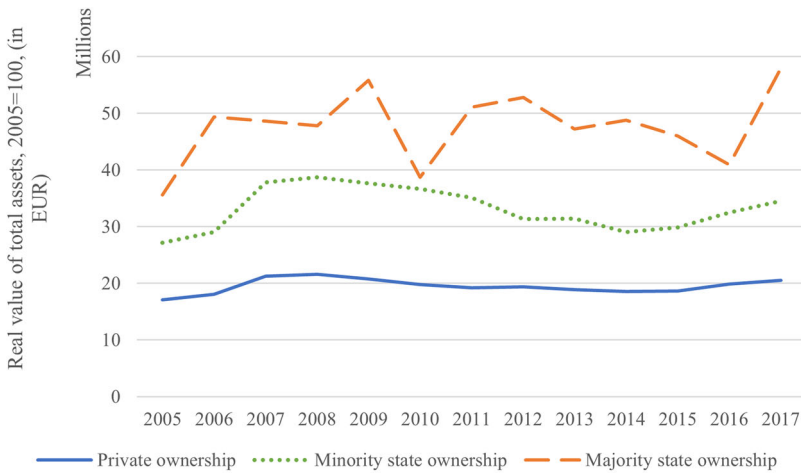
(d)

**Figure 2.** Continued.

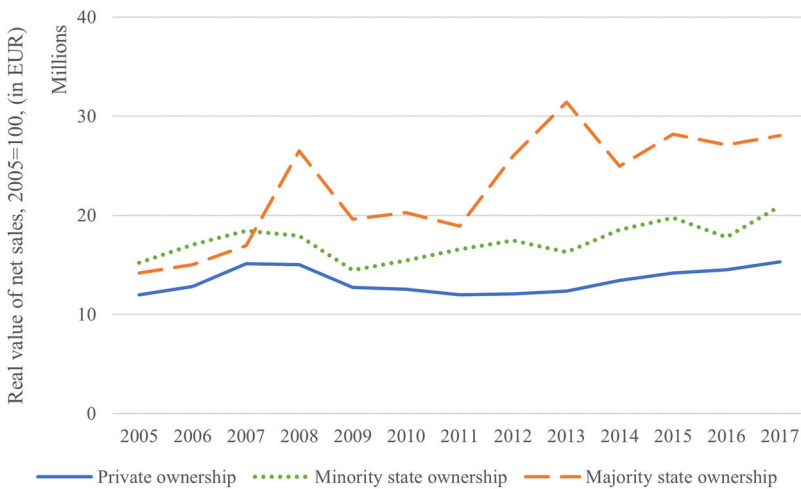
Figure 4 provides frequency distributions of the Herfindahl index of concentration and share of the first owner in total ownership structure. In half of the firms or more concentration measures are one or close to one, which is mostly associated with the private ownership of legal entities and individuals.

#### 4.2. Regression results

Panel regression results show that state-owned firms in Slovenia perform worse than their privately-owned counterparts. As shown in Table 2, firms with minority state ownership record, on average, 1.23 percentage points lower risk-adjusted ROE, 0.69 percentage points lower ROA and 3.02 percentage points lower ROS compared to



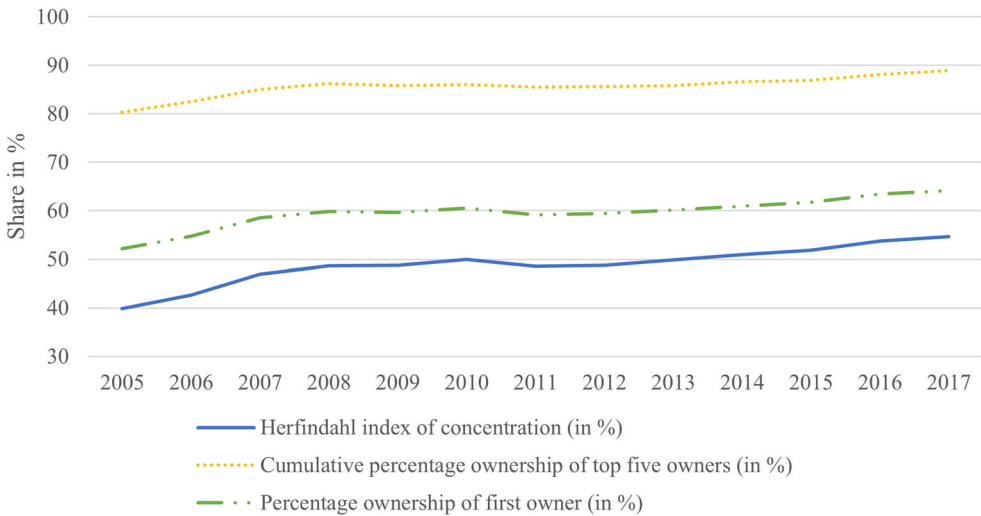
(e)



(f)

**Figure 2.** Continued.

privately-owned firms. The negative association is even stronger for firms with majority state ownership, which, on average, have 3.19 percentage points or 1.09 percentage points lower risk-adjusted ROE or ROA, respectively. These findings are in line with several empirical studies for Central and Eastern European and other countries (for an overview see, for example, Megginson, 2017 and Iwasaki et al., 2018). As regards other explanatory variables, financial leverage (debt-to-equity ratio) is negatively associated with profitability, although the effect is low and being statistically significant only for ROS and ROA. The value of total assets contributes to ROS, whereas the value of sales works in the opposite direction with regard to ROS but shows a



**Figure 3.** Ownership concentration, 2005–2017, in %.

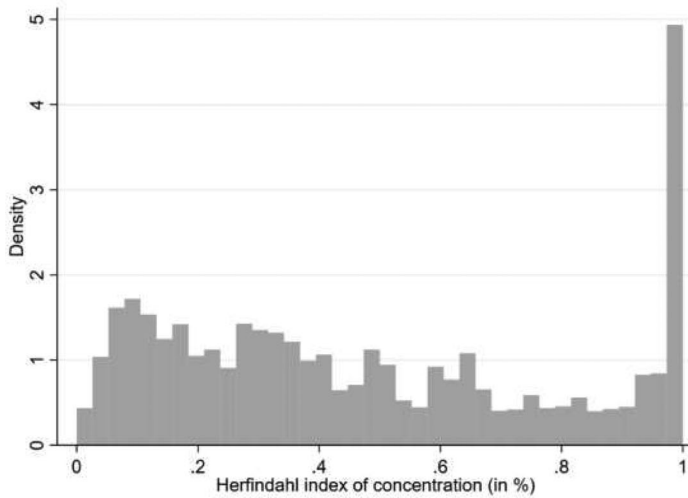
Source: Authors' calculations based on the merged AJPES data and ownership structure data set.

positive and statistically significant association with the risk-adjusted ROE and ROA. The negative association between ROS and net sales revenues might be associated with the size differences of firms, with bigger firms recording lower profits on the unit of sales.<sup>6</sup>

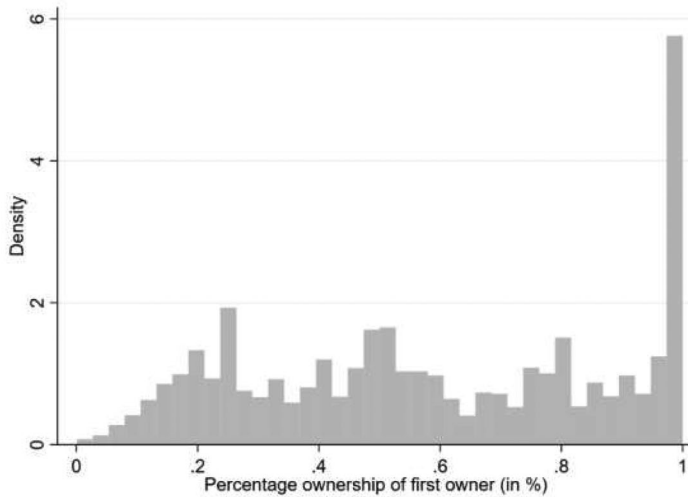
We further estimated the Equation 1 at the level of industries. As shown in Table 3, firms with (both minority and majority) state ownership shares record lower profitability than privately-owned firms, yet association is not statistically significant in all specifications (the latter might be a consequence of a small number of firms in certain industries). As above, the negative association between ownership type and firm performance is higher for firms where state has a majority ownership share – for example, in industry groups JKLMN and BDE, these firms, on average record 4.17 and 3.94 percentage points lower risk-adjusted ROE than privately-owned firms. Similar can be observed for ROA, although the estimates are statistically significant only for industries JKLMN. With regard to ROS, the association between state ownership and performance is statistically significant only in manufacturing, where state owned firms record up to 2.86 percentage points lower ROS compared to privately-owned firms in the same industry.

The above findings imply that state-ownership in Slovenia is associated with lower firm performance, with this relation being affected also by industry sector, confirming our first hypothesis. This points on the potential weaker corporate governance quality in Slovenia state-owned firms and therefore less efficient use of capital. Similar findings are reported also for other transition economies (see, for example, Iwasaki & Mizobata, 2018), which can be explained by greater information asymmetries, higher transaction costs, and potential political involvement in state-owned firms (Sun et al., 2002).

The findings on the relationship between ownership concentration and firm performance (see Equation 3) are less conclusive. In Table 4 we present panel regression results on the relationship between risk-adjusted ROE and different measures of



(a)



(b)

**Figure 4.** Distribution of ownership concentration measures, 2005–2017.

Source: Authors' calculations based on the merged AJPES data and ownership structure data set.

ownership concentration. In all three model specifications the relation between the profitability ratio and ownership concentration variable is statistically insignificant. The same results are observed also for specification with ROA and ROS as dependent variables.<sup>7</sup> The estimates therefore do not confirm the second hypothesis. An overview of explanatory variables shows that the value of total assets negatively relates with the profitability measures, showing that bigger firms, on average, record lower profitability, whereas net sales revenues positively contribute to the performance of firms. In terms of different types of ownership, we can observe that foreign,



**Table 2.** Results of the panel regression analyses on the relationship between state ownership and performance of firms.

	Risk-adjusted ROE (1)	ROA (2)	ROS (3)
Dummies for ownership type: (reference group: privately-owned firms)			
Minority state ownership	-1.2326*** (0.3747)	-0.6929*** (0.1975)	-3.0172*** (1.1274)
Majority state ownership	-3.1897*** (0.8099)	-1.0877** (0.5128)	1.7748 (4.3703)
Debt-to-equity ratio <sub>t-1</sub>	-0.0025 (0.0018)	-0.0031** (0.0015)	-0.0260** (0.0123)
(ln) Total assets <sub>t-1</sub>	-0.2044 (0.1283)	-0.1086 (0.0674)	2.6565*** (0.6102)
(ln) Net sales revenues <sub>t-1</sub>	0.4312*** (0.0823)	0.1806*** (0.0457)	-1.9427*** (0.5273)
Foreign ownership	1.2739* (0.6533)	0.2592 (0.4182)	-0.4057 (1.2454)
Constant	0.8632 (2.0404)	0.8722 (1.2103)	-9.1964* (5.5102)
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Adj. R <sup>2</sup>	0.11	0.09	0.16
No. of observations	5,811	5,863	5,581

Statistical significance:

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.

Note: Robust standard errors in parentheses.

Source: Authors' calculations based on the merged AJPEs data and ownership structure data set.

**Table 3.** Summary of panel regression analyses on the relationship between state ownership and performance of firms by industries.

Industry sector <sup>a</sup>	C	BDE	FGHI	JKLMN
<b>Risk-adjusted ROE</b>				
Dummies for ownership type: (reference group: privately-owned firms):				
Minority state ownership	-1.6174*** (0.5828)	-0.6156 (0.8872)	-0.8882 (0.6930)	-1.0203 (0.7662)
Majority state ownership	-1.7247 (1.9779)	-3.9427*** (1.0512)	-2.0261* (1.1466)	-4.1690** (1.8182)
<b>ROA</b>				
Dummies for ownership type: (reference group: privately-owned firms):				
Minority state ownership	-1.2841*** (0.3674)	0.0108 (0.4943)	-0.2536 (0.3622)	-0.7261** (0.3441)
Majority state ownership	-0.6589 (1.6098)	-0.6978 (0.6146)	0.3335 (0.5014)	-2.3723*** (0.8570)
<b>ROS</b>				
Dummies for ownership type: (reference group: privately-owned firms):				
Minority state ownership	-2.8644*** (0.7240)	-0.9146 (0.7837)	-1.5370 (1.3105)	-7.1780 (4.6086)
Majority state ownership	-2.6332* (1.4374)	0.2183 (1.2006)	-1.2224 (2.3431)	27.7989 (26.1464)

Statistical significance:

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.

Notes: <sup>a</sup>Industry sectors: B – Mining and quarrying, C – Manufacturing, D – Electricity, gas, steam and air conditioning supply, E – Water supply; sewerage; waste management and remediation activities. F – Construction, G – Wholesale and retail trade; repair of motor vehicles and motorcycles, H – Transporting and storage, I – Accommodation and food service activities, J – Information and communication, K – Financial and insurance activities, L – Real estate activities, M – Professional, scientific and technical activities, N – Administrative and support service activities.

We present only regression coefficients for the dummy variables minority and majority state ownership (the reference group includes privately-owned firms) (see Equation 1). Industry sectors, with exception of manufacturing, were grouped due to small sample size. Robust standard errors in parentheses. Detailed results are available at the authors.

Source: Authors' calculations based on the merged AJPEs data and ownership structure data set.

**Table 4.** Results of the panel regression analyses on the relationship between concentration measures and risk-adjusted ROE.

Dependent variable: risk adjusted ROE			
Herfindahl index $t_{-1}$	-0.0016 (0.0053)		
Ownership share of first owner $t_{-1}$		-0.0017 (0.0061)	
Cumulative ownership share of top five owners $t_{-1}$			-0.0008 (0.0111)
Debt-to-equity ratio $t_{-1}$	-0.0023 (0.0020)	-0.0023 (0.0020)	-0.0023 (0.0020)
(ln) Total assets $t_{-1}$	-0.3586** (0.1695)	-0.3583** (0.1696)	-0.3600** (0.1684)
(ln) Net sales revenues $t_{-1}$	0.3440*** (0.1058)	0.3436*** (0.1059)	0.3431*** (0.1059)
Foreign ownership share	1.6903* (0.9963)	1.6902* (0.9959)	1.6872* (0.9962)
State ownership share	-1.0525 (1.5032)	-1.0544 (1.5032)	-1.0719 (1.5038)
Institutional investors ownership share	0.4126 (0.9227)	0.4143 (0.9228)	0.4167 (0.9229)
Private firm ownership share	1.0873* (0.6036)	1.0889* (0.6018)	1.0862* (0.6018)
Individual ownership share	1.4785* (0.7589)	1.4786* (0.7587)	1.4787* (0.7567)
Constant	-29.3173*** (3.0878)	-29.2931*** (3.0959)	-29.2861*** (3.2310)
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Adj. R <sup>2</sup>	0.10	0.10	0.10
No. of observations	5,811	5,811	5,811

Statistical significance:

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

Note: Robust standard errors in parentheses.

Source: Authors' calculations based on the merged AJPEs data and ownership structure data set.

individual or private-firm ownerships positively associate with the profitability measures, which might be associated with higher efficiency of these type of owners. In contrast, firms with state ownership share record negative regression coefficient, yet it is not statistically significant.<sup>8</sup>

Analyses at the level of industries (see Table 5) give more promising results, although the regression results are statistically significant only in some of the studied industries. The association between different ownership concentration measures and performance of firms (risk-adjusted ROE and ROA) is statistically significant in FGHI and JKLMN industries, although showing opposite effects. Whereas for industries FGHI estimates point that concentrated ownership increases firm performance, in industries JKLMN concentrated ownership might weaken firm performance (with estimates for five top earners being statistically insignificant). These results might imply that the effect of ownership concentration on firm performance in Slovenia might differ between industries.

How to explain the absence of an association between ownership concentration measures and firm performance, which could be observed also in some other studies for transition economies (see, for example, Iwasaki & Mizobata, 2020)? One of the limitations of the ownership data at hand is that do not enable the identity of the first owner or first top five owners. Moreover, the estimates may suffer from omitted

**Table 5.** Summary of panel regression analysis on the relationship between measures of concentration and performance of firms by industries.

Industry sector	C	BDE	FGHI	JKLMN
		<b>Risk-adjusted ROE</b>		
<i>Ownership concentration measures:</i>				
Herfindahl index $t_{-1}$	0.0062 (0.0084)	-0.0087 (0.0123)	0.0196** (0.0087)	-0.0310** (0.0126)
Ownership share of first owner $t_{-1}$	0.0055 (0.0096)	-0.0081 (0.0143)	0.0236** (0.0095)	-0.0349** (0.0150)
Cumulative ownership share of top five owners $t_{-1}$	0.0293 (0.0207)	-0.0139 (0.0227)	0.0286* (0.0156)	-0.0390 (0.0241)
		<b>ROA</b>		
<i>Ownership concentration measures:</i>				
Herfindahl index $t_{-1}$	0.0053 (0.0055)	-0.0047 (0.0070)	0.0091* (0.0052)	-0.0134** (0.0060)
Ownership share of first owner $t_{-1}$	0.0064 (0.0063)	-0.0062 (0.0086)	0.0102* (0.0054)	-0.0137** (0.0068)
Cumulative ownership share of top five owners $t_{-1}$	0.0137 (0.0131)	-0.0043 (0.0150)	0.0128 (0.0092)	-0.0016 (0.0111)
		<b>ROS</b>		
<i>Ownership concentration measures:</i>				
Herfindahl index $t_{-1}$	-0.0078 (0.0392)	-0.0207 (0.0143)	0.0078 (0.0184)	-0.0263 (0.0531)
Ownership share of first owner $t_{-1}$	-0.0159 (0.0502)	-0.0243 (0.0170)	0.0073 (0.0198)	-0.0401 (0.0633)
Cumulative ownership share of top five owners $t_{-1}$	-0.0033 (0.0586)	-0.0095 (0.0339)	0.0649 (0.0459)	-0.0313 (0.1125)

Statistical significance:

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

Notes: We present only regression coefficients for ownership concentration measures (see Equation 3). Industry sectors, with exception of manufacturing, were grouped due to small sample size. Robust standard errors in parentheses. Detailed results are available at the authors.

Source: Authors' calculations based on the merged AJPES data and ownership structure data set.

variables, as we cannot account for managerial performance and firm-level shocks. Expanding the data with the information on identify of owners and increasing the sample size might add to the robustness of the results and provide further findings.

## 5. Conclusions

This study examines the relationship between ownership structure and performance of Slovenian joint stock companies over the 2005–2017 period. Two aspects of ownership structure in relation to firm performance are analysed: comparison of performance of state-owned and privately-owned firms and the ownership concentration.

In a nutshell, we find that state-owned firms in Slovenia are, on average, less profitable than privately-owned firms. This finding is in line with most of the empirical studies for Central and Eastern European countries that shared similar transition process as Slovenia. Furthermore, in overall, we do not observe statistically significant relationship between ownership concentration and firm performance. This might imply that we do not observe an agency problem in Slovenian firms and that there is no significant difference in firm performance if there is a high concentration of ownership in hands of one owner. However, a more detailed analysis on the level of industry sectors gives more promising results, pointing on positive and statistically significant relationship in the FGHI industries and on negative relationship in the JKLMN industries. The

empirical findings point on the importance of further improvement of corporate governance practices in Slovenian state-owned firms and development and implementation of long-term strategy of management of state-owned firms.

Despite extensive empirical evidence on the relationship between ownership structure and firm performance, our article still importantly adds to the literature. First, it adds to a rather scarce empirical evidence on the ownership structure-performance relation in Slovenia as well as in the Central and Eastern European region, where predominantly we observe studies for Czechia. Second, the empirical analysis uses rich administrative data on firm level for a rather long period of time, focusing mostly on post-transition period. Third, an important novelty of our empirical approach is the application of the risk-adjusted ROE (using the industry-specific risk measures), which shows the return relative to the amount of risk involved. This gives us a more realistic measure of return and enables a better comparison of return across industry sectors.

Further research should include also other (qualitative) managerial and governance features of state-owned and privately-owned firms, such as characteristics of shareholders, structure of the board and duration of the mandate of the board's members, presence of insider (managerial) ownership. It would be also interestingly to observe how a change from state to privately-owned firm affected further operation of firms. Future research could also expand the performance measures studied which should not be only quantitative but also qualitative and deal with potential endogeneity problems in studying the ownership concentration effects.

## Notes

1. An overview of empirical studies is available in Wang and Shailer (2018); Iwasaki, Mizobata and Muravjev (2018), Yu (2013).
2. Despite privatisation reforms, governments have kept equity shares in many state-owned firms. For a discussion on this issue see, for example, Lazzarini and Musacchio (2018).
3. The estimates of the Hausman test showed that fixed effects models (with one exception) are more appropriate for analysis.
4. The profitability measures were calculated as follows: ROE = net profit or net loss / average total equity; ROA = net profit or net loss / average total assets; ROS = net profit or net loss / net sales revenues.
5. The HI is calculated as  $HI = \sum_i^N s_i^2$ , where  $s_i$  is the ownership share of shareholder  $i$  in the firm and  $N$  is the number of shareholders. Dispersed ownership structures will have low values of HI, whereas highly concentrated ownership structures will have HI close to one.
6. To confirm the robustness of the results, we performed additional panel regression analyses using first differences and additional lags in dependent variables. The results were in line with the results presented in Tables 2 and 3.
7. The results of the panel regression models, in which dependent variables are ROA and ROS, are available from the authors.
8. The regression coefficients of ownership concentration measures remained statistically insignificant also when applying panel regression analysis with first differences, confirming the robustness of results.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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