THE EFFECT OF MANAGEMENT PRACTICE ON PERFORMANCE: THE MODERATING ROLE OF OWNERSHIP

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Abstract

While scholars agree that ownership matters for firm performance in general, the detailed effects are still debated. We argue that ownership impacts firm performance not only directly but also through implementing different levels of management practice that impact firm performance too. We show that interactions between ownership and management practice have positive and negative effects on firm performance depending on how different owners can exploit the benefits of management practices or not. In that sense, ownership moderates the effect of management practices on performance.

1. DATA AND METHOD

1.1. Source of data

We use secondary data published by the World Management Survey (n.d.). This has several benefits: 1) due to their sampling procedure the data are highly reliable and valid, also exemplified through several highly-ranked publications (Bloom, Genakos, Sadun, & Van Reenen, 2012; Bloom, Lemos, Sadun, Scur, & Van Reenen, 2014; Bloom & Van Reenen, 2010); 2) the data consist of a large set of firms in

18 countries on various continents and over up to seven years. Creating a dataset comparable in size and depth would not only be very time-consuming but is almost non-researchable.

1.2. Data structure

The original information was collected by applying an interview-based survey method, explained in detail in Bloom and Van Reenen (2007). For evaluating management practices, a blind technique was applied, which means that telephone interviews were conducted with senior managers where information about management practices was obtained without informing the interviewee about the evaluation procedure. To ensure the neutrality of the evaluation, a neutral listener additionally evaluated the manager's responses. Responses were coded on a scale with 1 as "worst practice" and up to 5 as "best practice". The management practices are structured into five groups: 1) operations management, 2) performance monitoring, 3) target setting, 4) leadership management and 5) talent management (World Management Survey, n.d.).

Among other information, the dataset includes data on the company's industry (SIC code), country of residence, the number of employees, annual turnover and return on capital employed (*ROCE*). Furthermore, the intensity of competition in the business environment was asked for, as well as documented whenever an enterprise of the sample went bankrupt during the observation period. Regarding the interviewed manager, his nationality and academic degree are collected.

In total, the data set contains observations of 2,927 enterprises over up to seven years between 2002 and 2010. In total 7,094 firm-years are available meaning that each enterprise was observed for an average of 2.42 years. The observed entities have ownership structures of dispersed shareholders, family ownership with or without external CEO, private equity, and government entities.

We utilize *ROCE* as a dependent variable. *ROCE* is calculated from earnings before interest and tax (EBIT) divided by capital employed. As a performance indicator, *ROCE* measures how profitable a company works with the capital it has invested. The *ROCE* ratio is particularly suitable since it is related to another parameter and thus increases comparability and is free of tax and interest effects (Bausch, Buske, & Hagemaier, 2011).

As explanatory variables, we adopt ownership structure and management score. To ensure adequate processing, the original types of ownership, presented in the second column in Table 1, are aggregated according to the first column. The new variable "*ownership*" is then coded by type as: 1) dispersed, 2) owner, 3) owner external CEO, 4) private equity, 5) government, and 0) others or NA.

Table 1. Coding the data

Coding	Ownership	No. of firm-years
DISPERSED	Dispersed shareholders	2,347
OWNER_EXTCEO	Family owned, external CEO	265
OWNER	Family owned, family CEO	1,090
OWNER	Founder	749
GOV	Government	225
OWNER	Managers	267
OTHER	Other	534
PE	Private equity	285
OWNER	Private individuals	1,061
OTHER	(Empty)	271
Overall		7,094
Results of re-coding	Firm-years	
DISPERSED	2,347	
OWNER	3,167	
OWNER_EXTCEO	265	
PE	285	
GOV	225	
OTHER	805	
Overall	7,094	

The explanatory variable "*management score*" represents the result of an explorative factor analysis. The factor analysis aims to aggregate a large number of correlating variables to a small set of latent factors, where each factor explains as much of the variance of the original variable as possible (Klopp, 2010).

1.3. Panel data analysis

While the original authors analyzed the data cross-sectionally we decided to exploit the panel structure of the dataset. This allows us to analyze effects over time and firm-specific effects on firm performance. The data structure is schematically depicted in Figure 1.

Figure 1. Schematic data structure
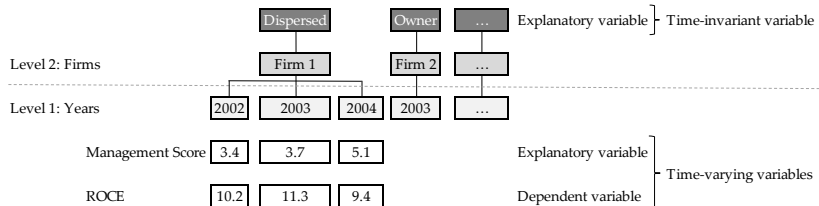
There is a two-level hierarchical data structure with observations (years) at level 1 clustered into level 2 (firms). The dataset has a panel structure where individual firms are observed over a certain period (years) and a cross-sectional structure depicting variation between firms. This complex data structure has to be considered in the model. The application of a standard linear regression model would not be sufficient as it assumes that there is an independent and identical distribution of the residuals. In other words: the uniqueness of individuals within a group would not be considered. This assumption would be flawed with regard to the temporal hierarchical structure of the data, as these usually show a pronounced dependency over time (Bell & Jones, 2015).

Therefore, a panel model seems more appropriate. Specifically, the data set forms an unbalanced panel, i.e., a partial incompleteness of the values with respect to years and firms. In addition, a panel model is highly efficient in investigating a causal relationship including the time component in the sense of before-and-after observations while controlling for unobserved heterogeneity of individuals (Jaba, Robu, & Balan, 2017). The effects between or within individuals or groups are referred to as "within" or "between" variations. In this case, "within variation" is related to variability of management score over time per firm. "Between variation" relates to variation between firms, i.e., related to ownership.

If the influence of an explanatory variable is considered identical for each of the N cross-sectional units, this is called a fixed effects model (FE). In this case, the coefficient of the explanatory variable is formulated as non-stochastic and identical for all cross-sectional units.

If there are random, unsystematic differences between the cross-sectional units in the influence of an explanatory variable, it is called a random effects model (RE). While the FE modeling is used more frequently in economics and political science and is referred to as the "gold standard", the RE model increases continually in popularity in various fields of science (Bell & Jones, 2015).

We employ several regressions to analyze the data, where $i = 1, \ldots, N$ individuals (cross-sectional units, i.e., firms) are observed over $t = 1, \ldots, T$ times (time-series, i.e., years).

Regression 1: OLS with pooled data

$$ROCE_{it} = \beta_0 + \beta_1 Score_{it} + \beta_2 OWNER_i + \beta_3 OWNER_{EXTCEO_i} + \beta_4 PE_i + \beta_5 GOV_i + \varepsilon_i \tag{1}$$

Regression 2: Fixed effects model

$$ROCE_{it} = \beta_1 Score_{it} + \alpha_i + u_{it} \tag{2}$$

where, β_1 signifies the coefficients the coefficient of the explanatory variable $Score_{it}$; α_i signifies the unknown entity-specific and time-invariant error term; u_{it} signifies the error term which assumes to be uncorrelated with X_{it} (here *Score*). The advantage of FE modelling is that it controls for all time-invariant entity-variations.

The difference is the estimation of firm-specific intercepts β_i and given that ownership types are constant over time (fixed) and thus, are excluded from the regression.

Regression 3: Random-effects model

$$ROCE_{it} = \beta_0 + \beta_1 Score_{1it} + \beta_2 OWNER_{2i} + \beta_3 OWNER\_EXTCEO_{3i} + \beta_4 PE_{4i} + \beta_5 GOV_{5i} + \alpha_i + u_{it} \tag{3}$$

where, β_0 signifies the y-intercept; $\beta_1 \dots \beta_5$ represents the coefficients for each explanatory variable; α_i signifies unknown entity-specific time-invariant error term; u_{it} signifies the error term which varies over the entities and time; both are assumed to be uncorrelated with X_{it}. The advantage of RE modelling is that it estimates the effects of time-invariant variables.

2. DESCRIPTIVE RESULTS

Table 2 presents descriptive statistics for *OWNERSHIP* and *ROCE*.

Table 2. Descriptive statistics for *OWNERSHIP* and *ROCE*

Type of ownership	Mean ROCE	Firm-years	in %		ROCE	
No entry or "other"	15.83	790	11%		Min	-25.00
1 = DISPERSED	17.57	2,325	33%		1st quartile	5.35
2 = OWNER	14.14	3,199	45%		Median	12.32
3 = OWNER_EXTCEO	13.89	278	4%		Mean	15.50
4 = PE	17.66	289	4%		3rd quartile	23.26
5 = GOV	11.38	213	3%		Max	50.00
Overall		7,094	100%		Std. dev.	15.50

The average *ROCE* is 15.50% with a standard deviation of 15.50%. The spread of values can be explained by the different industries that the data set combines. However, the majority of values ranges between 0 and 20%. The sharp dividing line between frequencies below and above zero is striking, but the reasons for that are unknown to the authors. There is a difference of 2.68% between the mean (15.50%) and the median (12.32%), which can be explained by outliers, especially in the upper range. The *ROCE*'s minimum and maximum were artificially set during the original survey as "less than -25%" and "greater than 50%", resulting in a minimum of -25%, maximum of 50% and range of 75%. When comparing the average *ROCE* by taking the ownership

structure into account, dispersed and private equity firms outperform with approximately 17.5% *ROCE*, indicating higher profitability than comparison groups. Owner-managed firms and family businesses with an external CEO show only slight differences in profitability, while state-owned enterprises perform at the lowest profitability level. These descriptive results are similar to the results of the original authors (Bloom et al., 2012).

3. CONCLUSION

The question of ownership and firm performance is part of an ongoing debate of understanding the impact of different types of ownership on various outcomes. It seems plausible that certain factors interact with each other and we postulate that this is the case with ownership type and management practice score.

In the present study, we re-analyzed archival data in order to test the postulated relationships.

While the ownership type of dispersed shareholders (*DISPERSED*) has on average the most favorable effect on firm performance, this effect can be surpassed for the owner type of the individual or family businesses with external management (*OWNER_EXTCEO*) if management is carried out above average. If the management quality is inferior, this effect turns into the opposite, and in the worst-case results in negative firm performance. On the other hand, private equity companies (*PE*) and state-owned enterprises (*GOV*) cannot reap the effect of good management. On the contrary, as the quality of management increases, firm performance successively decreases.

Further research should examine the theoretical framework of ownership type and its effect on the actions and decisions of managers. Questions arising from this are, why in some cases private equity companies and state-run companies cannot use the effect of good management for themselves. Furthermore, the country- and culture-specific influence in this context would also be interesting to examine.

Several limitations are worth noting: first, we analyzed secondary data. This circumstance limits more specific interpretation about the comparison group (*OTHER)*, as the authors are not familiar with the exact composition of this group. Second, the data depends on the statements of interviewed managers. Therefore, the data could be biased under the assumption that managers who are under regular observation in the form of interviews will pay more attention to the quality of their management practice and improve it accordingly, without the influence of the ownership structure. It should also be emphasized that there are countless factors that affect the success and profitability of an enterprise. In this study, only the interaction effects of a few of them are examined.

Nevertheless, we argue that this study sheds light on the role ownership plays in moderating effects of management practices on performance.

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