DOES SIZE INFLUENCE FIRM PERFORMANCE? EVIDENCE FROM ROMANIAN LISTED COMPANIES

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Abstract: *The paper investigates if size has any influence on firm performance for all non-financial companies listed at Bucharest Stock Exchange over 12 years period. The proxies for firm size were total assets, sales and number of employees. Control variables were tangibles, leverage, labour intensity, sales growth and company value added. Using a fixed effects panel data estimation model in order to account for individual firm heterogeneity, the paper finds a negative effect of firm size on corporate performance, when size is expressed in total assets and sales and no effect at all when number of employees is used as a proxy for size. Also, tangibles, leverage and labour intensity display a negative sign, the only positive determinants being sales growth and company value added. The findings suggest that the asset mix Romanian listed is not performance driving oriented, but is under the influence of the large amount of real-estate assets which are not directly involved in producing goods (as oppose to machine and equipments) and therefore do not directly generate profits.*

Keywords: size, firm performance, determinants

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1. Introduction

Size as determinant of firm performance has been an ongoing debate in the field of business and industrial economics. Larger firms are subjects to more scrutiny from investors, researchers and tax authorities alike and consequently empirical investigations related to their performance is a subject well covered in related literature. Moreover, larger companies are public companies in most of the cases and this adds up to the extended coverage of performance investigation. However, for a transition economy, the related literature is not so vast, mainly because of the short history of market based business conduct. In this setting, the paper investigates size as determinant of firm performance, taking into account the peculiarities of a transition economy.

The most notable feature of larger companies that affect their performance resides in economies of scale. According to conventional wisdom, economies of scale stems from the cost advantage that arises with increased output, therefore larger firms that are able to capitalize on economies of scale tend to be more profitable. Additionally, larger firms may benefit from their market power and lower interest

rates. Access to capital markets, especially for listed companies contributes further to increased profitability through lower cost of capital. Moreover, larger firms tend to impose entry barriers to competitors and start-ups, therefore conserving their privileges and market positions, which also acts in favour of increased profitability. However, for a former communist country, these rationales may not apply for several reasons. First, for such countries, larger companies are former communist state owned enterprises which are not well suited to play according to the market economy rules. This kind of companies may be large in terms of total assets, but their size has little to do with economies of scale, but with huge industrial platforms or acres of land which do not generate profits. Second, former or actual state owned companies do not have a sound market based corporate, but are still tributary to political connections and labour unions, which may negatively affects performance. Third, due to the short history of stock exchange in Romania, public companies have still to learn from the benefits of being listed, therefore the argument of lower capital cost is not so strong, especially if higher interest rates common for transition countries are taken into account.

In this setting, looking upon size as determinant of firm performance brings new insights, which are valid for a former communist country and hence may contradict the results of previous research done mostly on developed countries. This is the main contribution of this research.

The rest of the paper is organized as follows: section 2 presents a short literature review, section 3 develops the hypotheses, section 4 describes the data, section 5 presents the results, while section 6 concludes.

1. Literature review

The literature on firm size and its effects on profitability is vast and originated in the US in the '70s. Hall and Weiss (1967), Scherer (1973) documented a positive relationship between firm size and firm profitability, mainly because of economies of scale. Sheperd (1972) found a negative relationship which he attributed to X-inefficiency. i.e. failure to keep costs under control when competition is not strong. Amato and Wilder (1985) found a small and negative effect. More recently, Lee (2009) found a positive effect for US public companies and a nonlinear relation which suggest the profitability decreases once the firm size grows too much.

With respect to other countries of the world, the research is not so vast and generally investigates firm size along with other firm-specific characteristics as determinants of profitability. The results are mixed since size is found to have a positive effect on firm performance (Yazdanfar, 2013; Asimakopoulos et al, 2009), Maçãs Nunes et al (2009), Lee (2009), a negative effect (Goddard et al, 2005) or no effect at all (Glancey, 1998; Crespo and Clark, 2012).

With regard to dependent variable, in most of the cases firm performance is measured as a financial ratio, namely return on assets (ROA) such as in Hansen and Wernerfeld (1989), Glancey (1998), Goddard et al (2005), Zeli and Mariani (2009), Asimakopoulos et al (2009), Maçãs Nunes et al (2009), Crespo and Clark (2012), Yazdanfar (2013). Alternative measures are share value (Makhija, 2003), profit-cost margin (McDonald, 1999) or net income plus advertising expenses to

assets ratio (Lee, 2009).

With regard to Romania, the literature on firm performance is rather small. Pantea et al (2014) found a positive effect for firm size, while Mihai & Mihai (2012) found no effect at all for Romanian mining and quarrying companies. Gavrea and Stegerean (2012) focusing on a corporate governance approach found that firm size measured as log of sales has a positive impact on firm performance.

The present paper goes beyond the approaches undertaken so far, by extending both the companies' coverage and the determinants investigated, whitin the framework of resource based view of the firm.

3. Research design and hypotheses

The dependent variable
The firm performance is measured using return on assets (ROA) computed as net income to total assets ratio.

The independent variables
The independent variable of interest is firm size. In most of the previous research firm size is proxied by logarithm of total assets. The expected sign is ambiguous since there two opposing views concerning the effect of firm size on profitability. According to the first one, larger firms are able to make use of economies of scale, have better access to capital markets (Titman and Wessels, 1988) and poses a greater ability to put barriers to new comers (Maçãs Nunes et al, 2009). The second view claims that due to larger size, companies displays large diversification, less competition which triggers the so-called X-inneficiency (Sheperd, 1972). Moreover, for the case of former communist countries, large companies stand in many cases for former or actual state owned enterprises that do not perform efficiently due to political connections or to strong labour unions.

The firm-specific control variables are: leverage, tangibles, growth and labour intensity. The decision to include labour intensity is justified by large accepted opinion in Romanian that labour costs negatively affects firm performance mainly because of high social security contributions borne by employers. Another reason consists in the hypothesised soft labour policies of Romanian listed companies.

With respect to leverage, the expected sign is negative given higher interest rates for company loans, while for tangibles the expected sign is also negative mainly because of the fact that most of the Romanian listed companies are former socialist enterprises with high levels of fixed assets and poor performance. In many cases, tangibles consist mainly in buildings and plots of land, which were subject to frequent revaluations without any consequences for profitability, since these tangibles are not directly involved in producing goods for sale (as oppose to machines and equipments). Labour intensity (personnel expenses to turnover ratio) is expected to have a negative impact, mainly due to the fact that Romanian companies generally avoid making radical adjustments to their personnel policy. This often means overstaffing, which together with relative high social contributions rates borne by employers negatively affects firm performance. Company growth (percentage sales growth) was also investigated as a determinant of firm performance. Growth is seen in general as having a positive impact, mainly due to the additional income that company generates. Therefore, I expect a positive sign. Finally, value added is expected to have a positive sign since the value that a

company adds to its inputs is what drives the performance up and down.

A synthesis of independent variables and their expected sign is provided in Table 1.

Table 1. Independent variables and their expected sign

Firm size (SIZE)	Logarithm of: total assets/sales/employees	+/-
Leverage (LEV)	Total debt to total assets ratio	-
Tangibles (TANG)	Tangible assets to total assets ratio	-
Labour intensity (LAB)	Personnel expenses to turnover ratio	-
Company growth (GROWTH)	Sales growth in percentage	+
Value added (VA)	Value added to turnover ratio	+

In this framework, the multivariate model is:

$ROA_{it} = \alpha_0 + \beta_1 * SIZE_{it} + \beta_2 * LEV_{it} + \beta_3 * TANG_{it} + \beta_4 * LAB_{it} + \beta_5 * GROWTH_{it} + \beta_6 * VA_{it} + \varepsilon_{it}$, where i denoted the firm and t the year,

All variables are computed using relevant data collected from companies financial reports. Usual checking did not reveal any concerns with regard to multicollinearity between explanatory variables.

4. Data and methodology

The dataset used in this paper contains detailed information from balance sheet and income statement. It follows closely the BACH data scheme (see Appendix) and covers all non-financial Bucharest Stock Exchange listed companies for twelve years period (2000 – 2011), thus having 668 complete company-years observations. I did not cover years following 2011, because the implementation of International Financial Reporting Standards (IFRS) from 2012 makes company reports data less comparable. Nevertheless, the time spanning and company coverage is large enough for valuable insights.

I used unconsolidated data in order to better capture the specific company relevant data and to provide a longer period of comparable data. The sources of data were financial reports of listed companies available on the Internet sites, both of the companies and of the Bucharest Stock Exchange and National Security Commission. Since I use percentage sales growth from previous years, 60 firm-years go away, thus the final sample having 608 firm-years observations.

Descriptive statistics for dependent and independent variables are reported in Table 2.

Table 2. Descriptive statistics for dependent and independent variables

stats	N	mean	sd	min	p50	max
ROA	608	2.44	11.06	-116.65	2.66	82.10
SIZE (Assets)	608	731	2,990	8.03	96.70	33,800
SIZE (Sales)	608	511	1,790	4.07	70.40	16,800
SIZE (Employees)	608	1,851.86	6,193.6	14	724.50	78,170

TANG	608	50.80	20.19	0	50.02	96.75
LEV	608	39.39	25.61	0.51	36.23	158.08
GROWTH	608	0.16	0.41	-0.91	0.12	3.51
LAB	608	21.04	12.65	0.11	19.93	76.91
VA	608	31.02	26.19	-262.17	31.88	177.64

Assets and sales are in millions RON.

The mean for ROA is 2.44, while the median is rather close at 2.66. The majority of firms display positive ROA which suggest that listed companies are in general profitable. In terms of size, assets are much more than sales. The mean for assets (731) is 43% higher than the mean for sales (511), while the minimum and the maximum value are almost double (8.03 vs. 4.07 and 33,800 vs. 16,800 respectively). The average value of employees is 1851.86, while the median is 724.50. The tangibles represent in average half of total assets, and again the mean and the median are very close (50.8 and 50.02 respectively). The zero value for tangibles is for one IT seller company at the beginning of the period. Average leverage is around 40 percent, slightly lower than the average corporate indebtedness for Euro area non-financial companies of 43% in the first quarter of 2011(ECB, 2012). Annual average percentage sales growth is 0.16 which is quite a low figure. The mean for labour intensity is approximately 21%, while the median is around 20%. Corporate value added also displays similar values for the mean and median (around 31%).

5. Results
I used panel data fixed effect model in order to account for company heterogeneity through firm-specific intercepts that capture the effects of unobserved or unmeasurable firm characteristics that are relatively constant over time but vary over firms. By including firm-specific intercepts, I was able to control variables such ownership structure, managers team, earnings management, corporate culture, which are likely to be correlated with explanatory variables. An advantage of the fixed effects model is that is less prone to endogeneity and omitted variable bias. A shortcoming of the fixed effect model is that the results, being conditional on the sample, cannot be extrapolated. But, since data covers all non-financial companies traded at Bucharest Stock Exchange, this remains only a marginal problem (when inferring the results beyond public companies).
Table 4 summarizes the results of fixed effects regression: (1) depicts the results for size expressed as logarithm of total assets, (2) presents the results for size computed as logarithm of sales, while (3) displays the results for number of employees (in logs) as proxy for size.

Table 2. Regression results

	M1	M2	M3
SIZE	-2.307***	-1.852*	1.190
	(0.746)	(1.016)	(1.041)
TANG	-0.125**	-0.145***	-0.152***
	(0.0475)	(0.0415)	(0.0393)
LEV	-0.178***	-0.172***	-0.174***

	(0.0283)	(0.0291)	(0.0283)
GROWTH	1.717**	2.500***	2.347***
	(0.693)	(0.886)	(0.871)
LAB	-0.473***	-0.500***	-0.445***
	(0.0712)	(0.0788)	(0.0743)
VA	0.263***	0.271***	0.260***
	(0.0343)	(0.0308)	(0.0333)
Constant	60.35***	52.28**	10.17
	(13.44)	(20.43)	(7.819)
Observations	608	608	608
R^2	0.617	0.606	0.602

Clustered robust standard errors at firm level in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
(1) Size as logarithm of total assets
(2) Size as logarithm of sales
(3) Size as logarithm of number of employees
ROA = return on assets (net income to total assets ratio)
TANG = capital intensity (tangible assets to total assets ratio)
LEV = leverage (total debt to total assets ratio)
SIZE = company size (natural logarithm of total assets)
GROWTH = sales growth (annual sales growth in percentage)
LAB = labour intensity (personnel expenses to turnover ratio)
VA = value added (corporate value added to turnover ratio)

Size negatively affects firm performance, when it is expressed in log of assets and respectively log of sales, although the effect is more statistical significant for the former. There is no effect when size is proxied by number of employees. This finding acts in favour of the stated hypothesis that Romanian listed companies posses a significant amount of non-productive assets such as lands and buildings which, moreover, are subject to frequent revaluations. Although the sign is preserved when size is expressed as log of sales, the statistical significance is lower.

Tangibles negatively affect firm performance. One percentage point increase in tangibles triggers 0.121 pp reduction in ROA. This suggests that Romanian companies do not make use of their tangibles in a profitable manner and support the finding on size proxied by log of assets. Leverage displays a significant negative effect on firm performance. One p.p. increase in debt ratio determines 0.08 decrease in profitability. This suggests that servicing the debt reduces the ability of companies to invest in profitable, especially when taken into account high company interest loan. Labour intensity also plays a negative role with regard to firm profitability. The coefficient is negative and statistical significant in all model specifications. This suggests that Romanian companies were not able to efficiently use their labour force, mainly because of strong labour unions. The only control variables with a positive effect on profitability are growth and company value added.

6. Conclusions

The paper investigates the relationship between size and firm performance Romanian non-financial companies listed at Bucharest Stock Exchange over twelve years period (2000 – 2011). While the main focus was on size, the control variables used also reveals important findings.

The results show that size is negatively related to firm performance, especially when it is expressed as log of total assets, the common proxy for size used in related literature. This finding suggest that Romanian listed companies are not able to capitalize on economies of scale which are typically related to size or to take advantage from entry barriers to competitors, which are also related to large capital stocks. This point out to the fact that, in most cases, size is determined by the large amount of real-estate assets which are not directly involved in producing goods (as oppose to machine and equipments) and therefore do not directly generate profits. When size is expressed as log of sales, the results are not so statistically significant ($p<0.1$), although the sign is retained. There is no effect, when size is proxied as log of employees.

The results on size as log of assets are further supported by the results on tangibility, which account for more than half of total assets. The asset mix of Romanian listed companies is not value performance oriented. Leverage negatively affects firm performance mainly due to high interest rates common for a transition country. Labour intensity also displays a negative effect, mainly because of the strong labour unions and of the political connections. As expected, sales growth had a positive impact on firm performance, as well as value added that companies created. Romanian listed companies are able to create value in spite of their ineffective personnel policy and asset mix.

The results are valid only for listed companies and cannot be extrapolated to private held companies, since they have different investment and financing choices and certainly, different reporting requirements.

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