

# Determinants of Firm Performance: A Comparison of European Countries

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## Abstract

We try to analyze the factors that influence firm performance. In this context, we conducted an international comparison of four European countries. Using, alternatively, as a performance measure, return on assets ratio, return on equity ratio, returns on sales ratio and earnings per share, the empirical results show differences in determinants of firm performance between countries related to the age, cash ratio and size variables.

**Keywords:** performance, size, return on assets, return on equity, return on sales

## 1. Introduction

Many empirical works have attempted to study the determinants of firm performance. Indeed, the empirical results in this context are various. Morck et al. (1988) and McConnell and Servaes (1990) study the nonlinear impact of managerial ownership on firm performance. The authors also highlight the effects of activity sectors in this relationship. The results of the work of Marius, Delia, Cecilia (2014) support the significant effect of factors describing the economy of the country on firm performance. In the same perspective of the research mentioned above, our paper tries to identify the main factors explaining firm performance in Switzerland, Sweden and Italy. We take as a measure of performance the following ratios; returns on assets "ROA", return on sales, "ROS" return on equity "ROE" and earnings per share "EPS". Our work is organized as follows. Section 2 reviews the literature on the determinants of firm performance. Our empirical validation is made in section 3. Section 4 is devoted to presentation of results. In section 5, we test the effects of sectors in explaining determinants of firm performance. In last section, we review our results.

## 2. The Literature Review

Similar to the work of Gombola and Ketz (1983), Ho and Wu (2006) and Cinca Molinero and Larraz (2005), Dursun, Cemil and Uyar (2013) examine the determinants of firm performance measured by return on assets (ROA) and return on equity (ROE). Using the decision tree analysis methodology, the authors reached statistically significant effects of ratios measuring profitability, debt and growth opportunities.

Alfredo Koltar, Campopiano and Cassia (2013) studied the factors explaining firm performance by measuring the role of ownership structure, firm size, firm age, and tangible assets.

Similar to the work of Hawawini et al. (2003), Roquebert et al. (1996), Rumelt (1991), Jeremy and Peter (2008) examined the determinants of performance variation. The authors emphasize the influence of tangibility and intangibility of assets (Wernerfelt, 1984), as well as other variables related to activity sectors (Teece et al., 1997). Using a sample of 285 Australian firms divided into two groups; industrial firms and service firms, the authors find a statistically significant effect of resources on firm performance for the service sector, while the results show that intangible assets positively and significantly affect firm's performance in the service sector.

In line with the work of Branscomb (2001), Halkos (2007) and Cefis (2012), Orkun Bozkurt, Kalkan and Ayci (2013) identified the effect of technology, size and firm age on innovation performance of the firm. Using a sample of 30 Turkish firms operating in different activity sectors. The results conclude a positive and statistically significant effect of information technology on firm performance.

Similar to the work of Ngo and O'Cass (2013), Han, Kim and Srivastava (1998), Weerawardena, O'Cass and Julian (2006), Santos, Basso and Kayo Kimura (2014) examine the influence of firm employees and research and

development spending on firm performance. Firm profitability is measured by three ratios: Return On Assets, Return On Sales and Return On Equity ratios. The authors use a sample of 1,608 firms for 2000, 231 firms for 2003 and 277 for 2005 on the Brazilian market taken from PINTEC and Seresa and Gazeta Mercantil databases. Santos Basso, and Kayo Kimura (2014) found a positive and statistically significant effect of firm employees and research and development expenditure on assets profitability.

### 3. The Empirical Validation

#### 3.1 Sample Selection

Our sample contains of 103 firms from Italy, 103 firms from Switzerland and 103 firms from Sweden for a period of nine years, from 2003 to 2011. Our sample is divided into activity sectors as follow:

Table 1. Activity sectors of divided samples

	Manufacturing	Construction and Other Services	Professionals activities	Total
Italy	28	55	20	103 firms
Switzerland	19	71	13	103 firms
Sweden	21	44	38	103 firms

#### 3.2 Measurement of Variables

##### The Dependant variables:

To measure firm performance, we use alternatively the following four ratios.

**Return On Assets (ROA):** Similar to the work of Minichilli et al. (2010) and Alfredo, Josip, Giovanna and Cassia (2013), we measure firm performance by return on assets ratio (Net income over total assets).

**Return On Equity (ROE):** Like Dedrick, Gurbaxani and Kraemer (2003), Bharadwaj (2000), we measure firm performance by the net income over equity ratio.

**Return On Sales (ROS):** Similar to the work of Donghui, Fariborz, Pascal and Tan (2007), we adopt as a performance measure the net income to total sales ratio.

**Earnings Per Share (EPS):** Similar to the work of Chan, Chin and Fang (2006), we measure firm performance by Earnings Per Share "EPS".

##### The Independent variables:

**Growth Opportunities:** Growth opportunities are measured by the Market-To-Book ratio. Baber et al. (1996) and Gul (1999) suggest a negative relationship between growth opportunities and firm performance. An increase in growth opportunities may lead to a retrenchment in managerial behaviour (Gaver & Gaver, 1993; Skinner, 1993; Smith & Watts, 1992). However, the existence of growth opportunities can lead to profitable investment projects, which will positively affect firm performance. **Hypothesis 1:** there is a positive relationship between growth opportunities and firm performance.

**Firm Size:** We measure firm size by total assets logarithm. A large firm size can lead to significant growth opportunities (Agrawal & Knoeber, 1996; Klapper & Love, 2004). This latter will positively affect firm performance. However, Brian, McKenny, Opong and Pignatell (2014) suggest that a large firm size may create significant agency conflicts between managers and owners, which will negatively influence firm performance. **Hypothesis 2:** size can positively or negatively influence firm performance.

**Cash Ratio:** According to Dursun, Cemil and Uyar (2013), we measure Cash ratio by the total cash holdings over current liabilities. A high amount of cash in the hands of managers may cause a problem of over-investment, which will negatively influence firm performance. **Hypothesis 3:** there is a negative relationship between cash ratio and firm performance.

**Firm age:** We measure the reputation of the firm through the variable age. Lansberg (1983) and Chen-Hui Wu (2013) suggest that a high age may create a problem for the future management of firms, which will negatively influence firm performance. However, we argue that an older firm has a good reputation in the market, which will positively affect firm performance. **Hypothesis 4:** there is a positive relationship between firm age and firm performance.

### 3.3 The Models

To make comparison of determinants of firm performance between European countries, and following the methodology developed by Dhanya, Sweta and Pavithran (2012), we test the following models:

$$ROA_{it} = \alpha_0 + \alpha_1 Growth_{it} + \alpha_2 SIZE_{it} + \alpha_3 CashRatio_{it} + \alpha_4 Age_{it} + \varepsilon_{it}$$

$$ROS_{it} = \alpha_0 + \alpha_1 Growth_{it} + \alpha_2 SIZE_{it} + \alpha_3 CashRatio_{it} + \alpha_4 Age_{it} + \varepsilon_{it}$$

$$ROE_{it} = \alpha_0 + \alpha_1 Growth_{it} + \alpha_2 SIZE_{it} + \alpha_3 CashRatio_{it} + \alpha_4 Age_{it} + \varepsilon_{it}$$

$$EPS_{it} = \alpha_0 + \alpha_1 Growth_{it} + \alpha_2 SIZE_{it} + \alpha_3 CashRatio_{it} + \alpha_4 Age_{it} + \varepsilon_{it}$$

## 4. Presentation of the Results

### 4.1 Descriptive Statistics

The descriptive statistics are presented in table 2. For the dependent variables, Switzerland has the highest average of "ROA" (this value is very close to that found by Mei Yu, 2013, in the case of China, and Waelchli, J. Zeller, 2013 using a sample of 10,000 firms from Swiss), "ROS" and "EPS" equal to 0,0633; 0,0614 and 6,593 respectively. However, Italy has the highest average "ROE". Statistics also indicate that Italian firms are the biggest firms among the three countries (an average size equal to 21.115). Similarly, Italian firms have the lowest average of Cash ratio with a value equal to 0.187. Moreover, we note that firms in Switzerland are the oldest with an average age equal to 41.824. Sweden has the highest value of growth opportunities equal to 3,133, as measured by the Market-To-Book ratio.

Table 2. Descriptive statistics

Switzerland					
	OBS	MEAN	STD DEV	MIN	MAX
ROA	839	0,0633	0,125	-0,733	0,844
ROS	741	0,0614	0,127	-0,525	0,893
ROE	809	0,0690	0,147	-0,902	0,945
EPS	753	6,593	13,222	0,00544	137,157
MTB	763	2,396	4,876	0,000934	44,211
SIZE	864	20,855	1,477	16,896	25,248
Cash Ratio	620	0,373	0,233	0,00190	0,999
Age	839	41,824	37,685	1	145
Sweden					
	OBS	MEAN	STD DEV	MIN	MAX
ROA	815	0,0380	0,184	-0,951	0,976
ROS	666	0,0592	0,154	-0,867	0,992
ROE	775	0,0729	0,227	-0,918	0,983
EPS	693	2,691	14,755	0,000718	170,226
MTB	775	3,133	7,409	0,0113	88,156
SIZE	891	20,0249	2,597	11,218	24,291
Cash Ratio	656	0,203	0,184	0,000257	0,998
Age	857	38,121	34,197	1	127
Italy					
	OBS	MEAN	STD DEV	MIN	MAX
ROA	854	0,0527	0,110	-0,687	0,774
ROS	689	0,0543	0,0815	-0,327	0,585
ROE	777	0,0813	0,158	-0,732	0,947
EPS	768	1,881	4,481	0,00167	34,967
MTB	747	1,888	4,0898	0,0117	66,791
SIZE	893	21,115	1,589	13,224	25,847
Cash Ratio	745	0,187	0,172	0,000054	0,948
Age	899	36,681	34,796	1	146

### 4.2 Presentation of the Results

The results are presented in Table 3. our models explain 12,31%, 28,34% and 22,37% of performance for Italy,

Switzerland and Sweden.

**Growth opportunities:** Growth opportunities, as measured by the Market-To-Book ratio positively and significantly explain firm performance in SWITZERLAND and SWEDEN measured by "ROA", "ROE" and "ROS" ratios. This result holds for the firms of the other country, only, for the first two ratios. This result implies that firms with high growth opportunities invest their cash in projects with positive net present values, which will positively affect firm performance. However, we conclude a negative and statistically significant influence of growth opportunities on firm performance as measured by "ROS" ratio for Italy and Sweden. This result indicates that managers of these companies take projects with a required rate of return less than the cost of financing. Thus, the relationship between the growth opportunities and firm performance is influenced by another variable; ownership structure as supported by Hutchinson and Ferdinand (2004). The sign of this variable supports our first research hypothesis. The results for the Earnings Per Share variable are not statistically significant.

**Firm size:** Similarly to Marius Pantea et al. (2014), we conclude a positive and statistically significant effect of size on firm performance in Switzerland and Sweden. This result indicates that a large firm size leads to favourable growth opportunities, which will positively affect firm performance. However, coherently with the results of Alex, Ayse, Eason (2009) and Mei Yu (2013), the empirical results show that the larger size of Italian firms led to managers' opportunistic behaviour, which will negatively influence firm performance as measured by the ROA and ROS ratios. The sign of this variable is coherent with our second hypothesis.

**Cash ratio:** Similarly to Prakash and Michael (2007), we test the effect of Cash Ratio on firm performance. The empirical results concluded a negative and statistically significant effect of Cash ratio on the performance of Italian firms. This result indicates that the existence of cash in the hands of managers leads to an overinvestment problem. This result confirms our third hypothesis. Furthermore, we conclude a positive and statistically significant effect in Sweden.

**Firm age:** as suggested by Alex, Agustí and Mercedes (2013), the age variable positively and significantly affects firm performance for Italy and Switzerland. This interdependence can be explained as follows: older firm has a good reputation in the market, and can improve their profitability and performance.

Table 3. Determinants of firm performance

	Italy			
	ROA	ROS	ROE	EPS
C	0,475	0,417	0,159	1,942
MTB	0,0101***	-0,000279*	0,0328***	0,0112
SIZE	-0,0261*	-0,0198*	-0,0154	0,0108
Cash Ratio	-0,00486*	0,0312	-0,0172	0,339
Age	0,00327*	0,00179	0,00582**	-0,0107
R Squared (%)	15,39	1,36	12,31	0,5
Chix Deux	23,23	1,48	17,51	1,51
	Switzerland			
	ROA	ROS	ROE	EPS
C	0,0211	-0,360***	-0,0267	-51,935***
MTB	0,00841***	0,00344***	0,0171***	0,103
SIZE	-0,000172	0,0186***	0,00310	2,554***
Cash Ratio	0,0155	0,0208	-0,0271	5,381***
Age	0,00468**	0,000108	0,000360*	0,0977*
R Squared (%)	14,44	24,77	28,34	3,27
Chix Deux	45,77	30,29	98,19	22,59
	Sweden			
	ROA	ROS	ROE	EPS
C	-0,00641	-0,682***	-0,658	23,786
MTB	0,00366***	0,0083***	0,0101***	-0,01148
SIZE	0,00669	0,0348***	0,0397*	-0,935
Cash Ratio	0,137***	0,0366	0,228***	2,832
Age	-0,00274	-0,00005	-0,00340	-0,0397
R Squared (%)	9,39	22,37	15,24	0,44
Chix Deux	11,29	120,88	19,47	3,59

Note. \*, \*\*, \*\*\*: significance at 10%, 5% and 1% levels respectively.

## 5. Determinants of Firm Performance and Effects of Sectors

Similarly to the work of Fabrizio, Menozzia, Corbetta and Fraquelli (2013), we measure the effect of sectors on the performance of firms. The results are presented in Table 4. Our results conclude a positive and statistically significant effect of growth opportunities on firm performance in the three countries for all sectors, except for the professional activities sector in Italy. The Size coefficient is positive and statistically significant only for manufacturing, construction and other service activities in Sweden. The same result is found for the cash ratio only for construction and other service activities. Finally, older firms can create agency problems between managers, which may negatively affect firm profitability for the professional business sector in Italy. The same result is found for the industrial and professional activities sectors in Sweden.

Table 4. Determinants of firm performance and effects of sectors

			C	MTB	SIZE	Cash Ratio	Age	R Squared (%)	Chix Deux
<b>Italy</b>	ROA	manufact	0,0503	0,0155***	-0,00158	0,0359	-0,000156	36,61	13,55
	ROA	Const and other service	0,122	0,0121***	-0,00356	0,00825	-0,00257	53,18	107,53
	ROA	Professional activities	0,110	0,00285	-0,00303	-0,0126	-0,000228***	41,31	12,36
<b>Switzerland</b>	ROA	manufact	0,780	0,00614*	-0,0342	-0,0841	-0,0000148	26,49	5,97
	ROA	Const and other service	-0,104	0,00876***	0,00504	0,0372	0,000597**	21,61	54,60
	ROA	Professional activities	-0,541	0,103***	0,0231	-0,00352	0,00106**	26,46	10,81
<b>Sweden</b>	ROA	manufact	-0,527*	0,0229***	0,0290**	0,0908	-0,00147*	17,89	24,97
	ROA	Const and other service	-0,793***	0,00511***	0,0371***	0,149***	0,00152*	49,58	45,50
	ROA	Professional activities	0,387	0,00286***	-0,00749	-0,0326	-0,00345*	11,10	4,93

Note. \*, \*\*, \*\*\*: significance at 10%, 5% and 1% levels respectively.

## 6. Conclusion

Various empirical results on the determinants of firm performance led us to study in an international context the factors explaining firm performance for three European countries: Sweden, Italy and Switzerland. The results show that all variables affect significantly firm performance. The exception is the age of Sweden firms. Furthermore, we recorded a negative effect of Cash Ratio on firm performance for Italy and positive effect for Sweden and Switzerland. The differences in the ownership structure determinants are related, too, to the size variable.

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