

## **The Effect of Risk on Firm Performance: Evidence from Automobile Companies Listed in Tehran Stock Exchange (TSE)**

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**Abstract:** The debate, on which factors affect firm performance, has been a controversial issue in accounting and finance. This study assesses the effect of risk factors on firm accrual-based and cash flow-based performance measures in Automobile Companies in Tehran Stock Exchange for the period from 2005 to 2010, using Spss19 software, OLS (Ordinary Least Squares) regression method. Financial leverage and operating leverage as risk factors, ROI (Return on Investments) and OCFR (Operating Cash Flow Return) as firm performance measures are considered. Results showed that financial leverage does not have significant effect on ROI and OCFR. Operating leverage affects only on ROI. Operating leverage is negatively related to ROI. This study concludes that accrual based measure performs better than cash based one.

**JEL Classification Codes:** M41, G32

**Key words:** Firm Performance • Risk • Operating Leverage • Financial Leverage • Return on Investments • Operating Cash Flow Return

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### **INTRODUCTION**

Organization performance has been the most important issue for every organization. It is very important for managers to know which factors influence an organization's performance in order to take appropriate steps to initiate that factors. [1].

Hansen and Wernerfelt (1989) quoted that, there were two major streams of research on the determinants of organizational performance. One was based on economic tradition, emphasizing the importance of external market factors in determining organizational performance. The other line of research was built on the behavioral and sociological paradigm and saw organizational factors and their 'fit' with the environment as the major determinant of success [2].

Previous research had used many variables to measure organizational performance. Many studies found that different companies in different countries tend to emphasize on different objectives, but the literature suggests that financial profitability and growth to be the most common measures of organizational performance.

Financial measures enable researchers to construct trend analyses and benchmarking analyses [3]. The profitability of an organization is an important financial indicator to reflect the efficiency of the organization and the owners/managers ability to increase sales while keeping the variable costs down [4]. Profit margin, return on assets (ROA), return on equity (ROE), return on investment (ROI) and return on sales (ROS) are considered the common measures of financial profitability [5,6].

In today's dynamic world, leaders must be able to cope with the increasing volatility and turbulence of the environment due to globalization [7] [8]. Changes in the environment, therefore, can pose risks to the performance reliability of the organization [9]. Some risk factors include business risk, operating leverage, financial leverage, profit volatility [10].

Operating leverage is the extent to which fixed costs are used in a firm's operations. Operating leverage is a measure of risk and opportunity. Business risk is greatly influenced by the amount of fixed costs used in a firm's operations [11].

Financial leverage reflects the debt amount used in the capital structure of the firm. Debt carries a fixed service obligation of payments of interest. Financial leverage measures firm's exposure to the financial risk. Financial leverage can accelerate EPS under favorable economic conditions but depresses EPS when the economic goings is not good at economy and for the firm [12].

Financial leverage plays a major role in corporate investment decision-makings. Some research papers indicated that there is a relation between financial leverage and other factors such as stock returns, ROA, firm size, MV/BV ratio [13].

According to previous studies, financial leverage affects cost of capital, ultimately influencing firms' profitability and stock price [14-17]. Operating cash flow (OCF) is the measure used in the finance literature to examine the consequences of performance volatility [18]. Integration of cash flow data with traditional ratios would provide a superior measure of performance over accrual accounting data alone [19].

Competitive environment, globalization and technology rising require industries, special in automobile ones, to take into account such changes and do appropriate strategies to survive and perform profitable.

Considering the above notes about risk and performance, the objective of this study is to assess the impact of risk and environment on firm performance in Iranian automobile industry and determines which performance measure - accrual based or cash flow based - has better ability to reflect the business environment and risk. Risk factors in this study are financial leverage and operational leverage; ROI (return on investment) and OCFR (operating cash flow return on assets) are firm performance measures.

This study is the first one in which investigates both risk factors with two firm performance measures - accrual based and cash flow based - in Iranian automobile industry.

The remainder of this paper is as follows. Next section describes literature about this issue. Section 3 describes methodology, develops research hypotheses and details on sample and variable measurement. Section 4 provides descriptive statistics and the results of the empirical tests. Section 5 concludes.

**Literature Review:** Ability of earnings relative to cash flows to reflect firm performance is an important issue in finance and accounting. Under the accrual basis of

accounting, earnings are the better measure of firm performance than cash flows [20]. Dechow (1994) investigated circumstances under which accruals can improve earnings' ability to measure firm performance. He found that accrual plays an important role to explain the firm performance and cash flows suffer more severely from timing and matching problems that have negative effect on explaining firm performance [21].

Watson and Wells (2005) examined the association of various earnings and cash flow based measures of firm performance with stock returns to determine the measure(s) that best capture contemporaneous firm performance [22].

Lev (1974) in his paper on the association between operating leverage and risk quoted that the risk associated with an investment increases, as operating leverage increases [23].

Business risk is the uncertainty associated with organization's operating environment and reflected in the variations of operating income and hence, having a negative impact on the profitability of a given organization [11].

Ross (1977), Heinkel (1982) and Noe (1988) suggested that increasing leverage, by acquiring debt should have positive implications for firm value and performance [24] [25] [26]. Furthermore, Hadlock and James (2002) also supported this result, where they concluded that companies prefer debt (loan) financing because they anticipate a higher return [27]. According to Champion (1999), use of leverage is one way to improve the performance of the firm [28]. Gleason, Mathur and Mathur (2000) supported a negative impact of leverage on the profitability of the firm [29] while Roden and Lewellen (1995) found a significant positive association between profitability and total debt [30]. Thus, there is no universal theory about debt-equity choices.

Shubita and Alsawalhah's research (2012) revealed that there are significantly negative relation between debt and profitability. They suggest that profitable firms depend more on equity as their main financing option [31].

Liargovas and Skandalis (2009) showed that leverage in parallel with export activity, location and investments significantly affected firm performance in a relatively small market which inevitably suffered from the sharpen competitive pressures taking place throughout Europe [32].

Commander and Svejnar (2011) assessed the business environment constraints on firm performance and found that few business constraints affected

performance. Other factors such as education, health care matter more than differences in the business environment for firm performance [33].

## MATERIALS AND METHODS

The term methodology is a system of explicit rules and procedures in which research is based and against which claims of knowledge are evaluated [34]. Therefore, this section focuses on the research techniques adopted and used for this study with the aim of achieving the research objectives. This study is an empirical research that examines the effect of risk factors on firm performance measures-accrual based and cash flow based- in Iran's automobile industry and then determines which performance measure better explains risk factors. This research study is poised towards providing answers to the following questions:

“Do risk factors have any effect on firm performance in automobile industry in Iran? Which performance measure reflects risk better?”

So research hypotheses are described as follows:

- H1<sub>0</sub>: Risk factors do not have any effect on firm performance.
- H1<sub>1</sub>: Risk factors have effect on firm performance.
- H2<sub>0</sub>: Ability of Accrual based performance measure is not more than Cash flow based measure relative to risk.
- H2<sub>1</sub>: Ability of Accrual based performance measure is more than Cash flow based measure relative to risk.

This research aimed to find out the effect of financial and operational leverage on ROI and OCFR. This study measures corporate performance by the yearly return on invested capital (ROI) and operating cash flow return on assets (OCFR). Return on invested capital is computed as yearly net income divided by invested capital (total assets minus current liabilities). ROI is an accounting measure of how profitably the firm's managers put invested capital to use. This measure is commonly used in studies of corporate performance [35] and in 1992 by Kotter and Heskett [36]. Operating cash flow computed as net cash flow from operating activities retrieved from the companies' Cash Flow Statements. Operating cash flow return evaluates cash returns against used assets. The ratio is used while making a comparison between

companies with regard to the cash they are able to generate from available assets, instead of generated cash against earned profit. This ratio compares the business performance among various companies in the industry [37].

A debt-to-asset ratio was used to measure financial leverage in the study. Operating leverage was measured by looking at the ratio of fixed assets as compared to total assets of the corporation for the year. Therefore, financial and operating leverage are independent variables and ROI and OCFR are dependent variables.

The study covers six years period from 2005 to 2010 for automobile companies in Tehran Stock Exchange (TSE). This study uses secondary data. The data was collected from financial statements and RahavardNovin database and was analyzed using spss19 with Ordinary Least Square (OLS) method. Following regression models are estimated:

$$\begin{aligned} ROI_{i,t} &= \beta_0 + \beta_1 OL + \beta_2 FL + \varepsilon_1 \\ OCFR_{i,t} &= \alpha_0 + \alpha_1 OL + \alpha_2 FL + \varepsilon_2 \end{aligned}$$

Where:  $\beta_0, \alpha_0$ : intercept of equation,  $\beta, \alpha$ : coefficients for independent variables,  $\varepsilon_{i,t}$  = error term,  $i$  = firm,  $t$  = time = 1, 2, ..., 6 years

## RESULTS AND DISCUSSIONS

Tables 1 and 2 present descriptive statistics separately for each pair of variables.

Tables 3 and 4 show Pearson's correlation matrix. Pearson's coefficient correlation shows relation between variables. As shown in table 3, there is a negative relation at 0.01 significant level between ROI and OL, but the relation between ROI and FL is not significant. Although there is a relation among OL and FL with OCFR in table 4, but none of them are significant at 0.05 level. Also there is not a relation between independent variables at 0.05 significant level which may not lead to multicollinearity problem.

Tables 5 and 6 show the method of entering independent variables, financial leverage (FL) and operating leverage (OL), for regression analysis.

A summary statistic of regression models are in tables 7 and 8. Adjusted R-square in model 1 is 16/3%. This model can predict 16/3% of dependent variable (ROI). R-square in model 2 is 4%. Adjusted R-square is less than zero and the model can not have predictive power.

Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
ROI	.2568852752	.10268738546	23
OL	.2136660507	.13119892808	23
FL	.6377298410	.11613072749	23

Table 2: Descriptive Statistics

	Mean	Std. Deviation	N
OCF	.1181267761	.06985576472	23
OL	.2136660507	.13119892808	23
FL	.6377298410	.11613072749	23

Table 3: Pearson's correlation matrix

		ROI	OL	FL
Pearson Correlation	ROI	1.000	-.475	.024
	OL	-.475	1.000	.186
	FL	.024	.186	1.000
Sig. (1-tailed)	ROI	.	.011	.457
	OL	.011	.	.198
	FL	.457	.198	.
N	ROI	23	23	23
	OL	23	23	23
	FL	23	23	23

Table 4: Pearson's correlation matrix

		OCFR	OL	FL
Pearson Correlation	OCFR	1.000	.029	.200
	OL	.029	1.000	.186
	FL	.200	.186	1.000
Sig. (1-tailed)	OCFR	.	.448	.180
	OL	.448	.	.198
	FL	.180	.198	.
N	OCFR	23	23	23
	OL	23	23	23
	FL	23	23	23

Table 5: Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
1	FL, OL <sup>a</sup>	.	Enter

a. All requested variables entered.

b. Dependent Variable: ROI

Table 6: Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
2	FL, OL <sup>a</sup>	.	Enter

a. All requested variables entered.

b. Dependent Variable: OCFR

Table 7: Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.489 <sup>a</sup>	.239	.163	.09394216285	1.352

a. Predictors: (Constant), FL, OL

b. Dependent Variable: ROI

Table 8: Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	.201 <sup>a</sup>	.040	-.056	.07177732804	1.703

a. Predictors: (Constant), FL, OL

b. Dependent Variable: OCFR

Table 9: ANOVA<sup>b</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.055	2	.028	3.143	.065 <sup>a</sup>
Residual	.177	20	.009		
Total	.232	22			

a. Predictors: (Constant), FL, OL

b. Dependent Variable: ROI

Table 10: ANOVA<sup>b</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
2 Regression	.004	2	.002	.419	.663 <sup>a</sup>
Residual	.103	20	.005		
Total	.107	22			

a. Predictors: (Constant), FL, OL

b. Dependent Variable: OCFR

Table 11: Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	.274	.112			2.441	.024
OL	-.389	.155	-.497		-2.504	.021
FL	.103	.176	.116		.586	.564

a. Dependent Variable: ROI

Table 12: Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
2 (Constant)	.042	.086			.485	.633
OL	-.005	.119	-.009		-.040	.968
FL	.122	.134	.202		.906	.376

a. Dependent Variable: OCFR

In table 9 and 10, ANOVA results are presented. Tables 9, 10 show relations of ROI, OCFR with FL, OL. F statistic in model 1 is significant at 0.065 level which is higher than 0.05 level so is significant at 0.1 level. As it was clear from table 8 because of negative Adjusted R-square, F statistic is not significant here. So these results indicate that FL and OL does not affect OCFR significantly.

Coefficients in table 11 show that FL is not significantly related to ROI but OL at 0.05 level is significantly related to ROI. Other statistics and plots are presented in Appendix 1.

As it was presented in tables 8 and 10, table 12 indicates that at 0.05 level the coefficients are not significant and there is no relationship between OCFR and risk factors. So the null hypothesis is not rejected. Other statistics and plots are presented in Appendix 2.

### CONCLUSION AND RECOMMENDATIONS

Organizations want to know which factors influence the performance. Internal environment of firm and external environment affect on firm's performance. Changing the external environment of firms poses risk to their performance and sustainability. Financial profitability is the common measure of performance. In this study two measures are used for financial performance, ROI and OCFR. Unlike previous studies, results showed that financial leverage is related neither to ROI nor OCFR. Operating leverage is just only related with ROI. These results show that unlike previous studies, financial leverage does not affect on ROI and OCFR. According to empirical tests, can be said that accrual based measure better describes risk factors relative to cash based one. As quoted before, there is no universal consensus about debt-equity choices. Of course, Iran's situation must be considered in analyses. Automobile industry is not highly competitive in Iran and all products are sold. Even cars are pre-sold. Because of these reasons, may be Financial leverage and therefore debt to asset ratio are not related to ROI and OCFR significantly. Surely more researches are needed to reveal the reasons and factors empirically.

This study is limited to the sample of Iranian automobile industry firms. Future research should investigate generalization of the findings among other industries. It is suggested that firms should use other risk factors to predict firm performance.

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Appendix 1

Coefficient Correlations<sup>a</sup>

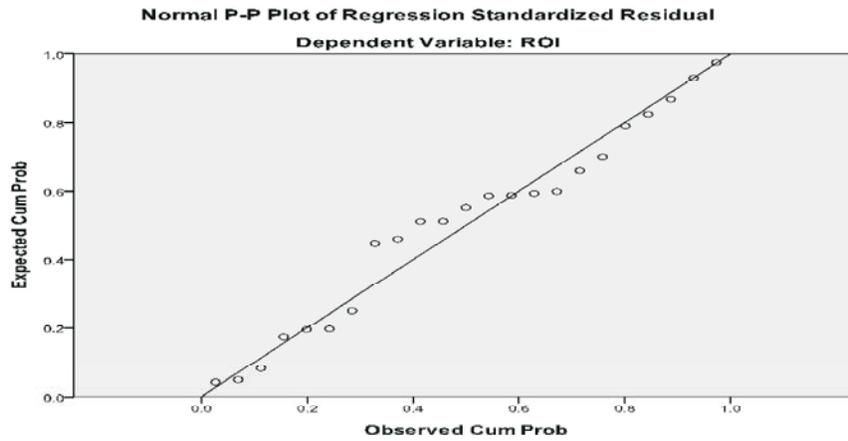
Model			FL	OL
1	Correlations	FL	1.000	-.186
		OL	-.186	1.000
	Covariances	FL	.031	-.005
		OL	-.005	.024

a. Dependent Variable: ROI

Residuals Statistics<sup>a</sup>

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.1529050171	.3337481618	.2568852752	.05021806162	23
Residual	-.16274714470	.18464379013	.00000000000	.08957033783	23
Std. Predicted Value	-2.071	1.531	.000	1.000	23
Std. Residual	-1.732	1.966	.000	.953	23

a. Dependent Variable: ROI



Appendix 2

Coefficient Correlations<sup>a</sup>

Model		FL	OL
1	Correlations	FL 1.000	OL -.186
	Covariances	FL .018	OL -.003

a. Dependent Variable: OCFR

Residuals Statistics<sup>a</sup>

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.0948770195	.1480902135	.1181267761	.01400733022	23
Residual	-.12592051923	.13600182533	.00000000000	.06843699705	23
Std. Predicted Value	-1.660	2.139	.000	1.000	23
Std. Residual	-1.754	1.895	.000	.953	23

a. Dependent Variable: OCFR

