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Gender diversity and firm performance: The moderating role of sales growth

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ABSTRACT

Whether gender diversity improves firm performance is a widely studied topic, but the empirical results have been somewhat mixed. We examine whether sales growth moderates the effect of gender diversity on firm performance. In a multivariate framework, the results of the effect of gender diversity are considerably stronger for firms that are growing fast, compared to those that are not. The analysis is based on examining firm-level data of 25,027 firms spanning 1992 to 2014.

KEYWORDS: Gender diversity, Upper management, and High growth firms

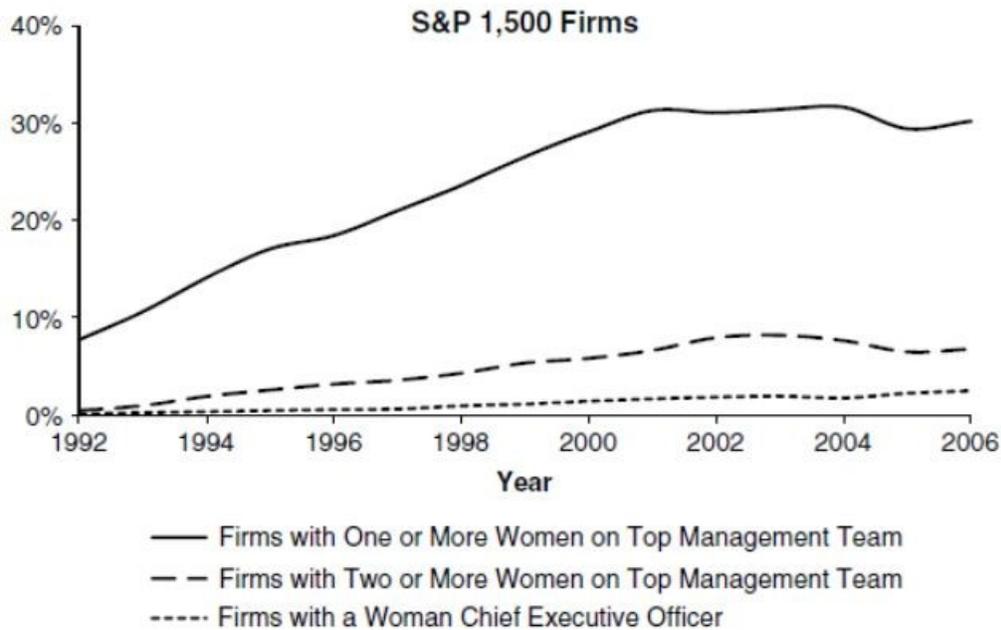
INTRODUCTION

In the past half-century, the number of women participating in the labor market has increased dramatically and has become closer to that of men. According to a report by the Bureau of Labor Statistics, the labor force participation rate of prime-age men (25 to 54 years) in 2010 was 89.3 percent, only 14.1 percent higher than for women in the same group. The representation of woman on management position is also not as bad. According to 2007 report, women account for 30 percent of the managers.

But when compared, the percentage of women on corporate boards and the upper management, the result is quite different. In Figure 1 we present a graph from Dezsö and Ross (2012) who plot the graph showing women representation on the upper management of U.S. S&P 1500 firms. This graph shows that men dominate the upper management. In 2006, less than 3 percent of these firms had a woman CEO, less than 8 percent of the firms had more than two women in the upper management. About 70 percent of the S&P 500 had zero women in upper management. This graph also shows that while there was an increasing trend in the number of women in the upper management until 2000, the trend has stabilized. Other studies have also reiterated what Dezsö and Ross (2012) says. Helfat, Harris, and Wolfson (2006) note that as of the year 2000, there were no women in 50 percent of the Fortune 1000 firms. Their study shows that pipeline for women in upper management doesn't look encouraging either. They write: "With regard to the pipeline to the CEO position, our data suggest that we should expect to see a slow increase in the percentage of CEOs that are women in the next five to ten years.... our estimates suggest that if current trends continue, perhaps 6 percent of CEOs in the Fortune 1000 will be women by 2016 (page 42)".

The upper echelons theory tells us that the upper management's interpretation of the situation the firm faces, like the threat of competitors, opportunities to expand, the riskiness of the possible outcomes, are dependent on their own personalized lens. This means that interpretation of the situation might differ from individual to individual, based on their experiences and background. The experience of being a woman is different and their interpretation of situations can be quite different than men. Because the lens with which the men and women see things are different, it will be useful to have both men and women on the team. This way, the analysis of the situation a firm faces can be more thorough, and decision that the firm ultimately makes might be much more appropriate.

Figure 1: Female representation in top management across time



Source: *Dezsö and Ross (2012)*

The puzzle is to ask the question: Are some firms missing out by not having women in the upper management? If this is the case, is it affecting all firms or only some firms? Based on the literature, this study will discuss in general firms are missing out by not having women in upper management and the board. Gender diversity leads to innovative thinking and motivates female employees, helping the firm to reach its full potential. In addition, this study also argues that gender diversity is particularly useful to firms that are increasing its sales. To increase in sales, firms sometimes need to diversify into unrelated sectors by differentiating their products; sometimes they need to acquire competitors and sometimes they need to identify new markets. For each of these scenarios, innovative thinking is important. When there are more females in the upper management, firms may be better equipped to grow successfully. Therefore, we predict that the effect of gender diversity on firm performance will be much stronger for firms that are growing rapidly. We examine this prediction by collecting firm level data from COMPUSTAT. This data set gives us firm-level financial information based on the balance sheet and income statement.

Using this information, we can construct measures for firm performance. We merge information from Execucomp with the COMPUSTAT data. This dataset gives us the information on the

gender and the rank of the top management. Our measure of gender diversity is the percentage of women among the top five ranking employees. We merge the Execucomp data with COMPUSTAT data. Then in a multivariate framework, we examine if the effect of percentage of female among the top five executives on Tobin's Q is greater for firms that are growing rapidly. Based on these measures, we find that, in firms that are growing fast as measured by their sales growth, gender diversity affects the firm value more.

The rest of the paper proceeds as follow. In section II, we will define the terms and discuss the literature. In Section III, we will develop an argument for the propositions, and in Section IV, we will conclude and discuss the managerial implications.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In this section, we will discuss what firm performance means, the gender diversity, and high sales growth. Then will proceed with the hypothesis development.

Gender Diversity is Associated with Innovation

Diversity is positively associated with innovation. Usually, innovation depends on a group effort of individuals in the firm rather than one employee. Innovation is more likely in a system that encourages people to discuss new ideas, is tolerant to alternative views, and has a group of people who can bring different perspectives to the table . Innovation requires vigorous interaction, where groups of individuals discuss, develop and refine their ideas to bring to life . Although a diverse group takes a longer time to reach an agreement, the quality of decisions is better. [Priem, Harrison, and Muir \(1995\)](#) suggest that to make a wise decision and not reach a poor quality immature decision, the firm ought to have some degree of conflict in viewpoints which a diverse body is likely to bring. [Lattimer \(1998\)](#) also suggests that diversity leads to better problem-solving as it promotes a more robust and critical evaluation of the options at hand.

Gender diversity, in particular, has shown to be effective in making a firm innovative. Specifically, having women on board is more important. Women tend to bring a new perspective on complex issues and help balance informational biases that might arise in strategy formulation . [Østergaard, Timmermans, and Kristinsson \(2011\)](#) investigate the relation between employee diversity and innovation. They examine diversity in terms of race, education, and gender. They examine these associations in 1,648 Danish firms and use a multivariate setting. Their study does not find that racial diversity matters but finds that gender diversity play an important role. Further, they also note that "the analysis shows that gender diversity is one of the variables that have the strongest relation with a firm's likelihood to innovate (page 507)."

Gender Diversity and Collaboration

One the one hand, the social identity theory suggests that diversity (gender diversity included) can damage cohesiveness, encourage the formation of different groups and as a result reduce communication . This leads to distrust, discord, and lack of customer focus and market orientation . Arguing that gender diversity might hurt firm performance, [Earley and Mosakowski \(2000\)](#) suggest that that member of homogenous groups tend to communicate better with each other, and in general get along better creating fewer conflicts. [Tajfel \(2010\)](#) and [Williams and O'Reilly \(1998\)](#) also suggest that a group that is homogeneous is more co-operative and

experience fewer emotional conflicts. These conflicts can be more time consuming and make decisions less effective.

On the other hand, researchers have also argued, as mentioned earlier, that a more diverse group, generally debates a wider point of views and reaches a decision that is of a higher quality . It is quite obvious that even though there might be some conflicts, the conflicts are possibly healthy and lead ultimately to improved decisions.

Gender Diversity & Corporate Strategy

Corporate strategy involves decisions such as which product line to expand and whether to expand into related or unrelated products. It refers to the vision of the company on what markets and businesses to get into as an organization. For example, decisions such as should Google get into space exploration, or building driverless cars?

[Dundas and Richardson \(1980\)](#) discuss some of the questions relating to corporate strategy. Should a firm stick to a dominant product, or should it try to diversify its line of business? To answer their question, they divide the corporate strategy into four categories: (i) single product, (ii) dominant product, (iii) related product and (iv) unrelated product. While [Dundas and Richardson \(1980\)](#) suggest that it is mainly the external environment that determines what strategy the firm should adopt. [Duhaime and Grant \(1984\)](#) suggest that the answer to what areas the firm should do business in might depend upon the internal environment of the firm, rather than external. [Markides and Williamson \(1994\)](#) mention that despite 30 years of research, there is still considerable disagreement on how and when diversification is good for a firm. However, researchers agree that an important aspect of corporate strategy is whether to expand into related or unrelated products. As discussed earlier, the answer is not upfront and also it requires innovative ideas and debating for different perspectives.

Gender Diversity & Business Strategy

Whereas corporate strategy is the big vision of the company on which market to get into, it is also the basis on which the firm competes. [Miles, Snow, Meyer, and Coleman \(1978\)](#) suggested that there are four types of organizations: Defenders, Prospectors, Analyzers, and Reactors. Defenders generally have a narrow domain for their product, and do not look for opportunities outside this domain; rather, they try to defend what they have. Prospectors are almost always continuously searching for new products to produce, and experimenting with new ways to respond to challenges from the market. Analyzers operate in two (or more) types of product domains, in one product they act like defenders, and in the other (usually a smaller market) they experiment with new ideas. If the new ideas work, they shift their resources to the new product. Reactors are those set of organizations that fail to respond effectively to the changes in the environment, and their responses are almost random. The managers of the firms need to decide whether to position the firm as Defenders, Prospector, Analyzers, or Reactors. Although [Miles et al. \(1978\)](#) didn't call these four groups as strategic groups, they were later considered to be as a classification of strategic groups.

The other classification of strategic groups was proposed by [Porter \(1980\)](#). He suggested that "differentiation, overall low cost, and focus and "stuck in the middle" are four different groups within an industry. The group that has differentiation as its main strategy tries to differentiate its product so as to create a unique market for its product, the overall low-cost group focuses on producing at the lowest cost while maintaining its quality, and the group that has "focus" as its strategy focuses on a particular group of customers and market. The firms considered as

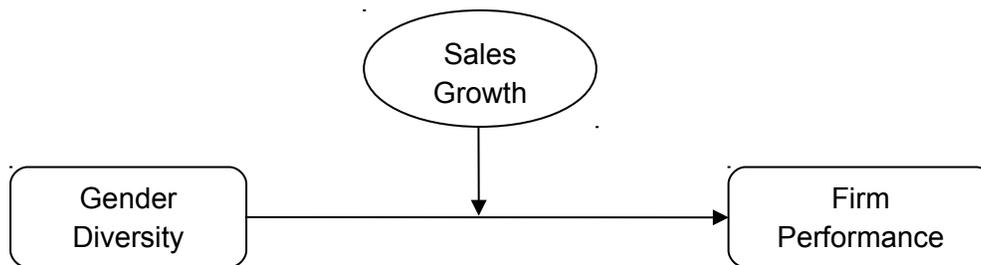
belonging to “stuck in the middle group” are involved in pursuing multiple strategies (two or more of differentiation, overall low cost, and focus) at the same time. Again, whether to position the firm as one that tries to differentiate its product, or try to reduce cost as far as possible, or to focus on a particular set of customers is a decisions managers will have to make, and this decision is an example of business strategy.

The right business strategy can make a lot of difference to a firm’s profitability. Nalebuff and Brandenburger (1995) give the example of GM who first competed on price and started to do poorly because when they reduced the prices, other car companies also reduced their prices. But when they changed their strategies to selling credit cards, which allowed them to use five percent of their charges towards buying a new car, they did really well. In essence, they changed the rule of the game; rather compete in price, they competed in customer loyalty. Since they were the first to come up with the idea, they had an advantage.

Again, deciding what business strategy to use to compete is not easy, as different situations need to be kept in mind, and the situation needs to be viewed with different angles. Therefore, we make the following hypothesis:

Hypothesis 1: *The effect of gender diversity on firm performance will be stronger for firms that are growing faster.*

Figure 2: Theoretical Model



METHODOLOGY

Empirical Model

$Tobin's\ Q = \beta_0 + \beta_1 PercentageOfFemale + \beta_2 (HighSalesGrowth * PercentageOfFemale) + HighSalesGrowth + \beta_4 \ln(Assets) + \beta_5 ReturnOnAssets + \beta_6 DebtToAssets + \beta_7 Intangible + \beta_8 NetOperatingLoss + \beta_9 PPE + \beta_{10} EquityIncome + Industry\ Indicators + Year\ Indicators + \varepsilon$ (1).

Where,

$Tobin's\ Q$ = the Tobin’s Q of the firm $(prcc_c * csho + at - ceq - txd) / at$

$PercentageOfFemale$ = the percentage of women among the top five executives

$HighSalesGrowth$ = an indicator variable that is equal to 1 for firms that are growing at the median level—sales growth is calculated $(sales / lag\ of\ sales)$

$\ln(Assets)$ = natural logarithm of the assets $(\ln(at))$

$ReturnOnAssets$ = ratio of net income to assets (ni/at)

DebtToAssets= ratio of debt to assets (lt/at)

Intangible= ratio of intangible assets to total assets (intan/at)

NetOperatingLoss= 1 if the firm has a net operating loss or else 0

PPE= ratio of plant property and equipment to total assets (ppent/at)

EquityIncome= Equity Income to assets (L.at).

The industry dummies are based on SIC 2 digit. A positive coefficient for the interaction term *HighSalesGrowth*PercentageOfFemale* will suggest that the positive effect of *PercentageOfFemale* is much stronger for firms with high sales growth. Therefore, a positive coefficient for this interaction term will be consistent with our hypothesis.

Data

Measuring Firm Performance

Firm's performance is measured using Tobin's Q. Tobin's Q is the ratio of market value of assets of the firm to their replacement value. It "is a forward-looking measure that captures the value of a firm as a whole rather than as the sum of its parts and implicitly includes the expected value of a firm's future cash flows, which are capitalized in the market value of a firm's assets (i.e., the combined market value of a firm's debt and equity)". [Dezsö and Ross \(2012\)](#) also cite a number of papers and discuss that Tobin's Q might be a superior measure because it is market-based, forward-looking and affected by the perception of the investors. The ROA and ROE are not forward-looking and can be affected by tax laws and earnings manipulations by managers. All the data we need to calculate Tobin's Q is available in COMPUSTAT.

Measuring Gender Diversity

Gender diversity can be measured in many different ways. This study focuses on the percentage of women among the top five management team of the firm. This number is usually quite small, but the idea is that even if it is small, having even one female out of top five can bring diversity to the firm, and the firm can benefit from the unique perspective that a woman's presence can bring.

Sample Selection, Summary Statistics & Correlation

The sample starts from 1992 and ends in 2014. It consists of all firms for which Tobin's Q, the percentage of females among the top executives, and the control variable that we mention in the equation is available. It excludes firms in the financial and utility industry. In order to remove the effect of outliers, we winsorize the dependent variable Tobin's Q, at 1 percent. The summary statistics of the sample used is presented in Table 1. There are on average 4.88 percentage females among the top five executives. More than 75 percent of the firm-years do not have any female representation in the top five executives of the firm. By design, the percentage of high-growth firms are about half of the sample.

The correlations presented in Table 2 suggest a positive and significant association between female employees in the top executive and Tobin's Q. Also, it looks like bigger firms have fewer female executives among their top five.

Table 1: Summary Statistics

	Mean	sd	p25	p50	p75	N
<i>Tobin's Q</i>	2.077	1.436	1.213	1.611	2.367	25027
<i>PercentageOfFemale</i>	0.048	0.117	0	0	0	25027
<i>ln(Assets)</i>	7.094	1.588	5.978	6.942	8.092	25027
<i>ReturnOnAssets</i>	0.033	0.488	0.015	0.054	0.093	25027
<i>DebtToAssets</i>	0.518	0.947	0.343	0.503	0.641	25027
<i>Intangible</i>	0.188	0.361	0.005	0.097	0.276	25027
<i>NetOperatingLoss</i>	0.015	0.433	0	0	0	25027
<i>PPE</i>	0.309	0.271	0.12	0.235	0.416	25027
<i>Equity Income</i>	0.001	0.009	0	0	0	25027
<i>HighSalesGrowth</i>	0.484	0.5	0	0	1	25027

Table 2:

Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) <i>Tobin's Q</i>	1.000									
(2) <i>PercentageOfFemale</i>	0.027	1.000								
	(0.000)									
(3) <i>ln(Assets)</i>	-0.170	-0.017	1.000							
	(0.000)	(0.006)								
(4) <i>ReturnOnAssets</i>	0.021	0.007	0.049	1.000						
	(0.001)	(0.256)	(0.000)							
(5) <i>DebtToAssets</i>	0.007	-0.007	0.028	-0.240	1.000					
	(0.255)	(0.287)	(0.000)	(0.000)						
(6) <i>Intangible</i>	-0.050	0.023	0.118	0.001	-0.000	1.000				
	(0.000)	(0.000)	(0.000)	(0.839)	(0.939)					
(7) <i>NetOperatingLoss</i>	0.026	0.001	-0.025	0.016	0.156	0.031	1.000			
	(0.000)	(0.912)	(0.000)	(0.013)	(0.000)	(0.000)				
(8) <i>PPE</i>	-0.090	-0.047	0.128	0.024	0.016	-0.137	0.009	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.012)	(0.000)	(0.150)			
(9) <i>Equity Income</i>	-0.018	-0.016	0.098	0.031	0.005	-0.004	-0.018	0.039	1.000	
	(0.004)	(0.011)	(0.000)	(0.000)	(0.417)	(0.532)	(0.005)	(0.000)		
(10) <i>HighSalesGrowth</i>	0.250	-0.036	-0.072	0.054	-0.048	0.084	0.002	0.091	-0.003	1.000

(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.773)	(0.000)	(0.599)
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RESULTS

The results of the regression analysis are consistent with our hypothesis: the effect of female executives on Tobin's Q is much stronger for firms that are growing faster. The results are shown in Table 3. The regression coefficient presented in Column 1 shows that the coefficient of the interaction term *HighSalesGrowth*PercentageOfFemale* is 0.519—positive and statistically significant at one percent. This suggests that the effect of *PercentageOfFemale* is much more positive and stronger when *HighSalesGrowth=1* (when the firm is growing fast). When the firm is growing fast, the effect of *PercentageOfFemale* is the sum of the coefficient of *PercentageOfFemale* and *HighSalesGrowth*PercentageOfFemale*. This number is positive (0.063+0.519), and F-test shows that this sum is significantly different than 0. However, based on this model, when the firm is not growing fast, there is no positive effect of female executives on Tobin's Q. When the firm is not growing fast (that is, when *HighSalesGrowth=0*), the coefficient of *PercentageOfFemale* is 0.063 and the associated p-value is 0.413.

Table 3: Regression Analysis

	(1)	(2)	(3)
	Dependent variable = Tobin's Q		
<i>PercentageOfFemale</i>	0.063	0.417***	0.178**
	(0.414)	(0.003)	(0.019)
<i>HighSalesGrowth*PercentageOfFemale</i>	0.519***		
e	(0.001)		
<i>HighSalesGrowth</i>	0.684***		
	(0.000)		
<i>ln(Assets)</i>	-0.092***	-0.163***	-0.014*
	(0.000)	(0.000)	(0.070)
<i>ReturnOnAssets</i>	0.065	0.234	0.010
	(0.222)	(0.212)	(0.727)
<i>DebtToAssets</i>	0.050***	-0.336	0.088***
	(0.000)	(0.197)	(0.000)
<i>Intangible</i>	-0.390***	-0.364**	-0.640***
	(0.009)	(0.016)	(0.000)
<i>NetOperatingLoss</i>	0.045	0.117	-0.152**
	(0.499)	(0.267)	(0.036)
<i>PPE</i>	-0.222***	-0.154**	-0.346***
	(0.000)	(0.028)	(0.000)
<i>Equity Income</i>	0.212	1.550	-1.228
	(0.869)	(0.347)	(0.513)
YEAR DUMMIES	YES	YES	YES
INDUSTRY DUMMIES	YES	YES	YES
Observations	25,027	12,119	12,908
R-squared	0.202	0.205	0.143

Robust p-value in parentheses

*** p<0.01, ** p<0.05, * p<0.1

I also test the result by splitting the sample based on whether the firm is growing fast or not and see if the coefficient of *PercentageOfFemale* is larger in the subsample where the sales growth is high. This is another way to test the result. Column 2 presents results of a regression analysis when only those firms that are growing fast are used. The coefficient of *PercentageOfFemale* is 0.417 and significant at one percent. Column 3 presents the result of a regression analysis when only those firms that are growing at a lower rate than the median are used. In this subsample, the coefficient of *PercentageOfFemale* is much smaller; it is 0.178 and significant at one percent. It is possible to do F-test whether these coefficients are significantly different. We do this test and find that F statistics is 2.25 and p-value is 0.1338 suggesting that the difference is not significant at 10 percent. we think the analysis in column 1 is much stronger because it is a pooled test; it has a larger sample, and the results are stronger.

CONCLUSION

In this study, we analyze whether a firm's sales growth moderates the effect of gender on the firm's performance. Using Tobin's Q as the measure of a firm's performance, we find that sales growth does moderate the effect of female executives on the firm performance. This result suggests that not all firms might benefit in the same way but by having a more gender-diverse executive, the positive effect is much stronger for faster-growing firms.

APPENDIX

Variables	Description	Source
Dependent variable		
<i>Tobin's Q</i>	the Tobin's Q of the firm (prcc_c*csho + at - ceq - txd)/at	COMPUSTAT
Research variable		
<i>PercentageOfFemale</i>	the percentage of women among the top five executives	EXECUCOMP
<i>HighSalesGrowth</i>	an indicator variable that is equal to 1 for firms that are growing at the median level	COMPUSTAT
Control variables		
<i>ln(Assets)</i>	= natural logarithm of the assets (ln(at))	COMPUSTAT
<i>ReturnOnAssets</i>	= ratio of net income to assets (ni/at)	COMPUSTAT
<i>DebtToAssets</i>	= ratio of debt to assets (lt/at)	COMPUSTAT
<i>Intangible</i>	= ratio of intangible assets to total assets (intan/at)	COMPUSTAT
<i>NetOperatingLoss</i>	= 1 if the firm has a net operating loss or else 0	COMPUSTAT
<i>PPE</i>	= ratio of plant property and equipment to total assets (ppent/at)	COMPUSTAT
<i>EquityIncome</i>	= Equity Income to assets (L.at).	COMPUSTAT

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