Canadian Journal of Forest Research
Revue canadienne de recherche forestière

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Journal:	<i>Canadian Journal of Forest Research</i>
Manuscript ID	cjfr-2016-0040.R2
Manuscript Type:	Article
Date Submitted by the Author:	01-Aug-2016
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Keyword:	gender diversity, diversity, financial performance, human resources management, workforce diversity

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Abstract

The extant literature concerned with enhancing competitiveness of forest sector companies has focused on phenomena rather than people who would drive those phenomena. Even generally, human resource management research is sparse in the forest sector literature, despite well documented knowledge that companies succeed more because of their people than any other factor. This article brings human resource issues to the core conversation in forest sector competitiveness research. Specifically, we focus on the link between gender diversity in top leadership and firm financial performance and suggest pathways to improve workforce diversity. The timing of our study is fortuitous as the graying workforce in the sector will create space for a new generation of leaders. Our argument is that diversity issues should be more proactively addressed in forest sector workforce recruitment not just because it is the right thing to do, but because it also has an underlying business case. This is an exploratory study, which is a first step in paving the way for future work on diversity management among forest sector companies. Our findings suggest that more gender diverse top management teams are associated with higher financial performance, but the level of gender diversity in boards of directors has no association with financial performance.

Key Words: diversity, financial performance, forest industry, gender diversity, human resources management, workforce diversity

Introduction

Until the beginning of the current century, the global forest industry was characterized by a relatively stable competitive context – markets were generally growing, buyer-supplier contracts were long term, and even leading companies were still internationalizing (Ojala et al. 2007). In short, competition among forest sector companies was low to moderate. But those times have disappeared (Hansen et al. 2014a). The emergence of numerous raw material sources through large scale plantations, myriad low cost processing centres, threats from substitute products, and turbulent economic, technological, ideological, and demographic patterns have pushed the forest industry to a point where it must find new ways to remain relevant (Kozak 2014).

How will this transition happen? Who will make it happen? The extant literature addressing such issues has mostly focused on phenomena—innovation management (Hansen et al, 2014b), sustainability management (Toppinen et al. 2016), new technology adoption (Panwar et al. 2012)—but people within companies who would drive those phenomena have seen surprisingly little discussion (for exception, see Kozak 2014). As such, human resource management research is generally sparse in the forest sector literature, despite well documented knowledge that companies succeed more because of their people than any other factor (Laursen and Foss 2003). We aim to take a step in bridging that gap in the forest sector literature. Our timing for this study is fortuitous because of an impending generational transition of a graying forest sector workforce that is reaching retirement age and creating space for a new generation of leaders. We argue that this oncoming wave of retirements presents a novel and significant opportunity for the forest sector to develop visionary policies and strategies to bring in a talented, creative workforce that can effectively steer the forest industry into an unpredictable future.

To be sure, a large-scale human resource transformation in the industry is not a trivial topic that can be effectively summarized in a single paper. Here, we specifically focus on leadership

diversity, which is one of the basic tenets of effective workforce development and a recurring issue for the forest sector that typically lacks diversity in its workforce (BLS 2014).

There are multiple motivations to pursue workforce diversity; some legislated, others based on ethical considerations, and yet others driven by the business case for doing so. Evidence suggests that more diversity pays off through increased creativity (Campbell and Minguéz-Vera 2008, Green et al. 2008), openness to change (Green et al. 2008), and innovativeness (Bantel and Jackson 1989, Campbell and Minguéz-Vera 2008) as well as enhanced company financial performance or value (Perryman et al. 2016, Isidro and Sobral 2015, Reguera-Alvarado et al. 2015, Giffi and McNelly 2013, Campbell and Minguéz-Vera 2008). Despite the fact that the general literature contains myriad studies investigating the diversity-performance relationship and there are sector specific studies for industries such as automotive, we were unable to uncover any peer reviewed studies covering the diversity-performance relationship in the forest products manufacturing sector. Given this dramatic gap in the literature, the present study is an initial foray into understanding the phenomenon within the forest sector. We focus our efforts specifically on gender diversity within the boards of directors and corporate executive teams (hereafter referred to as top management teams or TMTs) of large forest sector companies in North America, Europe and Oceania. Specifically, our objectives are as follows:

1. Identify the relationship between gender diversity at board and executive levels and the financial performance of forest sector companies
2. Propose a path forward for industry to increase its workforce diversity
3. Stimulate further research to promote workforce diversity in the forest sector

In the remainder of the paper, we first provide a theoretical background regarding gender diversity and its potential link with company performance. This is followed by a description of the methods employed in the study, results, and discussion. We then provide insights regarding

potential paths forward. Finally, because the topic of gender diversity is novel in the context of forest products industry, we emphasize directions for the future research needed to better understand how diversity may, or may not, benefit forest sector companies.

Theoretical Background

Although progress has been made in recent decades to diversify the leadership of corporate America, the current status of gender diversity remains poor. As of 2012, 20% of Fortune 100 board seats belonged to women. This is up only six percent over the previous six years (Anonymous 2013). In the manufacturing sector the situation is even worse where females occupy only just over 16% of board seats (Giffi and McNelly 2013). The situation is no better in non-board executive positions where just over 11% of officers in 2012 were women.

The question whether diversity enhances company performance has been debated by management scholars for decades (e.g., Erhardt et al. 2003) as there are arguments both in favor for and against it. There are many reasons that a diverse workforce may not produce positive results (Jayne and Dipboye 2004, Kochan et al. 2003). For example, Erhardt et al. (2003) aptly summarize this duality that diversity, on the one hand, can increase decision-making capacity but at the same time increase within-group conflict. Results from research investigating the economic impacts of diversity are decidedly mixed and are said to be so because of many differences among studies, missing explanatory variables, etc. (Adams et al. 2015). Very recent work finds a positive relationship between board diversity and financial performance (Perryman et al. 2016, Reguera-Alvarado et al. 2015). In a large-scale international study of 22,000 companies from 91 countries, Noland et al. (2016) found a positive association between female share of TMTs and firm performance in data for 2014, but no effect of board membership or board gender quotas on firm performance. Still, even meta-analytic studies come to conflicting findings (Post and Byron 2015, Pletzer et al. 2015). Clearly the

impacts of diversity are complex and likely also context dependent (Pletzer et al. 2015, Adams et al. 2015).

There are a number of theories (e.g., agency theory) that have been used to explain the impact of boardroom and TMT diversity on company performance (Reguera-Alvarado et al. 2015). Ultimately, group dynamics is the key concept and the principles of how groups relate to minority members can be used to suggest relationships between gender diversity and the effectiveness of the decision-making by those teams. At the most basic level, more diverse thinking leads to better decisions. Increasing diversity is said to introduce a number of factors that can contribute to enhanced group performance and following on, company performance. The foundational element of increased diversity is cognitive diversity or differential thinking that results from introducing different knowledge bases, experience bases, thinking styles, etc. As described by Perryman et al. (2016, p. 2), "Having top managers with varying outlooks and interpretations is critical to understanding complex environments...the same reality can be perceived by diverse managers in different but complimentary ways."

Research shows myriad positive implications of increased group diversity. Examples of positive implications of gender diversity include: improved group decision-making (Erhardt et al. 2003), improved managerial task performance (Dezsö and Ross 2012), enhanced legitimacy (Perrault 2015) introduction of new ideas and skills (Reguera-Alvarado et al. 2015) more innovative and creative decision-making (Bantel and Jackson 1989), better reflection of customer and stakeholder needs (Konrad et al. 2008), deeper and more extensive consideration of issues (Post and Byron 2015), and increased social capital and social responsibility (Bear et al. 2010). Specific to the impact of women on teams, they tend to reduce company risk taking and are associated with greater company performance (Perryman et al. 2016) despite higher turnover and absenteeism (Campbell and Minguez 2008). In addition, those companies that pursue a

more gender diverse leadership team and workforce will be tapping into a highly educated and skilled talent pool since, for example in the US, the greater proportion of college degrees are now earned by females (Catalyst 2004). These various elements should contribute to enhanced company performance. Based on the foregoing discussion, we hypothesize:

H1: Companies with a larger share of female board members have higher financial performance.

H2: Companies with a larger share of female top management team members have higher financial performance.

Methods

Population and Sample

We use secondary data for this study gleaned from Web sites and public documents of the target companies. As a sample frame we utilize the PricewaterhouseCoopers (PWC 2013) global top 100 pulp paper and packaging companies. PricewaterhouseCoopers conducts an annual study of the top 100 companies in the sector and provides various data about the companies. The ranking 2013 PWC ranking (for year 2012) is used in this study.

After an initial exploration of companies from around the globe, we found it infeasible to access data in some countries/languages. For example, Japanese companies seldom publish pictures of their boards or TMTs and the research team did not possess the necessary expertise to infer gender based on names. Accordingly, we chose to limit the target companies to those in North America, Europe, and Oceania. This resulted in an initial sample of 65 companies. Between publishing of the PWC top 100 list and our data collection, mergers or purchases eliminated multiple companies from the study. The final list of 54 companies is shown in Table 1.

202

203 **Data and Analysis**

204 The following data comes from company web sites and annual reports and information provider

205 YCHARTS:

- 206 • Total members of the board of directors
- 207 • Total female members of the board of directors
- 208 • Total members of the TMT
- 209 • Total female members of the TMT
- 210 • Size measured by annual sales
- 211 • World region of company headquarters (Europe, North America, or Oceania)
- 212 • Product area representing the largest proportion of sales (pulp, paper & packaging or
- 213 wood)

214 We use earnings before interest, taxes, depreciation, and amortization margin (EBITDA margin)
215 as a metric for company performance. Given the regional representation of companies and
216 inconsistencies in reporting, EBITDA margin is the most consistently available and/or reported
217 value across all companies. Our primary source for EBITDA margin is an online provider,
218 YCHARTS (ycharts.com). In total, the value for EBITDA margin comes from YCHARTS for 34 of
219 the companies and from company annual reports for the remaining companies.

220

221 Data were collected between February and November of 2015 and generally represents 2014
222 company results, although some companies may operate on a fiscal rather than calendar year.
223 Because of the variance in corporate structures among companies in the sample, two
224 researchers collected data regarding the boards of directors and TMTs. The findings of the two
225 researchers were compared and where differences existed a third member of the research team

helped make a final decision. Initial consensus between the two data collection efforts was quite high (84%), after adjudication it was 100%.

In pre-checking the financial performance data, three companies with either negative EBITDA margin value (Resolute Forest Products, PaperlinX) or lack of information (Billerud) were excluded, resulting in the final sample of 51 companies in the regression models. We use correlations and OLS regression to test relationships between company performance and the share of females in top management teams and in the boards of directors. For checking robustness of the relationship at this preliminary stage of analysis, we could use as control variables only firm size, product line and headquarter location. Specifically, EBITDA is the dependent variable in our regression models and the independent variables include: proportion of females on either Board or TMT, sales (control), dummy for companies with three or more females on Board or TMT, dummy for product line (control), and dummy for region in which the company is headquartered (control). Data for sales and financial performance are transformed in natural logs in order to improve distributional properties of data. To ensure that there is no residual heteroscedasticity, the White test is used along with an F-test for overall model significance in the least squares estimation process.

Results

Of the 51 companies in our final database, the largest set is headquartered in the US (15), followed by the Canada (10), and Sweden (5). The companies have 499 members of their boards of directors and 414 members of their TMTs. Overall, female members represent 15.9% of boards of directors and 15.8% of TMTs. The largest number of female board members for any one company is five (42% or 5 of 12) while the largest number for TMTs is six (50%). With respect to the TMTs, the most common roles for women are in the area of human resources,

followed by divisional president, finance, and communications (Table 2). In total, three (6%) of the companies had a female CEO. Kimberly Clark is the only US-based forest sector company that Catalyst identifies as having 25% or more women executives (Catalyst 2013). Overall, there were nine (18%) companies with no females on the board of directors, 21 (41%) companies with no females on the TMT, and three (6%) companies with no females on either (all from Europe). Overall, 85% of European companies had at least one female member of the board. However, this proportion was much lower for TMTs of European companies (38%) and may reflect EU legislation targeting better balance on boards of directorsⁱ. With respect to individual countries, the only company from Poland has no females in board or TMT positions while two of four companies from Portugal and four of ten from Canada are in the same situation. Figures 1 and 2 provide a picture of female representation by company.

According to results from correlation analysis (Table 3), the share of female board membership is positively correlated with size of the company as measured by sales. Female share of TMTs is also positively correlated with financial performance as measured by EBITDA margin. In addition, female shares in TMTs and boards are also correlated positively, which is to be expected, but the level of correlation is only moderate (0.31). Based on this, the risk of multicollinearity between sales and female representation in boards or TMTs is unlikely to be a problem in the models. The finding that female shares of TMT and board memberships are moderately correlated is in line with Noland et al.'s (2016, p. 9) comment that, "a more gender-balanced board might show greater interest in encouraging a more balanced executive team. Certain firm and national characteristics are robustly correlated with the presence of women not only in boards but also in upper management more generally."

It is also interesting to note substantial differences between companies listed in Figures 1 and 2 with highest shares of females in their board and TMTs. In addition, among the top 10

companies in the PWC list, only Kimberly-Clark and Stora Enso appear among the companies with highest share of females in top management. Three companies exist with at least half female TMT members (Sveaskog, Weyerhaeuser and Heinzl Holding), whereas only one Swedish company (Sveaskog), crosses the 40% threshold for females in board membership.

We estimate separate models for share of female TMTs and board memberships, and the results are reported in Tables 4 and 5, respectively. In addition to female TMT share (or share in board) the models include sales as well as dummy variables for companies with number of females exceeding two (executive dummy), product line (pulp, paper packaging or wood products), and region of headquarters (Europe, North America). Model 1 is the most parsimonious, including only the effect of female share in TMT. Model specification 2 includes sales as a control variable, and Model specification 3 includes all variables of interest. This approach is deemed sufficient as we are not interested in the estimation of elasticity values *per se* but whether significant relationship can be identified between firm performance and gender diversity in the first place.

According to Model specifications 1-3 for TMT membership share, there is a positive effect from increased female proportion on financial performance, whereas the effects of company size, region or product line are insignificant. The executive dummy variable for a threshold of more than two female members is also non-significant. All models have modest explanatory power, but the more parsimonious 1 and 2 are nevertheless significant according to F-tests indicating robustness of this finding and none of the models suffer from residual heteroscedasticity according to White-tests.

Results for Model specifications 4-6 for female board membership are generally non-significant, but are presented here for comparison purposes. According to F-tests, none of the models are significant.

Discussion

According to our regression models, there is only a weak positive effect from female TMT share on corporate financial performance and there is no effect from the share of board membership, as also indicated by the insignificant bivariate correlation. The dummy variable capturing a threshold of more than two females in either one of the teams is non-significant. Furthermore, no differences are evident based on region of headquarters or primary product line. In this respect the global forest industry is rather homogenous in terms of financial performance, a finding similar to that of Zhang and Toppinen (2011) from the perspective of industry internationalization.

The weak effect of gender diversity on performance is, perhaps, not surprising given the extremely low representation of females within the companies represented in this study. For example, 43 (84%) of the companies have two or fewer female representatives on their TMTs. This may reflect what is often referred to in the literature as tokenism (Schwab et al. 2015). There is evidence to suggest that the real impact of gender diversity on groups is when there are three or more females (approximately one in seven of the companies in our database). Konrad et al. (2008) refer to three as a magic number where female representation is no longer a token and the diverse views of female members become genuinely integrated into team discussions. For most of the companies in this study, it may be that the diversity present in the teams simply has no, or limited voice.

Gender is essentially a proxy for different experiences, ways of thinking, and values. The masculine industry leadership structure could be reflected in its dominant logic, the concept often used in conjunction with too strong lock-in and perceived difficulty to diversify existing business models and changing of the cultural mind-set (see Prahalad and Bettis 1986, Prahalad 2004). Given the small proportion of females in leadership positions in this study, an alternative explanation is that to get where they are today, women have largely needed to conform to the prevailing male-dominated culture. If this is, in fact the case, higher level decision-making in the study companies does not benefit from significantly different thinking and values.

With respect to the TMTs in our sample, females were often in positions related to human resources and communications and these positions may be less central to strategy making than other positions on the TMT. Accordingly, these individuals may be less well-placed to impact strategic decisions and, therefore, company performance.

An alternative theoretical lens through which to view the diversity conundrum is slack resources theory. In the trying times of the last decade, large forest sector companies, in general, have not experienced good financial performance (PWC 2013). Accordingly, they may lack the slack resources necessary to build a more diverse leadership team. Given the global financial crisis, historically low profitability, and a generally harsh operating environment, the focus could well have been more on staying afloat than on diversifying the board or TMT. In the end, women in leadership for much of the forest sector is a new phenomenon.

Campbell and Miguez-Vera (2008) suggest that board member diversity helps with marketplace understanding via a better match with employees and potential customers. In other words, when the diversity of the board better reflects the diversity of the marketplace, it is able to perform better in that market. In general, past research shows a forest sector that deserves

further development with respect to market and customer orientation (Han and Hansen 2016, Hansen and Juslin 2006, Cohen and Kozak 2002). Increased diversity on forest sector company boards and TMTs may be a way to further develop market and customer orientation as well as innovation (Hansen and Breed 2016). Others show that the percentage of females on boards is related to voluntary sustainability related actions, another sign of being in tune with the marketplace (Ben-Amar et al. 2015).

Given the intuitive sense of positive performance impacts of increased diversity, mixed findings in the literature, and the suggestions that the relationship is contextual, one can hypothesize that the lack of positive findings may be the result of poor implementation of group processes to capitalize on the potential of diversity. For example, the potential positive contribution of diversity to performance may be mitigated by the CEO and how he or she incorporates diverse views into decision making (Kakabadse et al. 2015, Pletzer et al. 2015). Webber and Donahue (2001) advocate for team development that would be more effective in drawing out different skills and knowledge that could then be applied to the problems at hand.

Finally, it is important to acknowledge that there are many factors impacting company profitability. These may have, as pointed out by one anonymous reviewer, a greater impact on firm performance than gender diversity. Still, given that we found a relationship between gender diversity and firm performance among these many factors shows the potentially valuable insights from further work in this area.

A Path Forward

The forest sector is not alone in its lack of diversity. In the US manufacturing sector, women represent only about 25% of the total workforce compared to nearly 50% in the general workforce (Giffi and McNelly 2013). In a report focused on the automotive industry, Wachol et

al. (2010 p. 8) suggest that, “For many automotive companies, recruiting female talent is a little like a dog chasing a car: What would the dog do if it caught one?” The same authors go on to outline the top five most important attributes of a job from women in the automotive industry: Challenging assignments, income/pay, work-life balance, working relationships, and promotion opportunities. We expect that this list is similar across most industries and countries, so it provides a starting point for companies that wish to be more strategic about their recruitment and retention efforts. However, while such lists are useful and there is benefit to understanding the drivers and incentives to attract and retain female talent, a better approach would be to manage the workplace in a more holistic manner. For example, using the list developed by Wachol et al (2010) outlined above, it would be most surprising if all employees, that is men and women, were not looking for the same attractive attributes in their workplace.

Perhaps the best example of the differing attitudes of workplaces towards the two genders exists after a couple start a family. While there are obvious improvements that can still be made, there is a general acceptance and efforts made by employers to offer female employees adjusted working conditions, be it to work flexibly or part time, after the birth of a child. For example, in Australia, the majority of working mothers with children aged 11 or younger do not work in the traditional 9-5 sense (Baxter 2013). Their working conditions tend to dramatically change after the birth of a child to incorporate part time, flexible hours, working from home or shift work. Such a dramatic shift away from the traditional work day, typically at an age where they are hitting the prime of their career, is likely to affect opportunities for promotion to the TMT or board level. Conversely, for men, the likelihood that they will change their approach to work is much less. Most typically this is a change to flexible hours – not part time as women often do. (Baxter 2013). The focus for future research and workplace policies should therefore not solely be on what women need in order to simply stay in the workplace, but rather what the workplace

can offer all its employees to ensure that the support exists for men and women to be on an equal footing and hence equally able to pursue opportunities for promotion.

The Pathway for Forest Industry Companies

Given the lack of research in this area specific to forest sector companies, we have much to learn. Our initial evidence, along with findings from cross-sector work, suggests that increasing gender diversity is positive for the industry. In any event, neither recent meta-analytic study finds increased gender diversity to negatively impact company performance (Pletzer et al. 2015, Post and Byron 2015), so the downside risk is small. In addition, women in top management is a signal to women throughout the organization that advancement is possible (Dezsö and Ross 2012).

The current demographics of the industry and a major pending wave of retirements presents a significant opportunity to recruit a young, vibrant workforce that can help move it into a more competitive future. Doing so will require well-constructed strategies on the part of industry, but if this opportunity is to be maximized, it may also need support from policy-makers and other actors in the forest sector innovation system. Promotion of workforce diversity must be an essential component of these strategies as it may have far reaching implications for the competitiveness of the future forest sector.

To be realistic, the pool of females qualified for leadership and board positions in the sector is small, especially relative to males. Even for the proactive and innovative forest sector company, it may be highly challenging to identify and attract candidates. Therefore, it is imperative that, regardless of ethical or business case motivations, that companies approach this issue with a well-tuned, long-term strategy. The strategy should encompass recruiting young employees and

promoting from within, attracting outside talent into traditional positions, and utilizing talent that is increasingly operating in a non-traditional manner through project work.

1. Systematically recruiting and developing internal talent is an essential component of any long-term diversification strategy. Companies should plan for effective recruiting of young females and careful mentoring of these individuals so that they are well-placed to climb the corporate ladder.
2. The strategy should also include recruiting talent from outside the organization since experience outside the company provides its own, additional diversity in thinking. Forest sector companies often proudly emphasize their promotion from within policies. While these policies can clearly be a positive element of company culture, they should not exclude the richness of experience and thinking that is possible from incorporating outside perspectives.
3. Another important element of the strategy is to actively engage with the growing number of people, typically women, who work on a project basis. Such candidates typically have the capacity to offer their diverse experience in an efficient and effective manner.
4. Finally, companies should promote a range of working approaches, to both male and female employees that allows them to stay actively engaged in the workplace when one or both parents may need alternative working conditions to manage the needs of a young family. Such flexibility will help ensure employees have the opportunity to retain and enhance their skills while also decreasing the likelihood of losing talent that the employer or industry more generally has invested in.

The Pathway for Researchers

There are a number of limitations in this study, mostly related to the small number of companies in our database and the fact that our data represents one point in time. Future efforts should include more companies and time series data. This could, for example, allow identification of

dynamic effects that were impossible to test for with our data and could also address causality of the relationship, especially since previous research has indicated persistence of profits in this same reference group of forest industry companies (Laaksonen-Craig and Toppinen 2008). There are many indices of company performance and value that should be considered in future, similar studies. Finally, diversity is not a singularly gendered issue. Ethnicity, age, sexual orientation, and beliefs all contribute to diverse groups and should be considered in future studies. Given the retiring workforce in the forest sector, age diversity (e.g., Ali et al. 2014) may be especially important to investigate.

Another pertinent question is about how much diversity is needed to make a difference? Are there thresholds or levels of diversity below or beyond which the diversity-performance link might not work? Previous research alludes to this possibility as higher levels of diversity can increase group conflict and decrease group communication (Campbell and Minguez-Vera 2008), create factions within teams (Adams et al. 2015), increase group turnover due to increased conflict and decreased communication (Bantel and Jackson 1989), and ultimately result in lower member satisfaction (Milliken and Martins 1996). Proposals for striking a balance between too little and too much diversity are also put forward (Campbell and Minguez-Vera 2008, Webber and Donahue 2001), but what is too little or too much remains contested. We believe that this balance is ultimately contextually-rooted and research can help forest sector companies identify and achieve the right balance.

Future work should focus on companies that have moved beyond the two female threshold and identify the outcomes and lessons learned from these processes. These insights would be invaluable to companies that wish to further diversify their teams and reap the potential financial rewards of those actions. Also, an in-depth understanding of how current female executives and board members in the industry view the sector they work in, how they have navigated their

481 careers in a male-dominated workplace, and advice they would give young females entering the
482 industry would be a significant contribution.
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Acknowledgment

The authors acknowledge Smiljana Škvarc for support with data collection. Furthermore, Anne Toppinen acknowledges financial support from the Academy of Finland (#Grant 278363) and Andreja Kutnar is pleased to acknowledge the support of European Commission for funding the project InnoRenew CoE (#Grant Agreement 664331) under the Horizon2020 Widespread-2015 program, and infrastructure program IP-0035.

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643 **Table 1: Companies in Sample, Including PWC Size Ranking in 2012 (PWC 2013)**

Rank	Company	Country	Rank	Company	Country
1	International Paper	US	52	Portucel	Portugal
2	Kimberly-Clark	US	55	Clearwater Paper	US
4	UPM - Kymmene	Finland	59	Louisiana-Pacific	US
5	Stora Enso	Finland	60	Sonae Industria	Portugal
7	Svenska Cellulosa (SCA)	Sweden	61	Tembec	Canada
8	Smurfit Kappa	Ireland	63	P H Glatfelter	US
10	Mondi Group	UK	66	Billerud*	Sweden
11	Metsaliitto	Finland	71	Heinzel Holding	Austria
13	Weyerhaeuser	US	72	Moelven	Norway
15	Domtar	Canada	74	KapStone Paper and Pkging	US
20	Sequana Capital	France	75	Norbord	Canada
21	Sonoco	US	76	Mercer International	Canada
23	Resolute Forest Products*	Canada	77	ENCE	Spain
24	Graphic Packaging	US	78	Catalyst	Canada
27	PaperlinX*	Australia	80	Plum Creek Timber	US
28	Cascades	Canada	82	Sveaskog	Sweden
33	West Fraser Timber	Canada	83	EUROPAC	Spain
34	Norske Skog	Norway	84	Western Forest Products	Canada
36	Packaging Corp of America	US	88	Appleton Papers	US
37	Boise Cascade	US	89	Interfor	Canada
38	Canfor	Canada	92	Arctic Paper	Poland
39	Lenzing	Austria	93	Schweitzer-Mauduit	US

41	Holmen	Sweden	94	Corticeira Amorim	Portugal
43	Mayr-Melnhof Karton	Austria	96	Altri	Portugal
44	Sodra	Sweden	97	Setra Group	Sweden
49	Ahlstrom	Finland	98	Reno De Medici	Italy
51	Universal Forest Products	US	100	Groupe Gascogne	France

644 *companies eliminated at analysis stage

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Table 2: Breakdown of female executive team member positions

Position	Number of females	Percentage of total female executives
Human Resources	14	22%
President of a Division of the Company	9	14%
CFO	8	12%
Communications	7	8%
Other	27	38%
TOTAL	65	

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650 **Table 3: Bivariate correlations between variables**

Variables	EBITDAM	Sales	Female share in board	Female share in TMT
EBITDAM	1.00			
Sales	0.11	1.00		
Share in board	0.10	0.29**	1.00	
Share in TMT	0.26 *	0.23	0.31**	1.00

651 ** Significant at 5% level, * significant at 10% level

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Table 4: Impact on company performance (EBITDA margin) for TMT membership

	Model 1	Model 2	Model 3
Intercept	-2.52** (0.00)	-5.78** (0.02)	-6.90** (0.03)
TMT share	1.54** (0.04)	1.36* (0.07)	1.83* (0.09)
Sales		0.15 (0.19)	0.19 (0.15)
Executive dummy			-0.31 (0.55)
Product line dummy			0.03 (0.92)
Region dummy			0.20 (0.44)
Adj. R2	0.06	0.07	0.03
F-test	4.39** (0.04)	3.10** (0.05)	1.34 (0.26)
White-test	0.93 (0.40)	0.94 (0.47)	0.86 (0.62)

Regression coefficient with p-values in parentheses, ** Significant at 5% level, * significant at 10% level

657 **Table 5: Impact on company performance (EBITDA margin) for board membership**

	Model 4	Model 5	Model 6
Intercept	-2.33** (0.00)	-6.55** (0.02)	-7.06* (0.01)
Female board share	0.20 (0.86)	-0.30 (0.80)	-0.66 (0.65)
Sales		0.20 (0.11)	0.21 (0.12)
Board dummy			0.09 (0.82)
Product line dummy			0.02 (0.95)
Region dummy			0.18 (0.50)
Adj. R2	-0.01	0.01	-0.03
F-test	0.03 (0.86)	1.37 (0.26)	0.63 (0.68)
White-test	0.44 (0.64)	0.88 (0.50)	0.54 (0.91)

658 Regression coefficient with p-values in parentheses, ** Significant at 5% level, * significant at 10% level

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661 Figure 1. Percentage of females in TMTs among sample companies (excludes zero values).

662 Figure 2. Percentage of female board membership among sample companies (excludes zero values).

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666 Figure 1. Percentage of females in TMTs among sample companies (excludes zero values).

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Figure 2. Percentage of female board membership among sample companies (excludes zero values).

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ⁱ DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on improving the gender balance among non-executive directors of companies listed on stock exchanges and related measures - <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012PC0614&from=EN>

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