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**The impact of women in management on organizational performance in project-based and non-project-based organizations**

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## **Abstract**

Project-based organizations face challenges of increasing skill shortages and risks of reducing competitiveness and performance. Leveraging female talent can create a competitive advantage and lead to positive organizational outcomes. Derived from the resource-based view of the firm and contingency theory, we predict that the impact of women in management and women in non-management on organizational performance will be stronger in project-based organizations than in non-project based organizations. Using a time-lagged research design and multi-source archival data from 932 for-profit organizations, the findings provide pioneering insights into differential impact of women's representation on organizational performance across the two levels in the organizational hierarchy and the two industry groups. For practitioners, the findings suggest that project-based organizations may need to consider how they increase their innovative capacity and address gender imbalances to capitalize on gender diversity benefits for organizational outcomes.

*Keywords:* Women in management; Organizational performance; Project-based; Non-project-based; Resource-based view.

## **1. Introduction**

A large and growing number of organizations across multiple industries organize by projects to conduct their business (Bredin, 2008; Crawford et al., 2013; Lindgren and Packendorff, 2006). Those project-based organizations (PBOs) have emerged as ideal organizational structures to deal with complex and fast-changing business and economic environments, characterized by the increasing competition of globalized financial, product, supply, and labor markets, as well as rapidly changing technologies (Hatcher et al., 2013; Hobday, 2000). The unique nature of PBOs relying on their flexible structure (Bredin, 2008; Davies and Hobday, 2005), predetermined project resources, a highly versatile workforce (Andersen, 2008; Chasserio and Legault, 2010; Child and McGrath, 2001; Legault, 2005), innovative project-based management practices (Buckle and Thomas, 2003; Hobday, 2000), and the ability to leverage existing intellectual assets, plays a critical role in projects and organizational performance (Andersen, 2008; Handzik et al., 2016; Ekrot et al., 2016).

PBOs often employ a large percentage of the skilled workforce and have a significant impact on countries' employment and overall economic performance (Hobday, 2000; DeFillippi and Arthur, 1998; Lindkvist, 2004). However, with a growing demand for skilled labor, PBOs are increasingly challenged by skill shortages (Goldman Sachs JBWere, 2009; PMI, 2017). These skill shortages pose a significant risk (PMI, 2017) to their competitiveness on a national and international scale (Miller and Shamsie, 1996; Toohey et al., 2009). Gender diversity may be the answer to skill challenges in those organizations (Goldman Sachs JBWere, 2009), offering a positive source of competitiveness and improved organizational performance (Catalyst, 2013; Ernst and Young, 2013; Ali et al., 2011; Frink et al., 2003). However, little is known about whether women's representation provides a stronger or weaker competitive advantage to these organizations compared to non-PBOs (Ali et al., 2011; Peretz et al., 2015). Research shows that employing the "soft skills" distinctive to women is required for success in project management in project industries (Chasserio and Legault, 2010; Debourse and Archibald, 2012; Lloyd-Walker and Walker, 2011). Indeed, French et al. (2014) suggest that PBOs are the best candidates to

benefit from gender diversity due to their reliance on skilled labor and team cohesiveness for best-performance outcomes.

Gender diversity–performance relationship research has mainly been conducted in non-PBOs (e.g. Dezsö and Ross, 2012; Dwyer et al., 2003; Francis et al., 2009; Joecks et al., 2013) or across industries (e.g. Ali et al., 2011; Frink et al., 2003; Nakagawa, 2014; Vafaei et al., 2015). Thus, the necessary understanding of the specific conditions under which women’s representation may provide a stronger or weaker competitive advantage in PBOs vs. non-PBOs is still lacking (Ali et al., 2011; Peretz et al., 2015). Jackson et al. (2003) and Joshi and Roh (2009) propose considering the effect of organizational context as a moderator in the diversity–performance relationship. Studying the moderating effect of context such as industry type (Ali et al., 2011; Richard et al., 2007; Joshi and Roh, 2009) may help refine past studies to achieve a “more precise and specific understanding” of the primary gender diversity–performance relationship (Rosenberg, 1968, p. 100).

This study aims to help refine the findings of past gender diversity–performance research and provide a better understanding of the effects of organizational context, as represented by project-based and non-project-based industries on the women’s representation–performance relationship. Therefore, this study makes four important contributions. First, it investigates the impact of women’s representation on organizational performance and offers a pioneering insight into the impact of women in management and non-management on performance. Second, we refine the positive findings of studies that propose that industry type (Ali et al., 2011; Richard et al., 2007; Joshi and Roh, 2009) moderates the benefits of gender diversity for performance (see Figure 1). Third, we address a critical research gap in the literature and respond to a call for more research exploring the importance of gender diversity in performance at the organizational level (Frink et al., 2003; Jackson et al., 2003; Richard et al., 2006). We add to this knowledge by showing that women’s representation at both the management and non-management levels can have a significant impact on organizational performance.

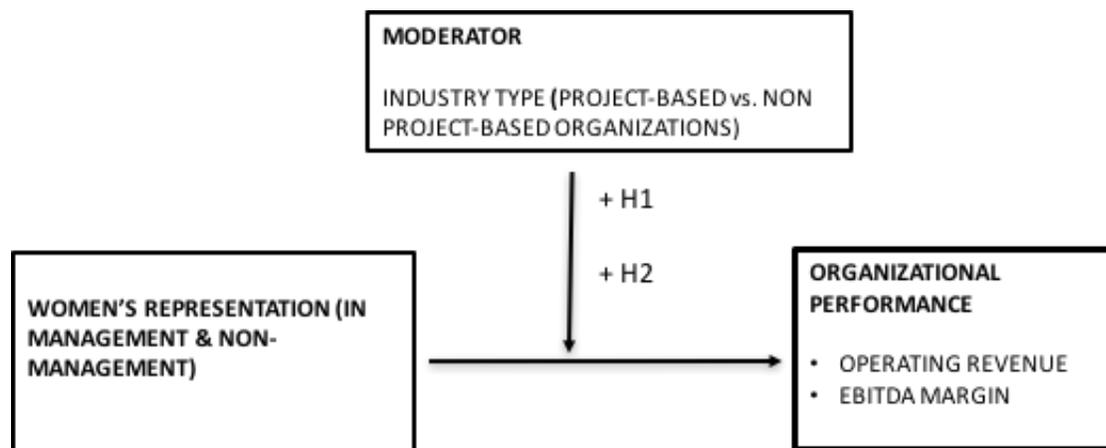


Fig. 1. Proposed model of women’s representation and organizational performance.

Fourth, the current study’s design helps strengthen the evidence behind women’s representation and the organizational performance link. The predictions are tested using organizations reporting to the Workplace Gender Equality Agency (WGEA) and data with a two-year time lag between women’s representation and organizational performance (Menard, 1991). The design allows the predictor to precede performance (Barney and Mackey, 2005). This study

also uses multiple data sources, comprising WGEA archival reports and ORBIS financial data, which enhances internal validity. It also uses two performance measures – operating revenue and the earnings before interest, taxes, depreciation, and amortization (the EBITDA margin) – enhancing construct validity of the outcome measure (Lumpkin and Dess, 1996).

## **2. Literature review and hypotheses**

### *2.1. Background and context*

While representing a prominent share of the workforce (45.8%) in Australia, women make up low numbers in most project-based industry sectors (WGEA, 2015). For instance, the Australian construction industry – the third highest employing sector of the economy at 10% and fourth fastest growing industry at an average annual growth of 4.8% for the past two decades – is one of the industries with the lowest participation rate of women at a total of 11.7% (Australian Trade Commission, 2015; WGEA, 2015). Similarly, women represent: 13.7% of the workplace in mining; 27.3% in manufacturing; 37.6% in information, media, and technology; and 42.5% in professional, scientific, and technical services (WGEA, 2015). All these industries are project-based (Martinsuo et al., 2006). This indicates a high degree of horizontal segregation, which measures the extent of difference within occupations (Blackburn et al., 2002).

Moreover, there are only 3% of women CEOs and 12% of women managers in construction, only 2.8% of women CEOs and 16.3% women managers in mining, and similarly low numbers of women CEOs and managers in: manufacturing; information, media, and telecommunications; and professional, scientific, and technical services (WGEA, 2015). This indicates that there is also a high degree of vertical segregation (women holding lower status and lower pay in organizations) in those industries (Blackburn et al., 2002; WGEA, 2015).

In Australia, the workplace equality legislation aiming to help eliminate discrimination and build equal opportunity for women was first introduced in 1986 as the *Affirmative Action (for Women) Act 1986* and later amended in 1999 to the *Equal Opportunity (for Women in the Workplace) Act*. In 2012, this was replaced by the *Workplace Gender Equality Act 1999* (the Act), tasked with advancing workplace gender equality to achieve outcomes for both women and men and improve the productivity and competitiveness of Australian business (WGEA, 2016).

### *2.2. Theoretical underpinning and hypotheses development*

Theory suggests that leveraging female talent creates a competitive advantage and can lead to positive organizational outcomes. For example, the resource-based view (RBV) of the firm (Barney, 1991) suggests positive outcomes for performance through creativity and innovation (McMahan et al., 1998). It advocates that diversity is likely to provide a broad range of skills, perspectives, and insights, resulting in increased group creativity, problem-solving abilities and, therefore, better organizational performance outcomes (Cox, 1993; Cox and Blake, 1991; Ely, 2004; Page, 2007; Thomas and Ely, 1996). Employees with a wide range of ideas and perspectives offer a wide range of solutions in decision-making (Cox and Blake, 1991). Barney (2001) argues that resources such as employees' diverse skills, experiences, and perspectives cannot be easily replicated and therefore present a significant source of sustained competitive advantage. Consequently, organizations benefit from these unique resources, gaining a competitive advantage exhibited in improved organizational performance (Barney, 1991).

Similarly, empirical research suggests that leveraging female talent creates a competitive advantage and improves organizations' financial performance (Catalyst, 2013; Ernst and Young, 2013; Joecks et al., 2012, McKinsey and Company, 2012, 2014). For example, McMillan-

Capehart (2003) demonstrates a positive relationship between organizational gender diversity and organizational performance, specifically in return on equity.

In addition, the importance of soft skills in projects is on the increase as the research into project manager competencies (Ireland, 2004), leadership styles (Turner and Muller, 2005), and project critical success factors reveals their impact (Azim et al., 2010). The soft skills include skills in: communication, teamwork, leadership, conflict management, negotiation, professionalism, and ethics (Azim et al., 2010). In complex business environments project managers/practitioners can't solely rely on the hard skills of linear, rational, and hard systems approaches to manage projects, but rather they should adapt to a more flexible approach through adding soft skills to successfully accomplish projects (Azim et al., 2010). For instance, Frink et al. (2003), who conducted two organizational-level empirical studies, demonstrated that an organization's performance is greatest when gender diversity is maximized (50% women's representation).

### *2.2.1. The moderating effects of industry type*

Researchers have utilized the contingency approach to investigate the impact of diversity on performance. Contingency theory allows researchers to examine factors that interact with diversity (Neale et al., 1999; Richard and Johnson, 1999). Following this approach, and based on organizational contingency theory (Galbraith, 1973), we propose that the impact of women's representation on organizational performance may be contingent on industry type. In this study, we argue that the positive effects of women's representation in management and non-management on organizational performance will be stronger for PBOs and weaker for non-PBOs. We base this argument on the differences offered by PBOs in contrast to non-PBOs, including a more flexible project-based operational structure (Bredin, 2008; Davies and Hobday, 2005), innovative project-based management practices (Buckle and Thomas, 2003; Hobday, 2000), and a highly autonomous and versatile workforce with the decision-making power in the hands of project managers (Chasserio and Legault, 2010; Child and McGrath, 2001; Legault, 2005).

Due to their project-based operational structure and team-based flexible working environment, PBOs can thrive in complex and dynamic business and economic environments (Hatcher et al., 2013; Hobday, 2000). Together with the benefits of knowledge, innovation, creativity, and effective decision-making in the face of uncertainty and risk, PBOs have potential to foster competitiveness, leading to higher performance (Grant, 1991; Söderlund and Bredin, 2006). The value of the resources in multi-functional and gender-diverse project teams (e.g. management style, perspectives, risk profile in decision-making, market insight, innovation, etc.) may be higher in PBOs, improving their competitive advantage (Ali et al., 2011). In contrast, non-PBOs organized around more permanent structures form teams around areas of responsibility and competence (Arvidsson, 2009), which may lead to less competitiveness.

Further, project management in PBOs continues to be practiced with financial measures driving the company's direction (Dyson and Berry, 1998; Meredith and Mantel, 2005). Research in economic psychology suggests that women are more risk-averse than men and that they adopt different strategies in their financial decision-making (Powell and Ansic, 1997; Francis et al., 2009). The individual-level gender differences aggregate through group composition to create systematic differences in organizational-level outcomes and, as such, a gender-diverse team, like a management team, may be less susceptible to groupthink and may make better financial decisions (Opstrup and Villadsen, 2014), leading to better performance.

The empirical research on diversity supports the argument that industry type affects the strength of the relationship between women's representation and performance (Ali et al., 2011). For example, Ali et al. (2011) found that industry environment can reinforce or reduce the effects of gender diversity on organizational performance. Therefore, we argue that industry type may affect the strength of the relationship between women's representation and performance. Specifically, the positive effects of women's representation will be stronger for PBOs and weaker for non-PBOs, as predicted by the RBV of the firm.

### *2.2.2. Impact of women in management on performance*

Recent research has widely examined the diversity–creativity and innovation link at the level of organizational performance, though without conclusive results (Kirton et al., 2016). The research conducted at the workgroup/team level is particularly relevant to PBOs where work is organized in teams (Crawford et al., 2013; Hobday, 2000; Kirton et al., 2016) and where innovation and creativity represent critical competencies (Hobday, 2000; Buckle and Thomas, 2003). Team members will offer a variety of skills and, due to high interdependencies in teams, successful outcomes depend upon team cohesiveness (Kirton et al., 2016). The RBV of the firm (Barney, 1991) suggests positive outcomes of diversity on performance through creativity and innovation, driven by a combination of different skills, perspectives, and backgrounds (Bassett-Jones, 2005; Danilda and Thorslund, 2011; Egan, 2005; Latimer, 1998). The resources of creativity, innovation, and better problem-solving are also particularly valuable at the management level as their impact can be reflected in organizational performance (Cordeiro and Stites-Doe, 1997; Shrader et al., 1997). For example, having more women in management can introduce different thinking patterns and strategies, more creative idea generation and, as a result, can lead to more innovative organizations (Díaz-García et al., 2013; Marinova et al., 2010; Østergaard et al., 2011). In turn, higher levels of innovation and creativity at the management level can improve organizational performance (Ali et al., 2015; Mintzberg, 1973).

In addition, men and women bring different perspectives that lead to different alternatives in decision-making (Egan, 2005; Rogelberg and Rumery, 1996). Effective decisions affect organizational performance (Dean and Sharfman, 1996), especially in organizations set in competitive environments such as PBOs (Hobday, 2000; Richard et al., 2007). When varied decision alternatives are evaluated from multiple viewpoints by a gender-mixed management team, this leads to a better impact on organizational performance (Campbell and Mínguez-Vera, 2008). In PBOs, managerial competence together with power and responsibility in the hands of project managers is especially important to success and performance (Hobday, 2000; Hölze, 2010; Söderlund, 2005).

Further, it can be argued that the degree of gender diversity in management signals to employees at lower hierarchical levels that there is a supportive and inclusive diversity climate (Allen, 2001; Casper and Harris, 2008). Women employees become more motivated if they see women in management, indicating a viable promotion path (Dezső and Ross, 2012). They are also likely to feel more accepted, as different gender roles may seem more accepted in the organization (Guy and Newman, 2004), leading to higher levels of job satisfaction, less turnover, and therefore better organizational performance (Ali et al., 2015). This could be particularly true for PBOs relying on a knowledge-based, skilled workforce.

The positive effects of gender-diverse management teams have generally been supported by research (for a review, see Jackson et al., 2003). Studies have suggested that the “collective intelligence” of a team is strongly correlated with the proportion of women in the team, making

the team more effective (Williams et al., 2015). Adler (2009), in his study of United States (US) Fortune 500 companies over a 19-year period from 1980 to 1998, found a correlation between women in senior management and high profitability. He identified that firms most progressive in promoting women to high-level roles outperformed other organizations, with higher overall profits by 34% when calculated for revenue, 18% in terms of assets, and 69% when measuring equity. Further, according to Catalyst's (2004) study of US Fortune 500 companies with the highest representation of women on their top management teams, those organizations experienced better financial performance in terms of being 35.1% higher on return on equity and 34% higher on total return to shareholders, in comparison to organizations with the lowest women's representation. Similarly, studies of mid-management's impact on organizational outcomes found a positive relationship between their involvement in strategy and a firm's performance (Wooldridge and Floyd, 1990), pointing out that not only top management but all managers affect organizational performance. Therefore, we argue that a higher number of women in management in PBOs where diversity is still very low in contrast to most non-PBOs, is likely to deliver these gender diversity benefits and offer noticeable impact on performance. Thus, we hypothesize that:

**H1.** Industry type moderates the positive relationship between women in management and organizational performance such that the relationship will be stronger for PBOs and weaker for non-PBOs.

### *2.2.3. Impact of women in non-management on performance*

Further, based on the RBV of the firm (Barney, 1991), we also argue that more women at the non-management level in PBOs may lead to more positive work group processes (Ancona and Caldwell, 1992), creating resource value and competitive advantage, and leading to higher organizational performance (Cox and Blake, 1991). Nkomo and Cox (1996) suggest that diversity at the non-management level promotes better insight and understanding of the marketplace where employees deal directly with customers. This market insight can help increase sales to a gender-diverse set of customers, leading to improved organizational performance (Frink et al., 2003). In addition, more diverse non-management workgroups can offer more innovative business solutions based on having broader knowledge and experience, and approaching problems from a wider range of perspectives (Hoffman and Maier, 1961; DiTomaso et al., 2007).

As the organizational structure and management processes of PBOs differ from those in non-PBOs, it is reasonable to expect that the impact of women in non-management roles will also differ. For a workgroup to achieve a positive outcome of diversity, "its members must be able to interact productively and constructively and feed off each other's strengths" (Opstrup and Villadsen, 2014, p. 294). Compared with men, women's cognitive style tends to emphasize harmony that may lead to less conflict and more team cohesion and in turn to greater gender-mixed team dynamics, where the distinct strengths of each gender can be leveraged (Krishnan and Park, 2005; Opstrup and Villadsen, 2014). The higher number of women in non-management in PBOs where effective teamwork is critical (Hobday, 2000; Crawford et al., 2013; Yang et al., 2011), in contrast to the more traditional hierarchical structure of non-PBOs, is likely to deliver these gender diversity benefits and have a noticeable impact on performance. Thus, we argue that:

**H2.** Industry type moderates the relationship between women in non-management and organizational performance such that the relationship will be stronger for PBOs and weaker for non-PBOs.

### **3. Research methodology**

A time-lagged research design was used to test the moderating effects of industry type on the relationship between women in management and organizational performance, as well as women in non-management and organizational performance. This study uses archival data from the WGEA database and financial data from the ORBIS database, with a two-year time lag between women's representation and performance.

#### *3.1. Sample and data collection*

The population of this research comprises all Australian for-profit organizations with the sampling frame representing all organizations that reported on gender equality initiatives to WGEA in 2014 ( $N=4,355$ ). The data (obtained from the WGEA database) provided information on women's representation (at management and non-management levels) for the 2014 period. Organizational performance data were obtained from the ORBIS database, which holds financial information on private sector organizations in Australia. The 2014 WGEA data file was matched with financial data from the ORBIS database from 2016. The final sample comprised 932 organizations representing a diverse research sample in terms of size and industry. The sample organizations ranged in size from seven to 175,000 employees (mean  $n=930$ ). They represented 19 private sector industry groups from the Australian New Zealand Standard Industrial Classification (ANZSIC). PBOs represented 472 organizations (51% of total sample), and non-PBOs consisted of 460 organizations (49%). Women's representation in management in the sampled organizations ranged from 0% to 100% (mean  $n=26%$ ) and in non-management ranged from 0% to 100% (mean  $n=35%$ ). The choice of 2014 as the initial data point for women's representation allowed a time lag of two years between women's representation and organizational performance. A two-year time lag has been used in past research (e.g. Guest et al., 2003; Youndt et al., 1996) and was adopted here based on common practice in diversity and HR literature (e.g., Ali et al., 2015; Lavrakas, 2008). ORBIS data included organizational performance measured as employee productivity and financial profitability. Data on the control variable of organizational size and moderator variable of industry type were also downloaded from the ORBIS database.

#### *3.2. Measurement*

##### *3.2.1. Predictors: Women's representation at management and non-management levels*

Women's representation at each of the two levels was calculated as a percentage of the total number of employees at that level (data obtained from the WGEA reports). The management level was aggregated by including the following standardized occupational categories (WGEA, 2014): executives, senior managers, and other managers. The non-management level was aggregated by including: professionals, technicians and trade workers, community and personal service workers, clerical and administration staff, sales staff, machinery operators and drivers, laborers, and others. The non-management categories mirror the major groups in the ANZSCO (Australian and New Zealand Standard Classification of Occupations) classification structure from the Australian Bureau of Statistics (WGEA, 2014). All full-time roles (including permanent and contract roles) were combined to account for full-time roles

overall per category. Part-time roles were converted into full-time equivalent by dividing them by two.

### 3.2.2. *Outcomes: Organizational performance*

The dependent variable is organizational performance, as measured by operating revenue and profitability. Veen-Dirks (2010) argues that a single organizational performance measure does not reflect the effectiveness of different functions of employees in an organization, hence this study used two independent performance measures as outcomes: a) the operating revenue as a direct measure of operating performance; and b) the EBITDA margin as a percentage of total revenue as a direct measure of organizational profitability. The operating revenue measure was selected as a performance measure of the organization's productivity. The operating revenue (in millions of Australian dollars) reflects the organization's employee performance impact (Ali et al., 2011; McMillian-Capehart and Simerly, 2008) and was also sourced from the ORBIS database. The EBITDA margin reflects organizations' profitability (Ali et al., 2015). EBITDA margin data (in millions of Australian dollars) were also obtained from the ORBIS database.

### 3.2.3. *Controls: Organizational size*

The analyses were controlled for the effects of organizational size on organizational performance. Aldrich and Auster (1986) found that small organizations may have a reduced ability to cope with governmental requirements and may be less able to compete with large organizations for labor, which may affect women's representation (Mightly, 1996). Further, due to economies of scale, large organizations have more potential for larger profits (Ali et al., 2011) and they may also be able to develop a broader range of gender-diversity initiatives (Osterman, 1995). Data on organizational size were obtained from the ORBIS database. Consistent with previous research, organizational size was operationalized as the total number of employees (e.g. Alexander et al., 1995).

### 3.2.4. *Moderator: Industry type*

The 19 private sector industry groups based on ANZSIC codes of the sample organizations were categorized into PBOs and non-PBOs. Accordingly, a dummy variable called "Industry type" was created, with "1" representing PBOs and "0" representing non-PBOs. Following Martinsuo et al. (2006), the PBOs include industry groups such as: mining; construction; professional, scientific, and technical services; manufacturing; and information, media, and telecommunications. In contrast, the non-PBOs include all other industries: wholesale trade; retail trade; electricity, gas, water, and waste services; education and training; accommodation and food services; rental, hiring, and real estate services; agriculture, forestry, and fishing; transport, postal, and warehousing; financial and insurance services; health care and social assistance; public administration and safety; arts and recreation services; administrative and support services; and other services.

## 4. Results and analysis

Table 1 presents the means, standard deviations, and correlation coefficients for all study variables.

Table 1

Means, standard deviations, and correlations.<sup>a</sup>

Variable	Mean	SD	1	2	3	4	5
<b>Controls</b>							
1. Organization Size	930.70	5976.63					
<b>Predictors</b>							
2. Women in Management	26.35	20.67	.05				
3. Women in Non-Management	35.37	22.28	.04	.77**			
<b>Moderator</b>							
4. Industry (1=PBOs; 0=Non-PBOs)	.51	.50	-.05	-.32**	-.38**		
<b>Outcomes</b>							
5. Operating Revenue	428531.82	2313592.50	.91**	.01	.00	-.00	
6. EBIDTA margin	9.42	14.72	.01	.05	.05	-.01**	.03

n = 932, <sup>a</sup> 2-tailed; \*  $p < .05$ , \*\*  $p < .01$

We used hierarchical multiple regression to test our hypotheses. The predictor variables (women in management and women in non-management) were centered (only for regression analysis presented in Table 2) to reduce multicollinearity with the interaction terms (Aiken and West, 1991). The interaction terms of women in management x industry and women in non-management x industry were created to test the hypotheses.

#### 4.1. Industry type as a moderator on the positive relationship between women in management and organizational performance

H1 proposed that the positive effects of women in management on organizational performance would be stronger in PBOs and weaker in non-PBOs. To test H1, operating revenue of the two industries was separately regressed on women in management and women in non-management. Control variables were entered in step 1, followed by women in management and women in non-management in step 2; and industry, women in management x industry and women in non-management x industry were entered in Step 3 (see Table 2). The results shown in Table 2 indicate that the interaction term women in management x industry had a significant positive effect on operating revenue ( $\beta = .09, p < .001$ ). In addition, the hierarchical multiple regression procedure was repeated to test the EBITDA margin of the two industries (see Table 2 under EBITDA margin 2016). The results shown under Model 3 in Table 2 indicate that the interaction term women in management x industry had a significant positive effect (Model 3:  $\beta = .13, p < .05$ ) on the EBITDA margin.

Table 2  
Hierarchical regression analyses.<sup>a</sup>

Variable	Women in Management 2014 predicting Operating Revenue 2016			Women in Non-Management 2014 predicting EBITDA margin 2016		
	Hypothesis 1			Hypothesis 2		
	$\beta$ (Model 1) <sup>b</sup>	$\beta$ (Model 2)	$\beta$ (Model 3)	$\beta$ (Model 1)	$\beta$ (Model 2)	$\beta$ (Model 3)
<b>Controls</b>						
Organization Size	.91***	.91***	.91***	.01	.00	.00
<b>Predictors</b>						
Women in Management		-.02	-.08**		.03	-.06
Women in Non-Management		-.01	.03		.03	.03
<b>Moderator</b>						
Industry			.03*			-.08*
<b>Interaction terms</b>						
Women in Management x Women in Non-Management			.09***			.13*
			-.06*			-.05
$R^2$	.83	.83	.83	.00	.00	.01
$F$	4519.60***	3.88*	5.34**	.11	1.26	3.85**
$\Delta R^2$	.83	.00	.00	.00	.00	.01
$F$ for $\Delta R^2$						

<sup>a</sup>  $n = 931$  (operating revenue), 925 (earnings before interest and tax); <sup>b</sup> Standardized coefficients are reported  
\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

We plotted the effect of women in management 2014 on operating revenue 2016, as well as on EBITDA margin 2016 in both types of industries. Figure 2 presents separate regression lines for PBOs and non-PBOs for operating revenue. The relationship between women in management 2014 and operating revenue 2016 was positive and significant ( $b = 8374, p < .05$ ) for PBOs (more women in management led to higher operating revenue in PBOs). The relationship between women in management 2014 and operating revenue 2016 was negative and significant ( $b = -8891, p < .01$ ) for non-PBOs (more women in management led to lower operating revenue in non-PBOs).

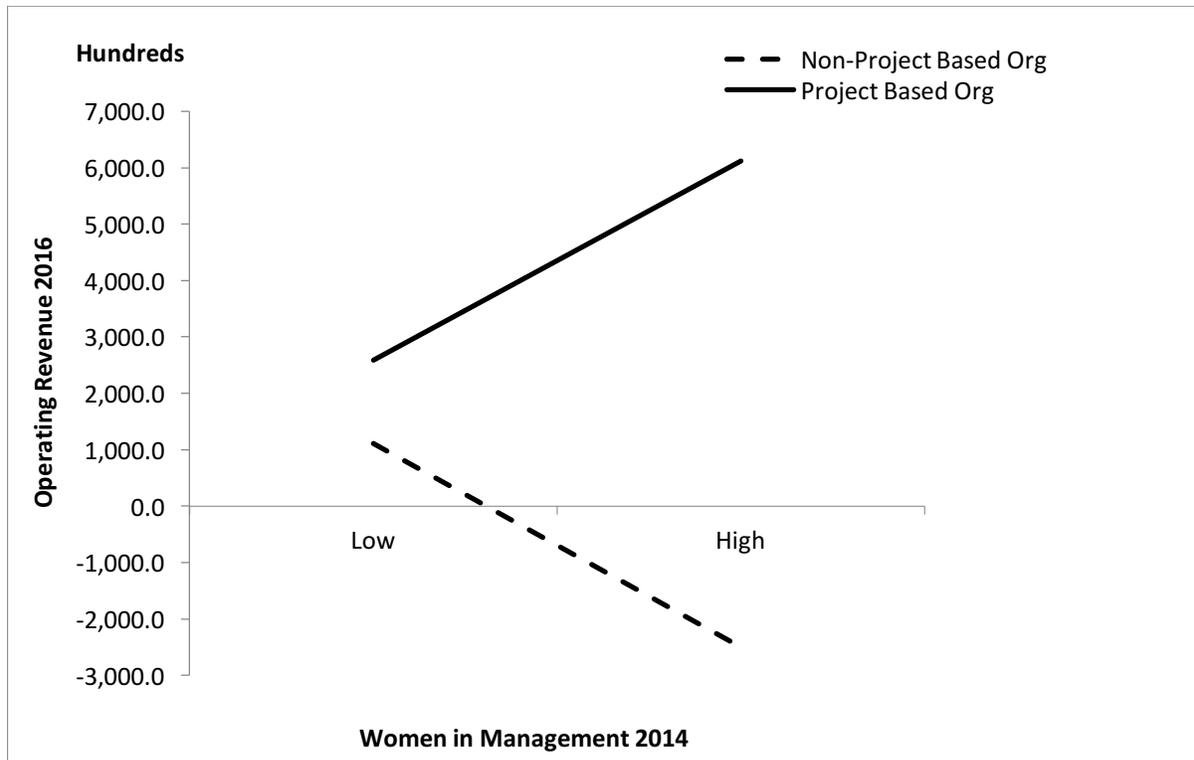


Fig. 2. Moderating effect of industry on operating revenue.

Figure 3 illustrates separate regression lines for PBOs and for non-PBOs for EBITDA. The relationship between women in management 2014 and EBITA margin 2016 in PBOs was positive (more women in management led to a higher EBITDA margin in PBOs) and significant ( $b = .1147, p < .05$ ). This relationship was negative but non-significant for non-PBOs ( $b = -.0418, n.s.$ ).

The significant positive relationship between women in management 2014 and operating revenue 2016 in PBOs, as well as between women in management 2014 and EBITDA margin 2016 in PBOs was consistent with H1. Thus, we found partial support for H1.



Fig. 3. Moderating effect of industry on EBIDTA margin 2016

#### 4.2. Industry type as a moderator on the positive relationship between women in non-management and organizational performance

H2 proposed that women in non-management would be more strongly related to organizational performance in PBOs and more weakly related to organizational performance in non-PBOs. The results shown in Table 2 indicate that the interaction term women in non-management x industry had a significant negative effect on operating revenue ( $\beta = -.06, p < .05$ ). The results also indicate that the interaction terms women in non-management x industry did not have a significant effect on the EBITDA margin.

We plotted the effect of women in non-management 2014 on operating revenue 2016 in both types of industries. Figure 4 presents separate regression lines for project-based and non-PBOs. The relationship between women in non-management 2014 and operating revenue 2016 was negative and significant ( $b = -7117, p < .05$ ) for PBOs (more women in non-management led to lower operating revenue). The relationship between women in non-management 2014 and operating revenue in 2016 was positive but not significant ( $b = 3382, n.s.$ ) for non-PBOs. Thus, no support was found for H2.

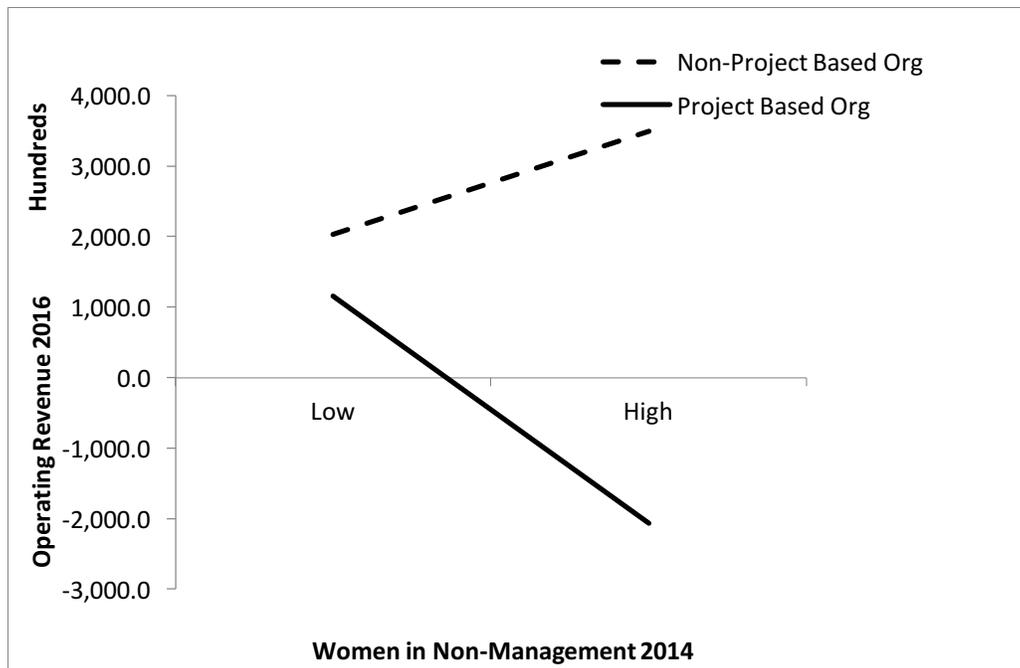


Fig. 4. Moderating effect of industry on operating revenue

## 5. Discussion

The main objective of this study was to investigate whether the relationship between women's representation and organizational performance changes in different types of industries. We set out to test the following effects expecting the relationships to be stronger in PBOs and weaker in non-PBOs: women in management on organizational performance, and women in non-management on organizational performance. The results of this study provide some evidence for these relationships.

Most importantly, our findings provide pioneering evidence for positive effects of more women in management on both operating revenue and EBITDA margin in PBOs. We also found that the effect of women in management on operating revenue was negative in non-PBO. These results support organizational contingency theory (Galbraith, 1973) and our argument that PBOs are best positioned to capitalize on the benefits of increased representation of women because of the greater value in creativity and innovation achieved through mixed teams. More women managers deliver a competitive advantage, leading to improved organizational outcomes (World Economic Forum, 2017). Due to the project-based operational structure and team-based working environment in PBOs, more women in management ranks represent a more valuable resource due to the high level of skills and qualifications, multiple perspectives, market insights, and management styles – all having a positive impact on decision-making (Dezsö and Ross, 2012; Marinova et al., 2010; Opstrup and Villadsen, 2014), leading to better performance.

The significant negative impact of women's representation in management on operating revenue in non-PBOs may be explained by the industry gender composition being out of balance in those organizations. Non-PBO workplaces, such as health services and education, are often dominated by women (WGEA, 2015). As shown in previous studies (Ali et al., 2011; Knouse and Dansby, 1999) any gender imbalance can lead to negative psychological effects of gender diversity, as predicted by self-categorization and social identity theories (Tajfel, 1978; Turner, 1987). Women and men may categorize themselves into psychological gender groups (Kanter, 1977b), leading to the inter-group dynamics that, in turn, can produce undesirable employee behavior such as decreased communication (Kravitz, 2003) and increased conflict (Pelled, 1996). In addition, more women in management in non-PBOs may be seen as a power threat to men (Allport, 1954; Blalock, 1967), increasing the perceived economic competition (Blalock, 1967) and inter-group conflict (Williams, 1947), and leading to in-group-out-group dynamics, further lowering performance. For instance, Brown et al. (2009) found that increased representation of women led to lower perceived organizational effectiveness. Ali et al. (2011) identified the "tipping point" of gender diversity (equivalent to 28/72 gender diversity), beyond which the diversity-performance relationship becomes negative and organizations risk losing the benefits of the positive effects of gender diversity predicted by the RBV of the firm.

At the non-management level in PBOs, the significant negative relationship between women's representation and operating revenue may be explained by women being clustered in low power and status positions. Women in non-management roles in PBOs largely fulfill support, administrative, and sales roles (French and Strachan, 2015) and therefore have limited input into organizational financial and operational decision-making (Mintzberg, 1973; Tengblad, 2006). In her study, Ely (1995) found that role stereotyping based on the social construction of gender roles can lead to lost benefits of gender diversity.

Another possible explanation for these findings may be the diversity climate. For example, French and Strachan (2015, p.14) found that gender diversity policies implemented in the Australian construction industry "are minimal in design; implementation and outcomes." Most of the implemented policies focused on fulfilling of legislative responsibilities, particularly related to overcoming discrimination and harassment, and policies encouraging flexibility and inclusivity in the organization of work of both men and women (French and Strachan, 2015). Therefore, the diversity climate, represented by "employee behaviours and attitudes that are grounded in perceptions of the organization context related to women and minorities" (Mor-Barak and Cherin, 1998, p.83), will vary in those industries. Yet, diversity climate affects employees' organizational loyalty (Jauhari and Singh, 2013), attachment (Gonzalez and DeNisi, 2009), job satisfaction (Hofhuis et al., 2012), and performance (McKay et al., 2007), and provides strong behavioral guidelines for employees and managers. A positive diversity climate suggests positive diversity-related attitudes and behaviors that are expected, supported, and rewarded in the organization (Mor-Barak and Cherin, 1998). It signals to employees that the organization values the contributions of all members and relies on their full inclusion to be successful (Kossek and Zonia, 1993; Mor-Barak and Cherin, 1998; Nishii, 2013). However, negative group processes, such as stereotyping, subgroup formation, relationship conflict, and discrimination stemming from similarity/attraction, self-categorization, and social identity-based processes, can hinder performance (Byrne, 1971; Tajfel and Turner, 1986). For example, French and Strachan (2015) found that both women and men in project organizations identified that women are still experiencing different treatment as well as different recognition in terms of pay and rewards. These potentially unfair and discriminatory outcomes for women may weaken

social integration, increase relationship conflict, and reduce communication, cooperation, and cohesion, causing dissatisfaction and disengagement and therefore reduced performance (Boehm et al., 2014). As French et al. (2014) found, building a diversity climate is not a primary concern in project organizations and equality policies are not well established or well regarded. Diversity studies have shown that when values that support the diversity programs conflict with the practices that guide employees' and managers' behavior in the workplace employees are likely to withdraw psychologically and behaviorally from their organization, leading to negative outcomes such as absenteeism and turnover that negatively affect performance (Ekrot et al., 2016; Peretz et al., 2015).

Further, having only a few gender-based work–life programs that are specifically important to women in non-managerial roles signals to employees that the organization has an unsupportive diversity climate (Ali et al., 2015). This negative diversity climate can lead to reduced performance due to relationship conflicts (Jehn et al., 1999), communication problems, and difficulties in working together (Alagna et al., 1982). It can also lower task and team cohesion (Shapcott et al., 2006) as predicted by self-categorization and social identity theories.

### *5.1. Major theoretical implications and future research*

The study's results have important theoretical and research implications. This is a pioneering study that provides evidence for the moderating effect of industry type (PBOs v. non-PBOs) on the relationship between women's representation and organizational performance. This highlights the value of applying a contingency approach to investigating the impact of women's representation on performance, aiming for a theoretical explanation of the distinctive impacts of diversity in different industries. The results support organizational contingency theory (Galbraith, 1973) and suggest that the impact of women's representation on organizational performance may be contingent on industry type. Moreover, the results support the integration of contingency theory with the RBV of the firm to propose the processes through which women's representation at management level can lead to stronger performance (Barney, 1991; Galbraith, 1973). The support found for this relationship reinforces the argument that contingency theory can be used in various contexts and with other theories.

The findings can also help refine the RBV of the firm. The valuable resources offered by women in management in PBOs provide a competitive advantage that leads to improved organizational performance. Hence, this study helps to further advance our understanding of the resource-based theory (Cox and Blake, 1991; Galbraith, 1973; Tajfel, 1978; Turner, 1987) and refine previous findings in gender diversity research.

The study findings also address a critical research gap: the limited research exploring the importance of gender diversity on performance at the organizational level (Frink et al., 2003; Jackson et al., 2003; Richard et al., 2006). We add to this research by showing that gender diversity at management levels can have a significant impact on organizational performance. This is particularly true for less gender-diverse organizations, such as PBOs, where creativity, innovation, and better decision-making in projects are valued and necessary for competitive advantage (Chasserio and Legault, 2010; Lloyd-Walker and Walker, 2011).

Further, the study's design helps strengthen the evidence behind women's representation and the organizational performance link. It examines multiple organizations and uses multiple data sources (WGEA archival reports and ORBIS financial data) which enhances internal validity. It also uses two performance measures – operating revenue and the EBITDA margin –

enhancing construct validity of the outcome measure (Lumpkin and Dess, 1996) and providing rigor in diversity–performance studies.

Future research could benefit from investigating why more women in non-management levels in PBOs leads to weaker organizational performance. Further, the effects of diversity climate (affecting satisfaction and performance) could be a possible moderator on the women’s representation–organizational performance relationship (French and Strachan, 2015; Mor-Barak and Cherin, 1998). Adopting a qualitative study, future research could also investigate why increased women’s representation does not appear to strengthen organizational performance at non-management levels in PBOs. Moreover, future research could also explore whether the findings of this study generalize to organizations in other industries and to other national contexts. Australia is a moderate to high masculine country (Ali et al., 2015), so results may be different in extremely low masculine countries, such as Denmark, the Netherlands, Norway, and Sweden (Hofstede, 2001).

### *5.2. Practical implications*

From a practical standpoint, the study offers important implications for organizational competitiveness and performance. Investigating PBOs where occupational gender segregation is high and gender-diversity initiatives are relatively limited, our study further refines prior empirical research highlighting the benefits of gender diversity. This is particularly important and timely for PBOs facing the challenges of skill shortages that affect their competitiveness and performance (Smyth and Pryke, 2009). Thus, for both line and HR managers, gender diversity in PBOs could be a clear business objective. They may be able to emphasize the potential contribution of more women in management to organizational outcomes and design their workplace gender equality strategies and policies in a way that signals the importance of promoting women to senior roles and to increase women’s representation in management.

Our study also highlights the role of stereotyping and discrimination in the link between women’s representation in non-management and performance in PBOs. For managers, this finding is important because it sheds additional light on the destructive outcomes of such behavior and the question of how to prevent it in project-based workplaces. For companies, perceptions of stereotyping and discrimination continue to be relevant in practice as they often lead to costly lawsuits, ruined public images, and severe losses in organizational morale (Hicks-Clarke and Iles, 2000; James and Wooten, 2006; Pruitt and Nethercutt, 2002).

Further, managers may be able to minimize conflict or lack of cohesion within non-management project teams and maximize creativity and problem-solving abilities by focusing on the importance of different leadership approaches for different groups in projects (French et al., 2014). This highlights the importance of training project leaders and managers in the significance of team dynamics specific to encouraging inclusivity and communication in teams to ensure cohesion and better outcomes. In addition, introducing supportive and comprehensive work–life initiatives and diversity programs for non-management employees can lead to improved job commitment and satisfaction (Allen and Montgomery, 2001; Thompson et al., 1999), and therefore potentially higher organizational performance (Ali et al., 2015).

### *5.3. Study limitations*

This research has limitations worth noting. The research does not provide direct support to the RBV of the firm. Rather, it used the RBV of the firm to derive testable predictions (Barney and Mackey, 2005). A direct test of the RBV of the firm would measure the value, rarity,

imitability, and non-substitutability of the intangible resources resulting from gender diversity and their impact on processes and/or performance (Henderson and Cockburn, 1994; Barney, 2001). The processes of decreased communication, lack of cohesion and cooperation, and increased conflict are best measured at the group level (Alagna et al., 1982; Jehn et al., 1999; Shapcott et al., 2006) vs. organizational level. In addition, the study could not control for the effects of other forms of diversity, such as racial and ethnic diversity, as the sample organizations (organizations reporting to WGEA) are not legally required to capture this data. However, Australian organizations have low levels of racial and ethnic diversity (Australian Bureau of Statistics, 2016) and therefore those diversity forms are unlikely to affect the study results.

## **6. Conclusion**

Overall, this study contributes to our knowledge of the effects of industry on the women's representation–organizational performance relationship. For continued strong competitive and economic performance, PBOs may need to consider how they increase their innovative capacity and address the occupational gender imbalances at the industry and organizational levels to take advantage of the diversity benefits for positive organizational outcomes.

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