

## **Structural Ambidexterity vs. Contextual Ambidexterity: Preliminary Evidence from Malaysia**

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**Abstract:** Structural and contextual ambidexterity have dominated the discussion on organisational ambidexterity where the similarities and differences between them are being emphasised. One of the critical views is that although, both of them are essential, the impacts on performance may be dissimilar. Since, there are fewer empirical studies been done to demonstrate this view, this study aims to compare and contrast the effects of structural ambidexterity and contextual ambidexterity on the firms' performance of New Product Development (NPD). This study is examined in the case of manufacturing sector in Malaysia. The data was collected via a questionnaire survey targeting product and production managers and processed with SPSS v.19 statistical technique. The results of correlation and linear regression analyses have shown that structural ambidexterity and contextual ambidexterity are indeed dissimilar in their effects on NPD performance but at the same time are complementing each other. It is concluded that both of them are important but must be applied according to the right contexts. This also implicates that organisational ambidexterity should have both direct and indirect link to firm performance. Since, this is a preliminary study more empirical works need to be done to generalise the findings.

**Key words:** Contextual ambidexterity, manufacturing sector of Malaysia, NPD performance, preliminary study, structural ambidexterity

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### **INTRODUCTION**

This study was an empirical extension of the conceptual paper published recently focusing on the relationships between organisational ambidexterity and New Product Development (NPD) performance (Zaidi and Othman, 2014). According to the researchers, previous studies that have empirically compared and contrasted between structural ambidexterity and contextual ambidexterity on NPD performance are still low. For instance while studies on organisational ambidexterity have been performed in Malaysia, the focus was not specific on structural ambidexterity vs contextual ambidexterity. Therefore, an empirical research to investigate the effects of structural ambidexterity and contextual ambidexterity on NPD performance of manufacturing firms in Malaysia is crucial to minimise the research gap. Since, most topics on organisational ambidexterity are still dominated by the fundamental issues and discussions, instead of going for a full scale of empirical research, this study takes a preliminary action as an attempt to understand the effects of structural ambidexterity and contextual ambidexterity on NPD

performance for the benefits of future study. It is also hoped that the results would be able to signify the links (either direct or indirect) between organisational ambidexterity and firm performance for the benefit of theoretical development.

**Problem statement, research question and objective:** This study was motivated by the following three issues. First, the common measures for organisational ambidexterity with the interaction term of explorative and exploitative NPD (He and Wong, 2004) was inappropriate to measure neither structural ambidexterity nor contextual ambidexterity (Zaidi and Othman, 2014) as they have completely different characteristics and ways of creating balance (Birkinshaw and Gibson, 2004). As such, it would be important to measure them according to their special characteristics but few empirical studies have actually done that. Second, due to the number of empirical studies comparing and contrasting between structural and contextual ambidexterity on NPD performance is still uncommon, less that we know how does they faired together on NPD performance. Third, although, the mainstream literature of organisational

**Table 1: Structural ambidexterity vs contextual ambidexterity (Birkinshaw and Gibson, 2004)**

Characteristics	Structural ambidexterity	Contextual ambidexterity
How is ambidexterity achieved?	Alignment-focused (exploitation) and adaptability-focused (exploration) activities are done in separate units or teams	Individual employees divide their time between alignment-focused (exploitation) and adaptability-focused (exploration) activities
Where are decisions made about the split between alignment and adaptability?	At the top of organisation	On the front line by salespeople, plant supervisors, office workers
Role of top management	To define the structure, to make trade-off between alignment and adaptability	To develop the organisational context in which individuals act
Nature of roles	Relatively clearly defined	Relatively flexible
Skills of employees	More specialists	More generalists

ambidexterity has described structural ambidexterity and contextual ambidexterity as being complementary in nature (Gibson and Birkinshaw, 2004) still they can also be contradicting each other (He and Wong, 2004). With these issues in mind, it would be crucial to address the problem of how can structural ambidexterity and contextual ambidexterity be complemented in one time but contradicted in another time? As a respond to the question of this problem, the objective of this study is to investigate the effects of structural ambidexterity and contextual ambidexterity on NPD performance where they can be compared and contrasted.

#### **Structural ambidexterity vs contextual ambidexterity:**

Ambidexterity refers to the ability to use both hands with equal skill. In organisational context, it refers to the firm's ability to simultaneously deploy explorative and exploitative NPD (Luzon and Pasola, 2011) as they need coordination and integration to create value (Teece, 2007). In the context of this study, organisational ambidexterity is defined as a firm's ability to simultaneously exploit existing products with known knowledge and explore new product with unfamiliar knowledge (Andriopoulos and Lewis, 2009). There are two widely accepted meanings of organisational ambidexterity (Gibson and Birkinshaw, 2004). The one that exists in the firm's structure refers to as the structural ambidexterity while the one that lies in the behavioural orientation refers to as the contextual ambidexterity (Luzon and Pasola, 2011). Table 1 for comparison.

As shown in Table 1, structurally ambidextrous firm separates the explorative from the exploitative unit each with different management, processes, structures and cultures but are well integrated under a senior management team (O'Reilly and Tushman, 2004) to allow the structures to be "tightly coupled (within) subunits that are themselves loosely coupled with each other" (Benner and Tushman, 2003 p. 247). In order to become structurally ambidextrous, one needs to have the senior teams:

- That have the ability to sense and understand different needs of businesses
- That are committed to implement ambidexterity
- That communicate a clear vision to allow both explorative and exploitative NPD to co-exist

In contrast, contextual ambidexterity is viewed as a meta-level capacity where the simultaneous pursuing of explorative and exploitative NPD within a single business unit is built on the processes or systems that encourage individuals to divide their time between activities (O'Reilly and Tushman, 2004). This means while the individuals in their units provide value to the current customers, they also seek the opportunities in the changing environment and respond accordingly. Therefore, contextual ambidexterity allows individuals in the firm to dynamically and flexibly decide on how to divide time between the rewarded and valued activities of explorative and exploitative NPD (Gibson and Birkinshaw, 2004). The collective efforts of individuals at pursuing explorative and exploitative NPD can be exhibited at the organisational level of contextual ambidexterity (Schudy, 2010).

Although, the ways structural ambidexterity deals with explorative and exploitative NPD were different from contextual ambidexterity, both of them are important to be viewed together. For instance while structural ambidexterity gives short-term benefits, contextual ambidexterity gives long-term benefits to the firm. And while structural ambidexterity manages the incongruences between explorative and exploitative NPD within separate business units, contextual ambidexterity manages the incongruences with the collective behavioural ability of individuals (Gibson and Birkinshaw, 2004). This implies both types of organisational ambidexterity achieve balance between explorative and exploitative NPD in a different ways that deserve equal attention.

However, the literature had stressed upon structural ambidexterity when dealing with the conflicting nature between explorative and exploitative NPD as the standard approach (Birkinshaw and Gibson, 2004). Unfortunately, separation of activities in different structures can cause isolation (He and Wong, 2004). For this reason, firms may also need to be contextually ambidextrous since, it complements structural ambidexterity in pursuing different NPDs simultaneously (Gibson and Birkinshaw, 2004). For instance while structural ambidexterity is needed to create differentiation between explorative and exploitative NPD with dual structures, contextual ambidexterity is needed to create integration between dual structures with behavioural and social means (Andriopoulos and Lewis, 2009). As such, it will be difficult to investigate the effects

of organisational ambidexterity if one of them is excluded since there was no single way to become ambidextrous and there was also no single leadership model for ambidexterity (Gibson and Birkinshaw, 2004). Therefore, as they complement each other, structural and contextual ambidexterity should be investigated side-by-side on NPD performance to fully understand their consequences (Simsek *et al.*, 2009).

#### Organisational ambidexterity and NPD performance:

NPD performance was the interest of this study because organisational ambidexterity is observed through the simultaneous pursuing of explorative and exploitative NPD. Since, performance can be seen through various perspectives such as accounting, marketing and operations (Neely, 2002) and various categories such as profitability, market valuation, operational performance and innovation (Aral and Weill, 2007), the criteria for measuring NPD performance are diversified including both financial and nonfinancial measures (Wang *et al.*, 2009). Financial and nonfinancial criteria are critical to measure NPD performance due to the need of firms to continuously improve their existing products for current viability and at the same time develop new products for future viability. In the recent studies, both measures were demonstrated to the manufacturing and R&D firms in Malaysia (Omar *et al.*, 2015; Kowang *et al.*, 2014). With this reason and since the effective performance measures for organisational capabilities should be based on the context (Loasby, 2010), this study has adapted both financial and nonfinancial measures for NPD performance.

Furthermore, although financial performance is measured with the accounting-based measures such as sales growth, profits, Return-On-Investment (ROI) and market share (Ittner *et al.*, 2003), the nonfinancial criteria that is measured the intangible assets are actually the indicator to firm's financial performance (Kaplan, 2008) such as where firm's performance is related to constant development and introduction of new product (Ernst, 2002). For these reasons, it appeared that the nonfinancial performance is also critical to measure NPD. For instance, even though the internal exploitative of known technology and external explorative of new technology that are positively related to innovative performance are not related to financial performance (Rothaermel and Alexandre, 2009), they were found to be contributed to the financial performance of manufacturing firms in Malaysia (Rosli and Sidek, 2013).

In the context of this study, organisational ambidexterity that enables the firm to simultaneously pursue explorative and exploitative NPD to achieve long-term success is related to performance (Gibson and Birkinshaw, 2004). Since, the improvement in NPD portfolio management positively increases NPD performance (Acur *et al.*, 2010) each and every types of

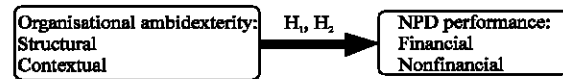


Fig. 1: A simplistic diagram of conceptual framework

organisational (structural and contextual) ambidexterity is expected to be positively related to NPD performance. For instance, manufacturing firms in Malaysia can increase their NPD performance with organisational ambidexterity by creating balance between explorative and exploitative NPD (He and Wong, 2004). Meanwhile, a previous study has also suggested a jointly deployment of explorative and exploitative NPD with organisational ambidexterity at different levels will results in positive effects on NPD performance (Chu *et al.*, 2011).

In addition, previous study had revealed contextual ambidexterity does have a strong relationship with firm's performance (Gibson and Birkinshaw, 2004). Meanwhile, an empirical research had proven that when applying functional structure (for ambidexterity) to incremental NPD process, the effect on derivative innovation performance is positive. On the other hand, when applying cross-functional structure (for ambidexterity) to radical NPD process, the effect on breakthrough innovation performance is also positive. In contrast, when applying functional structure to radical NPD process or applying cross-functional structure to incremental NPD process, the effect on innovation performance is negative (Visser *et al.*, 2010). This implies organisational ambidexterity itself may have limitations and negative effects on NPD performance if pushed way to far (He and Wong, 2004). Since, no much empirical evidences comparing between structural ambidexterity and contextual ambidexterity on NPD performance, it would be critical to empirically investigate these relationships further.

**Conceptual framework and hypotheses building:** As to investigate the effects of structural ambidexterity and contextual ambidexterity on NPD performance where they can be compared and contrasted, a simplistic conceptual framework modified from the original version proposed in Zaidi and Othman (2014) was developed as shown in Fig. 1.

Since, there were fewer empirical studies been done on the topic of organisational ambidexterity (Raisch *et al.*, 2009), the following hypotheses were built partly on the previous findings and partly on the concept itself where the researchers believed that "changes in the value of one variable are related to changes in the value of the other variable" (Argyrous, 2011 p. 17):

- H<sub>1</sub>: The effect of structural ambidexterity is different from contextual ambidexterity on financial performance of NPD
- H<sub>2</sub>: The effect of structural ambidexterity is different from contextual ambidexterity on nonfinancial performance of NPD

## MATERIALS AND METHODS

This preliminary study is taking places in the manufacturing sector of Malaysia to compare and contrast the effects of structural ambidexterity and contextual ambidexterity on NPD performance. The respondents were randomly selected among product or production managers (and equivalent) from the directory of the Federation of Malaysian Manufacturers focusing on NPD. All-in-all, 105 responses were received from 700 samples sent. The data that was collected via questionnaire contains seven items for structural ambidexterity (adapted from Tempelaar, 2010), six items for contextual ambidexterity (Fiset and Dostaler, 2013), four items for financial performance (Wang *et al.*, 2009) and six items for nonfinancial performance (Wang *et al.*, 2009; Atuahene-Gima *et al.*, 2006). The description of these items after data reduction is shown in Table 2. Meanwhile, six items for firm profiles were also adapted from various related studies. The data was then processed with the SPSS v.19 statistical technique to perform descriptive, correlation and regression analyses according to the objective. With these methods in mind, the results would be able to signify the links between organisational ambidexterity and firm performance which is importance for theoretical development.

**Data preparations and factor analysis:** As noted earlier, this preliminary study has received 105 responses, however only 87 responses were acceptable after data screening and cleaning and preparation for parametric analysis. There was no nonresponse bias in this study. The Shapiro-Wilk test has shown that the distributions of all data were approximately normal for structural ambidexterity ( $p = 0.105$ ), contextual ambidexterity ( $p = 0.163$ ), financial performance ( $p = 0.142$ ) and nonfinancial performance ( $p = 0.06$ ) at the significance level of  $p < 0.05$ . All variables were reliably good as they exceeded the Cronbach's Alpha of 0.70 (structural ambidexterity ( $\alpha = 0.855$ ), contextual ambidexterity ( $\alpha = 0.904$ ), financial performance ( $\alpha = 0.824$ ) and nonfinancial performance ( $\alpha = 0.713$ )). Meanwhile, the principal component analysis (KMO MSA = 0.791 and Bartlett's test of Sphericity = 0.00) has suggested four components (cumulative % of Eigenvalues = 69.817). This has also caused removal of four items from structural ambidexterity and three items from nonfinancial performance. Since, the acceptable minimum numbers of item per component are three, all variables have sufficient items retained for further analysis (i.e., structural ambidexterity (4 items), contextual ambidexterity (6 items), financial performance (4 items) and nonfinancial performance (3 items)). Table 2 for the description of items retained in each component.

**Profile of respondents:** Descriptive analyses on the dataset have revealed that 71.3% of all respondents were product or production managers, 65.5% of them have served the firms for <11 years, 58.1% of firms were established for <21 years, 62.8% of firms were categorised under SME with employees No. >150, 82.2% of firms

Table 2: Description of items retained in component

Description of items	Codes
<b>Structural ambidexterity</b>	
The production activities that are structurally separated within the organisation	Q1d
The innovation activities (e.g., R&D) that are structurally separated within the organisation	Q1e
The departments (e.g., line or staff) that are clearly separated within the organisation	Q1f
The customers' needs that are served from separate departments	Q1g
<b>Contextual ambidexterity</b>	
Take initiative beyond the confines of your own jobs	Q2a
Alert to opportunities beyond the confines of your own jobs	Q2b
Seek out opportunities to combine your efforts with others	Q2c
Cooperative to combine your efforts with others	Q2d
Act as a broker who always looking to build internal linkages	Q2e
Act as a multi-tasker who comfortable wearing more than one 'hat'	Q2f
<b>Financial performance</b>	
The firm's sales growth relative to competitors	Q3a
The firm's market shares growth relative to competitors	Q3b
The firm's growth in profit relative to competitors	Q3c
The firm's Return on Investment (ROI) relative to competitors	Q3d
<b>Nonfinancial performance</b>	
The quality of product that is better than the firm own other products	Q4d
The quality of product that is better than the competing (competitors) products	Q4e
The customers' perception that the product is more reliable than the competing products	Q4f

were doing incremental NPD and one-thirds of respondents were from the electrics and electronics and plastics-related industries (37.1%). The analysis also shown that all Mean values were above 4 (for average) in a 7-point Likert scale implying that the respondents was generally, agreed (between scales 5-7) with the statements on all variables.

## RESULTS AND DISCUSSION

Correlation analysis (not displayed here) has shown that structural ambidexterity was only significantly correlated with nonfinancial performance ( $r = 0.277$ ) while contextual ambidexterity has no problem to significantly correlated with both financial ( $r = 0.288$ ) and nonfinancial ( $r = 0.583$ ) performance. At the meantime, structural ambidexterity and contextual ambidexterity ( $r = 0.462$ ) and financial performance and nonfinancial performance ( $r = 0.289$ ) were also found to be significantly correlated, all of which were positive at  $p < 0.01$  level (2-tailed). Implicitly, the analysis has found that contextual ambidexterity has a moderate relationship with nonfinancial performance while the correlation between structural ambidexterity and nonfinancial performance is weak. Accordingly, two regression analyses were performed, each for financial and nonfinancial performance. Table 3 for the summary of analyses.

Table 3 shows that Model 1 for the effects of structural ambidexterity and contextual ambidexterity on the financial ( $F = 4.869$ ,  $p = 0.010$ ) and nonfinancial performance ( $F = 21.369$ ,  $p = 0.000$ ) were generally existed at the significance level of  $p < 0.01$  which means at least one of the two types of organisational ambidexterity was significantly affecting NPD performance. From another angle, these findings suggested that the variances in structural ambidexterity and contextual ambidexterity were explained about 10.5% ( $R^2 = 0.324^2$ ) variations in the financial performance and 34% ( $R^2 = 0.583^2$ ) in the nonfinancial performance which implies that the organisational ambidexterity influenced nonfinancial performance more than financial performance.

By referring to the coefficients table in Model 1, it was found that structural ambidexterity is negatively related to financial performance at the coefficient value of Beta = -0.167 and positively related to nonfinancial

performance at Beta = 0.01. In both cases, the effects of structural ambidexterity on NPD performance were very minimal. This observation was proven by the insignificant results between structural ambidexterity and financial ( $p = 0.158$ ) and nonfinancial ( $p = 0.921$ ) performance at  $p < 0.01$  level. In contrast, contextual ambidexterity was found to be positively related to the financial (Beta = 0.365) and nonfinancial (Beta = 0.578) performance with weak to moderate strength. With these strengths, the effects of contextual ambidexterity on the financial ( $p = 0.002$ ) and nonfinancial ( $p = 0.000$ ) performance were significant at  $p < 0.01$  level.

In conclusion, all hypotheses have found support. In details, when comparing between structural ambidexterity and contextual ambidexterity on NPD performance, the regression analyses have found that structural ambidexterity differs from contextual ambidexterity on both financial ( $H_1$ ) and nonfinancial performance of NPD ( $H_2$ ). In both cases, while structural ambidexterity has no effect on NPD performance, contextual ambidexterity was affecting the NPD performance in a positive way. This implies increasing in the level of contextual ambidexterity will improve the level of NPD performance and vice versa.

In general, the results in this study were found to be consistent with the impressive aspect of organisational ambidexterity where the link with performance is proven to be existed (O'Reilly and Tushman, 2013). However, when comparing between structural ambidexterity and contextual ambidexterity, it was found that structural ambidexterity has no significant effect on NPD performance. As such, unless all results were significantly supported, structural ambidexterity and contextual ambidexterity have limited room for comparing and contrasting purposes. With all we have from the findings, this study is able to come up with the following insights.

**Firstly, the effect of moderation variable:** With no direct effect of structural ambidexterity on NPD performance, this may suggest that structural ambidexterity is actually works well under the conditions (moderation) of uncertain environment (O'Reilly and Tushman, 2013). As such, since contextual ambidexterity has direct positive effect on both financial and nonfinancial performance, this could means that structural ambidexterity is better suit turbulence environment while contextual ambidexterity is

Table 3: Summary of regression analyses for NPD performance

Analysis	Analysis (performance)			Financial			Nonfinancial		
	Financial	Nonfinancial	Model 1	Beta	t	Sig.	Beta	t	Sig.
ANOVA F	4.869	21.369	Constant	-	1.439	0.154	-	1.207	0.231
Sig.	0.010*	0.000*	Structural ambidexterity	-0.167	-1.424	0.158	0.010	0.099	0.921
Summary R	0.324	0.583	Contextual ambidexterity	0.365	3.121	0.002*	0.578	5.752	0.000*

\* $p < 0.01$  level

better suit stable environment. This was evidenced in the recent study that has found where NPD performance was positively affected by structural ambidexterity under high-level of market and technological turbulence in contrast, contextual ambidexterity was only positively affected NPD performance under the condition of low market turbulence (Zaidi and Othman, 2015).

**Secondly, the types of item:** Upon inspection of the items that were used to measure nonfinancial performance (Table 2), it appears that all the retained items were only related to quality measures after data reduction. In other words, the nonfinancial performance was actually represented by quality performance. This implies that structural ambidexterity could possibly have affected the nonfinancial performance if the measuring items are different from Table 2. Accordingly, it also appeared that structural ambidexterity has no effect on sales growth, market share, profit and ROI which suggests that separate structures (or units) for explorative and exploitative NPD is not proven to bring any direct or immediate financial gains to the firms. However, bear in mind that the structural ambidexterity in this study was only measured with four items that was originally seven. As such, the findings were based on limited measures for structural ambidexterity.

**Thirdly, the characteristic of respondents:** Opposite to the results of structural ambidexterity, the findings were inclined toward contextual ambidexterity with all direct positive effects on financial and nonfinancial performance of NPD. In other words, the results suggested that contextual ambidexterity is relatively better than structural ambidexterity on achieving NPD performance. However, these findings were only relevant within the scope of this study which could be explained by the demography of respondents. For the records, this study was responded by >65% product or production managers who have served the firms no >10 years in which 62.8% of all responses were from SME and where the incremental NPD represented 82.2% of total projects. This implies that majority of respondents who preferred contextual ambidexterity over structural ambidexterity on NPD performance were younger professional that came from less structured (or rigid) organisation, with the activities mainly focusing on continuous improvement of existing products. Consequently will this simply implies that the characteristics of firm who preferred structural ambidexterity over contextual ambidexterity are just opposite of the observed demography? Although, no detailed analysis been done in this study to confirm the influence of respondent's demography on the

relationships between organisational ambidexterity and NPD performance, at this point of time, it would be worth noting that the effects of organisational ambidexterity on NPD performance may (or may not) be influenced by the firm's demography/characteristics (perhaps, acts as a confounding or extraneous variable).

**Lastly, the complementary of organisational ambidexterity:** The correlation analysis has suggested that structural ambidexterity and contextual ambidexterity was related with moderate strength ( $r = 0.462$ ). Therefore, it is possible that although structural ambidexterity has no direct effect on NPD performance but when mediated by contextual ambidexterity, the effect will become significant and positive. As such, a Sobel test (not shown here) was performed to investigate the mediating effect of contextual ambidexterity between structural ambidexterity and NPD performance. It was found that contextual ambidexterity indeed mediated the relationships between structural ambidexterity and financial ( $p = 0.00927$ ) and nonfinancial ( $p = 0.00025$ ) performance at the significance level of  $p < 0.01$ . In contrast, Sobel test also found that structural ambidexterity was not mediated contextual ambidexterity to financial ( $p = 0.17203$ ) and nonfinancial ( $p = 0.92134$ ) performance. This implies that structural ambidexterity will only affect NPD performance when "complemented" by contextual ambidexterity but not the other way around. This could also means that firms who possessed both contextual ambidexterity and structural ambidexterity in a complementary manner are doing better than firms who possessed just contextual ambidexterity. However, more empirical test is needed to support this argument, since the sample size is not fully met the assumption for the test (Fritz and MacKinnon, 2007).

## CONCLUSION

Correlation analysis has found that the relationships between structural ambidexterity and contextual ambidexterity on NPD performance were dissimilar. While, contextual ambidexterity correlated to both financial and nonfinancial performance of NPD from weak to moderate strength, structural ambidexterity only correlated to the nonfinancial performance with weak strength. Accordingly, the regression analyses have shown that contextual ambidexterity is positively affecting the NPD performance while structural ambidexterity has no effect on the NPD performance. However, structural ambidexterity and contextual ambidexterity did complementing each other. These findings have answered the research question and achieved the objective of the study where the relationships and effects of structural

and contextual ambidexterity were compared and contrasted on the NPD performance. Since, this study was at the preliminary stage, the discussions, limitations and recommendations should be noted for the improvement of future study and better understanding of the nature of structural vs contextual ambidexterity.

### **IMPLICATIONS**

This study has brought at least three implications to the literature of organisational ambidexterity. Firstly, since the characteristics of structural and contextual ambidexterity have been clarified with the factor analysis, they can be used as a starting point to identify firms with structural ambidexterity and contextual ambidexterity. Furthermore, these characteristics can also be used to differentiate between ambidextrous and non-ambidextrous firms. Secondly, the findings that have shown different effects between structural ambidexterity and contextual ambidexterity on NPD performance will enable us to further understand the interactions between them and know the right timing to use them individually or in complementary. Lastly, this study has found that organisational ambidexterity as in general can be related directly and indirectly to NPD performance. As such, study on organisational ambidexterity should not necessarily be done on firm's performance. This implies the benefits of organisational ambidexterity could also be existed in firms but in different forms. All-in-all, the findings have contributed to the development of organisational ambidexterity as to explain the source of sustainable competitive advantage via firm performance.

### **LIMITATIONS**

This study was a preliminary in nature where the processes followed may not be too rigid. Accordingly, the sample sizes were small (<100) to perform regression analysis by standard. However, all assumptions for the parametric analysis were followed. Since, some outputs were only slightly better than the minimum requirements for regression analysis at the significance level of  $p < 0.01$ , the findings should be interpreted with care bearing the scope and context of this study. Lastly, this study was not critical on whom being structural ambidextrous and whom being contextual ambidextrous as the data were gathered according to the respondents' perception.

### **RECOMMENDATIONS**

With the limitations in mind, this study has identified the following room for improvement for future research agenda. Firstly, the sizes of sample should be increased to

better achieve the assumptions for parametric analysis. Secondly, since the final numbers of item for measuring nonfinancial performance were only three after data reduction, future study should lists more items from well-known literature instead of just six. Thirdly, although the data for this study was taken from various manufacturing industries, the responses were dominated by the SME where most NPD were incremental. As this could possibly influence the findings, future study should focus on a specific industry and/or size of firm to confirm the findings are replicable. Lastly, the scope of NPD performance can be expanded to include wider dimensions. For instance, different sets of performance, such as innovation performance, market performance, operational performance, etc. should also be examined in a search for a better fit for structural ambidexterity and contextual ambidexterity in the firms.

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