Research Article

Contingency Factors Influencing the Use of Management Accounting Techniques in Indonesian Manufacturing Firms

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ABSTRACT

This study examined the effect of four contingency factors (competition intensity, extent of decentralisation, top management support and resources availability) on management accounting (MA) techniques use across Indonesian manufacturers. MA techniques examined comprised of activity-based costing (ABC), activity-based management (ABM), cost-volume-profit analysis (CVP), integrated performance measures (IPM), operating budget (OB) and target costing (TC). Survey method was used in which the respondents were 41 managers of Indonesian-listed manufacturing firms. Data were analysed with Partial Least Square (PLS) Structural Equation Modelling (SEM). Significant and positive associations were observable between extent of decentralisation and resources availability, top management support and resources availability, top management support and use of MA techniques and resources availability and use of MA techniques. Additional analysis reveals the mediating role of resources availability in facilitating significant positive indirect effects of extent of decentralisation and top management support on MA techniques use. This study distinguish itself as it examines the effect of multiple contingency factors on the adoption of essential MA techniques among Indonesian manufacturing business practice in line with the congruence fit notion. This study contributes to contingency-based MA literature in emerging economies settings and offers practical implications regarding the influence of internal and external contingency factors on MA techniques use in an emerging economy.

Keywords: Contingency Factors, Competition Intensity, Extent of Decentralisation, Top Management Support, Resources Availability, Management Accounting Techniques

1. INTRODUCTION

Contingency theory asserts that the use of management accounting (MA) techniques can be determined by organisation's internal and external contingency factors (Chenhall, 2003) and there is a wide array of contingency factors; both externally and internally; that is plausibly expected to influence firm's use of MA techniques (Otley, 2016). This was in line with the notion of 'congruence' or 'selection' fit within contingency perspective (Gerdin & Greve, 2004) which emphasises the appropriateness between firm's selection of performance measurement techniques and external and internal contingencies that possibly influence firm's decision (Gerdin, 2005; Holm & Ax, 2020; Daowadueng et al., 2023). Prior studies posit that firm's decision to use specific MA techniques is undertaken due to intense competition (Mia & Winata, 2014; Ahmad & Zabri, 2015). Furthermore, several studies have argued that the adoption of MA techniques requires the utilisation of firm's financial and physical resources. Hence it is plausible to expect that resources availability can determine firm's decision to adopt MA techniques (Duh et al., 2009). Several studies also documented that extent of decentralisation within firm's organisational structure can create demand for implementing certain MA techniques, as managers in a firm with a more decentralised structure would typically require more sophisticated accounting techniques to manage their organisation (Abernethy et al., 2004; Gerdin, 2005; Hoque, 2011). Finally, the adoption of MA techniques is also possibly influenced by the adequacy of support from firm's top management in line with their role as key decision makers (Fullerton et al., 2013; Nguyen et al., 2017).

Although empirical evidence about the relationship between firm's external and internal contingencies and MA techniques use has been demonstrated in prior studies, it is arguable that the necessity to examine such relationship in an emerging economy setting is still considered important by the literature (e.g. O'Connor et al., 2004; Duh et al., 2009; Ahmad & Zabri, 2015; Daowadueng et al., 2023) especially because of a substantial increase in gross domestic product (GDP) experienced by several emerging economies in the last decade (World Bank, 2021). One of the countries experienced a relatively high economic growth is Indonesia. As of 2021, Indonesian nominal GDP had surpassed US$ 1 trillion, which placed the country in 16th worldwide (International Monetary Fund, 2021). This has brought the attention of international business practitioners, policymakers, professionals and academics to learn more about Indonesian business practices (Rhodes et al., 2008). In addition, a substantial proportion of Indonesian GDP was generated by manufacturing sector and this sector also employed a considerable percentage of Indonesian workforce (World Bank, 2021). These factors have motivated this study to investigate the effect of contingency factors on MA techniques usage across Indonesian manufacturing firms. As emerging economies may have organisational and structural

differences compared to developed countries in regards to accounting, performance measurement and management control practices (Moses & Hopper, 2022; Daowadueng et al., 2023), we thus expect to find conceptually and practically different findings from prior studies, thus offers an essential contribution that shape the contingency-based MA literature and practical aspects in Indonesian and emerging economies.

MA techniques examined in this study were in line with a list stipulated in management accounting literature (O'Connor et al., 2004; Duh et al., 2009; Hoque, 2011; Armitage et al., 2016) and instructional materials (Weygandt et al., 2021; Mowen et al., 2023) such as activity-based costing (ABC), activity-based management (ABM), cost-volume-profit (CVP) analysis, integrated performance measures (IPM), operating budget (OB) and target costing (TC). This study uses survey method and Partial Least Square (PLS) Structural Equation Modelling (SEM) analysis to examine the proposed association between contingency factors and MA techniques usage. By investigating the linkage between contingency factors and MA techniques use, this study attempts to contribute towards the enrichment of contingency-based MA literature in emerging economies. In line with congruence fit notion, which imply the appropriateness of selection of MA techniques that are fit with firm's contingencies (Gerdin & Greve, 2004; Holm & Ax, 2020), this study aims to contribute towards contingency-based MA literature in emerging economies by providing empirical evidence about the role of multiple contingency factors in influencing MA techniques adoption by Indonesian manufacturers. Several contingency factors tend to be overlooked by firm decision-makers despite their potential to strategically influence firm's operating and business practices (Cadez & Guilding, 2012; Lee & Wang, 2020). Thus, this study also attempts to offer practical contribution to decision-makers by providing insightful evidence regarding the role of contingency factors in affecting MA techniques adoption among companies in a developing economy.

This paper is structured as follows. Section 2 explains the literature review and hypothesis development and section 3 shows the methodology. Section 4 discusses data analysis of PLS-SEM results and section 5 outlines conclusion.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Organisations typically use MA techniques for planning and control purposes. Following the contingency theory (Chenhall, 2003; Otley, 2016), multiple contingency factors are anticipated to be linked with the use of MA techniques. This study expects several factors to be related to firm's usage of MA techniques. Those factors are: competition intensity (Mia & Winata, 2014), extent of decentralisation (Gerdin, 2005), top management support (Fullerton et al., 2013), and resources availability (Duh et al., 2009). In line with the congruence fit notion which emphasise the appropriateness of selection

between MA techniques and contingencies (Gerdin & Greve, 2004), we predict positive associations between those factors and the use of MA techniques. Figure 1 shows the hypothesised model.

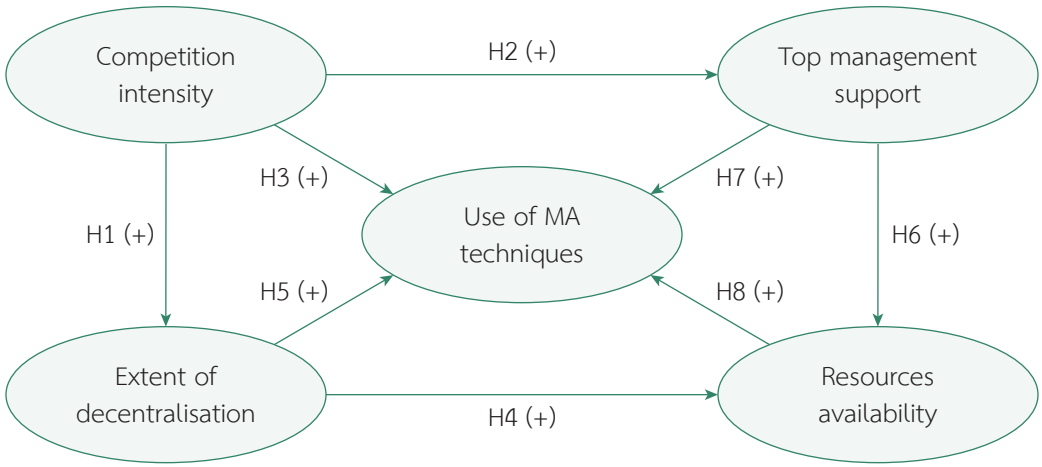

Figure 1 Hypothesised Model.

2.1 Competition Intensity and Extent of Decentralisation

The potential linkage between competition intensity and extent of decentralisation has been documented in prior studies. It is documented by Gordon & Narayanan (1984) that firms facing a greater competitive and uncertain environment applied a more organic structure characterised by more participative decision making which resembled a more decentralised approach. Hoque (2011) documented a positive association between intensity of competition faced by firms and delegation of authority where firms faced increased market competition tend to delegate more decision-making authority to their lower or local-level managers. Study undertaken by Kong et al. (2022) shows positive association between extent of competition and decentralisation. As such, we predict a positive association between competition intensity and extent of decentralisation. The first hypothesis is therefore stated:

H1: A positive association exists between competition intensity and extent of decentralisation.

2.2 Competition Intensity and Top Management Support

Several studies have documented the relationship between intensity of competition and extent of support from top management. Chenhall (2003) argued about the association between a more hostile external environment and greater reliance on formal controls stipulated by top management. Similarly, Murray (1989) posited a linkage between top management involvement and support and

the intensity of competition faced by firm. Furthermore, it is asserted by Simons (1994) that the degree of top management support and involvement might increase in line with a more competitive situation faced by the firm. It is therefore plausible to expect a positive linkage between intensity of competition and top management support, which yields the second hypothesis:

H2: A positive relationship exists between competition intensity and top management support.

2.3 Competition Intensity and the Use of MA Techniques

Applebaum et al. (2011) argued that a strategical shift in MA role and techniques occurred as a response towards a more competitive business environment. Holm & Ax (2020) argued that in a competitive context characterised by high customer service competition, intensity of competition was positively associated with more sophisticated customer accounting techniques. Similarly, Hoque (2011) found that firms experiencing more intense competition tend to initiate more changes in their MA systems to address issues resulting from highly competitive uncertainty. Duh et al. (2009) documented a positive association between more intense competition and firm's tendency to use MA and control techniques to a greater extent. As such, we expect a positive linkage between intensity of competition faced by firms and MA techniques use. Firms operating in an environment with more intense competition will use MA techniques to a greater extent than firms operating in an environment with less intense competition. This takes us to the third hypothesis:

H3: A positive association between competition intensity and use of MA techniques is expected.

2.4 Extent of Decentralisation and Resources Availability

Decentralisation refers to the extent to which autonomy within organisations; such as decision-making and use of resources; are delegated, taken, and resolved at a lower hierarchical level (Soobaroyen & Poorundersing, 2008). Managers in decentralised firms typically have a greater opportunity to access different types of information which exist as a result of available resources (Indjejikian & Matějka, 2012). A positive association between firm's decentralised structure and allocation of resources is also expected, where the adoption of a decentralised structure will be typically followed by ensuring availability and allocation of resources (Groves & Loeb, 1979). For those reasons we anticipated a positive linkage between extent of decentralisation and availability of firm resources. Here, a greater degree of decentralisation shall increase the necessity of making firm resources available. Hence, the fourth hypothesis is stated.

H4: A positive association exists between extent of decentralisation and resources availability.

2.5 Extent of Decentralisation and the Use of MA Techniques

Tran et al. (2022) investigated the effect of decentralisation on implementation of responsibility accounting. They found a positive association between decentralised structure and responsibility accounting. Similarly, Abernethy et al. (2004) documented a positive association between extent of decentralisation and application of more specific and comprehensive accounting measures. Rouwelaar et al. (2016) also documented a positive relation between extent of structural decentralisation and manager's involvement in firm's strategic decisions, including strategic measurement practices, which arguably explicate the connectedness between decentralisation and MA techniques usage. Abdel-Kader & Luther (2008) found that decentralised firms adopt more subtle MA practices to equip managers with enhanced relevant information for planning, controlling, and decision-making in which they are responsible. Hence, we predict a positive relationship between extent of decentralisation and MA techniques use, where more decentralised firms will use MA techniques to a greater extent than firms with a lesser extent of decentralisation. The fifth hypothesis is stated.

H5: A positive relationship exists between extent of decentralisation and the use of MA techniques.

2.6 Top Management Support and Resources Availability

A relationship between top management support and resources availability has been demonstrated in prior studies. It is posited by Dong et al. (2009) that support from top management is exemplified by ensuring constant and sufficient availability of resources for firm's activities. Hornsby et al. (2002) argued that one of the essential roles of top management is to provide necessary resources for implementing innovative ideas as these resources are typically provided to encourage beneficial innovations. It is argued by Teo et al. (2007) that an integral role of top management is to address the issue related to resources allocation and availability within a firm. These arguments lead to the sixth hypothesis in this study. Support from top management is exemplified by ensuring the availability of resources (Dong et al., 2009). Thus, an increase in the degree of support from top management is predicted to be translated into making firm resources available. The sixth hypothesis is therefore outlined:

H6: A positive linkage exists between top management support and resources availability.

2.7 Top Management Support and the Use of MA Techniques

Prior MA studies (Al-Sayed & Dugdale, 2016; Duh et al. 2009) generally find a positive relationship between top management support and implementation of MA techniques. These findings highlighted the importance of the role of top management in supporting MA techniques use. Ahmad & Zabri (2015)

found a positive association between extent of commitment and support from firm managers and implementation of more sophisticated MA practices. Tung et al. (2011) found a positive relationship between top management support and firm performance measurement effectiveness. Talke et al. (2011) found a positive linkage between top management involvement and firm's orientation towards innovation, including adopting strategic solutions aimed at enhancing firm's operational and performance measurement effectiveness. Similarly, Burkert & Lueg (2013) argued about the essential role of top executives in supporting the introduction of value-enhancing measurement practices. Support from top management was also posited to be positively associated with successful implementation of activity management practices (Baird et al., 2007). In summary, a positive linkage between top management support and MA techniques use is anticipated, which outlined as follows:

H7: A positive association exists between top management support and the use of MA techniques.

2.8 Resources Availability and the Use of MA Techniques

Availability of a firm's resources; such as financial, physical, and organisational resources; can determine the implementation of MA techniques (Jermias & Gani 2005). Pavlatos & Kostakis (2018) argued that firms with low financial resources in the past tended to implement more innovative MA tools more extensively once they had enough financial resources to enhance their financial performance. On the other hand, firms with a high availability of financial resources tend to modify and upgrade their existing MA techniques to be more sophisticated, timely, and integrated (Wu & Boateng 2010). Several studies had documented the importance of firm resources availability in facilitating a successful adoption of capabilities-enhancing initiatives, including contemporary managerial and measurement practices (Anderson & Eshima, 2013; Schilke, 2014). Based on these explanations, a positive linkage between firm resource availability and the use of MA techniques is predicted and stated as follows:

H8: A positive relationship between resources availability and the use of MA techniques is anticipated.

3. METHODOLOGY

3.1 Sample Selection and Data Collection

Survey method was used in which the respondents were accounting or finance managers of Indonesian manufacturing firms registered in Indonesian Stock Exchange (IDX). Survey method was deemed appropriate for this study due to unavailability of archival proxies for examining our variable of interests. Although survey method is not without shortcomings, there are several tests of measurement model that will be undertaken to ensure the validity and reliability of our instruments to enhance generalisability of result (Bedford & Spekle, 2018). These tests are discussed further in the result section.

There were 193 manufacturing firms registered in the IDX list as of October 2021. From this list, 12 firms were excluded because of insufficient financial data or discontinued of operation. Hence 181 firms were initially contacted for survey. Initial phone calls for each firm were made to gather early interest for participation. From this process, 103 firms agreed to take part and the questionnaires were subsequently sent. The survey package sent to each respondent also comprised a cover letter stated the purpose of this study and a statement that guaranteed the preservation of respondent's anonymity and confidentiality. We undertake two stages of survey follow-ups (Van der Stede et al., 2007). The first follow-ups were undertaken two weeks after the questionnaires were initially sent and the second follow-ups were undertaken two weeks afterwards. In total, 41 usable responses were obtained from 181 firms initially contacted for survey (22.65% response rate).

Non-response bias analysis was performed by comparing mean scores of firms' key attributes between responding and non-responding firms and early and late respondents. The result (not tabulated) indicated that the mean differences for several attributes such as total assets, total sales, return on assets (ROA) and number of employees did not vary significantly between responding and non-responding firms (all $p > 0.1$). Further result (not tabulated) also indicated insignificant differences in mean scores of variables of interest between early and late respondents. Thus, it can be concluded that the appearance of a significant non-response bias in our study was negligible. The likelihood of common-method bias was assessed via Harman's one-factor test (Podsakoff et al., 2003). The result (not tabulated) reflected by the first component in a principal component analysis stood at 40.78% (< 50%) which indicates the absence of a significant common-method bias (Podsakoff & Organ 1986; Fuller et al., 2016). Overall, it is arguable that non-response and common-method bias were not major concerns in this study.

Table 1 shows the demographic information of firms and respondents surveyed where more than 50% of respondents surveyed have worked in their company for at least five years or more. Descriptive statistics are displayed in Table 2[1]. It is noticeable that the mean score of use for each MA technique was well above the midpoint of 4.0, indicated a relatively high extent of use of MA techniques across Indonesian manufacturers surveyed.

Table 1 Demographics of Firms and Respondents

Description	Frequency	%	Description	Frequency	%
Experience:			**Segment of the industry:**		
0–3 years	9	22.0	Food products	9	22.0
3–5 years	9	22.0	Metal and steel	4	9.8
5–10 years	7	17.1	Textile products	4	9.8
10–15 years	5	12.2	Vehicle parts	4	9.8
> 15 years	11	26.7	Packaging	3	7.3
Job position:			Wood and furniture	3	7.3
Accounting/Finance Manager	17	41.5	Building materials	2	4.9
Cost/Financial Controller	4	9.8	Consumer goods	2	4.9
Head of Accounting/Finance Division	6	14.6	Electronics	2	4.9
General Manager	1	2.4	Agriculture	1	2.4
Accounting/Finance Senior Manager	2	4.9	Chemicals	1	2.4
CFO	1	2.4	Pharmaceuticals	1	2.4
Other	10	24.4	Other	5	12.2

[1] One missing item was found in one response for a question about MA techniques. Hence, we conducted Little's MCAR test and the result revealed that such item was 'missing completely at random' (MCAR). As the missing item is categorised as MCAR (Chi-Square = 38.621, $p > 0.1$), an imputation method can be used to replace the missing item (Hall, 2008). The item was replaced using Expectation-Maximisation (EM) method. EM approach is an iterative two-stage process involved E-stage that provides the most accurate estimates of the missing data and M-stage that produces parameter estimates considering the missing data is replaced (Hall, 2008). The result of this process leads to a complete data set of 41 responses.

Table 1 Demographics of Firms and Respondents (Cont.)

Description	Frequency	%	Description	Frequency	%
Position experience:			Number of employees:		
0–3 years	16	39.0	1–500	11	26.8
3–5 years	12	29.3	501–2,000	15	36.6
5–10 years	3	7.3	2,001–5,000	6	14.6
10–15 years	5	12.2	5,001–10,000	4	9.8
> 15 years	5	12.2	> 10,000	5	12.2

Table 2 Descriptive Statistics

Variable	Mean	Standard deviation	Theoretical range		Actual range	
			Min	Max	Min	Max
CI	5.058	1.096	1.00	7.00	2.60	7.00
DC	4.085	1.127	1.00	7.00	1.00	6.50
TMS	5.764	1.016	1.00	7.00	3.00	7.00
RA	5.723	1.035	1.00	7.00	3.00	7.00
MAT	5.800	0.954	1.00	7.00	3.38	7.00
MAT-ABC	5.878	1.071	1.00	7.00	3.33	7.00
MAT-ABM	5.640	1.108	1.00	7.00	3.00	7.00
MAT-CVP	6.089	1.077	1.00	7.00	3.00	7.00
MAT-IPM	5.528	1.271	1.00	7.00	2.33	7.00
MAT-OB	5.841	1.083	1.00	7.00	2.50	7.00
MAT-TC	5.821	1.069	1.00	7.00	2.00	7.00

CI, Competition intensity; DC, Extent of decentralisation; TMS, Top management support; RA, Resources availability; MAT, Management accounting techniques, consists of: ABC (Activity-based costing); ABM (Activity-based management); CVP (Cost-volume profit analysis); IPM (Integrated performance measures); OB (Operating budget); TC (Target costing).

$n = 41$

3.2 Variable Measurement

Variables examined in this study were measured with existing instruments to maintain validity and reliability. Content review by academics and practitioners was undertaken before the distribution of questionnaires. The questionnaire was extensively reviewed by three accounting academics and four business practitioners that are not involved in survey. Any suggestions from these reviews were used as inputs to refine and improve the final version of questionnaire.

3.2.1 Competition Intensity

Competition intensity was measured by a set of questions adapted from Lee & Yang (2011). The questions require respondents to indicate whether their firms currently perceive intense competition about factors such as prices, new products development, marketing and distribution, market share and competitors' behaviours. Responses are on a 7-point Likert scale items ranging from 1 (not at all) to 7 (to a great extent). Higher score indicated higher competition intensity and lower score indicated lower competition intensity.

3.2.2 Extent of Decentralisation

Extent of decentralisation was measured via instrument adapted from Jermias & Gani (2005). Respondents were asked to indicate the typical influence that they had in determining the outcomes of several factors in their firms such as increasing expenditure for advertising, promotion and research and development, changing the selling price of major product or product line and increasing the number of employees. Responses are on a 7-point Likert scale, ranging from 1 (very low influence) to 7 (very high influence). Higher score indicated higher extent of decentralisation and lower score corresponds to lower extent of decentralisation.

3.2.3 Top Management Support

Top management support was measured by a set of questions derived from Fullerton et al. (2013). Respondents were asked to indicate the extent of support received from top management team in their firms related to the adoption of MA techniques on a 7-point Likert scale, ranging from 1 (of a little support) to 7 (of a great support). Higher score indicated higher extent of support from top management in regards to MA techniques use and vice versa.

3.2.4 Resources Availability

Resources availability was measured by a set of questions adapted from Duh et al. (2009). The questions require respondents to indicate the impact of their firm's financial, physical, and non-physical resources on the adoption of MA techniques. Responses are on a 7-point Likert scale, ranging from

1 (not at all) to 7 (to a great extent). Higher score indicated higher impact on resources availability regarding MA techniques usage and lower score indicated the opposite.

3.2.5 Management Accounting (MA) Techniques

The list of MA techniques examined was selected based on several references, including MA instructional materials (Weygandt et al., 2021; Mowen et al., 2023) and previous contingency-based MA studies examined the association between contingency factors and MA techniques use (e.g. O'Connor et al., 2004; Duh et al., 2009; Hoque, 2011; Armitage et al., 2016). Consideration was taken in deciding the MA techniques to be included, including the perceived applicability and relevance in the Indonesian context (Rhodes et al., 2008). Examination of the literature eventually yielded six MA techniques: activity-based costing (ABC), activity-based management (ABM), cost-volume-profit analysis (CVP), integrated performance measures (IPM), operating budget (OB), and target costing (TC). The use of MA techniques was measured by a set of questions adapted from Duh et al. (2009). The questions require respondents to indicate whether the use of each MA technique was reflected in their firms. Responses are on a 7-point Likert scale, ranging from 1 (not at all) to 7 (to a great extent). Higher score indicated higher extent of use of a particular MA technique and lower score corresponds to lower extent of use.

4. RESULTS

This study used Partial Least Square (PLS) Structural Equation Modelling (SEM) to test the proposed hypotheses and SmartPLS version 4.0 was used to analyse the data. PLS-SEM was utilised in this study as it can accommodate data with normality issues (Lee et al., 2011; Hair et al., 2019) and is able to handle issues related to sample size that are commonly found in studies where prediction was the main objective (Hair et al., 2011). As outlined by Hair et al. (2019), the PLS-SEM analysis spanned around two stages, test of measurement model and test of structural model. Test of measurement model aims to statistically assessing the constructs and instrument used in our survey to ensure that they are valid and reliable (Bedford & Spekle, 2018). Table 3 shows the correlation matrix of variables examined.

Table 3 Pearson Correlation Matrix

No	Variables	1	2	3	4	5	6	7	8	9	10	11
1	CI	1.000	0.196	0.145	0.220	0.252	0.088	0.192	0.326*	0.150	0.259	0.299
2	DC	0.196	1.000	0.349*	0.558**	0.531**	0.407**	0.450**	0.498**	0.460**	0.457**	0.457**
3	TMS	0.145	0.349*	1.000	0.665**	0.673**	0.592**	0.561**	0.413**	0.671**	0.661**	0.548**
4	RA	0.220	0.558**	0.665**	1.000	0.782**	0.675**	0.569**	0.546**	0.768**	0.744**	0.707**
5	MAT	0.252	0.531**	0.673**	0.782**	1.000	0.851**	0.853**	0.826**	0.890**	0.896**	0.822**
6	MAT-ABC	0.088	0.407**	0.592**	0.675**	0.851**	1.000	0.790**	0.659**	0.717**	0.648**	0.564**
7	MAT-ABM	0.192	0.450**	0.561**	0.569**	0.853**	0.790**	1.000	0.699**	0.761**	0.608**	0.515**
8	MAT-CVP	0.326*	0.498**	0.413**	0.546**	0.826**	0.659**	0.699**	1.000	0.628**	0.664**	0.614**
9	MAT-IPM	0.150	0.460**	0.671**	0.768**	0.890**	0.717**	0.761**	0.628**	1.000	0.787**	0.644**
10	MAT-OB	0.259	0.457**	0.661**	0.744**	0.896**	0.648**	0.608**	0.664**	0.787**	1.000	0.904**
11	MAT-TC	0.299	0.457**	0.548**	0.707**	0.822**	0.564**	0.515**	0.614**	0.644**	0.904**	1.000

CI, Competition intensity; DC, Extent of decentralisation; TMS, Top management support; RA, Resources availability; MAT, Management accounting techniques, consists of: ABC (Activity-based costing); ABM (Activity-based management); CVP (Cost-volume profit analysis); IPM (Integrated performance measures); OB (Operating budget); TC (Target costing).

*** significant at 0.01, ** significant at 0.05, * significant at 0.1

4.1 PLS Test of Measurement Model

This test consists of examination of factors loadings, internal consistency reliability, convergent validity, and discriminant validity (Hair et al., 2019). For factor loadings, all items display > 0.6 loading scores except ABM3 ("Activity cost information is used to manage non-production costs") with a loading score of 0.590. As items with low loading scores affect explanatory power of a research model to a lesser extent (Hulland, 1999), the item was excluded from further analysis. Table 4 displays factor loadings scores from the final PLS measurement model.

Table 4 Factor Loadings from the Final PLS Measurement Model

Variable	Item	Loading
Competition intensity (CI) Please indicate the extent to which the following statements reflect the situation in your company (1 = not at all, 7 = to a great extent)		
CI1	Your company faces high degree of prices competition for products	0.720
CI2	There is high degree of market competition in the new products development faced by your company	0.602
CI3	There is high degree of market competition in marketing and distribution faced by your company	0.870
CI4	Your company faces high degree of market competition in gaining market share	0.711
CI5	Behaviours of competing companies bring a serious threat to your company	0.678
Extent of decentralisation (DC) Please indicate the typical influence you had in affecting the outcome of the following decisions in your company (1 = very low influence, and 7 = very high influence)		
DS1	Increasing (beyond budget) the level of expenditure for advertising and promotion	0.748
DS2	Changing the selling price on a major product or product line	0.689
DS3	Increasing (beyond budget) the level of expenditure for research and development	0.657
DS4	Increasing (beyond budget) the number of employees in our company	0.808

Table 4 Factor Loadings from the Final PLS Measurement Model (Cont.)

Variable	Item	Loading
Top management support (TMS) Please rate the extent of support from the top management in your company in regards to the adoption of a set of management accounting techniques (1 = of a little support, and 7 = of a great support)		
TMS1	Initiating the adoption of management accounting techniques	0.963
TMS2	Implementing the adoption of management accounting techniques	0.959
TMS3	Providing training for the use of management accounting techniques	0.875
Resources availability (RA) Please rate the impact of the following aspects in regards to the adoption of a set of management accounting techniques (1 = not at all, and 7 = to a great extent)		
RA1	Availability of financial resources to support the adoption and implementation of the management accounting techniques	0.807
RA2	Availability of physical resources (e.g. hardware, equipment, building) to support the adoption and implementation of the management accounting techniques)	0.976
RA3	Availability of non-physical resources (e.g. software, database, information systems) to support the adoption and implementation of the management accounting techniques	0.898
Management accounting techniques (MAT) This question is about a list of management accounting techniques. Please indicate the extent to which the following statements are reflected in your company (1 = not at all, and 7 = to a great extent)		
ABC1	Operating processes are analysed and allocated into their component activities	0.756
ABC2	Operating costs are explicitly traced to activities	0.781
ABC3	Product costs are determined using activity-based costing	0.703
ABM1	Decisions about products (e.g. mix, pricing, production method) are based on activity-based product costs	0.751
ABM2	Activity cost information is used to manage production costs	0.731
ABM4	Activity cost information is used for preparing budgets	0.845

Table 4 Factor Loadings from the Final PLS Measurement Model (Cont.)

Variable	Item	Loading
CVP1	Costs are separated into fixed and variable components for product costing	0.755
CVP2	Costs are separated into fixed and variable components for decision-making	0.753
CVP3	Costs-volume-profit analysis is used in decision making	0.761
IPM1	Performance measures are systematically linked across levels of the organisation's hierarchical structure	0.890
IPM2	Managers' performance measures are explicitly designed to contain a mix of leading (e.g. customer satisfaction) and lagging indicators (e.g. sales)	0.862
IPM3	Managers' performance measures are explicitly linked to the organisation's competitive strategy	0.817
OB1	Cash/working capital budgets are prepared	0.862
OB2	Sales budgets are prepared	0.898
OB3	Profit budgets are prepared	0.903
OB4	Production budgets are prepared	0.847
TC1	Target costs are used for performance evaluation	0.814
TC2	Target costs are used for preparing budgets	0.820
TC3	Target costs are used for various decisions (e.g. product design, product mix, pricing, production method)	0.739

The internal consistency reliability was evaluated via Cronbach's alpha and Composite reliability indicators. As documented in Table 5, internal consistency reliability scores were all >0.7 which demonstrated adequate internal consistency reliability (Hair et al., 2011). Convergent validity was examined via Average Variance Extracted (AVE) score (Hall, 2008). As displayed in Table 5, an acceptable convergent validity can be concluded from the data since the AVE scores were all >0.5. Thus, it can be concluded that adequate internal consistency reliability was sufficiently demonstrated.

Table 5 Internal Consistency and Convergent Validity

Variable	Cronbach alpha	Composite reliability	AVE
CI	0.772	0.783	0.520
DC	0.705	0.722	0.530
TMS	0.925	0.932	0.871
RA	0.876	0.906	0.803
MAT	0.970	0.973	0.651

CI, Competition intensity; DC, Extent of decentralisation; TMS, Top management support; RA, Resources availability; MAT, Management accounting techniques.

$n = 41$

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). HTMT serves as an alternative and contemporary approach to assess discriminant validity that can be used in variance-based SEM studies (Bedford & Spekle, 2018; Hair et al., 2019). It is noticeable in Table 6 that HTMT scores of all variables were all <0.9 and the result does not consist a value of 1. This implies an acceptable level of discriminant validity (Hair et al., 2019; Iyer et al., 2019). In summary, acceptable validity and reliability scores were demonstrated from each component from the test of measurement model.

Table 6 Heterotrait-Monotrait Ratio (HTMT) List

Category	Heterotrait-Monotrait Ratio (HTMT)
CI ↔ DC	0.372
CI ↔ TMS	0.181
CI ↔ RA	0.263
CI ↔ MAT	0.325
DC ↔ TMS	0.442
DC ↔ RA	0.701
DC ↔ MAT	0.631
TMS ↔ RA	0.748

Table 6 Heterotrait-Monotrait Ratio (HTMT) List (Cont.)

Category	Heterotrait-Monotrait Ratio (HTMT)
TMS ↔ MAT	0.720
RA ↔ MAT	0.869

CI, Competition intensity; DC, Extent of decentralisation; TMS, Top management support; RA, Resources availability; MAT, Management accounting techniques.

n = 41

4.2 PLS Test of Structural Model and Hypotheses

The direct paths of PLS structural model results that correspond with the proposed hypotheses are documented in Table 7. Figure 2 illustrates the structural model with path coefficients, significancy of results and R^2.

H1 expects a positive association between competition intensity and extent of decentralisation. Table 7 displays the result. It shows an insignificant positive linkage between competition intensity and extent of decentralisation (coefficient = 0.194, t-statistic = 1.029, $p > 0.1$). This lends no support for H1. On contrary to our prediction, it appears that more intense competition perceived by firm does not subsequently lead to a greater extent of decentralisation. This result contradicts findings from prior studies that asserted a positive linkage between competition intensity and extent of decentralisation (Gordon & Narayanan, 1984; Kong et al., 2022).

It is predicted in H2 that competition intensity and top management support will be positively related. The result in Table 7 demonstrated an insignificant positive relation between competition intensity and top management support (coefficient = 0.172, t-statistic = 0.916, $p > 0.1$). This provides no support for H2. It is arguable that more intense competition perceived by firms does not immediately affect the degree of support given by top management. This result was not in line with assertions from previous studies (Murray, 1989; Simons, 1994) which argued for a positive association between perceived competition intensity and support from top management.

H3 predicts a positive linkage between competition intensity and use of MA techniques. It is shown in Table 7 that the linkage between competition intensity and MA techniques use was insignificant and positive (coefficient = 0.097, t-statistic = 0.779, $p > 0.1$). H3 is not supported. It appears that a more intense competition perceived by firms did not in turn determine their adoption of MA techniques. This result contradicts findings from prior studies asserted a positive association between competition intensity and use of MA techniques (Hoque, 2011). The insignificant results in H1, H2 and H3 are

arguably attributable to structural and organisational differences of emerging economy in which the study is undertaken (Moses & Hopper, 2022; Ahmad & Zabri, 2015 Daowadueng et al., 2023). Most of Indonesian businesses have been ongoingly managed in a rather centralised way, regardless of the competitive situation (Yuliansyah et al., 2019). This speaks for an insignificant linkage displayed in H1. Moreover, decision-making in typical Indonesian companies has been prolongedly dominated by non-business agenda, which makes the prevalent of suboptimal decisions that are not competitively feasible (Kristanto & Cao, 2024). This corresponds for insignificant relations in H2 and H3.

It is expected in H4 that the relationship between extent of decentralisation and resources availability will be positive. The result in Table 7 indicates a significant and positive relation between extent of decentralisation and resources availability (coefficient = 0.316, t-statistic = 3.951, $p < 0.01$). H4 is therefore supported. This finding was in line with Groves & Loeb (1979) argument that increase in extent of decentralisation will be generally followed by firm's effort to ensure the availability and allocation of resources. Hence, it can be concluded that a greater extent of decentralisation adopted by firm will be followed by the availability of resources to ensure successful execution of firm activities.

H5 stated a prediction about positive association between extent of decentralisation and MA techniques use. It is demonstrated in Table 7 that the association between extent of decentralisation and use of MA techniques was insignificant and positive (coefficient = 0.102, t-statistic = 0.801, $p > 0.1$). This indicates no support for H5. It can be stated that a greater extent of decentralisation in firm structure does not subsequently lead to adoption of MA techniques across firms surveyed. This result contradicts the finding of Abdel-Kader & Luther (2008) that asserts a positive linkage between a greater extent of decentralisation and adoption of a wide array of MA techniques. It appears that a mere decentralised structure was not adequate to determine MA techniques adoption, as it would also depends on the availability of firm resources (Anderson & Eshima, 2013). This potentially indirect association will be examined in additional analysis in our study.

H6 expects a positive relationship between top management support and resources availability. Result in Table 7 displays a significant and positive relation between top management support and resources availability (coefficient = 0.548, t-statistic = 4.620, $p < 0.01$). H6 is supported. This result supports findings stated in prior studies that one of the most common forms of support from top management is reflected by ensuring the availability of necessary resources (Teo et al., 2007) required for undertaking firm's activities (Dong et al., 2009) and the resources themselves are also needed for implementing innovative ideas (Hornsby et al., 2002). As such, it can be asserted that the availability of a firm's resources is determined by support received from its top management.

It is predicted in H7 that the linkage between top management support and use of MA techniques will be positive. Result shown in Table 7 conclude a significant and positive linkage between top management support and MA techniques use (coefficient = 0.251, t-statistic = 1.896, $p < 0.05$). H7 is supported. This result confirmed findings from prior studies highlighted positive association between support received from firm top management and a seamless implementation of MA techniques (Al-Sayed & Dugdale, 2016; Duh et al., 2009). This finding also confirms assertion from previous studies regarding the importance of support from top management as a necessary factor required for a successful adoption of contemporary MA practices (Baird et al., 2007; Ahmad & Zabri, 2015).

H8 predicts a positive relationship between resources availability and use of MA techniques. Result in Table 7 conclude a significant and positive relationship between resources availability and MA techniques use (coefficient = 0.570, t-statistic = 4.164, $p < 0.01$). Hence, H8 is supported. This outcome was consistent with results from prior studies asserted the availability of firm resources as a requirement influencing adoption of MA techniques (Jermias & Gani, 2005) and determine the modification or upgrade of existing MA techniques (Wu & Boateng, 2010). Hence, it is arguable that the availability of firm resources exhibits an important role in firm decision to adopt MA techniques.

Table 7 Direct Paths, PLS Structural Model Result

Hypothesis	Direct paths	Coefficients	t-statistics	p-values
H1	CI ⟶ DC	0.194	1.029	0.152
H2	CI ⟶ TMS	0.172	0.916	0.180
H3	CI ⟶ MAT	0.097	0.779	0.218
H4	DC ⟶ RA	0.316	3.951	<0.01***
H5	DC ⟶ MAT	0.102	0.801	0.212
H6	TMS ⟶ RA	0.548	4.620	< 0.01***
H7	TMS ⟶ MAT	0.251	1.896	0.029**
H8	RA ⟶ MAT	0.570	4.164	< 0.01***

CI, Competition intensity; DC, Extent of decentralisation; TMS, Top management support; RA, Resources availability; MAT, Management accounting techniques.

*** significant at 0.01, ** significant at 0.05

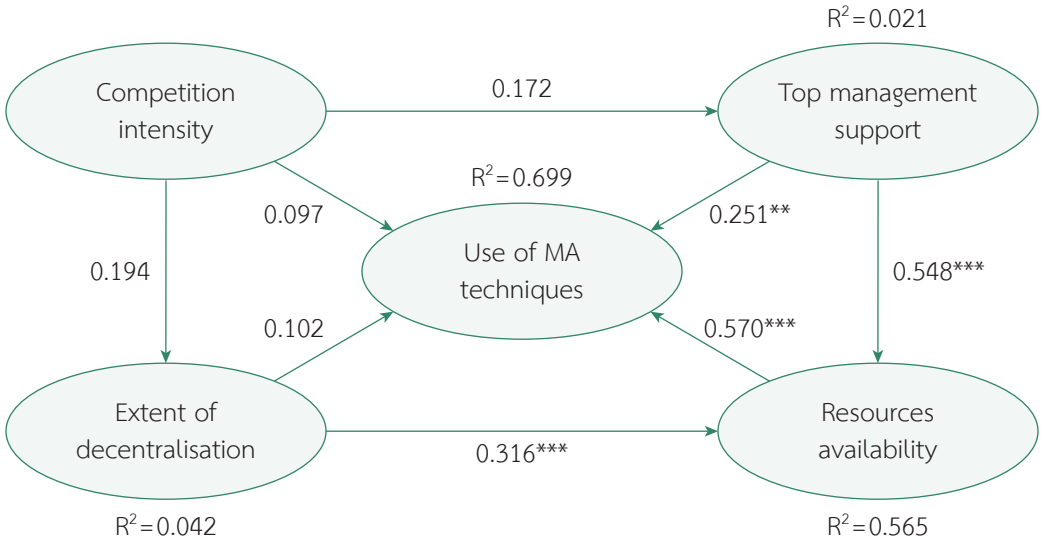

Figure 2 PLS Structural Model with Path Coefficients and R^2

*** significant at 0.01, ** significant at 0.05

4.3 Additional Analysis

Several indirect paths were analysed to identify the possibility of discovering significant mediating relationships. Table 8 displays significant indirect paths from PLS structural model results. We use the requirements stipulated by Nitzl et al., (2016) and Zhao et al., (2010) to categorise type of mediating relations as either indirect only, complementary, or competitive mediations and whether it can be labelled as full or partial mediation. A significant mediation relationship is demonstrated by significant coefficients for indirect paths and the lower and upper confidence interval levels contained no zero value (Nitzl et al., 2016; Zhao et al., 2010). Table 8 displayed two significant mediating relations. The first significant mediating relation documented a positive effect of extent of decentralisation on use of MA techniques that occur via resources availability. This mediating relation can be regarded as an indirect only (full) mediation since the hypothesised positive direct association between extent of decentralisation and use of MA techniques (H5) was insignificant.

The second significant mediating relationship was noticeable where a positive indirect path involves top management support with use of MA techniques occur via resources availability. This mediating relation can be labelled as complementary (partial) mediation since the significant mediating relation was in the same direction as in H7 which shows a significant direct positive association between top management support and MA techniques use. It is therefore arguable that these two significant mediating relations emphasised the integral role of firm resources availability on MA techniques use.

It is noticeable that the availability of firm resources because of adoption of a more decentralised structure will eventually lead to the use of MA techniques. It is also observable that support from top management is translated into making firm resources available, which lead to the adoption of MA techniques. In conclusion, these mediating results confirmed findings from prior studies (Groves & Loeb, 1979; Hornsby et al., 2002; Dong et al., 2009; Fullerton et al., 2013) highlighted the importance of firm's resources availability in bridging the association between firm structure and top management involvement with implementation of contemporary solutions; such as MA techniques; aimed to enhance firm's effectiveness.

Table 8 Significant Indirect Paths from PLS Structural Model Results

Indirect path	Coefficient	Standard Deviation	t-statistic	Confidence interval (Bias corrected)		Type of mediation
				Lower (5%)	Upper (95%)	
DC ⟶ RA ⟶ MAT	0.206***	0.066	3.133	0.103	0.306	Indirect only (full)
TMS ⟶ RA ⟶ MAT	0.313***	0.117	2.674	0.150	0.519	Complementary (partial)

CI, Competition intensity; DC, Extent of decentralisation; TMS, Top management support; RA, Resources availability; MAT, Management accounting techniques.

*** significant at 0.01

5. CONCLUSION

This study seeks to investigate the effect of contingency factors of competition intensity, extent of decentralisation, top management support and resources availability on management accounting (MA) techniques use across Indonesian manufacturers. Using contingency theory (Chenhall, 2003; Otley, 2016) this study predicts and finds positive associations between extent of decentralisation and resources availability, top management support and resources availability, top management support and use of MA techniques and resources availability and use of MA techniques. These demonstrated the direct effects of top management and resources availability in determining firm's adoption of MA techniques. Furthermore, additional analysis reveals mediating role of resources availability in facilitating positive associations between extent of decentralisation and use of MA techniques and top management support and use of MA techniques.

By investigating the relationship between contingency factors and use of MA techniques across Indonesian manufacturing firms, this study contributed to contingency-based MA literature in emerging economies in several ways. Firstly, as in congruence fit notion (Gerdin & Greve, 2004) results from this study show that Indonesian manufacturers' adoption of MA techniques was directly determined by contingency factors of top management support and resources availability and was indirectly influenced by the extent of decentralisation in firm's structure, as this factor initiate the availability of firm's resources which in turn determine adoption of MA techniques. Secondly, this study yielded different results from prior contingency-based MA, which is exemplified by insignificant effect of competition intensity on extent of decentralisation, top management support and MA techniques adoption. In addition, several mediating relations are also identified, which complements findings from prior studies. This study therefore enriched the contingency-based MA literature by showing the effect of several contingency factors; particularly top management support and resources availability; on the adoption of MA techniques in an emerging economy setting. This study also offers practical contributions that can expand manager's understanding about the role of several contingency factors that can directly; and indirectly; affect firm's adoption of contemporary MA techniques. Having a clear understanding about this cause-effect linkage can help managers in manufacturing firms to consider those factors in adjusting firm's strategy to accomplish better MA practices that can foster the attainment of firm's strategic objectives (Langfield-Smith, 1997; Tung, Baird & Schoch, 2011).

This study has limitations. Firstly, we only utilised a sample of manufacturing firms to address the hypothesised relationships. As the use of MA techniques recently has become prevalent in other sectors apart from manufacturing (Weygandt et al., 2021), future studies can expand the sample category to include firms from other sectors; such as services; to increase generalisability of results. Secondly, as stipulated by several studies, there are other contingency factors that could affect firm's adoption of MA techniques such as business strategy (Lee & Wang, 2020) and organisational culture (Asiaei & Jusoh, 2015). Future studies may consider examining effects of these factors on the adoption of MA techniques. Lastly, this study experienced a limitation of a relatively low sample size. Future studies can address this limitation by increasing the number of firms contacted at the initial stage to increase the possibility of having more responses.

Results of this study yield insightful evidence essential for academics and business practitioners regarding the relevance of contingency factors of extent of decentralisation, top management support, and resources availability; in determining MA techniques usage across Indonesian manufacturers. Another contribution of this study was the identification of mediating relationships involving contingency factors examined and MA techniques use, which extend our understanding regarding how multiple

contingency factors can directly and indirectly affect MA techniques adoption in an emerging economy setting. Apart from MA field, findings of this study are also applicable to other disciplines such as organisational studies in emerging economy settings (Zhou & Li, 2010) as it discusses the impact of top management support on MA techniques adoption and management science due to evidence regarding the interconnectedness of several managerially-relevant contingency factors that eventually affect MA techniques use across Indonesian manufacturers (Wu et al., 2023).

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