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Management Accounting Systems (MAS) Adoption: Empirical Evidence from Malaysian Manufacturing Companies

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Abstract: A clinical work was done among six students from Malaysian primary schools. Three of them were normal students and the other three were learning disabled students. The purpose of the clinical work was to see whether private class, parenting advice and food supplements, which were provided for the chosen students, can give a significant different in learning disabled students before and after the clinical work. Assessing by the test scores of Malay language and Mathematics, the clinical work was a success due to the learning disabled students able to show significant improvement before and after the clinical work. Hence, private class, parenting advices and food supplement can be used as the rehabilitation tools for learning disabled students in helping them to learn well as their normal peer.

Key words: MAS · Intensity of competition · AMT · Top management support · Human capital

INTRODUCTION

In the current business environment, there is an intense competition among businesses in the corporate world either in developed countries or developing countries [1]. Corporations aim to reach high profit and position in the market from various aspect of the business [2]. In relation to this situation, directors of corporations carry bigger responsibilities particularly to control cost, enhance productivity and making the right decision in a company [3] [4]. Management accounting systems (MAS) may provide useful information for the businesses in terms of planning, monitoring and controlling business process [5].

MAS are consisting of traditional and sophisticated practices. Some of the traditional MAS are standard costing and variance analysis, traditional budgeting and cost volume profit analysis, while some of the sophisticated MAS are Just-in-time (JIT), Activity-Based Costing (ABC), Total Quality Management (TQM), target costing and many others [6]. Despite of the emerging sophisticated MAS, Malaysian companies are still leaving behind as most of them currently adopting and relying on traditional MAS [6]. As for the sophisticated MAS, the use is lacking and some countries have not even adopted it at all [7].

The most popular criticisms for management accounting over the past two decades have been on the traditional tools such as variance analysis, budgeting, cost volume profit analysis and variance analysis that were claimed to be no longer relevant for today's manufacturing companies [7], [4],[8]. Despite the criticisms, it has invited researchers to further explore the research in MAS using survey based studies. These include various studies that had been conducted in developed countries such as the UK [9-12].

Based on the studies, common findings have been that traditional MAS are still relevant and to certain extent may outweigh the advanced MAS. This had raised questions whether is it premature to assume that traditional MAS lack relevance, as what had been claimed by [13]. Apart from that, there are lack of knowledge concerning the current state of MAS especially in less developed countries [14-16]. There is a lack of research in determining the level of MAS adoption in Malaysia; whether Malaysian companies still adopt traditional MAS or never had adopted advanced MAS at all. Although limited studies had been conducted, most of the studies

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were conducted in manufacturing companies, due to the fact that MAS is highly related to manufacturing industry [5].

The use of MAS among the Malaysian manufacturing companies has increased for the period of five years from 2003-2007 [17]. As technology becomes more advanced, the existing MAS need to be replaced with new techniques and systems that can cope with the change in production process as well as the cost structure. This study will again select manufacturing companies as the sample but will focus only on large manufacturing companies, to examine the level of MAS adoption. According to [5], in order to improve, the sample size should be large and randomly collected throughout Malaysia. Hence, the sample in this study will be collected randomly all over Malaysia, not focusing only in one region.

The extent of competition, business environment and technology has brought challenges for managers and pressures for management accounting to change. There are many contingent factors that may influence the use of MAS identified by previous researchers which can be classified into external and internal factors [18]. This study will only focus on four contingent factors which includes intensity of competition, Advanced Manufacturing Technology (AMT), top management support and human capital. Most prior studies identified that intensity of competition and advanced manufacturing technology influence the use of MAS [19, 20]. Intensity of competition has encouraged many companies to adopt innovative managerial practices such as just in time (JIT) and total quality management [21].

However, very limited study had been conducted to examine the top management support as one of the contingency factors that may influence MAS adoption [21]. examinedorganisational factors that may impact Activity-Based Costing (ABC) adoption. In the study, the top management support is one of the organisational factors. The result indicated that organisational factors are associated with initial interest in ABC. Apart from that, top management support was also found to have direct effect on the implementation of ABC due to the role of top managers in striving for the companies' objectives [22].

As for human capital, previous studies had tested the relationship between intellectual capital and adoption of specific MAS such as economic value added and performance measurement system. A study in Vietnam tested the relationship between knowledge management and MAS [23]. It was found that the adoption of knowledge management in businesses will increase the implementation of MAS. Human capital is one of the elements under intellectual capital and previously, it has not been examined as one of the main contingency factors that may influence the adoption of MAS.

On the other hand, in the commonly examined contingency factors such as intensity of competition and AMT, there are inconsistent findings from prior research. Intensity of competition was found to has a positive relationship with management accounting change as well as MAS adoption [24]. However, it was found that intensity of competition has no influence on MAS adoption [25]. Most prior studies found that AMT has a positive influenced on MAS adoption [24]. But [26] had found that technology is not one of the antecedents of management accounting change. Hence, this study will examine the contingency factors with limited prior study such as top management support and human capital. The two common contingency factors such as intensity of competition and Advanced Manufacturing Technology (AMT) are also being examined in this study due to the inconsistent findings by prior studies. Additionally, this study aims to provide further insight to contingency theory and also business practices.

Conceptual Framework and Formulation of Hyphothesis: The use of a contingency framework for management accounting information systems analysis is a recent vogue [27]. According to [6], "the approach of contingency to management accounting is actually based on the premise that there is no universally appropriate or suitable accounting system that applies equally to all companies in every circumstances" [19]. This indicates that there are no specific MAS that every organisation could adopt as different companies have different situations and circumstances. It is suggested that specific features of an appropriate accounting system depends on the specific circumstances in which a company finds itself [27].

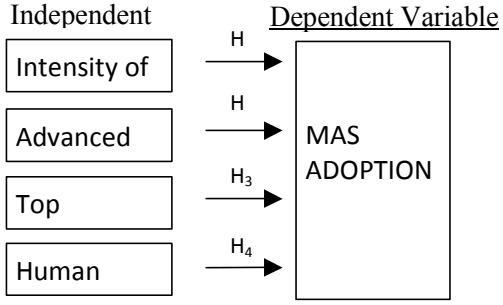

Fig. 1: Conceptual Framework of the Research

Based on the contingency theory that had been studied by previous scholars, the four factors namely intensity of competition (external factor), Advanced Manufacturing Technology (AMT), top management support and human capital (internal factors) might be the drivers to why there is different MAS adoption in different companies. Hence, a conceptual framework had been developed (shown in Figure 1). The conceptual framework proposes the relationship between the four contingent factors and the adoption of MAS. The overall objective in this study is to identify factors that influence the level of MAS adoption. This study is conducted to examine whether the four contingent factors may have influence on the adoption level of MAS. The independent variables in this study are the four contingent factors, while the dependent variable is the adoption level of MAS in Malaysian manufacturing companies. The relationship between independent variables and dependent variable will lead to the development of hypotheses.

Literature Review and Hyphothesis Development

Intensity of Competition and MAS Adoption: Intensity of competition has positive influenced on management accounting change [28]. The evolution of broad range MAS in 14 Indian firms had been explored and the result found that changes in external environment had triggered changes in MAS [25]. It indicates that when there is a change in the outside environment of the organisation, it had driven the MAS in the organisation to change. This shows a positive relationship between intensity of competition with MAS. However, a study by [29] did not found a direct positive relationship whereby the result indicates that competition does not affect management accounting change directly, but it affects management accounting change through influence of organisational structure. Despite of the positive relationships, there are also negative results found by previous scholars. In a study conducted by [27], intensity competition was not found to be important predictors of change in management accounting control systems. The effect of market competition was found to be not significant to the increase of adoption of western management accounting [25]. Therefore, the first hypothesis in this study is developed as;

H1: Intensity of competition has a positive relationship with MAS adoption.

Advanced Manufacturing Technology (AMT) and MAS Adoption: In a study conducted by [30], it was found that technological advanced is one of the important predictors of change in management accounting control systems. [21] had also found that AMT has positive and significant relationships with the extent of use of strategic management accounting. The findings in study conducted by [9] had been supported by Al Qimri and Drury in 2007 [24]. According to these authors, the higher the level of cost system sophistication, the higher the extent of MAS adoption such as JIT and lean production techniques. Similarly, the differences in sophisticated MAS are driven by the adoption of AMT, JIT systems and TQM. However [21] had found that technology is not an important predictor in management accounting change. Based on the previous literatures, second hypothesis is developed;

H2: Advanced Manufacturing Technology (AMT) has a positive relationship with MAS adoption.

Top Management Support and MAS Adoption: According to [31], top management support is expected to be positively associated with ABC adoption. In their findings, organisational factors such as top management support, internal champion support and organisational size are associated with initial interest in ABC. According to a study conducted by Mustafa and, they concluded that most studies reviewed by them had claimed the criticality and vitality of the top management leadership and commitment in implementation of TQM. In a study on JIT implementation that was conducted by [32], top management support was found to have a direct effect on JIT implementation. Top management support was also found to be the most important factor that influence the implementation of ABC. Hence, it leads to the development of the third hypothesis in this study;

H3: Top management support has a positive relationship with MAS adoption.

Human Capital and MAS Adoption: The level of knowledge management has impact on the management accountant which eventually have impact on MAS adoption. A study had investigated the circumstances of intellectual capital management on MAS adoption. The findings found that the intellectual capital implementation level has a positive relationship with MAS adoption.

Apart from using the term knowledge management, there is a study on intellectual capital with performance measurement and corporate performance conducted by [33] and it was conducted in Malaysia. Intellectual capital comprises of human capital, relationship capital (customer capital) and structural capital. In the findings, they found that the investment level in intellectual capital is associated with MAS, business performance and the respond to future events' ability.

Human capital will be examined as the new contingent factor that may affect the adoption of MAS. Based on previous literatures mentioned earlier, it can be seen that knowledge management and intellectual capital may influence the adoption of MAS. Intellectual capital may also influence the adoption of economic value added. Economic value added is the internal measure that is most appropriate for performance. As economic value added is considered as one of MAS, if intellectual capital has direct effect on economic value added adoption, it can be assumed that intellectual capital may have direct effect on MAS adoption too. When intellectual capital had direct effect on MAS adoption, it can be assumed that human capital (a variable under intellectual capital) may have influence on the adoption of MAS. Thus, the fourth hypothesis is developed in this study;

H4: Human capital has a positive relationship with MAS adoption.

Research Methodology

Sample Selection: The unit of analysis of this research is company and the research is conducted using a cross sectional approach. The study used probability sampling particularly simple random sampling as it is the simplest and less complicated compared to other techniques. A survey is conducted among 200 large Malaysian manufacturing companies which are listed in the 2014 Federation of Malaysian Manufacturing (FMM) Directory. The sample is selected randomly throughout Malaysia and not focusing on one region as in the research conducted by [34] and [17]. Manufacturing companies are chosen due to the belief that management accounting adoption or change are more likely to exist in this type of company.

The survey is conducted among large manufacturing companies. This is actually in line with [19] whereby they stated that in order to improve, the sample size should be large. Large samples will give more relevant findings. For example, studies conducted on recently-developed MAS (ABC to be specific) have proven that adoption level in larger companies is higher [35]. Larger companies have greater access to resources that will enable them to experiment administrative innovations.

Data Collection: After listing out all of the samples, they are electronically mailed with cover letter and questionnaire. Although mail and internet surveys differ in many ways, they are recognised as the method to maximise survey response rates [36]. Upon completion of the instruments preparation, all questionnaires were electronically mailed (email) in the middle of March 2015. The respondents were given eight weeks to complete the survey. Within the first four weeks, there were 34 companies responded to the survey. After several follow-up through email and phone call to the remaining respondents, six more responses were received by the end of April 2015 resulted in a total of 40 answered and completed questionnaires. Therefore, the total response for this study is 20 percent. A response rate that is less than 25 percent is considered as normal and common in research among accounting areas [34]. Hence, this rate can be considered as enough for the purpose of inference and statistical analysis [37].

Measurement of Variables: All constructs are measured using validated or established instruments used in prior researches.

Management Accounting Systems (MAS): The study aims to identify the level of adoption of MAS in each of the selected companies. All of the respondents were asked to indicate to what extent they employ the techniques. To measure MAS, a 5-point Likert scale was used. The scale is ranged from 1= not used, 2= low used, 3= moderate used, 4= high used and 5=widely used. The items for measuring MAS are derived from the instruments used by [38]. The instruments that originally from Baines and Smith only covered the advanced MAS, thus traditional MAS are added to the instruments by referring to [37]. The first five techniques are traditional MAS and the remaining are advanced MAS.

Intensity of Competition: To measure the competitive environment, all of the respondents were asked to indicate the level of competition based on the competitive environment in their organisation using the 5-point Likert

scale. The scale ranges from 1= not intense at all to 5=very intense. The items for competitive environment are derived from the instruments used by [39].

Advanced Manufacturing Technology (AMT): In the questionnaire, the respondents were asked to indicate their extent use of particular advanced technologies in their companies. A 5-point Likert scale was used and the scale ranging from 1= not used, to 5= widely used. The items to be measured for this variable are derived from the instruments used by [40].

Top Management Support: In the questionnaire, the respondents are required to indicate the extent of support and participation of top management in their companies. The top management support was measured using 5-point Likert scale ranging from 1=not at all, to 5= very high extent. The items to be measured for this variable are derived from the instruments used by [38] based on [41].

Human Capital: Human capital is the professional skill and experience, creativity and knowledge of the employees. The respondents are required to indicate to what extent is their agreement on the companies' human capital whether they have the knowledge, skills and also have the creativity in the questionnaire. A 5-point Likert scale was used from a scale of 1= strongly disagree, to 5= strongly agree. The items to measure human capital are derived from instruments by [42].

RESULTS AND DISCUSSIONS

Tax Non-Compliance Behaviour.

Descriptive Analysis

Profile of the Responding Companies: The profile of the companies that participated in completing the survey is presented in Table 1. Majority of the companies (95%) have been operating for more than 10 years. The remaining are both companies that have been operating their business between 5-10 years and less than 5 years with the percentage of 2.5% respectively.

Most of the respondents are classified under electrical and electronics industry (20%), followed by engineering supporting and petrochemical and polymer industry, with 10% and 10% respectively. All of the respondents have more than 150 employees which indicate that they are large in size. Majority of the companies (16%) have total assets ranging from RM2.5 to RM50 million. Most of the participated companies (14%) have more than RM100 million annual sales revenues.

Table 1: Profile of the Responding Companies

Demographic variables	Categories	Frequency	Percent
Years of operations	Less than 5 years	1	2.5
	5 - 10 years	1	2.5
	More than 10 years	38	95
Industry classification	Electrical and electronics	8	20
	Engineering supporting	4	10
	Food processing	3	7.5
	Machinery and equipment	2	5
	Petrochemical and polymer	4	10
	Rubber products	2	5
	Textiles and apparel	1	2.5
	Basic metal	3	7.5
	Wood-based	3	7.5
	Others	10	25
Type of company	Local	22	55
	Foreign	15	37.5
	Joint venture	3	7.5
Type of product	Consumer	18	45
	Industrial	22	55
Number of employees	151 - 300	24	60
	301 - 450	8	20
	More than 450	8	20
Total assets	RM 2.5 - RM 50 million	16	40
	RM 51 - RM 100 million	10	25
	More than RM 100 million	14	35
Annual sales revenue	RM 5 - RM 10 million	3	7.5
	RM 11 - RM 25 million	7	17.5
	RM 26 - RM 50 million	9	22.5
	RM 51 - RM 100 million	7	17.5
	More than RM 100 million	14	35

Adoption Level of MAS in Malaysian Manufacturing Companies:

Table 2: Descriptive Statistics of the Main Variables (n=40)

					Theoretical Range	
Variables	Min	Max	Mean	Standard Deviation	Min	Max
MAS adoption	1.80	4.33	3.55	0.53	1.00	5.00
Intensity of competition	2.33	5.00	3.72	0.56	1.00	5.00
Advanced Manufacturing Technology	1.00	4.82	3.38	1.11	1.00	5.00
Top management support	3.00	5.00	4.14	0.63	1.00	5.00
Human Capital	3.00	5.00	3.85	0.51	1.00	5.00

Table 2 describes the overall mean score for each of the variables in this study. The overall mean for MAS adoption is 3.55 and it indicates that the adoption rate of MAS among Malaysian manufacturing companies was moderate. Traditional techniques are often said to be more utilised in Asian countries compared to advanced techniques [6]. However, in this descriptive result, it showed the overall mean for both traditional and sophisticated MAS. The organizations that responded can be seen as utilising both techniques moderately. Traditional and advanced management accounting techniques do complement each other.

The overall mean score for intensity of competition was 3.72. It indicated that the competitive environment among the companies that participate in completing the survey is slightly intense. As for the advanced manufacturing technology (AMT), the overall mean score was 3.38 which indicate that these companies moderately used AMT in their daily business operations. This result portrayed that these two factors have impact on the level of use of MAS among these companies. The evolution in management accounting had been suggested by IFAC framework to have major changes in MAS utilisation in stages 3 and 4 and it is said to be caused by increases in competition and AMT [37].

Top management support had an overall mean score of 4.14. This high score indicated that the top management had given their full support to their companies. The top management can be said to be supportive in terms of making long-term plans, providing research and development, new technology, promoting education or training to the staff and also arrange for an external advisors to assist the companies. As for human capital which is the last variable, the overall mean score was 3.85. The score indicated that the human capitals in the sample companies are considered as valuable assets and benefited to the companies. Overall, the human capitals give them a competitive advantage of having employees with knowhow, expertise, knowledge, experience and skills.

Table 3 shows the list of management accounting techniques in descending order by mean and the number of companies that utilised the techniques extensively and not extensively. In the first column, the lists of the techniques are ranked based on the mean scores of each of the techniques (from the highest mean score to the lowest mean score). Based on the result, TQM had the highest mean score which was at 4.20, followed closely by standard costing at a mean score of 4.15 hence indicating that these two techniques were used highly by the sample companies. Product profitability analysis, budgetary control, variable costing, shareholder value analysis, customer profitability analysis and benchmarking also have quite high mean scores that were above 3.50.

The high mean score of TQM indicated that companies in manufacturing industry nowadays are concerned with the quality of their products in order to improve the customers' satisfaction. It also portrays the importance of non-financial information among managers in the manufacturing companies. To gain a highly satisfied customers, companies throughout the world are competing to produce high quality products and services. Standard costing, budgetary control and variable costing represented the traditional MA techniques and with high mean scores, traditional MAS are still useful in this era despite of the technological advancements that had been made.

By referring to the techniques listed in the table, they are the combinations of traditional and sophisticated MAS and highly used by these sample companies. The combination of traditional and advanced MAS that are being highly used supported the literature which stated that traditional and advanced MAS complement each other. Despite of all the critics on traditional techniques, it is still relevant among these manufacturing companies in Malaysia.

Table 3: Ranking of MA Techniques and the Number of Companies that Utilised the Techniques

			No. of companies (%)		
MA Techniques	Mean	Rank by mean	Extensively used	Not extensively used	Total (%)
Total quality management (TQM)	4.20	1	85	15	100
Standard costing	4.15	2	97.5	2.5	100
Product profitability analysis	3.93	3	82.5	17.5	100
Budgetary control	3.90	4	72.5	27.5	100
Variable/marginal costing	3.80	5	80	20	100
Shareholder value analysis/EVA	3.78	6	85	15	100
Customer profitability analysis	3.73	7	67.5	32.5	100
Benchmarking	3.60	8	62.5	37.5	100
Value chain analysis	3.38	9	50	50	100
Full/absorption costing	3.30	10	50	50	100
Cost-volume-profit (CVP) analysis	3.28	11	52.5	47.5	100
Activity based management (ABM)	3.23	12	42.5	57.5	100
Product life cycle analysis	3.20	13	30	70	100
Activity based costing (ABC)	3.20	14	50	50	100
Target costing	2.53	15	7.5	92.5	100

Table 3 shows that value chain analysis, full or absorption costing, CVP analysis and the rest of the techniques are being moderately used by the sample companies as the mean scores decreased. ABM and ABC were also being moderately used by them. In this study, the least technique that was being utilised by the selected manufacturing companies is target costing, with a mean score of only 2.53. The result regarding target costing is supported by previous study whereby stated that target costing is not widely used in Asian countries including Malaysia.

Test of Hypotheses

Multiple Regression Analysis Result: In order to examine the expected relationship between the adoption level of MAS and the factors that had been mentioned before, the following regression model was run:

Equation:

Where,

COMP = Intensity of competition
AMT = Advanced manufacturing technology
TMS = Top management support
HUCA = Human capital

The regression result was displayed in Table 4. Based on Table 4, the whole set of the predictor variables seemed to be accounted for 74% (Adjusted $R^2 = 0.74$) of MAS adoption in the sample companies. This is an acceptable result as previous researchers such as [38] and [25] which had 0.65 and 0.48 respectively for their Adjusted R^2 value. They had also conducted a study on management accounting change with their own contingency factors. The result from the table also indicated that the best predictors of MAS adoption were AMT and intensity of competition which is based on the beta values of each independent variable.

Table 4: Regression Analysis Results

	MAS Adoption		
Variables	Standardized Beta	t-value	Sig. value
Intensity of competition	0.75	5.22	0.00
Advanced Manufacturing Technology	0.92	6.28	0.00
Top management support	0.17	1.05	0.30
Human capital	-0.58	-4.27	0.00
R^2	0.76		
Adjusted R^2	0.74		
F Value	28.07		

Intensity of Competition and MAS Adoption: Based on Table 4, the regression for the relationship between MAS adoption and intensity of competition is 0.75. The result from the beta value showed that the intensity of competition has a strong and unique contribution to explain MAS adoption. The sig. value is 0.00 ($p < 0.05$) which makes a statistically significant unique contribution

to the equation. Thus, it can be said that intensity of competition has a positive and significant relationship with MAS adoption (Beta = 0.75, $p < 0.05$). This result is supported by [24] whereby intensity of competition has a positive and significant relationship with the use of budgeting system. Szychta [28] also found that intensity of competition has a positive influenced on the changes in management accounting. When the companies operate in a situation where the intensity of competition is high, the managers tend to make a better decision by adopting MAS [16]. Hence, based on the result, the first hypothesis in this study (H1) is supported. Intensity of competition has a positive and significant relationship with MAS adoption.

Advanced Manufacturing Technology (AMT) and MAS Adoption: The regression result displayed in Table 4 indicates that the beta value for AMT is the highest among other independent variables (0.92). It means that this variable makes the strongest unique contribution to explain the adoption of MAS. The sig. value is 0.00 ($p<0.05$) indicating a statistically significant unique contribution to the equation. AMT can be said to have a positive and significant relationship with MAS adoption (Beta = 0.92, $p<0.05$). This result is supported by previous study whereby new technology influences the cost structures to change. Ahmad and Leftesi [43] also found that AMT has a positive and significant relationship with the extent use of strategic management accounting. Hence, the regression result for the relationship between AMT and MAS adoption had indicated that the second hypothesis (H2) in this study is supported. AMT has a positive and significant relationship with MAS adoption.

Top Management Support and MAS Adoption: The regression result displayed in Table 4 for the relationship between MAS adoption and top management support is very poor (0.17). Even though it showed a positive relationship, it is considered weak as the beta value is very low compared to other independent variables. Apart from having a very low beta value, the sig. value is 0.30 ($p > 0.05$). In this case, top management support is not making a significant unique contribution to the prediction of the MAS adoption. The result indicates a very weak positive relationship and it is not significant (Beta = 0.17, $p > 0.05$). Even though most of the companies have high level of top management support, it can be concluded that the support given by the management is not related with the adoption of MAS. It can also be assumed that the research and development made by the sample companies are not regarding MAS adoption and thus, it is not the main predictor for MAS adoption. Hence, the third hypothesis (H3) in this study is not supported. Top management support has no significant relationship with MAS adoption.

Human Capital and MAS Adoption: Based on Table 4, the regression result for the relationship between MAS adoption and human capital is -0.58. The beta value is quite high, indicating a quite strong relationship among the two variables. However, the negative value showed a negative relationship between MAS adoption and human capital. As for the sig. value, it is 0.00 ($p < 0.05$), indicating that human capital is making a significant unique contribution to the prediction of MAS adoption. Hence, human capital has a negative and significant relationship with MAS adoption (Beta = 0.58, $p < 0.05$). This is because, employees sometimes do not have interest to change to new systems or practices. This might be due to their age factors; older employees or staff will resist for any new changes as they are already in their comfort zone and expert in their normal routine. They might not have proper accounting qualification and skills that restrain them from adopting MAS in their business. The human capital in the company itself might think that the new changes will not work so they refused to participate in any adoption of new techniques. Hence, the fourth hypothesis (H4) in this study is not supported. Human capital has a negative and significant relationship with MAS adoption.

Table 5 showed the summary of the hypotheses testing result. Hence, it can be seen clearly from the result that only intensity of competition and AMT can be considered as the contingent factors that have influence on MAS adoption among the manufacturing companies in Malaysia. These two factors supported previous findings related to contingent factors that influenced the management accounting systems. The other two internal factors namely top management support and human capital have no influence on MAS adoption.

Table 5: Summary of Research Hypotheses and Findings

Hypotheses		Findings
H1	Intensity of competition has a positive relationship with MAS adoption	Supported
H2	AMT has a positive relationship with MAS adoption	Supported
H3	Top management support has a positive relationship with MAS adoption	Not supported
H4	Human capital has a positive relationship with MAS adoption	Not supported

CONCLUSION

This study reports the result for the adoption level of MAS among manufacturing companies in Malaysia and the factors that may have influence on the adoption level of MAS. As for the adoption level of MAS, the result indicated that in the current year; 2015, the level of MAS adoption by the responding manufacturing companies is moderate. The utilisation of overall MAS (traditional and sophisticated MAS) in Malaysia can be seen as moderate and not too low. Most companies utilised both traditional and sophisticated MAS in their business. The most widely used technique by the companies is TQM.

The study provides theoretical and practical contributions. The common contingency factors such as intensity of competition and AMT were found to have a positive relationship with MAS adoption and this result may confirmed on the findings by previous studies and assist in solving the inconsistency of findings. Additionally, it provides further insights to the contingency theory in terms of adding more findings on top management support and introduction of new factor which is human capital. However, due to the insignificant and negative results found for these two factors, more studies should be conducted in the future because based on literatures; top management support and human capital are both important.

In terms of practical contributions, this study provides useful knowledge for the industries and also companies. It will increase the awareness to adopt more advanced MAS to be able to keep pace with competitive and advanced business environment. Managers in companies will have better knowledge on the factors to be considered in adopting MAS. This study used survey method and data collection, therefore, the main limitation in conducting this research is the low response rate. The responding companies were not being given ample time to complete the survey. This eventually had lead to a small number of responses which influenced the results in this study. Due to a very small number of samples, they may not fully represent the whole population of Malaysian manufacturing companies.

Future research should continue investigating the level of adoption of MAS among Malaysian companies and it should be generalised to all companies and not be restricted only in manufacturing industries. The adoption level of MAS should be determined in other industry such as service industry and comparison can be made between manufacturing and service industry. More studies on contingency factors such as top management support and human capital should be conducted among Malaysian companies. More time should be given to the respondents in order to get more feedback.

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