

## Inventory management practices among Malaysian micro retailing enterprises

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### Keywords

Inventory management, retailing sector, Malaysia, micro enterprises, SMEs

### Abstract

*Inventory management represents a key success factor that shows how efficient a company is controlling its inventories. However, there is little information on inventory management practice in a small business setting. Therefore, this study examines the current state of inventory management practices and factors that influence their use in micro retailing enterprises. A questionnaire survey was employed to gather data from the targeted respondents. Using 100 completed replies, the results demonstrate that most responding enterprises have adopted both unsystematic and systematic inventory management approaches in their business. A fully systematic approach of inventory management was only utilized by 33 per cent of the total respondents. In terms of inventory management techniques used, 'the rule of thumb' is the most popular among respondents. Meanwhile, EOQ, Bar Code Tagging and VMI are only applied by a small number of respondents. The results also indicate that Purchasing and Controlling are the most frequent inventory management activities applied by micro enterprises as opposed to Storage and Tracing. Finally, the results suggest that owner/managers' attitude and knowledge in inventory management have significant and positive influences on inventory management practices. On the other hand, the cost factor has a significant and negative influence on inventory management practices. Thus, all three proposed hypotheses developed in this study are supported.*

### 1. Introduction

Inventory management is one of the most important components in operation management (Capkun et al., 2009), as this area has been a central management function in material management systems (Mohanty, 1985; Rajeev, 2008; and Ahmad et al., 2014). It is also a crucial aspect of management, since inventory is one of the significant financial assets of a business that can indirectly affect profitability. Dobler (2006) claimed that firms with good inventory management can increase the firms' overall profit that will result in an increased level of working capital, production and customer satisfaction (Rajeev, 2008). The roles and functions of inventory management should be clearly assessed through linking the firm's goal to the requirement of the inventory. Pirttila and Virolainen (1992) argued that the task of inventory management is to transform broad and general business objectives into operational actions in day-to-day inventory control and aims to strike a balance between inventory investment and customer service (Heizer and Render, 2014, p. 512). This is because firms with high volume of inventories usually have to bear substantial inventory costs such as the holding cost, transportation, and management costs (Waller et al., 2006). Thus, these financial commitments need to be controlled carefully. Apart from that, the objective of inventory management is to turn over the inventory as quickly as possible without losing sales (Gitman and Zutter, 2012). In achieving these goals, enterprises should understand customer needs, vendor partnerships, technology, data integrity, and performance measurements (Lee and Kleiner, 2001).

In the retailing industry, an efficient inventory management practice may give a significant implication to the firm's performance. Retailing refers to a process of selling consumer goods or services to customers through multiple channels of distribution to earn a profit (Gaur et al., 2005). Demand is made through various target markets and promotional activities, for fulfilling the consumers' wants and needs through a lean supply chain (Gaur et al., 2005). Therefore, the retailing

industry involves a substantial amount of inventories that need to be sold to the end customers. For the past 25 years, retailing has gone through a phase of unprecedented change as the intensity of competition among retailers and customers' demands have increased (Bala, 2012). During this phase, the operations in retail businesses have transformed from manual inventory control systems to computerized systems. This is in line with the changes that occurred in technology and to meet with the current economic demand. Beheshti (2010) argued that in today's dynamic and competitive business environment, inventory managers of retail organizations are increasingly under pressure to develop systems that will enable them to minimize inventory costs, improve the flow of inventory in the supply chain, and meet customer demand in a timely fashion. The successful retailers will utilize a systematic inventory management in improving their customers' satisfaction through refined merchandise assortments and in-stock position (Lee and Kleiner, 2001). High level of customer satisfaction will result in increased revenue, lower inventory level, greater liquidity, and improved return on investment. Thus, inventory management represents a key success factor that displays how efficiently a company is controlling its inventories.

In most countries, the retailing industry consists of a significant number of businesses, especially in the small and medium-sized enterprises (SMEs) sector. For example, in Malaysia, almost half of the SMEs come from wholesale and retail industries. Out of this portion, 80 per cent of the establishments fall into the category of micro enterprises. Malaysian micro enterprise is defined as businesses that fall within the criteria of having either an annual sales turnover of less than RM 300,000 (equivalent to approximately USD 75,000) or fewer than five employees. The predominance of retail businesses is consistent with the high proportion of micro enterprises, which comprise 77 per cent of the total Malaysian SMEs (Ahmad, 2012). This signifies the important roles of micro enterprises for promoting the growth of retailing activities in the economy. Given the significant number of micro-enterprises, this sector contributes significantly to the economic development, employment and entrepreneurship opportunities. In regards to this, the application of a systematic inventory management within this sector should not be underestimated.

There are substantial empirical evidences concerning the inventory management practice (for example Lee and Kleiner, 2001; Capkun et al., 2008; Koumanakos, 2008; Shah and Shin, 2007; Rajeev, 2008 and Koliass et al., 2010). Despite this, the research into inventory management practices within small businesses is still scarce. Previous studies suggested that most inventory control techniques and concepts in use at present are applied mostly by larger firms, which have less financial restriction for adopting the modern management approach. Chikan and Whybark (1990) argued that SMEs were slow to adopt and implement contemporary inventory management practices. This is due to the inadequacy of resources in SMEs, including limited financial and skills which have become the main barriers for employing a more sophisticated approach. Thus, additional empirical evidences need to be collected to provide a clear insight on inventory management practices within the small enterprises context. Furthermore, in the case of retailing industry in Malaysia, there is a lack of information on inventory management practices in the SMEs sector. Therefore, this paper has begun to bridge this gap by investigating the current practice of inventory management in the Malaysian micro retailing enterprises and factors that influence inventory management practice. Consequently this paper enriches the body of knowledge in inventory management in small businesses. The remainder of this paper is set out as follows; the literature review is discussed in the next section followed by methodology and results and discussions. Conclusion is presented in the final section of this article.

## 2. Literature Review

There are considerable studies into the factors influencing inventory management practices. Previous studies had suggested a number of potential variables associated with the inventory management practice that came from a different context of research. Financial constraints, human factor, technology used and other organizational factors were among the variables found in the

previous studies. For example, Chikan and Whybark (1990) explored the inventory management practices of SMEs in Finland, based on the experiences of managers in the inventory management. The findings suggested that in Finland, the inventory management decisions were made at the operational level with minimal guidance from the top. This result which indicated the *laissez faire* leadership style may influence the different level of inventory management practices in an organization. Furthermore, Chikan and Whybark (1990) claimed that the lack of accurate, real-time and suitable aggregate information of material flows and stock levels prevented the Finnish SMEs from setting precise quantitative goals for inventory management. Likewise, Manthou (1994) conducted a study on the use of computer information systems in inventory management in small to medium and large companies of Northern Greece. The research found that although the use of computers at the operational level was satisfactory, the use of integrated information systems was non-existent in small to medium firms.

The main problem of a sophisticated inventory management usage was due to the inadequacy of qualified personnel as well as the management's attitude. In a later study, Ayad (2008) examined key factors within the control of store managers to optimize the inventory and store. The results found that different stores within the same companies and different departments within the same stores delivered different results, mainly due to human factors, specifically in terms of critical thinking, functional knowledge, and leadership. Strohhecker and Grobler (2013) focused on the physiological traits of inventory managers by investigating the influence of four personal traits (intelligence, knowledge, personality and interests) on performance in a dynamically complex inventory management task. The results showed that intelligence was the strongest predictor of inventory performance. Additionally, the results suggested that a strong interest for social issues can lead to higher cost and thus, worse performance.

Meanwhile, Rajeev (2008) investigated the factors associated with inventory management problems in the machine tool enterprises in Bangalore, India. The study revealed the use of rule-of-thumb for inventory management, random ordering of materials and low attention given on forecasting, training and development, computer use, purchasing and variable lead-time. Similarly, Bala (2012) concluded that retailers with the sophisticated computerized systems for better forecasting and improved inventory management had an edge over the others in terms of profitability. Thus, retailers can make use of the proposed model for demand forecasting of various items to improve the inventory performance and profitability of operations. Ali et al. (2013) who investigated inventory management of perishable products proposed that time decay and shortages were common issues in products with short life cycles. The financial volatility necessitated a more accurate characterisation of inventory costs based on the time-adjusted value. This was consistent with the findings of Chikan and Whybark (1990), who revealed that financial pressures forced the enterprises to reduce their inventories, which eventually led to internal as well as external stock outs. Other previous studies that investigated inventory management in different angles of study were carried out by Waller et al. (2006); Wallin et al. (2006); Niranjan et al. (2012); and Shen et al. (2013). Waller et al. (2006) who explored the impact of common inventory system inaccuracies that occurred in retail outlets on the inventory levels, fill rate, and service level of those outlets found that inventory system error and the frequency with which the error was corrected were statistically significant for the fill rate and service level. Furthermore, Wallin et al. (2006) explored the critical factors that influenced the decision on the purchase of inventory management, which were based on four choices; inventory speculation, inventory postponement, inventory consignment, and reverse inventory consignment. They concluded that the decision was influenced by three factors; customer demand or usage requirements, nature of the supply line and bargaining power of a firm relative to the supplier. Next, Urban (2002) examined the interdependence of inventory management and retail shelf management and found a linear relationship between the optimal order quantity and allocated shelf space.

There are substantial studies on vendor-managed-inventory (VMI) as VMI has become a widely used tool for the supply chain performance improvement (Niranjan et al., 2012). Furthermore VMI has been proven to be an effective tool for improving the supply chain performance by decreasing inventory-related costs and increasing customer service (Shen et al., 2013). This claim was supported by Tanskanen et al. (2009), who explored the challenges of managing logistics at corporate level in the construction industry, and concluded that VMI was an efficient solution for small item logistics at construction sites, provided that it was well-designed and movable. Dorling et al. (2006) identified seven key determinants of successful VMI and strategic supply chain relationships for industries characterised by oligopolistic competition. These were integrated into a step-wise framework that provided a path for practitioners to follow when establishing the VMI and strategic supply chain relationships in the New Zealand food industry. Meanwhile, Claassen et al. (2008) investigated the performance outcomes of VMI from a buyer's perspective and enablers for its successful application. The findings showed that buyer-perceived VMI success was impacted by the quality of the buyer-supplier relationship, the quality of the IT-system and the intensity of information sharing, but not by the actual quality of the information shared. Furthermore, VMI had led to three performance outcomes: higher customer service levels, improved supply chain control and, to a lesser extent, cost reduction. In more recent study, Niranjan et al. (2012) investigated the critical issues surrounding VMI implementation, and to support corporate practice with a methodology for evaluating the VMI readiness of firms. Fifteen features that determined the suitability of VMI can be broadly categorised as product-, company-, and supplier-related features. Next, Shen et al. (2013) who explored VMI practices from small and medium Indian enterprises found that organizational issues and unwillingness to share information were the major barriers of VMI adoption.

The literature above suggested that inventory should be properly and systematically managed in order to avoid loss to the company, as it associates with the performance. Organizational issues and an unwillingness to share information within the retailing enterprises appeared to be significant challenges to further improve the inventory management practices within small businesses. The literature also proposed that the culture of lack of precision of inventory information, especially due to the lack of sophisticated system or technology, might affect the efficiency of inventory management. Other than that, the prioritising of tasks for the whole inventory management process should be emphasised for enhancing the performance of inventory management. Therefore, this research was conducted to fill in the research gap and to contribute additional information to the body of knowledge in the inventory management field by exploring the current state of inventory management practices among small retailing enterprises and factors that influence the practices of proper inventory management among small enterprises. Factors found in relation to inventory management guided the development of the research framework of this study. Based on the previous studies exploring the effects of the contextual variables and inventory management practices, this study had sought to test whether cost and human factors had a significant influence on the inventory management practices. While the cost factor remains a clear barrier in the small business context for the adoption of systematic management practices (see Chikan and Whybark, 1990 and Ali et al., 2013), owner/managers' attitude towards a proper inventory management practice and their knowledge on inventory management may have a greater likelihood on higher inventory management practices. Managerial support towards the use of management practices had been investigated in many studies related to the use of advanced management practices. For example, Ahmad and Mohamed Zabri (2015) argued that the commitment of owner/manager was one of the key factors that affected the extent of use of sophisticated techniques in smaller firms. This is consistent with Ayad (2008), who concluded that human factors, specifically in terms of critical thinking, functional knowledge, and leadership, played roles in the implementation of proper inventory management practices. This study restricted

the number of selected contextual variables due to the relevancy of these variables in a small business setting. Thus, the following hypotheses were developed in order to achieve the research aim of this study.

*H<sub>1</sub>: Cost barrier has a significant influence on inventory management*

*H<sub>2</sub>: Attitude towards inventory management has a significant influence on inventory management*

*H<sub>3</sub>: Knowledge on inventory management has a significant influence on inventory management*

This study divided inventory management practices into two components; Storage and Tracing and Purchasing and Controlling. Figure 1 illustrates the influence of cost barrier, owner/managers attitude and knowledge towards inventory management practices.

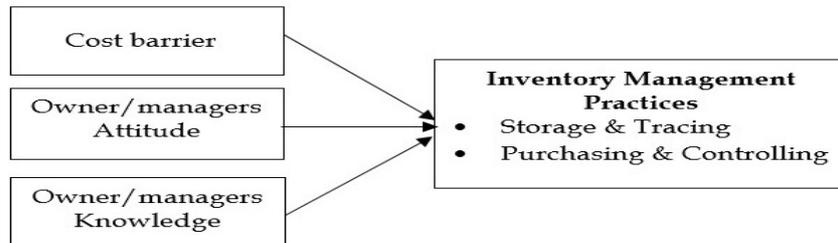


Figure 1: Conceptual framework of contextual factors and inventory management dimensions.

### 3. Research methodology

This study focuses on micro enterprises in the retailing industry as the target population. Questionnaires were distributed directly to 500 owners/managers of the micro retailing enterprises, using a simple random sampling among the retailing enterprises in order to allow for an unbiased representation of a group. Responses to the initial questionnaires were received from 55 respondents. After several follow-ups, a total of 100 completed responses were received, which was equal to 20% of the response rate. The questionnaire comprised of information on the background of respondents, general questions on inventory management practices, details of inventory management practices and factors influencing the inventory management practices. Details of inventory management practices were measured using 16 items related to how the inventory was stored, handled, controlled and purchased. These activities were further classified into two main categories; Storage and Tracing and Purchasing and Controlling. The first category refers to the activities related to how the inventories were kept and traced. This component helps the enterprises to easily trace and identify the inventories. The second category comprise of activities related to purchase and control. This is a critical aspect of inventory management in ensuring sufficient amount of inventories are available when needed. Meanwhile, the selected factors associated with inventory management practices included cost, owner/manager's attitude and owner/manager's knowledge on inventory management. All items were measured using a five Likert scale from 1; Strongly Disagree to 5; Strongly Agree. The reliability analysis using a Cronbach's alpha value was conducted in order to calculate the internal consistency of all scaled-items used in this study. The closer the Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items. Table 1 shows the results of the reliability test.

Table 1: Results for reliability tests

No.	Variables	No. of items	Cronbach's alpha coefficient
1	Inventory management practices	16	0.94
2	Cost barrier	4	0.819
3	Owner/managers' attitude	5	0.858
4	Owner/managers' knowledge	3	0.896

The results of the reliability test indicated that all items were found to be highly reliable where the Cronbach's alpha values were greater than 0.8.

#### 4. Results and discussions

This section discusses the results of the data collected from 100 replies. Descriptive analysis was employed to understand the profiles of the respondents. Meanwhile, correlation and multiple regression analyses were conducted for hypotheses testing on the influence of cost barrier, owner/managers' attitude and knowledge on inventory management practices. The section begins with a discussion on the profiles of the firms.

##### Profiles of the responding firms

Table 2 shows the profiles of respondents in terms of number of employees, years in business, inventory management approach and the techniques adopted. The results showed that most respondents had a number of employees below 5, which indicated the size of microenterprises. This was followed by small and medium-sized enterprises which were around 17 per cent and 5 per cent respectively. Meanwhile, the majority of the enterprises were still new in the business, where more than 50 per cent of the respondents stated that they had been operating for not more than five years. About a quarter of the total respondents had been in business for more than 10 years.

Table 2: Demographic profiles of respondents (N=100)

	Frequency (%)		Frequency (%)
<i>Education level of owner/managers</i>		<i>Years in business</i>	
UPSR/PMR	10	Less than 5 years	58.0
SPM	48	5 to 10 years	18.0
STPM/Diploma	26	10 – 15 years	10.0
Bachelor degree	16	≥ 15 years	14.0
Total	100.0	Total	100.0
<i>No. of employees</i>		<i>Type of business entity</i>	
0 – 5	78.0	Proprietorship	66
6 – 20	6.0	Partnership	13
21 – 50	11.0	Companies	18
51 – 150	3.0	Non-registered	3
> 150 employees	2.0	Total	100.0
Total	100.0		
<i>Owner/managers' gender</i>			
Male	67		
Female	33		
Total	100.0		

##### General information on inventory management practices

Table 3 presents the data on the general information of inventory management practices. The results show that 17 percent of the total respondents have unsystematic inventory management practices, which is considered low. However, nearly 50 percent of the respondents agreed that their inventory was managed in both systematic and unsystematic ways, which meant that formal and informal approaches have been undertaken. The results also demonstrate that a third of the total respondents used a fully systematic way. Overall, the results suggest that a moderate number of small business retailers have implemented proper inventory management practices. In terms of techniques used, the results indicate that 'own experience' or 'the rule of thumb' appear to be the most used techniques in inventory management among the respondents. Meanwhile, the EOQ technique is only utilized by 26 percent of the respondents. Bar code tagging and VMI are the lowest techniques used by the respondents, with six percent and four percent respectively. The results suggest that the majority of the respondents used their own experience to manage the inventory, which is more to the informal style. This might be due to their relatively small size and other constraints that may contribute to this condition. Therefore, in general, most respondents made use of the informal method in managing inventory for their routine operations.

Table 3: General information of inventory management practices (N=100)

	Frequency (%)		Frequency (%)
<i>Inventory management approach</i>		<i>Techniques used in inventory management</i>	
Unsystematic	17.0	Own experience/Rule of Thumb	64.0
Mix of systematic and unsystematic	49.0	Economic Order Quantity (EOQ)	26.0
Systematic approach using certain inventory management techniques	34.0	Vendor Managed Inventory	4.0
Total	100.0	Bar Code Tagging	6.0
<i>Quantity of inventory storage</i>		Total	100.0
Low	15		
Medium	52		
High	33		
Total	100.0		

### Detailed information of inventory management practices

This section discusses in details of the current state of inventory management practices which were measured using 16 items related to inventory management main activities. The 16 items were initially developed based on two principal activities of inventory management; Storage and Tracing and Inventory Purchasing and Controlling. A principal components analysis (PCA) with varimax rotation was first carried out to confirm whether the items used matched to these categories or fell into other aspects of inventory management. Table 4 presents the results of PCA analysis which divides the selected 16 items of inventory management into two broad activities. The first component includes 10 items (B12, B13, B15, B19, B20, B21, B22, B23, B24 and B25) whereas the other category consists of 6 items (B10, B11, B14, B16, B17 and B18). This classification is roughly consistent of the decision made to categorize inventory management into two main categories that included storage and purchasing. Table 4 includes the descriptive analysis for each of the 16 items. The highest mean scores are B21: Suppliers will be evaluated in terms of price, quantity of purchase and reliability; B22: organization has a list of valid and reliable suppliers; and B24: All inventories received from suppliers will be checked through supplier's invoice and Purchase Order' with the mean values of 3.98; 3.95; and 3.79 respectively. These findings suggest that micro enterprises put emphasis on the accuracy of the purchased items from their valid and reliable suppliers. This purchasing procedure which involved the evaluation aspect is a critical process for avoiding waste and loss of the purchased items. Other significant items were B13; B23; and B25, with the mean values of 3.69; 3.63; and 3.60 respectively. These three items indicate a control on when a new order will be made and a regular monitoring on the previous purchased items. The findings denote that the respondents have a high use of the inventory management procedure for Purchasing and Controlling.

Table 4: Descriptive statistics of inventory management practices and PCA

No.	Description	Mean	Std. dev.	Skew	Kurtosis	Rotated Component Matrix <sup>a</sup>	
						Component 1	Component 2
B10	Every inventory's movement in and out of the firm is properly recorded.	3.29	1.22	-.097	-.959	.128	<b>.746</b>
B11	All inventory will be physically counted every year.	3.17	1.21	-.053	-.743	.177	<b>.797</b>
B12	Controls over defect or slow inventories.	3.51	1.07	-.483	-.222	<b>.434</b>	.328
B13	Thorough investigation if there is any shortage/excess of inventories.	3.69	1.07	-.661	-.088	<b>.556</b>	.443
B14	All inventories are classified by category with specific inventory codes.	3.25	1.31	-.228	-1.038	.514	<b>.640</b>
B15	Purchase order is properly numbered & controlled.	3.52	0.99	-.567	.110	<b>.644</b>	.441
B16	Shelf space for the storage of inventories are properly labelled for easy retrieval of inventories.	3.59	1.22	-.416	-.681	.332	<b>.667</b>
B17	Inventory records are kept by store keeper and reviewed by manager.	3.23	1.43	-.288	-1.166	.367	<b>.704</b>
B18	All inventories are controlled based on the optimal quantity level to avoid shortage or excess of inventories.	3.58	3.28	-.313	-1.153	.442	<b>.683</b>
B19	Purchase order is compulsory for every purchase of new inventory.	3.28	1.36	-.353	-1.089	<b>.595</b>	.534
B20	Purchase orders must be verified by authorized employees.	3.39	1.39	-.525	-.989	<b>.599</b>	.571
B21	Suppliers will be evaluated in terms of price, quantity of purchase and reliability.	3.98	1.06	-1.039	.683	<b>.831</b>	.189
B22	Organization has a list of valid and reliable suppliers.	3.95	1.16	-1.016	.228	<b>.744</b>	.178
B23	Organization identifies inventory re-order point.	3.63	1.11	-.678	-.024	<b>.720</b>	.343
B24	All inventories received from suppliers are checked through supplier's invoice & Purchase Order.	3.79	1.20	-.944	.136	<b>.744</b>	.380
B25	Any discrepancies in Purchase Orders and Supplier Invoice will be reviewed regularly.	3.60	1.23	-.683	-.392	<b>.762</b>	.208

Next, Table 5 presents the mean scores for each items under Cost barrier; Owner/managers' attitude; and Knowledge and average mean scores for all inventory management subcomponents. The results indicate that owner/managers' attitude is perceived to be high, with the mean value of 3.52 compared to cost barrier and owner/managers' knowledge. Next, inventory management activities under Purchasing and Controlling is found as the most frequent inventory management activities applied by the respondents as opposed to Storage and Tracing. The overall inventory management practice is considered moderate with the average mean score of 3.52.

Table 5: Descriptive results for all main variables used (N=100)

No	Items	Min	Max	Mean	Std. Deviation	Skew.	Kurtosis
C1	Approximate cost of space provision for storage purposes.	1	5	2.68	1.15	.092	-.587
C2	Cost of tools/equipment related to inventory control	1	5	2.38	1.05	.191	-.936
C3	Maintenance cost for the storage/security/ventilation.	1	5	2.38	1.04	.327	-.619
C4	Cost of storage facilities (shelves, boxes and packaging).	1	5	2.50	1.09	.385	-.356
C5	Average Cost	1	5	2.49	0.87	.397	-.154
A1	A systematic inventory management is needed	1	5	3.82	1.25	-.759	-.510
A2	Effort to implement inventory management.	1	5	3.53	1.19	-.255	-.993
A3	Time taken to implement systematic inventory management	1	5	3.20	1.17	-.092	-.917
A4	Contribution of systematic inventory management to profitability	1	5	3.70	1.14	-.507	-.567
A5	Willingness to make any changes in the operations	1	5	3.34	1.22	-.311	-.807
A6	Average Attitude	1	5	3.52	0.96	-.335	-.050
K1	Level of knowledge on inventory management.	1	5	2.83	1.27	.236	-1.078
K2	Level of knowledge on inventory handling techniques	1	5	2.78	1.20	.223	-.900
K3	Training/guidance received in inventory management.	1	5	2.74	1.21	.308	-.800
K4	Average Knowledge	1	5	2.79	1.12	.292	-.832
IM1	Storage & Tracing	1	5	3.30	1.02	-.302	-.612
IM2	Purchase & Control	1	5	3.63	0.89	-.768	.401
IM3	Inventory Management	1	5	3.52	0.87	-.536	-.229

### The relationship between factors and inventory management practices

This section provides the results of correlation analysis between the number of employees (Emp); education (Edu); inventory usage (Usage); inventory approach (App); inventory techniques (Tech); Cost; attitude (Att); knowledge (Know); Storage and Tracing (Stor.); Purchasing and Controlling (Purch.); and inventory management (IM). Table 4 and Table 5 also present the normality distribution for items involved in the measurement model. Normality assessment was made by assessing the measure of skewness of each item. The absolute value of skewness should be lower than 1.5 to confirm if the data were normally distributed (Zainudin, 2015). The absolute values of skewness for all items were lower than 1.5, which indicate that all of the items are normally distributed.

Table 6: Pearson correlation test for contextual factors and inventory management

Item	Emp	Edu	Usage	App	Tech	Cost	Att	Know	Stor.	Purch.	IM
Emp.	1	.429**	.201*	.135	.396**	-.152	.235*	.298**	.363**	.216*	.273**
Sig. value		.000	.045	.181	.000	.131	.018	.003	.000	.031	.006
Edu.		1	-.132	-.047	.410**	-.126	.021	.295**	.322**	.127	.199*
Sig. value			.192	.644	.000	.213	.833	.003	.001	.208	.047
Usage			1	.461**	.166	-.240*	.166	.105	.266**	.231*	.258**
Sig. value				.000	.098	.016	.100	.297	.007	.021	.009
App.				1	.181	-.149	.218*	.246*	.313**	.306**	.305**
Sig. value					.072	.139	.030	.014	.002	.002	.002
Tech.					1	-.230*	.143	.360**	.451**	.235*	.327**
Sig. value						.021	.155	.000	.000	.018	.001
Cost						1	-.134	-.050	-.241*	-.249*	-.267**
Sig. value							.184	.622	.016	.012	.007
Attitude							1	.442**	.376**	.457**	.454**
Sig. value								.000	.000	.000	.000
Know.								1	.450**	.275**	.363**
Sig. value									.000	.006	.000
Stor.									1	.811**	.921**
Sig. value										.000	.000
Purchase										1	.969**
Sig. value											.000
IM											1

Table 6 shows that seven contextual variables have significant and positive relationships with inventory management practices. The owner/managers' attitude towards inventory management and knowledge on inventory management have a moderate correlation with inventory management, which signified the crucial role of owner/managers in initiating a proper inventory management. Meanwhile, the inventory's general approach and techniques are significantly associated with inventory management, which is quite sensible in this context. The bivariate results indicate that the number of employees, education and amount of inventory usage have low and significant relationships with inventory management. Lastly, the cost factor has a negative relationship with inventory management practise due to the fact that a high cost inhibits the employment of the proper approach of inventory management. The results are acceptable in the small enterprises context due to significant constraints of resources faced by firms from this sector.

### The influence of selected contextual variables on inventory management practices

The multiple regression analysis was performed to analyze the influence of the three selected contextual variables; Cost barrier; owner/managers' attitude towards inventory management; and owner/managers' knowledge on inventory management practices and to test the three proposed hypotheses. The following regression model was developed to demonstrate the influence of the independent variables on the dependent variable.

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where Y (INVMNGT)=Inventory Management;  $X_1$ =Cost barrier (COST);  $X_2$ =Owner/Managers' attitude on inventory management (ATTITUDE);  $X_3$ = Owner/Managers' knowledge on inventory management (KNOWLEDGE); and e = error term. Table 7 shows the results of the multiple regression analysis. The overall regression model explained that 22.9 per cent (adjusted R<sup>2</sup>) of the variance in the dependent variable (F=9.518, P=0.000) and the standardized beta coefficients for all independent variables have significant influences on the inventory management practices. Therefore, all of the proposed hypotheses are supported. The following multiple regression model based on the results are as follows:

$$\text{INVMNGT} = 2.860 - 0.222\text{COST} + 0.199\text{ATTITUDE} + 0.185\text{KNOWLEDGE} + e$$

Table 7: Multiple regression analysis results on the influence of cost, attitude and knowledge on inventory management practices.

<b>Model Summary<sup>b</sup></b>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.479 <sup>a</sup>	.229	.205	.780	1.852
a. Predictors: (Constant), Knowledge, Cost, Attitude					
b. Dependent Variable: InvMngt					
<b>ANOVA<sup>a</sup></b>					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	17.361	3	5.787	9.518	.000 <sup>b</sup>
Residual	58.369	96	.608		
Total	75.730	99			
<b>Coefficients<sup>a</sup></b>					
	Unstandardized Coefficients		Std. Coeff.	t	Sig.
	B	Std. Error	Beta		
Constant	2.860	.415		6.898	.000
Cost	-.222	.091	-.225	-2.431	.017
Attitude	.199	.095	.218	2.105	.038
Knowledge	.185	.080	-.236	2.313	.023
a. Dependent Variable: InvMngt					
b. Predictors: (Constant), Knowledge, Cost, Attitude					

## 5. Conclusion

This research reports the quantitative results obtained from 100 useable responses to a questionnaire sent to a sample of 500 Malaysian micro enterprises in the retailing sector, enquiring as to the current state of inventory management practices and factors that influence the practices. Descriptive, bivariate and multiple regression analyses were carried out in order to achieve the research aims. In term of the general practices of inventory management, most respondents have adopted both the unsystematic and systematic inventory management approaches in their business. Less than 18 per cent of the respondents indicated the use of an unsystematic method and a third of the respondents utilized a fully systematic way in managing their inventory. The responses seem sensible as small enterprises sometimes made decisions based on intuition or an informal approach. Furthermore, most of the micro enterprises felt complacent with their current state of practices and have a slow revolution and adaption to the modern approach. The lack of knowledge in inventory management and cost barriers further contributed to this situation.

In terms of techniques used in inventory management, the staffs 'own experiences or 'the rule of thumb' appear to be the highest inventory management techniques, which implies the informal style of managing inventory. EOQ, bar code tagging and VMI are only adopted by a minority of the respondents. The results might be reflected by the limitation of resources and expertise frequently facing small enterprises that have hindered the practice of proper inventory management which may expose them to serious inventory problems. There are considerable consequences for not having an inventory management system in place such as retail theft, ineffective decision making and reduced performance, which may put the enterprises in an uncompetitive position. The details of the level of use of the selected inventory management practices which were measured based on two categories (inventory Purchasing and Controlling; and Storage and Tracing) through 16 selected items suggested that micro enterprises had a high level of practice on inventory Purchasing and Controlling as opposed to Storage and Tracing of inventory. The accuracy of inventories received from their suppliers and monitoring supplier performance in terms of price and quantity with a list of valid and reliable suppliers and the examination on supplier's invoice and purchase order which was a crucial procedure when purchasing inventories received a great attention among respondents.

Next, based on the correlation analysis, the results have showed that the number of employees, education, inventory usage, inventory approach, inventory techniques, cost barriers,

attitude and knowledge have significant and positive relationships with inventory management practices. The owner/managers' attitude and their knowledge on inventory management have high correlation with the extent of use of inventory management, which meant that the owner/managers played a crucial part for facilitating the development of the proper implementation of inventory management in small businesses. Cost barrier is negatively associated with inventory management practices, which implies that the cost associated with inventory management may reduce the proper inventory management in micro businesses. As small enterprises have financial challenges to develop a systematic approach of inventory management, the issues should not be taken lightly as inventory management is one of the key determinants to success. The analysis on the effects of cost barrier; owner/managers' attitude towards inventory management; and owner/managers' knowledge on inventory management on the level of the inventory management practices reveal that all factors have significant effects on inventory management. While the owner/managers' attitude and knowledge have significant and positive effects on inventory management, the cost factor is found to have a negative effect on inventory management among the micro enterprises. Hence, all three proposed hypotheses are supported. The results suggested that the unavailability of expertise as well as the cost factor may impede the application of inventory management in micro enterprises. The results provide additional empirical evidences on the use of inventory management and suggest that there is a room for micro enterprises to improve their inventory management system. The unsystematic or informal approach may reduce competitiveness due to customers' dissatisfaction or an increased cost of handling, lost, defect or slow inventories. This statistical evidence confirms the previous findings with respect to the effects of cost, owner/managers' attitude and knowledge on inventory management (Chikan and Whybark, 1990; Ayad, 2008; Strohhecker and Grobler, 2013, Ali et al., 2013; Ahmad and Mohamed Zabri, 2015; and Wallin et al., 2006).

This research has increased the knowledge of inventory management in SMEs context and it can be a starting point for further investigations in this area. The work presents new additional evidences into inventory management practices and factors that influence the application of inventory management in micro retailing enterprises. As such, this study does not only contribute new information to the body of knowledge, but also presents insightful findings on inventory management for the related policy makers in Malaysia. This study is limited to the small businesses in the retailing industry; therefore, the findings of this study are not generalized to other sectors or industries. Future studies should increase the number of sample in order to collect more reliable evidences in this area or add more contextual variables such as the effect of technologies, business strategies and culture on the application of inventory management practices within small businesses.

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