

## **Innovation in Distribution Channel, Cost Efficiency & Firm Performance: The Case of Indonesian Small & Medium Enterprise Scales**

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### **Abstract**

*Even though the characteristic of distribution channels once established generally hardly to change (Ramaseshan et al., 1994), they become essential for SMEs export oriented to grow. It has been believed SMEs play crucial parts for generating employment, reducing poverty, adding value and contributing to GDP in most global economy. In spite of the existences literatures, studies on the relationship between distribution channel activities innovations and firm performance, particularly among export-oriented SMEs, are barely found. Using 120 samples collected from agricultural-based industry in Java-Indonesia, the result appeared innovation in distribution channel was positively significant with distribution efficiency, which in turn, improving the overall firm performance. The findings and implications would be grand challenges for SMEs export oriented in Indonesia.*

**Keywords:** distribution channel, innovation, efficiency, performance, SMEs, Indonesia

### **1. Introduction**

For decades, small & medium enterprises (SMEs) have been existed and major in their establishments and contribution in global economy- Thailand (Nagai, 2007); Malaysia (Shankar, 2010); Korea (Yhee, 2001) & Indonesia (Akira et al., 2011) as well as in most rest of the economy- Malaysia (32 % of GDP, 19 % of exports, & 56 % of employment & expected benefiting more from 2000 to 2020 period -Shankar, 2010). American SMEs have become a great engine in employment creation too (Agyapong, 2010). Singapore, Taiwan, Thailand, & South Korea-SMEs to employment ranged from 35% to nearly 61 % by contributing value added from 22 % to 40 % (Salleh, 1991) and poverty alleviation by jobs' creation (Vandenberg, 2006).

These days, adopting export-oriented for SMEs' performance is precious. Engaging in global market letting them be more recognizable upon competitors & affords them better entrée to new markets (Ungson et al., 1997). Dunusinghe (2009) & Kotz (2011) supported surely that involving in international trade/export boosting economic growth/GDP. Interestingly, export malfunctions happen because of process activities (Ogbeuhi et al, 1994) instead of some other factors.

### **Literature Review**

For years since 1970s distribution channel had been known at length for (Williamson, 1989, 2007) its capability to ease transaction cost. Empirical evidence transparently emerged in sorts of findings.

As international channel operation is significant with export performance (Ely, 2009), the 1990s work of Weigand (1991) found interesting indications that the applications of non formal channels might generate the unkind intermediaries leading to performance alleviation. Ramaseshan *et al.*, (1994) & Zdenko *et al.*, (2011) argued it is the channel members' position that determine the performance. Anderson, (1997) supported channel members' performance can be enhanced by certain coordination degree among them. Rialp *et al.*, (2002) examined the integration of structural channels over firms in Spain who engaged in exporting and invented obvious evidence that establishing linkage to importers via distribution decision can enhance export process. While, Mcnaughton (2002) shared his findings- the aim of multiple distribution channel establishment is to serve foreign market. Establishing independent channels also impact better for channel members. Here, as Kumar (2000) suggestion, decentralization is recommended.

However, Rose *et al.*, (2004) found clearly that conflict among channel members might cause problems in turn reduce performance. Interesting findings by Frazier *et al.*, (1989) on industrialized manufacturers demonstrated sales and profit also take a part in the channel relationship sustainability harmonization. (Brett, 1995) Confirmed further that information exchange among members play crucial part in enhancing their relationship performance. While John (2006) add trust as an essential element to maintain the relationship. Jennifer (2008) & Juh, (2009) further asserted channel relationship commitment & trust become the key mediator determines the channel performance.

As in short brief literature above, the studies emphasized on the relationship and governance arrangement of channel members. And their all lead to channel members' performance. While studies of distribution channels' activities, particularly in the context of SMEs export oriented agricultural based industries, on manufacturing, barely found.

It has been in a consensus that innovation to be the main driver for firms to pursue better competitiveness & performance. However, empirical evidences of innovations including in distribution channel-firm performance associations are miscellaneous. Some studies have found innovation is closely associated with firm performance (Ansir & Akira, *et al.*, 2011, Pla-Barber & Alegre, 2007; Moini, 1995, Love, 2001, & Gunday *et al.*, 2011). Others suggested the effect of process innovation gave different results to firm performance (Geroski & Machin, 1993). (Eitan Naveh *et al.*, 2006) found too much & little innovation also did not explain performance. Mark, (2004) argued innovation did not effect performance. Some others pointed process improvement did not influence sales growth of the small firms (Wolff & Pett, 2006). Fabricio *et al.*, (2004); Gary *et al.*, (2008); Wang *et al.*, (2009); Nada *et al.*, (2008); Morgado *et al.*, (2008); Gunnar *et al.*, (2009); Satya *et al.*, (2009), & Sullivan *et al.*, (2009) suggested innovation using technology and different method in distribution channel activities are significant with performance.

The miscellaneous result of the past findings of innovation probably excluded the mediating effect of distribution channel efficiency between the innovations -including in distribution and firm performance. To clarify the miscellaneous empirical studies, this study examine the mediating effect of distribution channel efficiency on the association between the innovations in terms of activities of distribution channels and the firm performance of SMEs export-oriented as such study barely found. However, the impacts of distribution channel activities' innovations on firm performance & the implications will be presented as well.

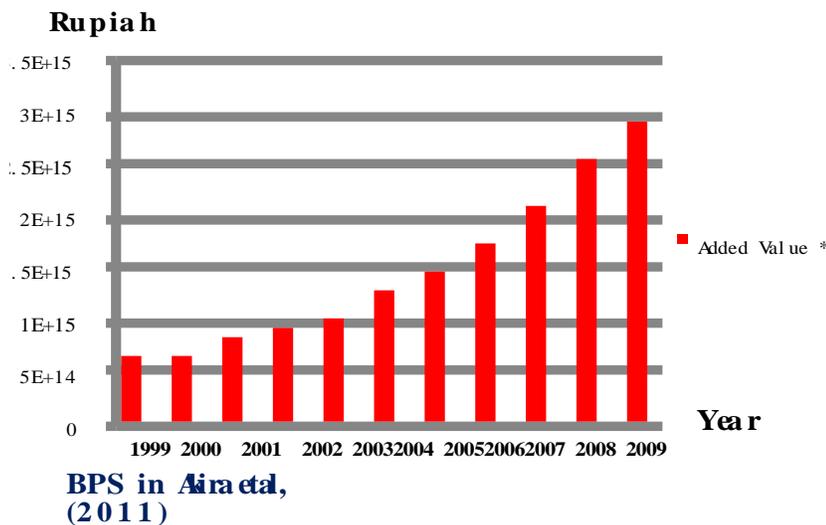
## **2. SMEs and the Indonesian Economy**

When The Thailand decided adopting floating on its currency in mid-1997, financial crisis in ASEAN unavoidably done- the Asian financial crisis. It made the exchange rate of domestic ASEAN countries and some others - Indonesia, Malaysia and the Philippines harshly depressed. The economic downturn happened for most all of them let their currency semi freely depend on the U.S dollar and at the same time received a substantial amount of short-term foreign capital. In Indonesia, the crisis made the Rupiah currency depreciated dramatically from around 2,500 to 10,000 Rupiah per U.S. dollar, whilst its GDP declined by 13% in 1998 (Wengel & Rodriguez, 2006). Stuningly, large enterprises (LE), and SMEs responded differently to it. Some how, SMEs survival under the crisis much better than larger ones. As the local market demand was low, the SMEs switched their market to the global. On the contrary, LEs were still under performed for their high import substances in their products (Berry, Rodriguez & Sandee, 2002).

Since then, the existences and establishments of SMEs has attracted the interest of the globe. As SMEs in Indonesia are mostly concentrated in agro-based industries, their capability to generate employment and value added are highly seen. Illustrated in figure 1-next page, they generated value added as much as 2,993,151 billion Rupiahs or 56.5% of value added in total. By their establishment, in 2009, the number of SMEs totaled 52.7 million or 99.9% of all firms establishments. In terms of job creation, Indonesian SMEs provided about 96.2 million employment or 97.3 % of the total employment (Akira et al, 2011).

Though for their significant contribution in the economy, Indonesian SMEs were, as others in the globe, hindered by various obstacles. Some of the issues were related to internal aspects like marketing & promotion, technology, & human capital (Manginsela,2005; Nurul, 2008; Tulus, 2009); and some other external ones - capital access & legality issues (Nurul, 2008). Abundant efforts have been taken to alleviate facing the sector by the Government, somehow, product distribution channel innovation is still a myth for local SMEs, especially those established in rural area, particularly on tight customs procedures & trade regulations as well as unreached good infrastructure(Tulus, 2009-can be seen in notes- the page before references). This paper focuses on innovation in distribution channel among SMEs export oriented.

Figure 1. Value added growth of SMEs 1999-2009 in Indonesia



### 3. Conceptual framework and hypotheses

#### 3.1 Distribution channel innovation and efficiency, and firm performance.

Bowersox et al, (1986) suggested distribution channel should be designed to carry out five fundamental functions-adjustment or assortment, transfer or transportation, storage, handling and communication. Other recommendations from Walters (1977) assured that distribution channel activities are categorized into two general groups, i.e. assortment and logistics. With respect to the activities, many of them are engaged along the distribution channel connecting to the members, namely suppliers, manufactures and end consumers. However, most of the activities are concentrated in, namely, logistics- inbound and outbound logistics. Inbound logistics support the materials' flow from suppliers into producers, whereas outbound logistics from the producers to the next channel. It is essential to pay attention that the activities shared to each other. All the activities involve costs. Outbound logistics for instance incur namely, transportation cost, warehousing and inventory cost, order processing cost, information cost & so forth (Somuyiwa, 2010).

(Walters, 1977: p.199) says assortment is “a collection of two or more types of goods, which either complement each other directly or in total possess some degree of potency for future contingencies”.

It was inferred that giving advantage for typical market is the aim of assortment. Diehl & Poynor (2010) found customers tend to be less fulfilled when choosing options from larger to smaller assortments. Salvador, (2010) worded using product configuration technology to customise product into diverse assortments as customers' preference will productively enhance sales for the efficient way of serving products to the customers. As optimal assortment activities relied on the right demand characteristic for each product, forecasting demand activities for new products in assortment can bring decision making then lead to the efficiency (Juin, 2009). It has indication that doing innovation in assortment would improve efficiency, hence, the first hypotheses emerge

***H1 : Innovation in assortment will be positively associated with distribution performance in terms of efficiency.***

Most firms know order handling as one of the crucial factors for business processes (Kritchanchai & MacCarthy, 1999). Most firms more know order handling become the main logistic activity that can speed up product and service flow (Bowersox, Closs & Helferich, 1986). Previous study also know that innovation in order handling would furnish on distribution efficiency performance. Furthermore, firm closely knows the technological support application, such as radio-frequency identification and global positioning system can improved real-time tracking information for products and replacement along the chain as well (Gaukler, 2008). They believe, re-engineering or the application of simulation in order processing added more value along the distribution chain, which can improve distribution performance (Zhang et al, 2009). They more believe the use of enterprise resource planning solution which commonly called "ERPS" in order processing is capable of improving operational efficiency in order delivery (Bendoly, 2004). As most of the firms know innovation in order handling will effect efficiency, therefore, the next hypotheses will be

***H2 : Innovation in order handling will be positively associated with distribution performance in terms of efficiency.***

It has been in a debate at length, an effective and efficient information sharing is essential for distribution channel performance (Zhou & Benton, 2007). Lee *et al.*, (1997) mentioned channel members' coordination-suppliers, manufacturers, distributors and retailers, would be the key for struggling flexibility that enables them to progress logistic efficiency processes in response to the quick changing market conditions. Fern'andez, (2006) indicated that using information technology in information processing, transfer and collection might improve market knowledge & their relationship with clients & suppliers or other channel members. Heide (1994) suggested as the success factors for export-oriented SMEs relied upon firms' ability to manage their relationship with foreign importer, Fern'andez, (2006) add the use of information technology (internet) in distribution channel apparently was found to facilitate the internationalization process of SMEs & to improve the relationship with other firms within the same value chain. Similar with other innovation addressed earlier that the information system sharing will probably positively influence efficiency performance, therefore, the hypotheses as follows,

***H3: Innovation in information system sharing will be positively associated with distribution performance in terms of efficiency.***

Product and distribution scheduling is known as logistic activity relating to when & where, the goods to be produced & delivered (Ballaou, 1978). Therefore, Ballaou believes the activity could optimize income and source usage. Varimna (2009) found an integrated scheduling method involving material, inventory, production, & delivery activity found can improve efficiency. Other method using computer programming in the coordination for instance what it is called monolithic & hierarchical approach for coordination of the supply chain product flow indicating similar outcome that both approach be capable of finding good coordinated schedules for large size problems in a logical computation time that lead to efficiency (Tadeusz, 2009). While related with integrated system, the study of using integrated scheduling system also be able to obtained operational performance in terms of efficiency in network (Subramanya 2009).

***H4: Innovation in product & distribution scheduling system sharing will be positively associated with distribution performance in terms of efficiency.***

Inventories appear be a significant fraction of business enterprise. Which is its assets (Kruger, 2005). A range of inventory problems created for its mismanagement.

Loss of productivity happens, the unwanted items do, a reduced level of customer commitment level exist, the accumulation of costly physical inventories also occur, if inventory are not managed properly. It is noted that the cost savings gathering from improved practices in inventory management are substantial (Meyer, 1991). Therefore, innovation in inventory management and control are crucial for firms to omit its mismanagement that threatens a firm's viability (Sprague & Wacker, 1996). Firms realize using a typical management method in inventory would free them to minimize inventory costs, avoid direct consequences, reduce unnecessary activities & keep the material resources enough (Chikan, 1990). Natarajan (1991) discusses with others & meet the conclusion that focusing on integrated strategic & other competitive factors- cost, delivery and quality would enhance performance. It is noted that firms would be likely to invent the product before delivering to their customers, hence, it is also estimated that innovation in inventory would be enhancing distribution performance efficiency.

***H5: Innovation in inventory will be positively associated with distribution performance in terms of efficiency.***

The role of transportation system is crucial as it could provide better logistic efficiency, reduce operation cost, and promote service quality. It is surprising that Chang (1988) found transportation costs, in average, cover 6.5 % of market revenue and 44 % of logistics costs. Hence a good transportation operation in logistics system could increase business competitiveness (Tseng, 2005), in line with this argument, Stefansson (2009) assured that a typical method of transportation coordination using three major elements : smart goods, smart vehicles and smart infrastructure could bring positive impact on supply chain performance. In contrast, poor coordination of the logistic system would lead to higher costs, longer delivery times, higher levels of loss and damage, & lowered customer service (Lee, Padmanabhan & Whang, 1997).

***H6 : Innovation in transportation will be positively associated with distribution performance in terms of efficiency.***

Warehousing generates time utility for potential customer (Koyle, 1976). As the movement of finished goods or/& material handling concentrated in and around the warehouse facilities, bottleneck in the warehouse can add more costs in transactions. To avoid such interruption, some technologies can be adopted and could improve distribution performance (Koyle, 1976). Computerized both hardware & software in automation & simulation in warehousing and material handling could solve efficiency improvement in the operation. Evidence speaks that simulation program can be an alternative method for efficiency improvement in the warehousing and material handling system (Diaz, 1988). Using technology of namely autonomous vehicle storage & retrieval systems - AVS/RS and web-based design conceptualization tool in warehouse permits firms to control costs, extend capacity, & improve their services to consumers (Heragu and Xiou, 2008).

***H7: Innovation in warehousing will be positively associated with distribution performance in terms of efficiency***

Firms in general, see packaging as a tool for product promotion & use. While the engineers, in general, see packaging as a protective device only. Interestingly, distribution management see packaging much more broadly. They see any change in design, size, media of transportation and so forth would contribute to the distribution efficiency (Walter, 1977). A recent study by Lacroix (2007) in Young on 800 American shoppers demonstrated that innovation in new packaging systems directly effected price expectation and product selection among the shoppers. If packaging can be modified properly, it is very likely to contribute a positive return on investment (ROI) by increased market share. It is also likely to raise prices. At then, the additional profit could be used to cover incremental costs. Morgado, (2008) suggested that plastic material based have advantages as they can provide less material, & also permit recycling. Using plastic materials, coloring activity, decorating activity, & printing activity can allow the innovated packaging to receive not only all the necessary information for the customers, but also other essential aspects including customer recognition

***H8 : Innovation in packaging will be positively associated with distribution performance in terms of efficiency.***

“Acquisition is the logistic activity that makes the product available to the logistic system. It is concerned with the selection of supply source locations, quantities to be acquired, purchasing schedule, and the acquired product form” (Bowersox et al, 1986, p.12-13). The crucial of acquisition to logistic is that purchasing decision has physical and time aspect that influence logistic cost.

“Acquisition or purchasing refers to those activities that take place between the organization and its suppliers” (Ballou 1978, p.298). In this department, besides product and prices, delivery, be accurate would become key element of the flow system.

Usually, firms purchase things between 40% and 60% of its sales dollar for material, therefore, the efficiency of this stage would be concerned. Consider its important impacts on logistic cost, purchasing quantities, timing of purchasing, source location, & form of the goods become some factors to be importantly considered. Therefore, choosing single or multiple suppliers, hedging price due to the changing currency value, pricing & so on would become concerned to be looked further (Ballou 1978). Using technology in acquisition would be enable firm as a buyer obtain strategically valuable resources, achieve market power, or generate strategic renewal (Graebner, *et al.*, 2010).

***H9: Innovation in acquisition will be positively associated with distribution performance in terms of efficiency***

In terms of products' flow efficiency, Borgstrom (2005) defines it how expenditure being disbursed in the lower point. The low cost would lead to firms' profit. Empirical studies obviously showed the positive relationship between efficiency and profit is strong. Using efficiency as parameters also be able to influence firm's innovative output that will refer to competitiveness (Lee *et al.*, 2010). Empirical result of technical efficiency on SMEs further emphasized that efficiency be intimately interrelated with profit (Major *et al.*, 2008 & Ferri *et al.*, 2012). In consistent with Major (2008), study of clothing firms in China also demonstrated high degree of sales both in domestic and export tend to be achieved by firms who have high degree of technical efficiency operation (Mok *et al.*, 2010). Furthermore, As Ulaga (2003) emphasized time in delivery and operational cost could create value in efficiency. More over, innovation in distribution channel : Assortment (Fabricio, 2004 ); Order handling (Linda, 2009); Information system sharing (Nada, 2008); Inventory (Rajeev, 2008 ); warehousing and material handling (Heragu, 2009 ); packaging (Morgado, 2008 ); and transportation (Gunnar, 2009 ) were significant positively leading to firm performance economic indicator as well, therefore

***H10 : distribution efficiency mediate the association between distribution channel innovation and the SMEs performance economic indicator.***

All the suggestions above give clues for SMEs that Innovation in distribution channel will improve distribution efficiency and hence positively effect on their performance.

### **3.2 Control variables and firm performance**

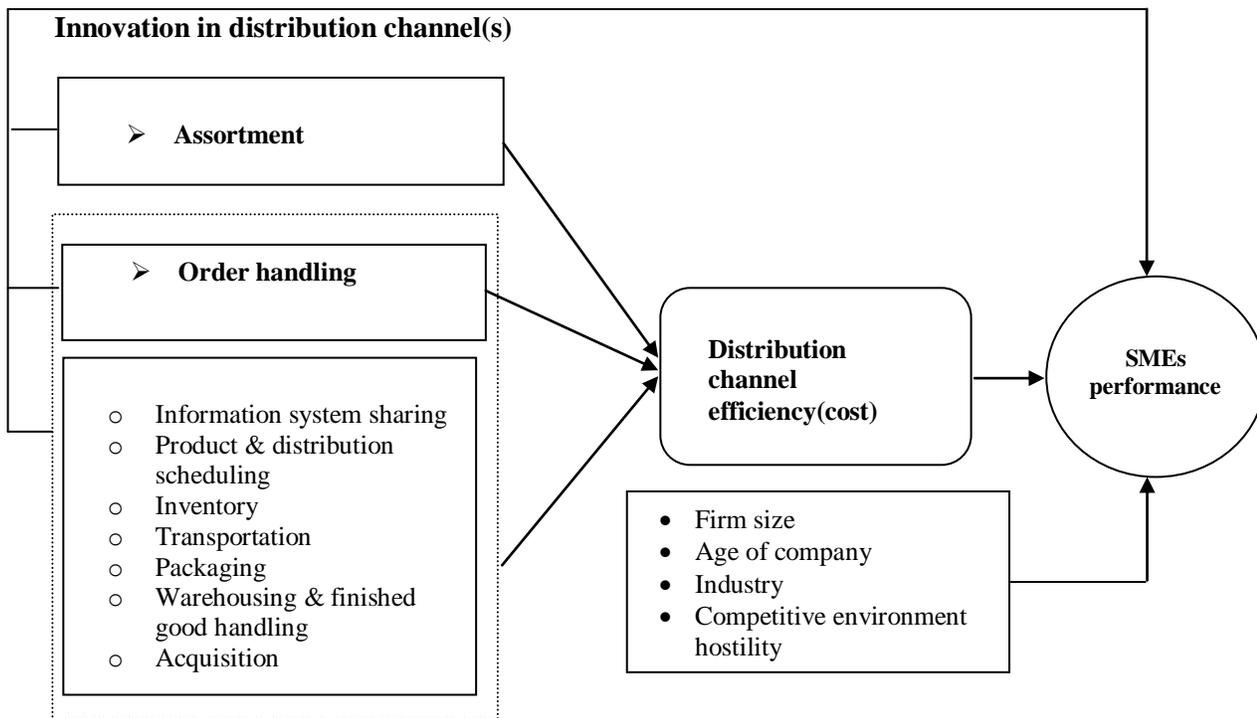
Acknowledging probable shock of size of the firm, age of company, industry and competitive environment hostility on firm performance as found in other studies, were integrated as control variables in this study. Firm size does have impact on firm performance, but the degree and trend of its impact is diverse. While other studies (Ozgulbas, Koyuncugil & Yilmaz, 2006; Orser, Hogarth-Scott & Riding, 2000); other studies found differently (Moreno & Casillas, 2007; Shanmugan & Bhaduri, 2002).

Impact of firm age on firm performance is diverse too. Kristiansen, Furuholt & Wahid (2003) found that the length of time in operation was significantly associated with business success. Similar positive impact of firm age can also be found in Shanmugam & Bhaduri (2002) and Birley & Westhead (1990) due to vast social capital owned by older firms. In contrast, other studies (Nichter & Goldmark, 2009) found that new firms grew faster than the older ones.

Significant influence of different types of industry on firm performance can be found in Gadenne (1999) and Humphreys & McClung (1981), among others due to different marketing strategies and management practices (Gadenne, 1999). Pertinent to competitive environment hostility and firm performance, a study by Miller & Friesen (1982) is interesting.

Some theoretical foundations of individual perspective of innovation, transaction cost, depot, & resource base view theory would be expected to be supported by result of the conceptual frame work. Individualist perspective : Innovation is triggered and driven by certain individuals in the society who have necessary characteristics to make it happen-Entrepreneurs (Schumpeter 1934). The purpose of distribution channel establishment reducing economic cost that occur during the transaction (Williamson, 2007, 1989).

While the essence of depot theory is that the goods tend to flow to end consumers at price in which dictated by consumers(see Leo in Bruce, 1967). Further, the resource base view (RBV) recommends that a firm must know its relevant resources and capabilities : valuable, rare, inimitable & non-substitutable. The resources enable firms to generate sustainable competitive advantages (Barney, 1991 in Chakraborty, 2011). Therefore, the two words, efficiently- compared to the least efficient competitor (Peteraf & Barney, 2003 in Chakraborty, 2011) and effectively- refer to customers’ satisfaction, have essential implication in RBV. The implications of this theory is that if competitive advantage is not created due to use of such resources(tangible & intangible), RBV cannot be applied(Chakraborty, 2011). Considering the relationship among the variables above, the conceptual framework of this study is shown in following **Figure 2**.



**Figure 2. Conceptual framework of the study**

**5. Methodology**

**5.1 Sample and data**

Following the Ministry of Cooperatives and Small and Medium Enterprises and the Republic of Indonesia and Central Statistic Agency (BPS), this study measured SME as a business unit hiring less than 100 workers. Similar with other researchers-M.Mohd Rosli et al., (2012), Akira et al.,(2011), Lee et al,(2010), Eitan et al, (2006), Roper et al, (2001), & others, a self-administered questionnaires were used, data from 120 samples of SMEs export oriented were gathered by survey - Java Indonesia was selected for the research population, a pilot survey had been conducted first -to validate and test the constructs and items used in the questionnaire, face-to-face interviews were conducted, a “drop and collect” procedure was chosen- for the actual survey to ensure a high response rate for the study, the questionnaire was cross-checked first-to ensure all the questions had been answered, export-oriented wood, clothing and food-based industries SMEs were prioritized for their characteristic, & owners/top managers were asked -to fill up the questionnaire for they had the best knowledge for management and operation of their firm- particularly regarding distribution channel and firm performance

**5.3 Measures. SME performance**

Concomitant to Kongmanila & Takahashib (2009), and Murphy, Trailer & Hill (1996), the constructs of firm performance in this study built-in export sales volume, export intensity, and firm profitability. The respondents were asked to designate the level of their present business performance in the three variables compared to their closest competitors in the same industry using a 7-point scale, ranging from “1 = the lowest” to “7 = the highest”.

**Innovation in distribution channels.** In addition to research and development (R&D) activities, innovation in distribution channels in this study comprised the application of new technologies or modification of existing methods as defined by Kongmanilaa & Takahashib (2009) in each function of the distribution channel (assortment, order handling, information sharing, inventory, warehousing, packaging, and transportation coordination). Items for each distribution channel were derived from Bowersox, Closs & Helferich (1986) and Ballou (1978). Number of items for each variable of the distribution channel innovation and its reliability test (Cronbach's alpha) is shown in Table 1.

**Table.1: Variables, items and the reliability test.**

| Constructs  | Items | Cronbach's alpha |
|---|-------|------------------|
| Innovation in assortment                          | 5     | 0.908            |
| Innovation in order handling                      | 5     | 0.968            |
| Innovation in product and distribution scheduling | 5     | 0.979            |
| Innovation in information sharing                 | 5     | 0.971            |
| Innovation in inventory                           | 5     | 0.933            |
| Innovation in packaging                           | 5     | 0.927            |
| Innovation in transportation coordination         | 5     | 0.948            |
| Innovation in warehousing and product handling    | 5     | 0.883            |
| Innovation in acquisition                         | 6     | 0.921            |
| Distribution efficiency-cost                      | 3     | 0.858            |
| Competitive environment hostility                 | 4     | 0.840            |
| Firm performance (economic indicator)             | 3     | 0.841            |

**Source: based on the sample survey**

**Distribution channel efficiency-COST.** Modified & adopted from Ulaga (2003) & Borgstrom(2005), the three items used to measure the variable were: *operation cost*, *labour cost*, and *tariff cost*. Using the 7-point scale from "1= the least efficient" to "7= the most efficient", the respondents were requested to compare their performance in distribution channel as compared to their closest competitor in the same industry.

**Control variables.** Firm size and age were measured by net asset and year of operation of each enterprise respectively. Industry was measured by nominal scale; whilst competitive environment hospitality was measured in the 7-point scale, ranging from "1= the least hostile" to "7= the most hostile". The four items regarding demographic change, rate of obsolescence in product technology, market change, governmental regulatory change and market conditions were adopted from Miller & Friesen (1982).

Table 1 shows Cronbach's alpha for all the variables, which fell within the acceptable range of more than 0.7, which indicates the reliability of the scales (Pallant, 2005).

## 6. Results, hypothesis testing, and discussion

Table 2 demonstrated basic information on each variable or factor and correlations among them. Positive significant correlations happen almost among all distribution channel innovations and distribution efficiency leading to firm performance except for order handling innovation. Most of all the significances are consistent with the literature. The positive highest correlation occurs between information sharing & efficiency while the lowest one between order handling innovation and efficiency. Interaction among the variables were mostly positive.

While the relationship between distribution channel innovation and distribution channel efficiency is shown by the regression results in table 3, innovations in assortment ( $\beta = 0.093$ ,  $p < 0.01$ ), was found to be significantly related to distribution channel efficiency. Hence, *H1 was supported*. The next relationship between distribution channel innovations and distribution efficiency is shown by the multiple regression results in table 4. In this table, indicated innovations in information sharing ( $\beta = 0.064$ ,  $p < 0.01$ ), and transportation coordination ( $\beta = 0.047$ ,  $p < 0.05$ ) & innovation in warehousing ( $\beta = 0.069$ ,  $p < 0.01$ ) were found to be significantly related to distribution channel efficiency while the others were found not significant. Hence, *the hypotheses testing can be concluded that H3, H6, & H7 were supported while H2, H4, H5, H6, H8, & H9 were not supported*.

Controlling for firm size, firm age, industry and competitive environment hostility, table 5-model 6 demonstrates there is no any significant relationship : firm size, firm age, industry and competitive environment hostility with SME’s performance. Based on Baron and Kenny’s (1986) approach, in terms of efficiency, as seen in the table 5, when all independent variables with distribution efficiency in the estimation-model 6 were included, it can be seen that the significance of efficiency did eliminate the significance of the innovations particularly information sharing and transportation coordination for predicting SME’s performance-model 5. How to include the innovations in the model was step by step as addressed in the conceptual framework. Therefore, distribution performance in terms of efficiency mediates the relationship between innovation in distribution channel and firm performance economic indicators. Hence, the hypotheses testing can be concluded that H10 was supported.

**Table 2: Correlations among variables.** \* Significant at the 0.05 level (2-tailed). \*\* Significant at the 0.01 level (2-tailed).

| Var            | 1         | 2       | 3       | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11     | 12     | 13     | 15     |        |
|----------------|-----------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Firm size      | <b>1</b>  |         |         |        |        |        |        |        |        |        |        |        |        |        |        |
| Age of firm    | <b>2</b>  | .221*   |         |        |        |        |        |        |        |        |        |        |        |        |        |
| Sector         | <b>3</b>  | -.163   | -.149   |        |        |        |        |        |        |        |        |        |        |        |        |
| Hostility      | <b>4</b>  | .232*   | .004    | -.052  |        |        |        |        |        |        |        |        |        |        |        |
| Assortment     | <b>5</b>  | .102    | .041    | -.139  | .143   |        |        |        |        |        |        |        |        |        |        |
| Order handling | <b>6</b>  | -.199*  | -.033   | .015   | -.075  | .186*  |        |        |        |        |        |        |        |        |        |
| Information    | <b>7</b>  | .150    | -.152   | -.146  | .044   | .393** | .506** |        |        |        |        |        |        |        |        |
| Scheduling     | <b>8</b>  | -.075   | -.263** | -.121  | .163   | .416** | .345** | .528** |        |        |        |        |        |        |        |
| Inventory      | <b>9</b>  | .122    | -.139   | -.181* | .373** | .374** | .116   | .439** | .447** |        |        |        |        |        |        |
| Transportation | <b>10</b> | -.040   | -.091   | -.095  | .220*  | .405** | .316** | .370** | .447** | .353** |        |        |        |        |        |
| Packaging      | <b>11</b> | .201*   | -.079   | -.069  | .397** | .485** | .193*  | .373** | .423** | .493** | .401** |        |        |        |        |
| Warehousing    | <b>12</b> | .018    | -.030   | -.011  | .187*  | .307** | .336** | .315** | .289** | .407** | .316** | .463** |        |        |        |
| Acquisition    | <b>13</b> | -.242** | .049    | -.125  | .120   | .359** | .277** | .368** | .355** | .359** | .413** | .184*  | .343** |        |        |
| Efficiency     | <b>15</b> | .053    | -.107   | -.160  | .347** | .240** | .064   | .422** | .346** | .335** | .386** | .293** | .394** | .281** |        |
| Economic       | <b>16</b> | .244**  | -.050   | -.057  | .051   | .322** | .127   | .374** | .166   | .114   | .274** | .268** | .154   | -.006  | .353** |

Source: Based on the sample survey

**Table 3. Simple regression,** Note: \* p<0.05; \*\*p<0.01; \*\*\*p<0.001

| Regression     | Dependent variables | R-Square | Adj R-Square | $\beta$ | t     | p-value |
|----------------|---------------------|----------|--------------|---------|-------|---------|
| Assortment     | Efficiency          | .058     | .050         | .093    | 2.688 | .008**  |
| Order handling | Efficiency          | .020     | .004         | -.004   | .693  | .490    |

Source: Based on the sample survey

**Table 4. Multiple regression.** Note: \* p<0.05; \*\*p<0.01; \*\*\*p<0.001

| Variables                           | $\beta$  | P -value |
|-------------------------------------|----------|----------|
| Information sharing                 | .071     | .021*    |
| Product and distribution scheduling | .019     | .595     |
| Inventory                           | .024     | .552     |
| Transportation and coordination     | .069     | .049*    |
| Packaging                           | -.012    | .755     |
| Warehousing and product handling    | .093     | .016*    |
| Acquisition                         | 8.17     | .997     |
| Constant                            | 8.963*** |          |
| R <sup>2</sup>                      | .295     |          |
| Adjusted R <sup>2</sup>             | .251     |          |
| F                                   | 6.691*** |          |

Source: Based on the sample survey

**Table 5. Multiple regression-Baron & Kenney's approach (1986).** Note: \* p<0.05; \*\*p<0.01; \*\*\*p<0.001

| Variables                   | Model     |          |           |           |           |          |
|-----------------------------|-----------|----------|-----------|-----------|-----------|----------|
|                             | 1         | 2        | 3         | 4         | 5         | 6        |
| Firm size                   | 3.76**    | 3.90**   | 3.53**    | 3.90**    | 1.77      | 2.308    |
| Firm age                    | -.060     | -.034    | -.061     | -.062     | -.022     | -.021    |
| Sector                      | -.199     | .207     | .042      | .035      | .023      | .199     |
| Hostility                   | -.009     | -.110    | -.038     | -.033     | -.011     | -.076    |
| Assortment                  |           |          | .130**    | .119**    | .091*     | .096*    |
| Order handling              |           |          |           | .041      | -.024     | .008     |
| Information sharing         |           |          |           |           | .122**    | .076     |
| Product scheduling          |           |          |           |           | -.034     | -.041    |
| Inventory                   |           |          |           |           | -.063     | -.050    |
| Transportation coordination |           |          |           |           | .082*     | .059     |
| Packaging                   |           |          |           |           | .021      | .034     |
| Warehousing                 |           |          |           |           | .024      | -.017    |
| Acquisition                 |           |          |           |           | -.057     | -.055    |
| Distribution efficiency     |           | .419***  |           |           |           | .312**   |
| Constant                    | 13.569*** | 9.011*** | 12.216*** | 11.570*** | 11.943*** | 9.247*** |
| R <sup>2</sup>              | .072      | .198     | .164      | .177      | .281      | .327     |
| Adjusted R <sup>2</sup>     | .040      | .163     | .127      | .134      | .193      | .238     |
| $\Delta R^2$                | .072      | .126     | .092      | .014      | .104      | .046     |
| F                           | 2.227     | 5.632*** | 4.463**   | 4.063**   | 3.188***  | 3.650*** |

Based on the sample survey

The findings of this study supported the concept that distribution channel efficiency mediated the relationship between distribution channel innovation and SME's performance. This indicates that innovation in information sharing and transportation coordination can enhance distribution channel efficiency in terms of cost efficiency, which would positively affect SME's performance. The concept and practice of distribution channel is not new as it can be traced back to the ancient Egyptian; the only new is the way it is done (Glaskowsky, 1970; Waidringer and Eng, 2001). In consistent with Geroski & Machin (1993) and Wolff & Pett (2006), innovation in distribution channel is found to impact positively on firm performance. Innovative information sharing among channel members, such as raw-material suppliers, manufacturers (including SMEs), distributors, and retailers is the key for achieving the flexibility need that enables firms to improve logistic processes in response to the rapid changes in the market, which in turn significantly improve distribution channel efficiency and firm performance (Zhou & Benton, 2007; Lee, Padmanabhan & Whang, 1997).

As the role of transportation improves physical distribution efficiency (Tseng, 2005) and it is well appreciated (Somuyiwa, 2007, 2010) in the literature, this study provides new evidence to the conviction. Innovative transportation coordination was found to improve distribution channel efficiency, which directly influenced the SME performance. This finding is supportive as about one- to two-thirds of the enterprise expenses on logistic costs are spent on transportation (Chang, 1998). It is also consistent with Stefansson's (2009) argument that the use of technology in transportation would result more effective transportation coordination, such as, in selecting goods, vehicles and infrastructure, which brings about positive impact on distribution channel and firm performances.

## 7. Conclusion

Aggravated by the diverse findings of the previous studies on distribution channel innovation and firm performance, based on 120 export-oriented SME samples in Indonesia, this study confirms the concept that distribution channel efficiency mediated the relationship between distribution channel innovation and the SMEs performance. It can be concluded by doing innovation in distribution channel activities particularly in information sharing and transportation coordination can enhance the efficiency which improve SME's performance as they mediate the relation ship. While other innovations such as assortment innovation & warehousing innovation also lead to firm performance. More importantly as the government assistance has limitation to support the SMEs, SMEs them selves suggested to innovate their distribution channels.

### 8. Implications of the study

Nevertheless, the result of the study limitedly focused in internal aspects how innovation in distribution channels effect distribution performance of SMEs export oriented. This appeared to be the weakness of the study as external aspects obviously explain distribution performance in turn effect firm performance. However, as study conducted by M.Mohd Rosli *et al.*, (2012) on SMEs in Indonesia found global orientation is significantly associated with firm performance, Akira *et al.*, (2011) found that the involves of institutions are significant with innovation in Indonesian SMEs that lead to their firm performance. Further more, Xiaobo *et al.*, (2011) found infrastructure was significant factors to enhance firm performance whilst relating with IT infrastructure, study of Ronald *et al.*, (2010) found IT infrastructure lead to firm performance. Further study by Sumeet *et al.*, (2011), seeing the evidence of North American Free Trade Area (NAFTA), Asean Free Trade Area (AFTA)-developed by the members to create a free flow of goods, services, investment, and a free capital flow, equality economic growth and poverty alleviation (Lloyd *et al.*, 2004 in Suumet *et al.*, 2011), the study found barriers be significant in smoothing the goods' flow especially from one country to others.

However, when innovation in distribution channel conducted partially as seen in the correlation (table 2), most of each distribution channel innovations explain the efficiency performance and the significances are high-except for order handling innovation. As the interaction among the innovations were positives, these findings can be implicated that, if SMEs were established or operated and focus on one type of particular industry only- for instance SMEs export oriented focus on assortment innovation industry only and so forth, the innovations are likely highly significant to improve efficiency and lead to firm performance. Koschatzky Knut (1999) found innovations in supplier also intensified firms to do more in interregional networking to enhance firm performance. Further study by Kotz Andong *et al.*, (2011) emphasized that the economic growth in china relied on export. Another study confirmed by Dunusinghe (2009) found export activities are significant with GDP in Srilangka.

Another study by Michael Mullen, et al (2009) stated further that international trade is associated with economic growth. Here, realizing that SMEs establishments are dominating in numbers in global economy, the SMEs in illustration table 2 (correlation) & table 5-model 3,4, & so on, can absorb much more employment, add much more value, and give much more contribution to economic growth. The last but not least, instead of racing with other SMEs manufacturing, embracing other competitors by establishing the complemented industries become wise option. The illustration table 5-model 3,4, & so on also be relevant with individual perspectives (Schumpeter 1934, March et al, 1958), the theory of transaction cost (Williams, 1979, 1989), depot theory (Leo in Bruce, 1967), resource base view theory (Chakraborty, 2011). It can be explained tangible and intangible asset of innovations explain the efficiency of SMEs export oriented industries leading to competitiveness, at last, enhance overall firm performance.

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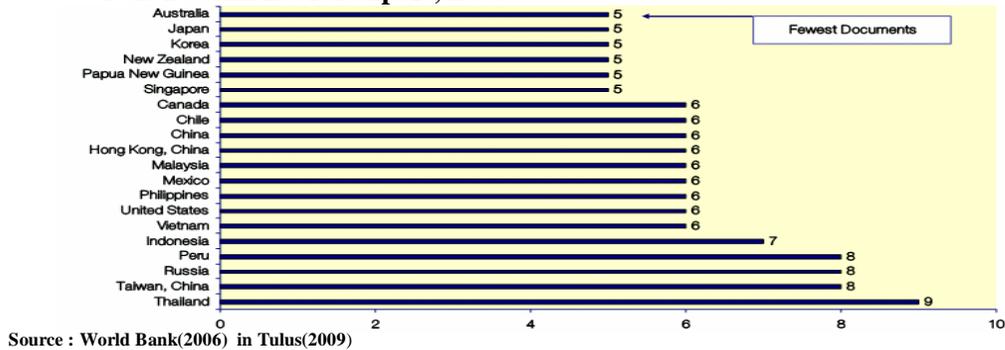
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Notes.

**N.1. Documents for export, 2006**



**N.3. Comparison logistic infrastructure of countries in ASEAN,**

| Countries  | Port           | Airport | Railway        | Road |
|------------|----------------|---------|----------------|------|
| Cambodia   | Poor           | Fair    | Poor           | Poor |
| Indonesia  | Poor           | Fair    | Good           | Fair |
| Laos       | Not Applicable | Poor    | Not Applicable | Fair |
| Malaysia   | Good           | Good    | Good           | Good |
| Philippina | Fair           | Fair    | Fair           | Fair |
| Singapore  | Good           | Good    | Good           | Good |
| Thailand   | Good           | Good    | Good           | Good |
| Vietnam    | Fair           | Fair    | Fair           | Fair |
| Burma      | Good           | Poor    | Poor           | Fair |

Zailani (2010)

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