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Impact of Distribution Channel Innovation on the Performance of Small and Medium Enterprises

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Abstract

Impact of innovation in distribution channel functions on firm performance, particularly among export-oriented, agro-based small and medium enterprises (SMEs) is under researched. Based on this literature gap, the present study examines the impact of distribution channel innovation on SMEs performance in Indonesia. A total of 120 samples were collected from export-oriented, agro based manuf acturing SMEs in Yogyakarta and the surrounding area s, Java. Using a regression analysis, the findings show that innovation in assortment, information sharing and transportation coordination had positive and significant relationships with firm performance. This study also found that distribution channel effectiveness mediated the relationship between innovation in assortment and transportation coordination and firm performance. All this finding is crucial for firms, who intend to remain competitive in the global market. Future studies, however, should consider many other factors that may influence firm performance in the agro-based industry.

Key words: Distribution channel; Innovation; Effecti veness; Performance; SMEs; Indonesia

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INTRODUCTION

Small and medium enterprises (SMEs) form a major part of the total business establishments around the globe (see Nagai, 2007; Yhee, 2001; Mukhamad & Kiminami, 2011). Due to its significant presence, the sector contributes substantially to Gross Domestic Product (GDP), employment, value-added creation and poverty alleviation (Agyapong, 2010; Salleh, 1991; Vandenberg, 2006). More interestingly, the increased involvement of SMEs in export activities in the recent period would make them more recognizable by competitors, better access to new markets (Ungson *et al.*, 1997), and more supportive of GDP growth (Dunusinghe, 2009; Kotz, 2011).

To be successful in the export market, however, requires many internal and external factors conducive to the exporting firms. Internal factors are variables that can be controlled by firms (Sousa *et al*., 2008; Duenas-Caparas, 2006), whereas external factors are beyond the firms' control. Identifying the variables affecting a firm's export performance is a strategic move and triggering a vital interest among export managers, public policy makers and researchers (Mohamad *et al.*, 2009). Hence, within the past 30 years, there were a substantial number of studies devoted to identifying key variables affecting export performance of the firms (Baldauf *et al.,* 2000; Ahmed *et al.,* 2004).

Previous studies have shown that export failure was substantially contributed by the ineffective processing activities, particularly the distribution channel (Ogbeuhi & Long, 1994), instead of some other factors. Many aspects of distribution channel studied in the past were members affiliation (Anderson, 1997; Rose *et al.,* 2004; Frazier *et al*., 1989; Brett, 1995; Morrisey, 2006; Jennifer, 2008), coordination management, conflict avoidance, sales and profits performance, information exchange, trust and commitment, all of which was regarded to improve the performance of channel members. In addition, studies on governance of distribution channel, the applications of non-formal channels, the position of channel members,

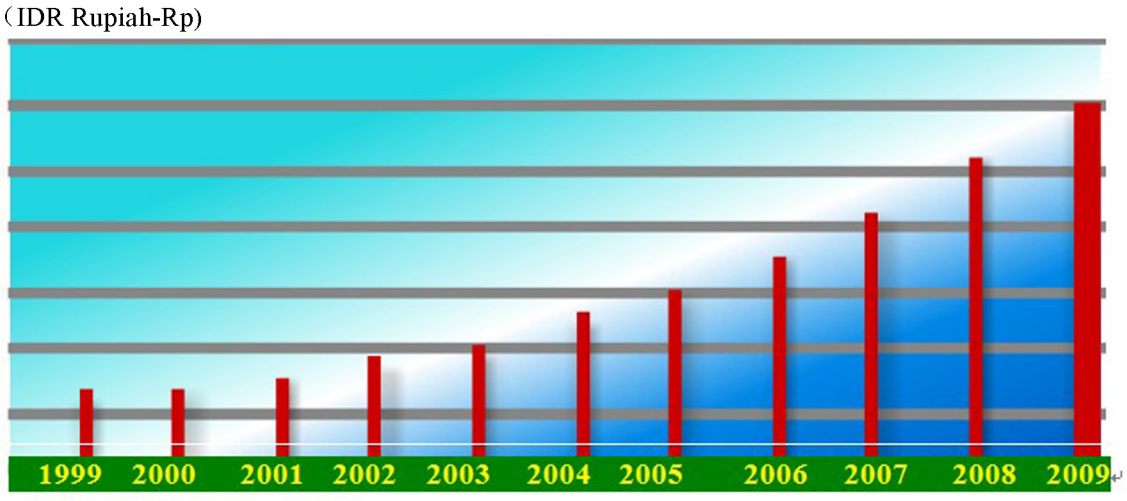
the establishments of multiple distribution channels, the establishment of importers' networks, and decentralization of channel distribution were narrowed down the performance issues, too (Weigand, 1991; Ramaseshan & Patton, 1994; Zdenko *et al.*, 2011; Mcnaughton, 2002; Rialp *et al.*, 2002; Ravi, 2000). Unfortunately, empirical studies on innovation in distribution channel activities, particularly on export-oriented, agro-based manufacturing SMEs were limited.

It is understood that innovation becomes a key driver for better competitiveness of firms. Some studies have found that innovation is closely associated with firm performance (Rosli *et al*., 2012; Mukhamad *et al.*, 2011; Pla-Barber & Alegre, 2007; Gunday *et al.*, 2011; Gary *et al.*, 2008; Nada *et al.*, 2008; Morgado *et al.*, 2008; Gunnar *et al.,* 2009). Others suggested that the effect of process innovation produced different results for firm performance (Geroski & Machin, 1993). Eitan Naveh *et al*. (2006) found too much and too little innovation did not explain performance. Mark (2004) further argued that innovation did not explain performance, whereas others discovered that the process improvement did not influence sales growth of small firms (Wolff & Pett, 2006). Until a similar study is conducted in the distribution channel of SMEs, there will be no concrete answers whether or not innovation in the supply chain activities has impact on firm performance. This study attempts to gauge how strong that innovation in distribution channel affects the performance of SMEs, with special reference to the mediating effect of distribution channel effectiveness.

1. SMES IN INDONESIA

The Asian financial crisis in the late 1990s revealed many good and bad things about the economies of the region. The bad things were that the depreciation of many currencies in the region since the mid-1997 plunged many countries into an unprecedented economic crisis. A high dependence of the regional economy on the US dollar and the weak structure of the economy made them more exposed to global economic turbulence. In Indonesia, the crisis caused the currency depreciate sharply from around 2,500 to IDR 10,000 per U.S. dollar, whilst its GDP declined by 13 percent in 1998 (Wengel & Rodriguez, 2006). Large enterprises (LEs), which were highly dependent on imported materials and capital goods were in a deep trouble. Many large factories were either underperformed (Berry *et al.,* 2002), closed down, or had to retrench their workers.

The good news was that the Indonesian SMEs were able to respond differently to the crisis. Using local materials and simple technology, the SMEs switched their market to the global one as the demand in the domestic market got lower. At present, SMEs accounted for the largest proportion of all establishments in the country. For example, in 2009, the number of SMEs was 52.7 million or 99.9 percent of the total establishments. They provided 96.2 million employment or 97.3 percent of the total employment (Mukhamad & Kiminami, 2011); and they generated value added for 2,993,151 billion *Rupiah* or 56.5 percent of the total value added. In fact, their value-added grew positively in the 1999-2009 periods (Figure 1).



BPS in Aki ra et al.,(2011)

Figure 1
Value Added Growth of SEMs 1999-2009 in Indonesia

Despite the significant contribution of the sector to the economy, Indonesian SMEs, as in other parts of the globe, were hindered by various obstacles. Some of the problems were related to the internal factors, such as marketing and promotion, technology, and human capital (Manginsela, 2005; Nurul, 2008; Tulus, 2009); and some others are external in nature, like capital market and legal issues (Nurul, 2008). Many efforts have been taken by the Government to mitigate the problems facing the sector. Nevertheless, in the context of distribution channel, many local SMEs, especially those in the rural area, were still facing difficulty in dealing with customs procedures, trade regulations and infrastructure (Tulus, 2009).

2. LITERATURE REVIEW

2.1 Effectiveness as Performance Indicator

Effectiveness can be referred to as a long term firm orientation (Morgan *et al.*, 2004). Scholars often equate effectiveness to non-economic performance or non-financial measure. It is further emphasized by Ataollah *et al.* (2010) that non-financial performance is crucial for a company's future performance. Pertinent to distribution issue, Rhea *et al.* (1987) see distribution effectiveness closely related to customer satisfaction. For instance, if a customer expects a delivery of an order is on a two-week time; then, the delivery service is considered effective once the order arrives in less than two weeks or on the last day of the delivery time. Otherwise, it is said ineffective, when the order reaches the customer later than the expected time. In fact, the longer the order reaches the customer the less effective the delivery services on the eyes of the customer will be.

Innovation in distribution channel as in other cases (Rosli *et al.*, 2012; Mukhamad & Kiminami, 2011; Pla-Barber & Alegre, 2007) would enhance firm performance. However, the impact of such innovation on firm performance would be less if it does not improve the effectiveness of distribution channel functions. Previous studies overlooked this possible association, thus the present study attempts to examine the mediating effect of distribution channel effectiveness on the relationship between distribution channel innovation and firm performance.

2.2 Conceptual Framework

A distribution channel is supposed to be designed to carry out five fundamental functions, namely assortment, transfer/transportation, storage, handling and communication (Bowersox *et al.*, 1986). Another prominent scientist argues that distribution channel activities can be categorized into two general groups, i.e., assortment and logistics (Walters, 1977). Many distribution channel activities are engaged along a distribution channel connecting diverse channel members, including suppliers, manufactures and end consumers. Nevertheless, most of the activities are concentrated in logistics (Ballou, 1978), which can be divided into inbound and outbound logistics. Inbound logistics support the materials flow from suppliers to producers, whereas outbound logistics connect producers to end users.

From the individualist perspective, innovation is triggered and driven by certain individuals in society, who have necessary characteristics to make it happen. These people are entrepreneurs, who have the capability to innovate and ultimately disturb a static equilibrium of an economy (Schumpeter, 1934). The Resource-Based View (RBV) asserts that a firm must know its valuable, rare, inimitable and non-substitutable resources and capabilities. These resources enable a firm to generate its sustainable competitive advantages. Therefore, the two concepts: the efficient versus the less efficient competitors and the effective versus the less effective firms from the viewpoint of customers will have great implications on a firm's competitive advantages (Brahma & Chakraborty, 2011).

Innovation in assortment (Fabrico, 2010; Juin, 2009), order handling (Linda *et al.*, 2009; Elliot Bendoly, 2004), information sharing (Campo *et al.*, 2010), product and distribution scheduling (Varimna, 2009; Chen, 2009; Subramanya, 2009), inventory (Chikan, 1990; Natarajan, 1991), transportation and coordination (Gunnar, 2009), warehousing and material handling (Diaz, 1988; Heragu & Xiou, 2008), packaging (Morgado, 2008) and acquisition (Graebner *et al.*, 2010) would have significant impact on distribution channel effectiveness, which in turn positively enhance firm performance. Some other scholars believe that effectiveness is strongly related to financial performance and long term orientation of a firm (Ataollah, 2010; Dossi & Pateli, 2010; Morgan *et al.,* 2004). Therefore, it is hypothesized that distribution channel effectiveness mediates the association between distribution channel innovation and SME's performance.

Besides all sorts of distribution channel innovation, some other factors, which may influence firm performance, are firm size, firm age, the industry and the environment. Firm size has impact on firm performance, but the degree and the trend of its impact is diverse. The impact of firm age on firm performance is diverse too. Kristiansen *et al.* (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 the vast social capital owned by older firms. The significant influence of different types of industry on firm performance can be seen in Gadenne (1999) and Humphreys & McClung (1981), among others due to different marketing strategies and management practices (Gadenne, 1999). The relationship between the environment hostility and firm performance is discussed in Miller & Friesen (1982).

The conceptual framework displaying the relationship among the studied variables is shown in Figure 2.

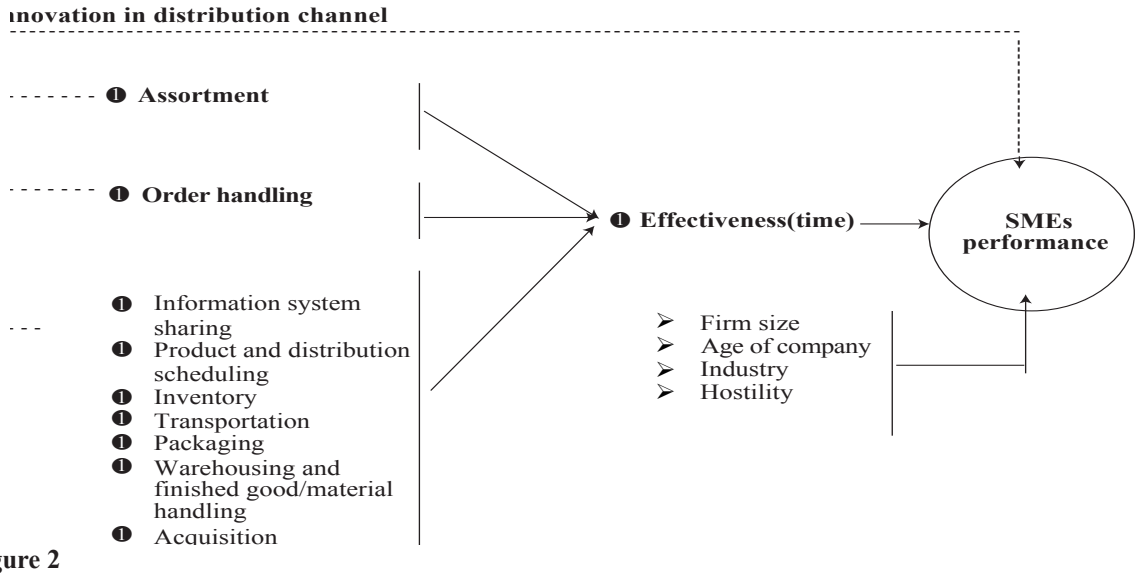


Figure 2
Conceptual Framework of the Study

3. METHODOLOGY

3.1 The Data

Following the Ministry of Cooperatives and Small and Medium Enterprises as well as the Republic of Indonesia and Central Statistic Agency (BPS), this study referred an SME as a business unit hiring less than 100 workers. Similar to other researchers (Rosli *et al.,* 2012; Mukhamad & Kiminami, 2011; Eitan *et al.,* 2006; Roper and Love, 2001), a self-administered questionnaire was used to collect data from 120 SMEs in Yogyakarta, the Special Province of Java, Indonesia and its surrounding areas. Prior to this, a pilot survey had been done to validate and test the constructs and items used in the questionnaire. A face-to-face interview as well as a "drop and collect" procedure for both the pilot and actual surveys was carried in order to ensure a high response rate among the respondents. The SMEs surveyed were involved in the export-oriented, agro-based industries. Their owners/top managers were asked to fill up the questionnaire because this group of people had the best knowledge in management and operation of the firms.

3.2 Measures

3.2.1 SME Performance

Concomitant with Kongmanila and Takahashib (2009), and Murphy *et al.* (1996), items for firm performance in this study were export sales, export intensity, and firm profitability. The respondents were asked to indicate 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".

3.2.2 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 Kongmanila & Takahashi (2009) in each function of the distribution channels. Items for each distribution channel were derived from Bowersox *et al.* (1986) and Ballou (1978).

Table 1
Variables, Items and the Tests

Constructs	Reliability		Normality	
	Items	Cronbach's alpha	Skewness	Kurtosis
Assortment	5	0.908	0.683	-0.836
Order handling	5	0.968	0.238	-1.337
Information sharing	5	0.971	0.839	-0.636
Product and distribution scheduling	5	0.979	0.907	-0.502
Inventory	5	0.933	1.068	-0.125
Packaging	5	0.927	1.235	0.048
Transportation coordination	5	0.948	0.232	-0.884
Warehousing and material handling	5	0.883	0.203	-0.830
Acquisition	6	0.921	0.215	-0.758
Distribution effectiveness	2	0.850	-0.171	0.315
Hostility environment	4	0.840	0.013	-0.230
Firm performance-economic indicator	3	0.841	-0.118	0.290

Source: Based on the sample survey.

Number of items for each variable of the distribution channel innovation and its reliability tests (Cronbach's alpha) are shown in Table 1. Cronbach's alphas for all the variables were above the acceptable minimum values of 0.7, which indicates the reliability of the scales used (Pallant, 2005). This table also shows that the values of skewness and kurtosis fell within the range of *-2.0* to *+ 2.0*, indicating the normality of the data (George & Mallory, 1995).

3.2.3 Distribution Channel Effectiveness

Modified and adopted from Rhea *et al.* (1987), the two items used to measure the effectiveness variable were: time speed to market the products and punctuality of order delivery. Using a 7-point scale from "1= the least effective" to "7= the most effective", the respondents were requested to compare their effectiveness performance in distribution channel as compared to their closest competitors in the same industry.

3.2.4 Control Variables

Firm size and firm age were measured by net asset (excluding land and building) and years of operation respectively. The industry was measured by nominal scale; whilst competitive environment hospitality was measured in a 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 and Friesen (1982).

5. RESULTS AND DISCUSSION

Table 2 demonstrates the basic information on each variable and correlations among them. Positive significant correlations could be seen for almost all distribution channel dimensions of innovation and distribution effectiveness. The relationship between distribution channel innovation and distribution channel effectiveness is shown in Table 3. It shows that innovation in order handling ($\beta = 0.039$, $p < 0.05$) and assortment ($\beta = 0.087$, $p < 0.001$) was significantly related to distribution channel effectiveness. A detailed relationship between distribution channel innovation and distribution channel effectiveness is displayed in Table 4. It shows that innovation in information sharing ($\beta = 0.070$, $p < 0.01$) and transportation coordination ($\beta = 0.049$, $p < 0.05$) was positively and significantly associated with distribution channel effectiveness; while the others were not significant.

Table 2
Correlation Among the Variables

Variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Firm size	1														
Age of firm	2	0.221*													
Sector	3	-0.163	-0.149												
Hostility	4	0.232*	0.004	-0.052											
Assortment	5	0.102	0.041	-0.139	0.143										
Order handling	6	-0.199*	-0.033	0.015	-0.075	0.186*									
Information	7	0.150	-0.152	-0.146	0.044	0.393**	0.506**								
Scheduling	8	-0.075	-0.263**	-0.121	0.163	0.416**	0.345**	0.528**							
Inventory	9	0.122	-0.139	-0.181*	0.373**	0.374**	0.116	0.439**	0.447**						
Transportation	10	-0.040	-0.091	-0.095	0.220*	0.405**	0.316**	0.370**	0.447**	0.353**					
Packaging	11	0.201*	-0.079	-0.069	0.397**	0.485**	0.193*	0.373**	0.423**	0.493**	0.401**				
Warehousing	12	0.018	-0.030	-0.011	0.187*	0.307**	0.336**	0.315**	0.289**	0.407**	0.316**	0.463**			
Acquisition	13	-0.242**	0.049	-0.125	0.120	0.359**	0.277**	0.368**	0.355**	0.359**	0.413**	0.184*	0.343**		
Effectiveness	14	0.297**	0.135	-0.150	0.051	0.339**	0.193*	0.420**	0.177	0.277**	0.349**	0.243**	0.257**	0.309**	
Firm performance	15	0.244**	-0.050	-0.057	0.051	0.322**	0.127	0.374**	0.166	0.114	0.274**	0.268**	0.154	-0.006	0.597**

* Significant at the 0.05 level (2-tailed). ** Significant at the 0.01 level (2-tailed).
Source: Based on the sample survey

Table 3
Simple Regression Analysis

Regression	Dependent variables	R-Square	Adj R-Square	B	t	p-value
Assortment	Effectiveness	0.115	0.107	.087	3.914	.000***
Order handling	Effectiveness	0.037	0.029	.039	2.138	.035*

Note: * p<0.05; **p<0.01; ***p<0.001
Source: Based on the sample survey.

Table 4
Multiple Regression Analysis

Variables	B	P -value
Information sharing	0.070	0.001**
Product and distribution scheduling	-0.046	0.060
Inventory	0.014	0.593
Transportation and coordination	0.049	0.040*
Packaging	0.010	0.716
Warehousing and product handling	0.015	0.548
Acquisition	0.021	0.221
Constant	8.460***	
R^2	0.260	
Adjusted R^2	0.214	
F	5.615***	

Note: Dependent variable: distribution channel effectiveness
Note: * p<0.05; **p<0.01; ***p<0.001
Source: Based on the sample survey.

In Table 5, six empirical models were estimated to evaluate the impact of distribution channel innovation and distribution channel effectiveness on firm performance. Moving from Model 1 through Model 6 can be seen that the explanatory power of the model (the R^2) improved significantly with the inclusion of one variable after the other. For the easy interpretation, however, Model 5 and Model 6 need special attention. Controlling for firm size, firm age, the industry and competitive environment hostility, Model 5 demonstrates that innovation in assortment ($\beta = 0.091$, $p < 0.05$), information sharing ($\beta = 0.122$, $p < 0.01$) and transportation coordination ($\beta = 0.082$, $p < 0.05$) had positive and significant relationships with firm performance. In contrast, the other distribution channel dimensions were not statistically significant.

Based on the Baron & Kenny's (1986) approach, if the inclusion of the distribution channel effectiveness variable eliminates the significance of the three innovative distribution channel dimensions, then the effectiveness variable is a mediator. As shown in Model 6, the effectiveness variable did eliminate the significance of the innovative distribution channel dimensions, particularly the assortment and transportation coordination. This suggests that the effectiveness of distribution channel mediated the relationship between innovation in assortment and transportation coordination and firm performance, but it did not mediate the innovation in other distribution channel dimensions. Hence, the hypotheses were partially supported.

Table 5
Results of the Multiple Regression

Variable	Model					
	1	2	3	4	5	6
Firm size	3.76**	1.50	3.53**	3.90**	1.77	-7.13
Firm age	-0.060	-0.078	-0.061	-0.062	-0.022	-0.047
Sector	-0.199	0.168	0.042	0.035	0.023	0.059
Hostility	-0.009	-0.002	-0.038	-0.033	-0.011	0.039
Assortment			0.130**	0.119**	0.091*	0.068
Order handling				0.041	-0.024	-0.027
Information sharing					0.122**	0.079*
Product scheduling					-0.034	-0.008
Inventory					-0.063	-0.076
Transportation coordination					0.082*	0.034
Packaging					0.021	0.028
Warehousing					0.024	0.009
Acquisition					-0.057	-0.089
Distribution effectiveness		0.966***				0.948***
Constant	13.569***	3.805*	12.216***	11.570***	11.943***	4.362*
R^2	0.072	0.383	0.164	0.177	0.281	0.494
Adjusted R^2	0.040	0.356	0.127	0.134	0.193	0.426
ΔR^2	0.072	0.312	0.092	0.014	0.104	0.213
F	2.227	14.179***	4.463**	4.063**	3.188***	7.317***

Note: dependent variable, firm performance; * p<0.05; **p<0.01; ***p<0.001
Source: Based on the sample survey.

As argued by Diehl and Poynor (2010), customers tend to be less satisfactory when they are given larger assortment. With the help of product configuration technology, diverse assortment is possible, which in turn increases effectiveness and customers' preference that ultimately improves sales (Fabrico, 2010). Juin (2009) suggests that the right demand characteristics for each product is essential. Hence, estimating demand activities for new products in assortment can bring about effectiveness and better firm performance (Juin, 2009).

The role of transportation in improving physical distribution performance is well recognized in the

literature (Somuyiwa, 2007, 2010). This study provides new evidence that innovative transportation coordination improved distribution channel effectiveness, which in turn influenced the SME performance. This finding is plausible as about one- to two-thirds of the enterprise expenses on logistic costs are spent on transportation (Chang, 1998). It is also consistent with Gunnar Stefansson's (2009) argument that the use of technology in transportation would result in more effective transportation coordination, such as, in selecting goods, vehicles and infrastructure, which brings about positive impact on distribution channel and firm performance.

CONCLUSION AND IMPLICATIONS

This study partially confirmed that the distribution channel effectiveness mediated the relationship between distribution channel innovation and SMEs performance. It was found that innovation in certain distribution channel functions, mainly assortment and transportation coordination enhanced the effectiveness of distribution channel, which ultimately improved the performance export-oriented SMEs. This finding provides some implications in several aspects. Theoretically, it is supportive that innovation in distribution channel is important to improve distribution channel performance (effectiveness), which immediately enhances firm performance. Practically, export-oriented firms, albeit small in size have no choice, but to adopt innovation, particularly in product assortment and transportation coordination. Only this way can SMEs improve their distribution performance and at last the performance of their firms.

Nonetheless, there are many other factors, which would influence firm performance beyond the scope of this study. Figure 3 depicts some internal and external factors that may affect firm performance. Besides the distribution channel variables discussed, other possible factors that may explain firm performance are global orientation of the firms (Rosli *et al.,* 2012), infrastructure (Ronald, 2010; Xiaobo *et al.,* 2011), institutions (Mukhamad & Kiminami, 2011), trade friendliness of logistics services (Sumeet *et al.,* 2011) and suppliers (Koschatzky, 1999). Therefore, all the economic agents – manufacturers, government, suppliers, and the others – have to effectively play their respective role, so that export-oriented firms could enhance their performance, which finally gives positive impact on the economy of a country. Future studies should consider this researchable area.

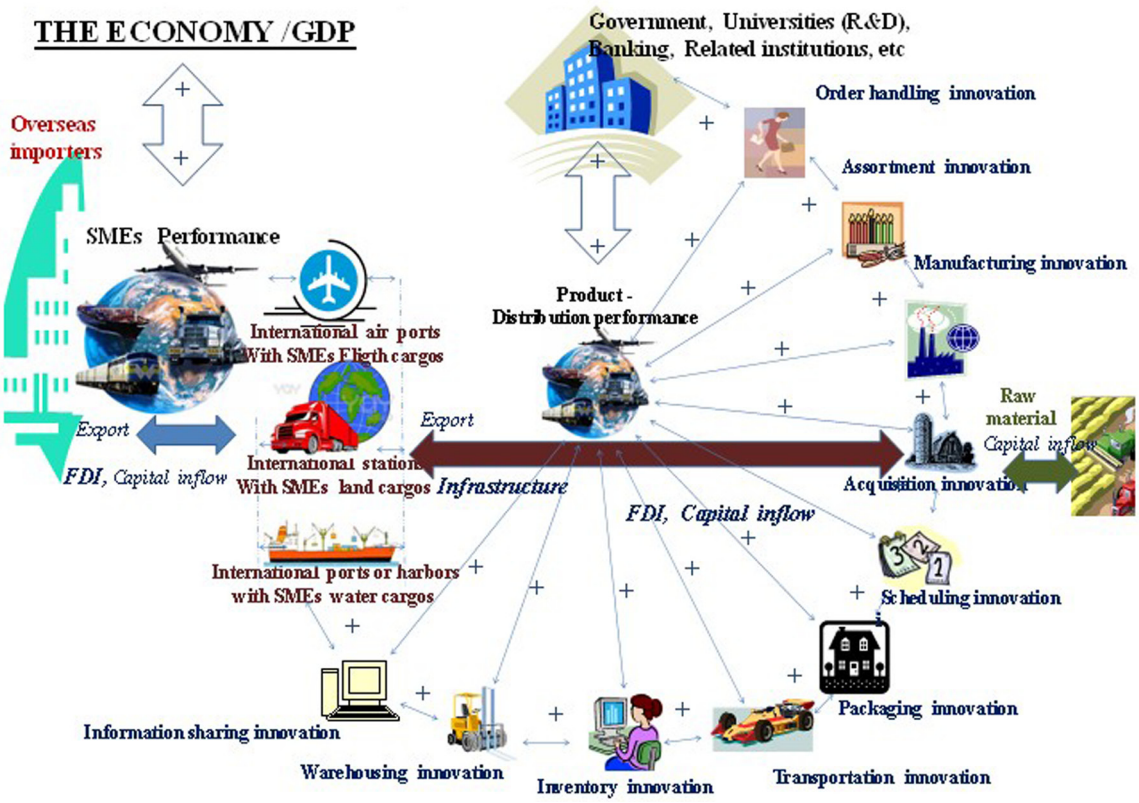


Figure 3
Variables Influencing SME Performance in a Broader Context

Data for this study were drawn from the dataset used by the first author in his PhD study at the Faculty of Economics and Administration, University of Malaya, Kuala Lumpur, Malaysia.

The findings of this paper have been presented by Ferri kuswantoro in a PhD colloquium, Series 04/2012 at the Postgraduate conference room, Faculty of Economic and Administration, University of Malaya, Kuala Lumpur, Malaysia on April 2012.

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