

# **The Antecedents Of Process Innovation And Smes Growth: Empirical Evidence From Shoe Manufacturing Sector In The Ashanti Region Of Ghana**

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## **Abstract**

This article contributes to the study of process innovation as a growth strategy for SMEs, enriching and complementing the widely held view that innovation in general impacts positively on SMEs productivity and growth. In furtherance, this study looks at the process innovation from three main angles as proposed by the Oslo Manuel, which are new process, improved process, and new and improved distribution. Firm level data were purposively collected from shoes manufacturing companies located in the Ashanti Region of Ghana, where Structural Equation Model were employed in coming out with the path estimates in determining the relationship between the variables. The results indicated that, adoption of new and improved distribution strategy impact positively on the growth of the SMEs, by way of reducing the cost of operations and increases customers' satisfaction. This was followed by the adoption of improved process strategy, where the productivity saw a massive improvement in the areas of quality and quantity, but there was no significance in the reduction of cost of production, whereas the adoption of new process strategy saw an increase in production, but its associated high cost of production negated the growth, to impact negatively on the growth of the SMEs. Base on the results from the study, our results suggest that adoption of process innovation have significant effect on the performance of the shoes manufacturing, the positive impact is not a wholesale, therefore entrepreneurs should not adopt all process innovation blanketly.

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**Keywords:** *Process Innovation, Improved Process, Improved Distribution, New Process, SMEs Growth*

## **Introduction**

The important contributions Small and Medium Enterprises (SMEs) made to national economies and the well-being of entrepreneurs have been widely recognized ( Zott, Amit, & Massa, 2011; Subrahmanya, 2011; Günday, Ulusoy, Kılıç, & Alpkan, 2011) by renowned researchers in the field, while there is a contention that by their nature, SMEs are highly innovative, even more than larger counterparts (Sudhir Kumar & Bala Subrahmanya, 2010). However, the knowledge about what types of innovation SMEs undertake and how they actually do it remains limited (A. A. Egbetokun, Adeniyi, Siyanbola, & Olamide, 2012; A. Egbetokun, Adeniyi, Siyanbola, & Olamide, 2010; Oke, Burke, & Myers, 2007; Hassan, Shaikat, Nawaz, & Naz, 2013).

The governments of most developed economies see new and smaller enterprises as the well-spring of economic growth, job wealth creation. A large body of evidence shows that SMEs, especially young firms, contribute greatly and increasingly to innovation system by introducing process innovation and adapting existing products to the needs of customers (Oke et al., 2007).

Many governments in the developing countries in an attempts to stimulate SMEs growth for national development, have introduced several innovative policies, yet the level of innovative activities among SMEs in the developing countries are not encouraging, as compared with their counterparts in the developed countries (MEST, 2010; Stephen & Mark, 2013; Teece, 2010; OECD, 2005). Several literature have accounted for the gap, yet most SMEs are either unaware of the importance of innovation to their business, or do know the type of innovation appropriate to trigger growth of their businesses. This is where this research comes in, with evidence-based research to demonstrate the positive relation between process innovation and SMEs growth.

This research work identifies the impact of the adoption of process innovation in the forms of new process, improved process and new and improved distribution system to the growth of SMEs in developing countries. It further assess the magnitude of the effect of each of the type of the process innovation on the SMEs growth, this in the nutshell will help policy makers, stakeholders and small business managers and entrepreneurs in policy decision making.

The paper contributes to literature in the following ways. First, the paper provides insight about the types of process innovation and their

contributions to the growth of SMEs in developing countries which has almost neglected process innovation.

### **Process Innovation and SMEs Growth**

The OECD Oslo Manual (OECD, 2005) defines process innovation as “ the implementation of new or significantly improved production or delivery methods. This includes significant changes in the techniques, equipment and/or software. Process innovation can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products”. While Reichstein & Salter (2006) describes process innovation as the acquisition of new capital equipment which facilitates the adoption of new and improved production process. According to Cabral, R., & Leiblein (2001) and Hollander (1965) process innovation occurred through the practices of learning-by-doing and learning-by-using. Some Scholars such as Womack et al (1991) and (Polder et al (2009) are of the view that process innovation is related to management innovation, in the sense that the management systems usually complement the technical ones.

There is an ample evidence that the adoption of process innovation leads to increase productivity and growth in the long run (Polder et al., 2009), but to whether process innovation in isolation will lead to growth, is yet to be proven in this research, as studies conducted by (Ettlie, 1988; Nabseth, L., & Ray, 1974; Thompson, 1967), linked process innovation to the product innovation before the growth was recorded.

In particular, it is confirmed that process innovation activities involve both organizational and technological changes (Gopalakrishnan, S. Damanpour, 1997; Reichstein & Salter, 2006) blurred and difficult to separate (Edquist, C., 2001; Ettlie, J. E., & Reza, 1992; Womack, J. P., Jones, D. T., & Roos, 1991). In this vein, process innovation is going to be isolated from other innovations, but test the effect of the three forms of process innovation as explicated by the Oslo Manual (OECD, 2005) to determine the effect of each on the growth of the shoe manufacturers in Ghana, which will set a bench mark for most SMEs in developing countries especially Sub-Saharan Africa.

The adoption of new process innovation have been described by many scholars (Oke, 2007; Prahalad, Hamel, & June, 1990; Yamamoto & Bellgran, 2013), as radical form of innovation as it involves the facing out of the old and obsolete equipment, and in place bring new efficient and effective machines. This may require huge capital investment, which in most cases are at the preserve of larger companies. It also increases cost of operations initially, but in the long run leads to higher growth and profitability.

In the same vein, the adoption of improved process innovation requires the blend of new and the existing production equipment, which may lead to higher operational cost, but lower than the new process. This requires the training and the upgrading of the technical know-how of the manpower. In the long run empirical research have recorded that an adoption of improved process leads to an increase in productivity and growth (Damanpour, Szabat, & Evan, 1989; Damanpour, Walker, & Avellaneda, 2009; Hassan et al., 2013)

The adoption of new distribution network stems from the old economics principles that, production is never complete unless the product reaches the consumer on time and at the right condition. The existence of stiffer competition in recent times have called for firms to step up their game, to more distribution effective and cost efficiency as (Porter & Kramer, 2011) cited in their work that, Wal-Mart in 2009 rerouted its trucks to reduced 100 million miles from its delivery routes and saved \$200 million even though it delivered more products. Adoption of new and improved distribution network in the long run leads to lower cost of operations, customer satisfaction and growth of the firm. We therefore hypothesize that;

*H1: The adoption of new process innovation impacts positive on the growth of shoe manufacturing in the areas of increase profit and net assets.*

*H2: The adoption of improved process innovation impacts positive on the growth of shoe manufacturing in the areas of increase profit and net assets.*

*H3: The adoption of new and improved distribution innovation impacts positive on the growth of shoe manufacturing in the areas of increase profit and net assets.*

## **Empirical Design**

With the help of the National Board for Small Scale Enterprises in Ghana, 300 shoe manufacturers were purposively sampled from the database of shoe manufacturers practicing process innovation and were in the Ashanti Region of Ghana, which is considered as the shoe manufacturing hub of Ghana. The survey is based on the previous work done by Eurostat Community of Innovation Survey (CIS), and the Reichstein & Salter (2006), which were based on Oslo manual (OECD, 2005) and (OECD, 2010), but has been adapted in meeting the Ghanaian context. The adapted questionnaires were widely piloted in 2015 in the Ashanti regional capital of Ghana, before implementing in the whole region in March 2016. Following Reichstein & Salter (2006) , Oslo manual (OECD, 2005) and OECD (2010) the CIS questionnaire itself draws on long tradition of research on innovation, including a Yale survey and the SPRU innovation database

(Klevorick, A. K., Levin, R. C., Nelson, R. R., & Winter, 1995; Cohen & Levinthal, 1990; Pavitt, K. L. R., Robson, M., & Townsend, 1989)

In pursuance of the objectives of this research, the sample was based on process innovators, defined as firms having introduced at least one new or improved process in the research period and being innovation active (innovation expenditures >0), regardless of having also conducted product or organization innovation activities. While the dependent variables were based on the increments in the total sales and the stock of capital.

The covariance –based model (CBM), specifically, Structural Equation Modeling was employed in analyzing the path estimates and relationships between the variables.

**Analysis and presentations of result**

292 cases were obtained, coded and screened from the 300 hundred participants recruited for this study. 195 (66.70%) constituted male and 123 (33.30%) formed females. The age of the respondents ranged from 25 to 50 with a mean level of (M 2.71, SD 1.387).

The psychometric properties of the cases were examined to know the location and variability of the data as responded by the SME owner managers and the managerial staffs recruited for the study. Utilizing Skewness (for age, income, gender) and Kurtosis (for the Likert-scales) on a threshold of +/- 2.00, none of the cases was identified with normality problem. This provided the evidence that the data is normally distributed. The table labeled “Standardized Regression Estimates and Descriptive for indicators” gives much information.

**Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA)**

An exploratory analysis was examined to extract the items in order to obtain a minimum factor that explains the 25 cases. The estimates adduced was 6972.973947 for X2, 190 for DF, at a significant level of 0.001 with .777 KMO value for Kaiser Mayor Oklin (KMO) measure of sampling adequacy. A measurement model was later generated and the modification indices were examined for the fitness level of the model. After co-varying some error terms, the goodness of fit indices obtained is CMIN/DF, 1.592, RMR, .031, CFI, .977, GFI, .899, NFI, .942, RMSEA, .04, PCLOSE, .840.

Standardized Regression Estimates and Descriptive for indicators

			Estimate	S.E.	C.R.	P	skew	kurtosis
Q3ANPI	<---	ANPI	0.77	0.054	15.92	***	-0.559	1.341
Q17GROWTH	<---	Growth	0.883	0.033	27.837	***	-0.714	1.206
Q5ANPI	<---	ANPI	0.758	0.058	15.537	***	-0.59	0.921
Q2ANPI	<---	ANPI	0.888				-0.700	0.882
Q7API	<---	API	0.788	0.056	17.713	***	0.904	0.858

Q4ANPI	<---	ANPI	0.799	0.054	16.891	***	-0.738	0.817
Q216GROWTH	<---	Growth	0.894	0.031	29.028	***	-0.647	0.609
Q19GROWTH	<---	Growth	0.819	0.038	22.102	***	-0.512	0.461
Q20GROWTH	<---	Growth	0.855	0.038	25.093	***	-0.488	0.396
Q9AIPI	<---	AIPI	0.904			***	0.906	0.39
Q10AIPI	<---	AIPI	0.863	0.048	21.222	***	0.788	0.367
Q8AIPI	<---	AIPI	0.882	0.052	22.269	***	0.726	0.192
Q6AIPI	<---	AIPI	0.800	0.054	18.229	***	0.787	0.135
Q15ANIDI	<---	ANIDA	0.803	0.041	20.335	***	0.314	-0.42
Q14ANIDI	<---	ANIDA	0.951			***	0.274	-0.477
Q18GROWTH	<---	Growth	0.975			***	-0.058	-0.537
Q11ANIDI	<---	ANIDA	0.787	0.043	19.46	***	0.098	-0.828
Q12ANIDI	<---	ANIDA	0.891	0.035	26.892	***	-0.218	-0.84
Q1ANPI	<---	ANPI.	0.719	0.053	14.347	***	-0.57	-0.927
Q13ANIDI	<---	ANIDA.	0.926	0.032	30.754	***	-0.128	-1.005

\* p < .05; \*\* p < .01; \*\*\* p < .01

### Validity and Reliability

Validity and reliability were emphasized where items and constructs were scrutinized in the research data to evince problematic issues for validity concerns. Convergent validity was examined with AVEs, square roots of AVEs and compared to inter-factor correlations. Concurrently, MSVs and ASVs were calculated and compared to justify the level of disparity among factors in the research model. Likewise, a composite reliability (CR) values were computed and compared to a threshold of 0.70 to indicate issues of problematic internal consistency of the survey items. The output from the analysis shows a strong validity and reliability cases as the observed variables met all the assumption and thresholds.

### Validity and Reliability

	CR	AVE	MSV	ASV	ANPI.	Growth.	ANIDA.	AIPI.	AIDI.
ANPI.	0.891	0.622	0.157	0.084	0.789				
Growth.	0.948	0.786	0.028	0.015	-0.073	0.887			
ANIDA.	0.942	0.764	0.269	0.120	0.359	0.148	0.874		
AIPI.	0.928	0.720	0.157	0.064	0.396	0.055	0.246	0.849	
AIDI.	0.893	0.643	0.269	0.095	0.210	0.168	0.519	0.192	0.802

### Structural Modeling

A construct model was generated using a Covariance Based Method (CBM) in the IBM AMOS after assumptions, research hypotheses and relationships have been taken into consideration. The path estimates were generated for the effect of all predictor variables on the outcome variables while age, gender and education of SME owner managers were not factored as explanatory variables but were controlled.

It is obviously discernible from the analysis that, the adoption of new and improved distribution strategy has a positive effect on the growth of the SMEs, by way of reducing the cost of operations and increases customers' satisfaction.

The adoption of improved process innovation followed with a positive and significant effect size, where the owner managers reported of massive improvement in productivity in respect with quality and quantity. The adoption of new process innovation saw an increase in production, but its associated high cost of production negated the growth, to impact negatively on the growth of the SMEs but with insignificant estimate.

Having considered the standardized estimated regression weight and probability values obtained in the analysis, the research hypotheses are discussed for acceptance or rejection.

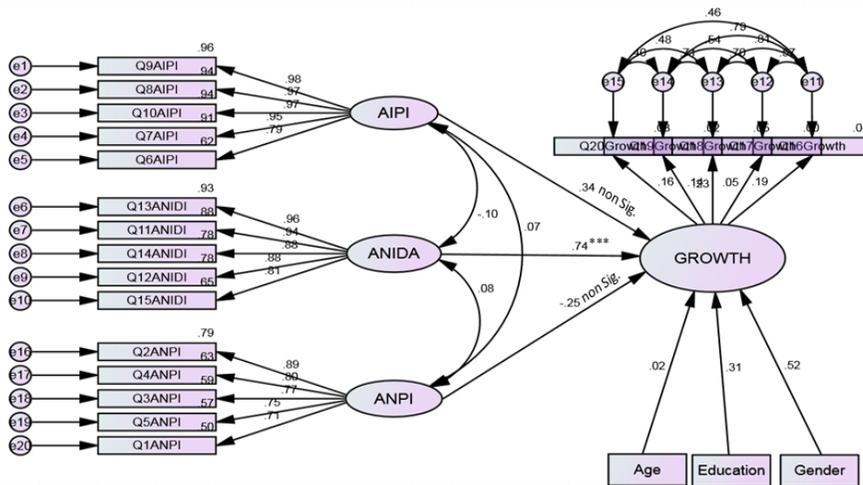


Figure 1: Model Construct

Notes: Adoption of New Process Innovation (ANPI); Adoption of Improved Process Innovation (AIPI); Adoption of New and improved Distribution Innovation (ANIDI)  
Non Sig (Non Significant effect)

\* p < .05; \*\* p < .01; \*\*\* p < .01

The ongoing evidence from the analysis suggests that, the research hypothesis H3 is accepted having considered the bearing effect that, the *Adoption of New and improved Distribution Innovation (ANIDI)* has on the growth and development of shoe manufacturing firms. In the same vein, the effect of the *Adoption of Improved Process Innovation (AIPI)* is documented to be positive and marginal; its alternative hypothesis is rejected in favor of the null, having known that, despite its positive effect, it does not significantly contribute to the growth and development of the shoe manufacturing firm considering the geographic region of this study. The *Adoption of New Process Innovation (ANPI)* was fingered with negative but non-significant effect on the growth and development of the firms recruited in the current study, therefore rejecting the alternative hypothesis H1. In all-the-round cases involved in the stages of the hypotheses testing and examination, the effect sizes upon which remarks were made takes into

concerns the control variables. Thus, all the estimated regression values for the predictor variables on the criterion variable remain evidential having controlled for the age, gender and educational status of the owner managers sampled from the shoe manufacturing industry.

### **Conclusion and Recommendations**

There are ample evidence that the adoption of process innovation leads to higher performance among SMEs, but the application of the principles should not be blanketly apply. The analysis shows that the, adoption of new and improved distribution strategy impact positively on the growth of the SMEs, by way of reducing the cost of operations and increases customers' satisfaction. This was followed by the adoption of improved process strategy, where the productivity saw a massive improvement in the areas of quality and quantity, but there was no significance in the reduction of cost of production, whereas the adoption of new process strategy saw an increase in production, but its associated high cost of production negated the growth, to impact negatively on the growth of the SMEs

### **Theoretical implications**

Theoretically, this research findings support the earlier held Resource base view theory (Lockett, A., Thompson, S., & Morgenstern, 2009) on the growth of businesses from the internal and external resources capabilities of a firm. The contributions to this theory are the concentration on the innovation of the existing and introduction of new technology and production equipment of the firm. In the nutshell, firms can experience growth by improving existing production process and/or introducing new process technologies. It goes further, to suggest an improvement in the distribution network through innovative process will also impact positive on the firms' performance and growth.

### **Policy implications**

As suggested by the OECD Oslo Manuel (OECD, 2005), that governments in an attempt to support the growth of SMEs in their domain, should introduce innovative policies through educational curriculums, setting up of innovative funds similar to Youth Enterprise Support (YES) Fund for SMEs to tap. YES Fund in Ghana is a good initiative, but the scope is narrow, for only the youth with limited resources. Other innovative ones targeting more people including the youth will be more appreciated. Also, the government should assist in setting up of research and development centers. This research finding therefore augments those held views and therefore edges government and other stakeholders to formulate favorable innovative policies for the SMEs.

### **Empirical implications**

Empirical findings from UK and other European countries suggest that, firms that employ process innovative practices experience higher growth, which falls in line with the findings of this research (Oke et al., 2007; Reichstein & Salter, 2006). Hence entrepreneurs must adopt the innovative practices to establish appreciable growth in their business. This can be done through outsourcing, forming or joining business clusters among other processes.

### **Future research**

This research concentrated on process innovation, it is therefore suggested that, the combination of other forms of innovation may result in higher growth.

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