



## Does Owner's Age Matter for Business Performance in the Rural Non-Farm Sector in Osun State of Nigeria?; Empirical Investigation from Static to Dynamic Models

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### Abstract

This study investigated the strength of owners' age as an important determinant of business performance in the rural non-farm sector in Osun state of Nigeria. Primary data were collected on three key business performance indicators as well as firm resources and age of owners of rural non-farm business. The three performance indicators used in this study are growth in sales, profit and income. Structured interview was used as the major instrument of data collection. Osun state rural non-farm sector was chosen to represent the rural non-farm sector in Nigeria. 480 respondents were drawn across the six administrative zones in Osun state. Quota sampling technique was used to select the 480 respondents who constitute the study sample. The data collected were later analyzed using appropriate descriptive statistics and econometric techniques. The result of the econometric analysis revealed that age of owners matter for business performance in the rural non-farm sector. From the correlation matrix result, age was found to have correlated positively with each of the three performance indicators. The results from both the static and dynamic model suggest that age of owner matters for business performance. On the basis of the econometric findings, the study concluded that older RNF operators have gained accumulated experiences over time as well as accumulated capital which have turned out to be important assets that keep them on top of the business and hence age has proved to be a strong factor that influenced the business performance in the rural non-farm business sector.

**Keywords:** Rural non-farm sector; Business performance; Static model; dynamic model; Osun state.

### 1. Introduction

Empirical studies confirmed that rural non-farm business co-exists with farm business opportunity among the rural households. Non-farm entrepreneurial activities constitute more than half of rural incomes in Nigeria (FMARD, 2004). In south-western Nigeria the contribution of Yoruba men and women to the development of the rural economy cannot be overemphasized. Their participation in various economic activities such as tailoring, mat weaving, cloth weaving, soap making, petty trading, food processing, blacksmithing, art and craft, etc. is being increasingly appreciated and documented (Soetan, 1996). These activities have generally been known to be critical for employment, income generation and survival of many households in the rural non-farm sector. Rural non-farm entrepreneurs are the driving force for competitive rural economic activities, which are affordable and manageable by rural people. They create a large number of non-farm employment and income opportunity in relatively less sophisticated managerial and technical skills.

According to Marsland et al (2000), rural non-farm activity is important in a number of ways: They absorb surplus labour in rural areas; they help farm based household spread risk; they offer more remunerative activities to supplement or increase agricultural income; they offer income potential during agricultural off-season and also provide a means to cope

or survive when farming fails. The rural non-farm economy is generally known to play a significant role in poverty reduction and wealth creation across nations.

Numerous studies have indicated the importance of non-farm enterprise to rural incomes. According to Gordon and Craig (2001), rural non-farm employment can play a potentially significant role in reducing rural Poverty. A study carried out by Reardon (1997) showed that the typical rural household in Africa has more than one member employed in a non-farm enterprise. Islam (1997), reports that the share of the non-farm sector in rural employment in developing countries varies from 20% to 50%. Reardon (1997) finds rural non-farm income shares in Africa ranging from 22% to 93%, and Newman and Canagarajah (1999) point to a large body of recent research that indicates that the RNF sector is now thought to be more dynamic and important than previously believed.

In Africa, the average share of rural non-farm incomes as a proportion of total rural income, is said to be 42%, it is higher than what is obtainable in Latin America and higher still than in Asia (Reardon et al., 1998). Most evidence shows that RNF activity in Africa is fairly evenly divided across commerce, manufacturing and services, linked directly or indirectly to local agriculture or small towns, and is largely informal rather than formal (Reardon, 1997). Haggblade et al. (1987) found services, food processing and petty trading to be the fastest growing, non-farm business. Households earn much more from rural non-farm activity than from farm wage labour, but (where the available data permit this comparison) non-farm wage labour is more important than self-employment in the non-farm sector (Reardon, 1997). Giving this background, this study aimed at finding out if age of owner of rural non-farm enterprises in Nigeria matter for their business performance. In essence the study is set to examine the effect of owner's age on business performance in the rural non-farm sector in Osun state. The rest of this paper is organized as follows: Section 2 presents a brief review of theoretical and empirical literature regarding the link between owner's age and business performance. Section 3 presents the data and the econometric methodology, Section 4 presents empirical findings while section 5 concludes.

## 2. A brief review of theoretical and empirical literature

From the resource-based perspective, firm resources in the form of capabilities, assets, and skills provide competitive advantage and underpin the organization's performance (Barney, 1991; Grant, 1991; and Peteraf, 1993). In other words, resource-based theory hinges on the resources and capabilities of the firm as underlying factors of performance. In this regard, the age of owner is seen as an important resource that could determine the level of performance in an organization either formal or informal organization. This view is due to the fact that experience is a function of age. Older workers will all things being equal perform better than their younger counterparts likewise older proprietors compared with their younger counterparts. This is due to the accumulation of experiences as well as capital which are needed for the survival of a firm. Findings from Chandler and Hank's (1994) study of small manufacturing businesses demonstrate the link between the availability of resource-based capabilities and business performance. An abundance of capabilities in the firm such as enhanced skills and competence acquired by experience which is a function of age of owner, age of firm, firm size, working capital, skilled and committed workers etc. ensure survival, rapid growth and profitability (Chandler and Hanks, 1994). The role of the business owner in the operation of the firm cannot be overemphasized (Lerner and Haber, 2000). This could imply that the age of business owner is an important asset that can influence the performance of a firm.

Entrepreneurship scholars across the globe who have attempted to explain business performance have measured performance differently. Some scholars used a variety of financial measures such as cash flow, return on assets (ROA) and return on equity (ROE) to assess business performance. Others suggest a combination of financial and non-financial measures to offer more comprehensive evaluation of firm performance (Li, Huang and Tsai, 2009). Subjective non-financial measures include indicators such as perceived market share, perceived sales growth, customer satisfaction, loyalty and brand equity (Li et al., 2009). Murphy, Trailer and Hill (1996) examined 51 published entrepreneurial studies using performance as the dependent variable and found that the most commonly considered dimensions of performance were related to efficiency, growth and profit. Efficiency comprises some financial measures such as return on investment (ROI) and return on equity (ROE), growth in sales, growth in the size of employees and profit includes return on sales and net profit margin.

Moreover many of these studies have focused attention on small scale business which are mainly found in the formal sector. Even, where the focus is extended to the informal sector, the rural non-farm sector has mostly often been neglected in term of modeling age of owner as an important variable that could influence business performance. Non-farm sector account for 42 percent of rural household income in Africa (Haggblade *et al.* 2000). A study conducted by Reardon *et al.* (1998) reveals that landless households depend on non-farm income to supplement their agricultural wage earnings. Even primarily agricultural households deploy capital and labour between farm and non-farm activities, enabling them to diversify incomes across the calendar year and reduce seasonal and inter-annual consumption risks Haggblade *et al.* (2000).

Haggblade *et al.* (2000) asserts that the RNFE houses a highly heterogeneous collection of trading, agro-processing, manufacturing, commercial, and service activities. The scale of activity varies enormously, from part-time, self-

employment in household-based cottage industries to large-scale agro processing and warehousing facilities operated by large multinational firms. Often highly seasonal, Reardon (2001) observes that rural non-farm activity fluctuates with the availability of agricultural input and in rhythm with household labour and financial flows between farm and non-farm activities. The composition of non-farm economic activity differs considerably as a result of wide variations in natural resource endowments, labour supply, location, historical background and institutional environment. On sectoral basis, despite a common policy, emphasis is on rural industries, in many countries of the world, manufacturing typically accounts for only 20 to 25 percent of rural non-farm employment, while trade, transport, construction, and other services account for 70 to 80 percent (Haggblade *et al* ,2000).

More importantly, several factors that affect business performance in different sectors have been suggested in the literature. Among these factors include entrepreneurial orientation (Lumpkin and Dess, 2001), business size (Wiklund and Shepherd, 2005) and gender (Cliff, 1998). Others include Age of firm (Takalashi, 2009; GEM, 2010, GEM, 2012), accounting, technology and purchasing (Alasadi and Abdelrahim, 2007). Also included are networking (Lipuma, Newbert and Doh, 2011), business age and size (Simon and Shepherd, 2014).

Going by the review of literature, we realized that age of owner has not really been given the desired consideration as an important factor of performance most especially in the rural non-farm sector in Nigeria. This study therefore examined the influence of age on business performance by controlling for firm resources in the rural non-farm sector in Osun State of Nigeria.

### 3. Data and Methodology

For the purpose of achieving the objectives of this study, primary data were collected on business performance indicators as well as firm resources and age of owner of rural non-farm business in Osun state. The three performance indicators used in this study are growth in sales, profit and income. Structured interview was designed as the major instrument of data collection. Osun state rural non-farm sector was chosen to represent the rural non-farm sector in Nigeria. 480 respondents were drawn across the six administrative zones in Osun state. Quota sampling technique was used to select the 480 respondents who constituted the study sample. The data collected were later analyzed using appropriate descriptive statistics and econometric techniques.

#### 3.1 The Model

The study came up with two models:

##### 3.1.1 Model 1:

This expresses each of the performance indicators as a function of age of owner and firm resources used as a control variable.

$Y = f(X_1, X_2)$  .....(1) Expressing this in a linearly econometric form, we have

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + U_1 \dots \dots \dots (2)$$

Where

Y = vector of performance indicators used as dependent variable

$X_1$  = age of owner used as explanatory variable

$X_2$  = firm resources used as a control variable

$\beta_0$  = intercept term or slope coefficient

$\beta_1, \beta_2$  = regression parameters to be estimated

$U_1$  = error term or disturbance term.

The a priori expectation is stated mathematically as

$$\frac{\partial Y}{\partial X_1}, \frac{\partial Y}{\partial X_2} \dots \dots \dots > 0$$

##### 3.1.2 Model 2:

This expresses each of the performance indicators as a function of one period lagged of the performance indicator and age of owner. Firm resources enter the model as a control variable.

$Y = f(Y(-1), X_1, X_2)$  .....(3) Expressing this in a linearly econometric form, we have:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 Y(-1) + U_2 \dots \dots \dots (4)$$

Where

$Y$  = vector of performance indicators used as dependent variable

$Y(-1)$  = vector of performance indicators lagged one period used as additional explanatory variable

$X_1$  = Age of owner of rural non-farm business

$X_2$  = Firm Resources

$\beta_0$  = intercept or regression slope coefficient

$\beta_1, \beta_2, \beta_3$  = regression parameters to be estimated

$U_2$  = error term or disturbance term.

The a priori expectation is stated mathematically as

$$\frac{\partial Y}{\partial X_1}, \frac{\partial Y}{\partial X_2}, \frac{\partial Y}{\partial (Y(-1))} \dots \dots \dots > 0$$

## 4. Empirical Results

### 4.1 Age Distribution of the Study Sample

The results in Table 1 shows that the larger proportion (51.6%) of the respondents were above 50 years of age while 48.4 percent were below 50 years. In spite of the importance of the rural non-farm sector to the national development, the findings showed that the sector is unattractive to the youth. This poses a serious threat to the continuity and sustainability of the sector. The finding here implies that the sector is at risk of succession threat which may have adverse effect on the national economy. The unwillingness of the youths to participate in RNFE can be attributed to the crude nature of the method of production associated with RNFE coupled with dull rural life as a result of lack of basic infrastructure such as electricity, good road networks, pipe-borne water, etc. The findings corroborate with that of Smith (2000) which pointed out that older household members in rural areas participate more than the youths in RNF activities. This, he attributed to the fact that it is the younger household members who migrate in search of non-farm income earning opportunities in urban areas. In order to de-congest the already congested urban centres in the country, there is need to provide infrastructure that will attract and retain the youths in the rural areas. This will enable them tap the opportunities offered by the non-farm sub-sector.

**Table 1: Age Distribution of the Study Sample**

Age of owner	n (n= 480)	%
0-29	48	10.0
30-49	184	38.4
50 and Above	248	51.6
<b>Total</b>	<b>480</b>	<b>100</b>

Source: Field Survey, 2014

### 4.2 Analysis of business performance in the rural non-farm sector in Osun State using performance indicators such as growth in profit, sales and household income

The result in Table 2 revealed the performance of RNFE in Osun state. It is revealed in the table, that the mean profit percent which was obtained as a ratio of profit to total cost multiplied by one hundred for each respondent was 31.1 percent. Though not too impressive a performance, it portrays the entrepreneurial viability of RNF business operators in the state given their investment climate, the meager financial resources available to them and their crude technology and operational practices. Using growth in sales as indicator of performance, the mean performance of RNFE in the study area taking over the last two years was 17 percent. This represents 17 percent growth in sales of the RNFE in the state in the last two years. This is also a low score of the value added in sales of the RNFE in the last two years; nonetheless, it is also remarkable given their condition of operation. Furthermore, using the percentage contribution of RNFE income to total income of the proprietors, the mean contribution of

RNFE income to the total income of the RNFE proprietors is 55 percent. This agrees with the findings of Reardon (2001), Fayomi (2011) which also found that about half of total income of rural household comes from the rural non-farm sector. This implies that boosting the rural non-farm activities through government assistance and technological innovation due to spillover-effect will induce rural non-farm share of total household income in Nigeria.

**Table 2: The Performance of RNFE in Osun State using Growth in Profit, Sales and Income as Performance Indicators ( n=480 )**

Performance Indicator	Mean	Standard Deviation
Profit (%)	31.1	2.0
Growth in sales (%)	17.1	1.4
Income (%)	55.2	1.3

Source: Field Survey, 2014

### 4.3 Result of Correlation Matrix

The result of the correlation matrix as presented in Table 3 showed that age positively correlated with each of the three performance indicators namely: profit (r=0.68), gross sales (r=0.55), income (r=0.69). Also, firm resources positively correlated with profit (r=0.97), gross sales (r=0.46), income (r=0.98).

**Table 3: Result of Correlation Matrix**

	PROFIT	GSALES	RNFCTTY	AGEOW	VRES
PROFIT	1	0.50686	0.987886	0.683875	0.970604
GSALES	0.50686	1	0.495585	0.545265	0.462467
RNFCTTY	0.987886	0.495585	1	0.690579	0.97602
AGEOW	0.683875	0.545265	0.690579	1	0.712017
VRES	0.970604	0.462467	0.97602	0.712017	1

### 4.4 Testing of Hypothesis

The hypothesis format adopted by this study is null versus alternative hypothesis. If the null hypothesis is rejected then the alternative hypothesis automatically become valid but if otherwise alternative hypothesis does not see the light of the day. The null hypothesis is denoted by  $H_0$  while the alternative hypothesis is denoted by  $H_1$ .

$$H_0: \beta = 0$$

$$H_1: \beta \neq 0$$

The study tests the null hypothesis that  $H_0: (\beta = 0)$  against  $H_1: (\beta \neq 0)$

To test this hypothesis, two models were estimated separately on each of the three performance indicators

#### 4.4.1 Age of Owner and Performance of the RNFE under the Static Model

Model 1 is a static model in which each of the performance indicators is regressed on age of owners and control for firm resources.

##### 4.4.1.1 Age of Owner and Profit Performance of the RNFE under the Static Model

The results in Tables 4(a) and 4(b) showed the effect of owner's age on profit performance of RNFE when control for firm resources. In Table 4(a), we included firm resources and the result showed that age has negative and insignificant effect on profit. In Table 4(b), we kept the slope coefficient of firm resources equal to zero, firm resources is turned off as a variable, we then found that age positively and significantly influenced profit performance.

**Table 4(a): Age of Owner and Profit Performance of the RNFE**

Dependent Variable: PROFIT				
Method: Least Squares				
Sample: 1 480				
Included observations: 480				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGEOW	-0.003119	0.003343	-0.932860	0.3514
VRES	0.440747	0.007045	62.56412	0.0000
C	16.03914	0.172612	92.91997	0.0000
R-squared	0.942177	Mean dependent var		31.12875
Adjusted R-squared	0.941935	S.D. dependent var		1.957024
S.E. of regression	0.471578	Akaike info criterion		1.340766
Sum squared resid	106.0780	Schwarz criterion		1.366852
Log likelihood	-318.7837	Hannan-Quinn criter.		1.351019
F-statistic	3886.188	Durbin-Watson stat		0.037374
Prob(F-statistic)	0.000000			

**Table 4(b): Age of Owner and Profit Performance of the RNFE**

Dependent Variable: PROFIT				
Method: Least Squares				
Sample: 1 480				
Included observations: 480				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGEOW	0.145802	0.007115	20.49302	0.0000
C	23.90337	0.358563	66.66439	0.0000
R-squared	0.467685	Mean dependent var		31.12875
Adjusted R-squared	0.466571	S.D. dependent var		1.957024
S.E. of regression	1.429337	Akaike info criterion		3.556456
Sum squared resid	976.5555	Schwarz criterion		3.573847
Log likelihood	-851.5494	Hannan-Quinn criter.		3.563292
F-statistic	419.9639	Durbin-Watson stat		0.028922
Prob(F-statistic)	0.000000			

#### 4.4.1.2 Age of owner and sales performance of the RNFE under the Static model

The results in Tables 5(a) and 5(b) showed the effect of owner's age on sales performance of RNFE when control for firm resources. In Table 5(a), we included firm resources and the result showed that age has positive and significant effect on sales. In Table 5(b), we kept the slope coefficient of firm resources equal to zero, firm resources is turned off as a variable, we found that age still has positive and significant influence on sales performance.

**Table 5(a): Age of Owner and Sales Performance of the RNFE**

Dependent Variable: LOG(GSALES)				
Method: Least Squares				
Sample: 1 480				
Included observations: 480				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGEOW	0.007282	0.000819	8.892077	0.0000
VRES	0.002354	0.001726	1.364111	0.1732
C	5.879605	0.042287	139.0410	0.0000
R-squared	0.294569	Mean dependent var		6.321919
Adjusted R-squared	0.291611	S.D. dependent var		0.137262
S.E. of regression	0.115528	Akaike info criterion		-1.472379
Sum squared resid	6.366372	Schwarz criterion		-1.446293
Log likelihood	356.3710	Hannan-Quinn criter.		-1.462125
F-statistic	99.59099	Durbin-Watson stat		0.076440
Prob(F-statistic)	0.000000			



**Table 5(b): Age of Owner and Sales Performance of the RNFE**

<b>Dependent Variable: LOG(GSALES)</b>				
<b>Method: Least Squares</b>				
<b>Sample: 1 480</b>				
<b>Included observations: 480</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGEOW	0.008078	0.000576	14.03447	0.0000
C	5.921611	0.029007	204.1417	0.0000
R-squared	0.291817	Mean dependent var		6.321919
Adjusted R-squared	0.290335	S.D. dependent var		0.137262
S.E. of regression	0.115632	Akaike info criterion		-1.472652
Sum squared resid	6.391208	Schwarz criterion		-1.455262
Log likelihood	355.4366	Hannan-Quinn criter.		-1.465817
F-statistic	196.9665	Durbin-Watson stat		0.075619
Prob(F-statistic)	0.000000			

#### 4.4.1.3 Age of Owner and Income Performance of the RNFE under the Static Model

The results in Tables 6(a) and 6(b) showed the effect of owner's age on income performance of RNFE when control for firm resources. In Table 6(a), we included firm resources and the result showed that age has negative and insignificant effect on income. In Table 6(b), we kept the slope coefficient of firm resources equal to zero, firm resources is turned off as a variable, we then found that age positively and significantly influenced income performance in the rural non-farm sector.

**Table 6(A): Age of Owner and Income Performance of the RNFE**

<b>Dependent Variable: Income</b>				
<b>Method: Least Squares</b>				
<b>Sample: 1 480</b>				
<b>Included observations: 480</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGEOW	-0.001273	0.002041	-0.623801	0.5331
VRES	0.297747	0.004301	69.23229	0.0000
C	44.99967	0.105377	427.0342	0.0000
R-squared	0.952654	Mean dependent var		55.23479
Adjusted R-squared	0.952455	S.D. dependent var		1.320316
S.E. of regression	0.287891	Akaike info criterion		0.353762
Sum squared resid	39.53438	Schwarz criterion		0.379848
Log likelihood	-81.90281	Hannan-Quinn criter.		0.364016
F-statistic	4798.878	Durbin-Watson stat		0.029150
Prob(F-statistic)	0.000000			



Table 6(B): Age of Owner and Income Performance of the RNFE

Dependent Variable: Income				
Method: Least Squares				
Sample: 1 480				
Included observations: 480				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGEOW	0.099330	0.004758	20.87540	0.0000
C	50.31236	0.239803	209.8070	0.0000
R-squared	0.476900	Mean dependent var		55.23479
Adjusted R-squared	0.475805	S.D. dependent var		1.320316
S.E. of regression	0.955926	Akaike info criterion		2.751885
Sum squared resid	436.7936	Schwarz criterion		2.769276
Log likelihood	-658.4524	Hannan-Quinn criter.		2.758721
F-statistic	435.7825	Durbin-Watson stat		0.027665
Prob(F-statistic)	0.000000			

#### 4.4.2 Age of Owner and Performance of the RNFE under the Dynamic Model

Model 2 is a dynamic model in which each of the performance indicators is regressed on age of owners, one period lag of performance indicator and control for firm resources. The dynamic model includes the lag of the dependent variable among the group of explanatory variables. The result obtained in the dynamic model appears to be more robust compared to the static model which seriously suffered from the problem of serial correlation. The better econometric performance of the dynamic model compared to the static model could be seen in the result shown in Tables 7, 8 and 9.

##### 4.4.2.1 Age of Owner and Profit Performance of the RNFE under the Dynamic Model

The results in Tables 7(a) and 7(b) showed the effect of owner’s age on profit performance of RNFE when there is inclusion of lagged dependent variable and control for firm resources. In Table 7(a), we included firm resources and lagged dependent variable. The result showed that age has negative and insignificant effect on profit. In Table 7(b), we kept the slope coefficient of firm resources equal to zero, firm resources is turned off as a variable, we then found that age positively but not significantly influenced profit performance. Also in both results in Table 7(a) and Table 7(b), R-Square and adjusted R-Square are very close indicating the goodness of fit of the dynamic model. It is also important to note that R-Square is comfortably high in both tables indicating the strength of age of owner in explaining the variation in the profit performance of the rural non-farm enterprises in Osun state of Nigeria.

To find out whether the model suffers from serial correlation problem, we test the hypothesis of serial correlation using the Durbin h-statistic since Durbin-Watson statistic has become inappropriate for this kind of model.

The Durbin h-statistic is given by

$$h = \left(1 - \frac{d}{2}\right) \sqrt{\frac{n}{1 - n\sigma^2Y}} \dots\dots\dots(5)$$

Where  $\sigma^2Y = \text{variance of the co-efficient of the lagged dependent variable.}$

If  $h < z - \text{critical value of 1.96, we fail to reject the null hypothesis and conclude that our model does not suffer from serial correlation}$

The computed h-statistic from each of Table 7(a) and Table 7(b) is less than the z-critical value of 1.96, hence we conclude that there is absence of serial correlation in our model.

**Table 7(A): Profit Performance and Age of Owner of the RNFE**

Dependent Variable: PROFIT				
Method: Least Squares				
Sample (adjusted): 2 480				
Included observations: 479 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PROFIT(-1)	0.938381	0.011252	83.39346	0.0000
AGEOW	-0.000921	0.000848	-1.086285	0.2779
VRES	0.027278	0.005267	5.178546	0.0000
C	1.006321	0.185662	5.420180	0.0000
R-squared	0.996264	Mean dependent var		31.11921
Adjusted R-squared	0.996240	S.D. dependent var		1.947858
S.E. of regression	0.119437	Akaike info criterion		-1.403743
Sum squared resid	6.775947	Schwarz criterion		-1.368906
Log likelihood	340.1964	Hannan-Quinn criter.		-1.390048
F-statistic	42220.08	Durbin-Watson stat		1.933370
Prob(F-statistic)	0.000000	Durbin- h Stat	<b>1.1654</b>	

**Table 7(B): Profit Performance and Age of Owner of the RNFE**

Dependent Variable: PROFIT				
Method: Least Squares				
Sample (adjusted): 2 480				
Included observations: 479 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PROFIT(-1)	0.993199	0.003918	253.4890	0.0000
AGEOW	0.000267	0.000838	0.318667	0.7501
C	0.183705	0.098680	1.861622	0.0633
R-squared	0.996053	Mean dependent var		31.11921
Adjusted R-squared	0.996036	S.D. dependent var		1.947858
S.E. of regression	0.122633	Akaike info criterion		-1.352997
Sum squared resid	7.158500	Schwarz criterion		-1.326869
Log likelihood	327.0428	Hannan-Quinn criter.		-1.342726
F-statistic	60059.21	Durbin-Watson stat		2.033299
Prob(F-statistic)	0.000000	Durbin- h Stat	<b>0.3661</b>	

#### 4.4.2.2. Age of Owner and Sales Performance of the RNFE under the Dynamic Model

The results in Tables 8(a) and 8(b) showed the effect of owner's age on sales performance of RNFE when there is inclusion of lagged dependent variable and control for firm resources. In Table 8(a), we included firm resources and lagged dependent variable. The result showed that age has positive and significant effect

on sales. In Table 8(b), we kept the slope coefficient of firm resources equal to zero, firm resources is turned off as a variable, we still found that age positively and significantly influenced sales performance in the rural non-farm sector. Also in both results in Table 8(a) and Table 8(b), R-Square and adjusted R-Square are very close indicating the goodness of fit of the dynamic model. It is equally important to note that R-Square is comfortably high in both tables indicating the strength of age of owner in explaining the variation in the sales performance of the rural non-farm enterprises in Osun state of Nigeria.

To find out whether the model suffers from serial correlation problem, we test the hypothesis of serial correlation using the Durbin h-statistic since Durbin-Watson statistic has become inappropriate for this kind of model.

The Durbin h-statistic is given by

$$h = \left(1 - \frac{d}{2}\right) \sqrt{\frac{n}{1 - n\sigma^2Y}} \dots\dots\dots(6)$$

Where

$\sigma^2Y = \text{variance of the coefficient of the lagged dependent variable.}$

If  $h < z - \text{critical value of } 1.96$ , we fail to reject the null hypothesis and conclude that our model does not suffer from serial correlation

The computed h-statistic from each of Table 8(a) and Table 8(b) is less than the z-critical value of 1.96, hence we conclude that there is absence of serial correlation in our model.

**Table 8(A): Age of Owner and Sales Performance of the RNFE**

Dependent Variable: LOG(GSALES)				
Method: Least Squares				
Sample (adjusted): 2 480				
Included observations: 479 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GSALES(-1))	0.940077	0.013324	70.55450	0.0000
AGEOW	0.000601	0.000257	2.337249	0.0198
VRES	-0.000652	0.000507	-1.286961	0.1987
C	0.370433	0.079249	4.674311	0.0000
R-squared	0.937920	Mean dependent var		6.320803
Adjusted R-squared	0.937528	S.D. dependent var		0.135208
S.E. of regression	0.033795	Akaike info criterion		-3.928714
Sum squared resid	0.542487	Schwarz criterion		-3.893877
Log likelihood	944.9270	Hannan-Quinn criter.		-3.915019
F-statistic	2392.125	Durbin-Watson stat		1.957291
Prob(F-statistic)	0.000000	Durbin- h Stat	<b>0.3102</b>	

**Table 8(B): Age of Owner and Sales Performance of the RNFE**

Dependent Variable: LOG(GSALES)				
Method: Least Squares				
Sample (adjusted): 2 480				
Included observations: 479 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GSALES(-1))	0.938765	0.013294	70.61435	0.0000
AGEOW	0.000392	0.000200	1.964631	0.0500
C	0.366517	0.079245	4.625124	0.0000
R-squared	0.937703	Mean dependent var		6.320803
Adjusted R-squared	0.937441	S.D. dependent var		0.135208
S.E. of regression	0.033818	Akaike info criterion		-3.929409
Sum squared resid	0.544378	Schwarz criterion		-3.903281
Log likelihood	944.0934	Hannan-Quinn criter.		-3.919138
F-statistic	3582.421	Durbin-Watson stat		1.954815
Prob(F-statistic)	0.000000	Durbin- h Stat	<b>0.5174</b>	

**4.4.2.3. Age of Owner and Income Performance of the RNFE under the Dynamic Model**

The results in Tables 9(a) and 9(b) showed the effect of owner’s age on income performance of RNFE when there is inclusion of lagged dependent variable and control for firm resources. In Table 9(a), we included firm resources and lagged dependent variable. The result showed that age has negative and insignificant effect on income. In Table 9(b), we kept the slope coefficient of firm resources equal to zero, firm resources is turned off as a variable, we then found that age positively but not significantly influenced income performance in the rural non-farm sector. Also in both results in Table 9(a) and Table 9(b), R-Square and adjusted R-Square are very close indicating the goodness of fit of the dynamic model. It is also important to note that R-Square is comfortably high in both tables indicating the strength of age of owner in explaining the variation in the income performance of the rural non-farm enterprises in Osun state of Nigeria.

To find out whether the model suffers from serial correlation problem, we test the hypothesis of serial correlation using the Durbin h-statistic since Durbin-Watson statistic has become inappropriate for this kind of model.

The Durbin h-statistic is given by

$$h = \left(1 - \frac{d}{2}\right) \sqrt{\frac{n}{1 - n\sigma^2Y}} \dots\dots\dots(7)$$

Where  $\sigma^2Y = \text{variance of the coefficient of the lagged dependent variable.}$

If

$h < z - \text{critical value of 1.96, we fail to reject the null hypothesis and conclude that our model does not suffer from serial correlation}$

The computed h-statistic from each of Table 9(a) and Table 9(b) is less than the z-critical value of 1.96, hence we conclude that there is absence of serial correlation in our model.

**Table 9(A): Age of Owner and Income Performance of the RNFE**

Dependent Variable: Income				
Method: Least Squares				
Date: 09/10/13 Time: 18:17				
Sample (adjusted): 2 480				
Included observations: 479 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Income(-1)	0.924554	0.011574	79.87918	0.0000
AGEOW	-0.000306	0.000539	-0.567885	0.5704
VRES	0.022094	0.003631	6.084287	0.0000
C	3.409499	0.521485	6.538057	0.0000
R-squared	0.996685	Mean dependent var		55.22839
Adjusted R-squared	0.996664	S.D. dependent var		1.314224
S.E. of regression	0.075911	Akaike info criterion		-2.310196
Sum squared resid	2.737175	Schwarz criterion		-2.275359
Log likelihood	557.2918	Hannan-Quinn criter.		-2.296501
F-statistic	47598.57	Durbin-Watson stat		1.906701
Prob(F-statistic)	0.000000	Durbin- h Stat	<b>1.0566</b>	

**Table 9(B): Age of Owner and Income Performance of the RNFE**

Dependent Variable: Income				
Method: Least Squares				
Sample (adjusted): 2 480				
Included observations: 479 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Income(-1)	0.991446	0.003753	264.1621	0.0000
AGEOW	0.000493	0.000542	0.910751	0.3629
C	0.438707	0.189932	2.309815	0.0213
R-squared	0.996426	Mean dependent var		55.22839
Adjusted R-squared	0.996411	S.D. dependent var		1.314224
S.E. of regression	0.078731	Akaike info criterion		-2.239325
Sum squared resid	2.950494	Schwarz criterion		-2.213197
Log likelihood	539.3183	Hannan-Quinn criter.		-2.229054
F-statistic	66358.08	Durbin-Watson stat		2.033113
Prob(F-statistic)	0.000000	Durbin- h Stat	<b>0.36397</b>	

## 5. Conclusion

The econometric findings in this study demonstrate that age of owner matter for business performance in the rural non-farm sector. From the correlation matrix result, age was found to have correlated positively with each of the three performance indicators namely profit, sales and income as used in this study. The results from both the static and dynamic model suggest that age of owner matters for business performance. It is on this note the study conclude that older RNF operators have gained accumulated experiences over time as well as accumulated capital which would have turned out to be important assets that keep them on top of the business and hence have more propensity to do better than their younger counterparts in the rural non-farm business sector.

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