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Risk Preferences and Coping Strategies among Poultry Farmers in Abeokuta Metropolis, Nigeria

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I. Introduction

Poultry production is a commercially viable enterprise contributing significantly to Gross Domestic Product (GDP). It has become a full time job for many Nigerians. However, in Nigeria, as other developing countries, most poultry farmers practice small scale farming with little opportunity for diversification and insurance (Babalola and Babalola, 2013). Their attitude to risk often influence their adoption of new technologies and to a large extent determine the success of many rural development programmes (Tonye et al., 1977 and Adejoro, 2000).

Most agricultural entrepreneurs, in the process of taking business decision, adopt the 'safety-first' rule before taking any risk. Based on the rule, the security of generating returns large enough to cover subsistence needs influence the decision maker's productive resource–use efficiency. According to Scandizzo and Dillon (1976), 'safety-first' criteria tend to be followed whenever the satisfaction of basic needs may be at risk. Thus, the degree of risk aversion manifested by individual farmer can be obtained from observed behaviour (Moscardi and Javry, 1977).

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And pests, low and poor performing breeds, poor weight gain/feed conversion, feeding and management problems and lack of capital (Apantaku et al., 1998; Isiaka 1998; Eekeren et al., 1995 and Famure, 1988). Variations or loss in productivity as a result of these problems can be minimized by improving the processes of risk management (Pender, 2001). Risk management option common among farming folks include: information collection, risk exposure reductio/avoidance, selection of less risky technologies, production diversification, cooperative participation, options of farm financing and insurance schemes (Hardaker et al., 2004).

a) Risk sources in agriculture

Risk sources to agribusiness enterprises, generally, can be grouped into social, market, institutional, financial, production and foreign exchange risk (Njavro, 2009; NIPC, 2006; Mikhaylova, 2005 and Dercon, 2002). Social risk is suggestive that the risks or hazards have their origin from man. The risk could be due to fire outbreak, burglary or theft, kidnapping of investors/workers for ransom, embezzlement, strike, civil commotion and changes in social structure e.g. divorce and dissolution of partnership which can lead to unexpected decline in efficient operation of enterprise and loss of useful manday.

Market risk arises due to fluctuation in input and output prices which may occur when the farmer has made a commitment to produce. It can also be as a result lower offer prices or entry of big external players. It includes risks that result from unpredictable exchange rates (Hardaker et al., 2004). Market and production risks are not independent, they are related. High transportation and marketing costs in developing countries isolate local rural markets from national and international markets. Since yield fluctuations are correlated within a small area, local prices determined by local production and demand are volatile, and for an individual farmer are negatively correlated to their production. The farmers therefore face production and market risks that are correlated depending on the level of regional market integration (Sadoulet and De Janvry, 1995). Market variability makes planning difficult by introducing uncertainties which in turn leads to inefficient resource allocation (Hazzel, 1998; Ellis, 1998 and Ellis, 2000).

Institutional risk can either be political which is the risk mostly due to instability in government machineries and policies, Sovereign risk which is the risk that foreign governments will not honor commitments such as trade agreements (Hardaker et al., 2004) or transaction risk which results from opportunistic behavior and the reliability of transacting partners (Dorward et al.,2007). The use of debt in financing agribusiness investment, seasonality of agric crops, and unlimited amount of savings exposes the firm to financial risk or liquidity risk. Foreign exchange risk is borne out of the firm's dependence on foreign currency.

Production risk occurs because agribusiness enterprise is affected by many uncontrollable events that are often related to weather such as unlimited rain or drought, diseases and pests (especially in poultry business), random physical hazards and technological failure of the production process. Valdes and Konandreas (1981) defined production risks as risks of natural causes. Production risk can be measured using the coefficient of variation, which is a measure of randomness relative to the mean yield value (Hardaker et al., 2004). Yield variability has an effect on the goal of meeting rising aggregate demand and on price and market stability (Aneke, 2007). It leads to unstable farmer income, unstable household food production, variable supplies and prices to consumers.

All these risks collectively affect the farmers' technical and profit efficiency (Barry and Baker, 1984; Bauer and Bushe, 2003; Aneke, 2007) thus they need to be managed.

b) Risk management strategies and policies

Farm size, age, innovativeness and risk aversion determine the choice of risk management strategy by farmers (Pennings et al., 2008). The identification of the sources of risk is important because it helps to choose the appropriate management strategy. Risk management strategies can be classified into two broad categories; ex-ante risk management and ex-post strategies.

Farmers implement ex-ante strategies because of lack of mechanisms to cope with risks ex-post. Natural hazards can be managed by irrigation, crop insurance and by growing resistant varieties. Market risks are managed by price stabilization programs, provision of information and credit subsidies. Social and political risks are managed by increasing farmers' political participation in decisions which affect their welfare and their future (Ellis, 1988). Other ex-ante responses include income diversification and farm enterprise diversification, organization flexibility, avoidance of high risk enterprises and holding liquid reserves of cash and credit (Valdes and Konandreas, 1981; Mishra and Morehart, 2001).

Ex-post strategies are coping strategies once livelihoods are threatened. Ex-post strategies include re-deploying labor, depleting food reserves on farm, drawing down on other savings and asset liquidation. These strategies also include the sale of productive assets like poultry birds as the last resort and activation of informal insurance networks within the extended family e.g. food, gifts or other remittances, loans from informal welfare groups. The problem with these networks is that they are located within the same locality and so can only cope with idiosyncratic risk and not covariant risks.

c) Farmers' attitude towards risk and decision making

Farmers' risk attitudes can be divided into three general types:

a. Risk averse
b. Risk preferring
c. Risk neutral.

A farmer can be in one of these types during a decision making process although he may not be in the same category for all decisions.

Risk averters are cautious individuals who prefer less risky sources of income or investments. They will sacrifice some amount of income to reduce the probability of low income or losses; this implies that they will forego some possible gains to reduce the probability of losses. This is referred to as his "risk premium" and it increases with the degree of risk aversion. Averting risk does not mean that the individual will bear no risk at all; instead he must be compensated for taking risks by receiving a return that is greater than what would be received if the outcome of an action choice were certain.

Risk preferring individuals however, would not be willing to give up the possibility of gains in order to reduce the probability of losses; he prefers more risky business alternatives. But a preference for risk does not mean that the individual will accept any risk regardless of the return; instead, it means that an individual will pay a premium or accept a return that is lower than would be expected if the outcome of a choice of action were certain in exchange for the opportunity to take a chance.

Risk neutral individuals on the other hand make decisions based on the expected values of distributions of consequence. He selects the action with the highest expected value irrespective of the associated distribution of outcomes.

II. Research Methodology

The research work was carried out in Abeokuta metropolis of Ogun State. Poultry production is more established in Abeokuta than any other town in Ogun State. The purposive sampling technique was used to select 70 poultry farmers keeping layers mainly. Data gathered covered socio-economic variables and risk preferences. Descriptive statistics, Risk Behavioural

Model (RBM) and the regression model were used to analyze data collected.

a) Model Specification

The RBM was developed by Roy (1952), is expressed below following Sekar and Ramasamy (2001) and Salimonu and Falusi (2007),

$$\Psi i = (\partial i^* - \mu i) / \sigma r \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where: Ψi = risk aversion Index; ∂i^* = disaster level of income; μi = Expected income from the farm; σr = Standard deviation of household income; i =1 to n while n= number of farmers

The disaster level of income (∂i^*) represents the point below which the behavior of the decision maker must change markedly; the farm household must borrow or sell assets to avoid starvation. This level of income would also be determined by the situation of the decision-maker in a given socio-economic environment (Sekar and Ramasamy, 2001). The model is constructed following the utility function. The respective respondent is a risk averter if $\Psi i < 0$, if $\Psi i = 0$, the farmer's attitude to risk is neutral and if $\Psi i > 0$, the farmer is a risk seeker or preferrer.

The ordinary least square multiple regression model was used to determine the influence of socioeconomic factors on farmers' preference for risk. The model can be explicitly stated as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, e) \quad \ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where;
Y = risk aversion Index (as explained earlier)
X_1 = age of respondents in yrs
X_2 = gender (male = 1; female = 0)
X_3 =level of education in yrs
X_4 = household size experience in trade in yrs
X_4 = volume of trade in kg (per week)
X_5= value of sale per week in naira
X_6= cost of purchase in naira
X_7= marketing cost in naira (which include transport, storage, packaging, grading, etc)
X_8= form of sale (fresh=1, processed=0)
X_9= participation in cooperative marketing (yes=1, no=0)
e = error term

Following Olayemi (1995) the relationship between the endogenous variable and each of the exogenous variables were examined using linear, exponential, semi-logarithm and double-logarithm functional forms. The lead equation was chosen based on the value of the coefficient of determination (R^2), statistical significance and economic theory.

III. Result and Discussion

a) Results of descriptive statistics

Results in Table 1 shows that the majority of the poultry farmers in the study area are above 30 years old (90%), they are mostly male (93%) and married (91%). The predominance of male farmers is an indication that agribusiness is generally labour intensive and still a strenuous enterprise in Nigeria. Furthermore, the tedious and time-consuming nature of poultry business discourages most prospective female entrances into the business. That most of them were married showed that they had access to family labour. The majority of the respondents (64%) had tertiary education which shows that there is high literacy level among the farmers in the study area. This could positively influence their participation in development programmes, awareness and adoption of innovations and risk management practices (Fawole and Fasina, 2005). Most of the farmers had household size of 5 or less. This is within the national average of approximately 5 (NBS, 2007). Household size is expected to vary directly with expenditure (Babalola and Babalola, 2013; Gebremedhin and Scott 2003). With a manageable household size, farmers, especially those with small holdings, are well able to cut down on expenditure in managing risk. In corroboration with good literacy level, farmers' experience in farming is expected to increase quality and quantity of output by reducing bird and egg losses, increase use of technologies and risk management strategies. The results further showed that approximately 53 percent of the farmers have been in business for between five and fifteen years which is relatively high enough for them to have gained mastery of the enterprise.

Table 1 : Distribution of farmers' characteristics

Characteristics	Freq (n= 70)	(%)
Marital status		
Married	64	91.4
Single	6	8.60
Gender		
Male	65	92.9
Female	5	7.10
Age		
<20	3	4.30
20-30	4	5.70
>30	63	90.0
Educational level		
Primary	2	2.90
Secondary	22	31.4
Tertiary	45	64.3
Experience (years)		
<5	11	15.7
5-10	20	28.6
11-15	18	24.3
16- 20	14	20.0
>20	8	11.4
Participation in co-op	38	54.3
Access to credit	37	52.5
Experience with risk		
None	1	1.40

Mild	12	17.2
Severe	57	81.4
Household size		
≤ 5	64	91.0
> 5	6	9.00
*Income (GM) per month		
<50,000	7	10.0
50,000-100,000	10	14.3
>100,000	53	75.7
*Income at which farmers will sell off Assets		
<10,000	13	18.6
10,000-20,000	55	78.5
12,000-30,000	2	2.9

**income in naira, N1~ $ 0.00625*

Source: Field survey (2013)

Although, about 54 percent of the farmers participated and have benefited from cooperative membership, 46 percent still do not participate. The importance of cooperatives in credit access, education and risk aversion has been detailed in past studies (Nto et al., 2011; Ayinde et al., 2008). The majority of the farmers (81%) have one time or the other experienced severe risk to their business. Also, most of the farmers (76%) earned above N100, 000 (approx. $ 625) monthly and the majority (79%) will be willing to sell off their assets in business if their monthly income drops below N20, 000 (approx. $ 125).

b) Major risk sources among respondents

Table 2 presents the common sources of risk in poultry business as identified by the respondents. Results showed that the major sources of risk include market (83%), production (69%), disease outbreak (63%) and political (61%) risks in that order.

Table 2 : Sources of risk in poultry business in the study area

Risk sources	Freq (%)
Currency (transaction, translation etc)	26 (37.2%)
Political (instability, policy shocks etc)	43(61.4%)
Production (weather, technology etc)	48 (68.6%)
Market (input and output price)	54 (83.1%)
Financial (credit access, interest rate)	33 (47.1%)
Social (mgt, industrial action, theft)	4 (5.7%)
Incessant power outage	15 (21.4%)
Outbreak of diseases	44 (62.90%)
Bad road network	22 (61.40%)

Source: computed from field survey (2013)

Apart from risks that are political in nature which is largely external (Dercon, 2002), other risks are those that can be managed by the farmers, if motivated, one way or another either by manipulation of farming systems, housing methods, time and frequency of stocking, feed composition etc. This result is consistent with expert judgments on the general risk sources in agribusiness as posited by Nto et al. (2011).

c) Farmers' coping strategies

A number of coping strategies adopted by the sampled farmers have been summarized and presented in Table 3. Nearly all the respondents (97%) increase their staff working hours for the same wage as a measure for coping with business risk. This goes to show that most of the firms were originally understaffed since the major business risks among poultry farmers in the study area are related to production and marketing (Table 2). Results also showed that significant proportion of the farmers also cut back household spending/expenditure (94%), diversification of enterprise (91%), cancel or postpone plans to expand business (90%), borrow (89%) and spend business reserves (86%) in order to cope with business risks.

Analysis of the frequency of use of these strategies showed that all are mostly seldom used. However, in ranking, the three most frequently used include increase in staff working hours (23%), seeking cooperative support (13%) and diversification of enterprise (12%).

Table 3 : Farmers' coping strategies against business risk

Strategies	Frequently Used	Seldom Use	Total Use %
Increase staff working hours	16(22.9%)	52(74.3%)	97.2
Cut back household spending/expenditure	7(10.0%)	59(84.3%)	94.3
Diversification of enterprise	8(11.4%)	56(80.0%)	91.4
Cancel or postpone plans to expand business	3(4.29%)	60(85.7%)	90.0
Borrowing	4(5.71%)	58(82.9%)	88.6
Spend business reserves	3(4.29%)	57(81.4%)	85.7
Integration (for input sourcing and sales)	6(8.60%)	49(70.0%)	78.6
Cooperative support	9(12.9%)	29(41.4%)	54.3
Insurance	4(5.71%)	32(45.7%)	51.4
Crash in wages	2(2.86%)	17(24.3%)	21.2
Reduce staff working hours	1(1.43%)	11(15.7%)	17.1
Layoffs/redundancies of staffs	3(4.29%)	19(27.1%)	31.4
Temporary closure	-	8(11.4%)	11.4

**multiple responses were recorded*

Source: computed from field survey (2013)

Ayinde et al (2008) have shown the importance of cooperative support and diversification (investment in more than one portfolio) as important risk management strategies for agricultural enterprises. It is important to

note that most of the farmers use more than one coping strategy in the face of business risks. Although cooperative participation and use of insurance have been recommended as good strategies for reducing business risks (Nnadi et al., 2013; Aina and Omonona, 2012), they are not well used by a lot of the respondents. Furthermore, the result showed that almost all the respondents remain in business in spite even in the face of risk. Only about 11 percent seek temporary closure as a coping strategy which implies that the farmers are likely to be risk seekers or preferring.

d) Farmers' risk preference/ attitude

Farmers' preference or attitude towards risk explains many observed economic decisions. Therefore, knowledge of farmers' attitude toward risk has important implications for the adoption of new farm technologies and the success of rural development programmes (Wik et al., 2004 and Wik and Holden, 1998).

Following the procedure outlined in the methodology, the farmers were categorized into risk preferences. Table 4 reveals that some 53 percent of the farmers in the study area have positive risk coefficients and were therefore categorized as risk preferring or seeking. This result corroborates the inference from Table 3 and is consistent with the conclusion of Ayinde et al (2008) that many farmers are not risk averse as been assumed in literature. Risk attitude largely depends on their socioeconomic characteristics.

Table 4: Distribution of farmers by risk preferences

Category	Risk aversion index	Frequency (n= 70)	Percentage
Risk Preferring	>1	37	52.9
Risk Indifferent/neutral	1	3	4.2
Risk Averse	<1	30	42.9

Source: computed from field survey (2013)

The regression analysis was estimated to determine the influence of the hypothesized socioeconomic factors on the farmers risk preference or attitude. The Semi-logarithm functional form was chosen as the lead equation based on the criteria earlier stated in the methodology. The result is presented in Table 5. The adjusted coefficient of determination (R-2) is 0.565 indicating that 56.5 percent of the variation in the marketing margin is explained by the variations in the specified independent variables. The value of the F-statistics was found to be significant at 1 percent. These diagnostic statistical results show that all the independent or explanatory variables had a joint impact on the dependent variable thus the model is of good fit.

The regression result shows that the variables that were significant at the 0.01 level of significance with a positive sign include the farmers' level of education, household size and access to credit. A percentage increase in these factors, respectively, will yield 0.099%, 0.047% and 0.085% increase in the risk aversion index. Similarly, the variables that were significant at the 0.05 level of significance with a positive sign include the farmers' age, participation in cooperatives and income level. A percentage increase in these factors, respectively, will yield 0.13%, 0.20% and 0.47% increase in the risk aversion index. The implication of this result is that with an increase in these socioeconomic, farmers' preference for risk tends to increase. The descriptive results also showed that majority of the farmers have at more secondary education, earns above 100,000 naira a month, had access to credit and participated in cooperatives and earns. It is apparent that the higher preference for risk among the respondents (see Table 4) is due to this. This result is in line with a priori expectation and agrees with previous literatures (Dadzie and Acquah, 2012; Binswanger, 1980; Moscardi and de Janvry, 1977).

Table 5 : Regression for socioeconomic determinants of farmers' preference for risks

Variables	Coefficient	t-value
Constant	7.328*	-5.024
Age	0.132**	2.460
Gender	0.228	-2.064
level of education	0.099*	5.234
Household size	0.047*	4.905
experience in trade	0.029	0.280
Participation in group co-op	0.201**	2.210
Access to credit	0.085*	4.452
Income level	0.470**	2.421

**significant at 1 %, ** significant at 5 %. R^{-2}= 0.565, F-value= 21.689*

Source: computed from field survey (2013)

Furthermore, studies have shown that older farmers are more likely to have more experience and sometimes accumulated more wealth than younger farmers. They are more likely to have greater social capital and incentives which can serve as some form of traditional insurance strategies in the process of decision making (Dadzie and Acquah, 2012; Aye and Oji, 2007). The larger the household size, the greater will be the possibility to get household members assisting on the farm in form of family labour supply especially during peak periods. This will compliment the farmers' major coping strategy of increasing labour input (see Table 3).

IV. Conclusion

The main objective of this study was to assess the risk preferences and coping strategies among poultry farmers in Abeokuta metropolis of Ogun State in South western Nigeria.

The study showed that poultry farmers usually have to deal with severe risk at some points the

management of the enterprise. Major risks are associated with marketing, production and external factors such as political interference. In coping with risk, the farmers result to increasing their staff working hours. Other major measures taken include reduction in household expenditure, diversification of enterprise and cancelation of plans to expand business. Most of the farmers are risk seekers and the factors which determined there risk preference include their age, level of education, household size, participation in cooperatives, access to credit and income level. All these factors have been found to positively influence farmers' preference for risk.

V. Recommendations

Based on the research findings, it is recommended that efforts should be directed towards policies and programmes that will further enhance farmers' participation and utilization of cooperatives in ameliorating production and marketing risks. Financial institutions, either government or private, are encouraged to collaborate with insurance companies in ensuring agricultural credit facilities to indirectly insure farms against risks. Efforts should be geared towards the development of programmes and institutions that would reduce production and market risks that have been found to be critical among poultry farmers. Furthermore, Government intervention policies targeting poultry production should put into consideration the major sources of risks as identified in this study.

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