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Determinants of Direct Marketing Strategy Adoption by Agro SMEs' in the Greater Accra Region, Ghana

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Authors' contributions

This work was carried out in collaboration between all authors. Author EDS designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors DBS and GTMK managed the analysis of the study. Author EDS managed the literature searches. All authors read and approved the final manuscript.

Research Article

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ABSTRACT

The study investigates the determinants of direct marketing strategy (DMS) adoption and its effect on gross sales of agro SMEs in the wake of the government's industrialization efforts. A multistage sampling was used to select 120 agro SMEs in the Greater Accra Region of Ghana, and the study took place between August 2011 and June 2012. Out of the 120 Agro SMEs' sampled, 39 firms were involved in processing level 1, 39 firms processing level 2 and 40 firms in processing level 3. A t-test was used to test the means of gross sales over the study period, of DMS adopting firms and non adopting firms. The double hurdle approach was used first to determine factors that influence SMEs adoption of DMS and second, to assess the effect of adoption on the gross sales of adopting firms. The results showed that DMS enhances growth in sales, since DMS adopting SMEs increased their gross sales significantly as compared to non adopting SMEs. The factors identified to influence the adoption of a DMS positively were, the processing level of product, location, organised structure of firm, type of packaging; whilst free zones status,

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use of wholesaler/distributors and internet use, negatively influenced adoption. The impacts of processing level engaged in, age of owner, packaging, and organized structure of firm; on the gross sales from DMS were estimated.
Conclusion: In conclusion, the adoption DMS enhances growth of Agro SMEs', when it is undertaken by organized firms involved in level 3 processing, located in urban areas. The study, recommends among others, encouragement in the adoption of DMS by stake holders such as MoFA, MoTI, NGOs, and DMS specific training should be given to agro SMEs.

Keywords: Direct marketing strategy; double hurdle approach; SME's growth.

1. INTRODUCTION

According to [1], Small and micro scale enterprises (SME's) contribute more than 50 percent, of employment and GDP in most African countries and also represent over 90 percent, of private businesses. In Ghana, the private sector is the largest employer, accounting for two-thirds (66.7%) of employed adults, with 55.9 percent of the total workforce being self-employed, 32.1 percent into agricultural activities and 23.8 percent into non-agricultural activities [2]. The Greater Accra Region is the home of many SME'S involved in agribusiness particularly in the production, processing and the marketing of agricultural products. SME's are believed to contribute about 70 percent, to Ghana's GDP and account for about 92 percent, of businesses in Ghana [3].

Over the last decade, agro industry producers have faced a number of challenges from an increasingly globalized food system and issues arising from changes in world trade. The changing dynamics of the agricultural sector such as higher input costs, increased regulatory burden, increasing competition in the output market, and pressure on prices received by primary producers, coupled with the ever evolving consumer preferences have contributed to an alteration of the types of management employed by firms [4]. Direct marketing strategy is one of such concepts management employs to meet the needs of its consumers.

Direct marketing strategy (DMS) includes various approaches in which the producer of goods or services directly contacts the end-user. Direct marketing includes face-to-face selling, direct mail, farmers market, U-pick, kiosks and road side stands, among others. Direct marketing can been seen as a value addition process, since producers compete on non price factors such as convenience, flavour, variety, and novelty; giving their customers something they want but cannot buy at the market place, it also enhances the financial viability of the producer [5]. Consumers have greater confidence in the safety of some of their food (such as poultry) when it comes from local producers. Direct marketing of agro products is certainly not a new phenomenon, but [6] indicated that the twentieth century saw a near disappearance of such marketing channels after World War II especially in the United States of America (USA). With time, however, the back-to-the-land movement of the 1970s and the farm crisis of the 1980s produced a generation of producers seeking diversified and decentralized marketing options and alternatives outside of traditional channels. Sales of products directly to consumers provided these opportunities, and took the form of roadside stands (very common in Ghana), farmers' markets, and U-pick operations [7].

The adoption of DMS has increased and this is due to the ability of producers to receive a better price by selling directly to consumers [8]. Nutritionists have attributed the increasing incidence of many chronic diseases (e.g. heart problems, diabetes) to diet and inactivity.

Consequently, consumers are increasingly seeking lower calorie alternatives but their focus is on functional foods, targeted to their wellness concerns [9]. Consumers are now resorting to DMS as one of the ways to address their ever increasing food safety concerns.Some studies indicate that direct marketing leads to greater stability of agriculture production and local economic autonomy for producers. Direct marketing also leads to economic spin-offs such as increased recirculation of capital in the local economy [10][11].Producers move to direct marketing as a response to financial pressure or in an effort to increase returns to their businesses [12].

A significant number of SMEs are still concentrated at the low end of the enterprise size scale even though they use DMS, and exist primarily as black survivalist firms with little capacity for sustained survival or growth [13]. In spite of the contribution of these firms to employment, their performance and growth have been poor. This implies that, even though direct marketing strategy provides an opportunity for agro industry SMEs to enhance their growth performance, it is dependent on how well it is managed by SMEs.

The objectives of the study are:

1. To identify factors influencing the adoption of DMS by agro SMEs',
2. To estimate the effects of factors on the gross sales of DMS adopting agro SMEs'.

Past researches show the potential for increasing gross incomes through direct marketing. These researches also indicate that the profitability of operations that utilize direct marketing is likely to be influenced by the type of enterprise and owner -manager characteristics, including enterprise size, employment status (that is, availability of labour), and location in urban areas. This study makes significant contributions to the direct marketing literature in Ghana. The study provides a clearer picture of the influence that type of enterprise, enterprise size, and business location in urban areas have on the adoption of DMS in the country. The sustained growth of these SMEs could, in turn, help to reduce income inequality, poverty and unemployment problems in the country [14], thus ensuring overall growth in the economy.

2. MATERIAL AND METHODS

2.1 Theoretical Model and Empirical Specification

To identify factors influencing the adoption of DMS and estimate the effects of DMS on the gross sales of adopting firms, it is assumed that producers maximize expected utility (profit) from their enterprises according to a von Neuman Morgenstern utility maximization function defined for wealth (W). Here the producer is seen as an individual wanting to maximize his wealth and has to decide which venture will best serve this purpose. It is expected that when confronted with a decision to choose between two alternative practices, the i^{th} producer compares the expected utility (profits) with the modern technology, to the expected utility with the traditional technology. Though direct measurement of producers' perceptions and risk attitudes on a modern technology are not available, inferences can be made for variables that influence the distribution and expected utility evaluation of the technology. These variables are used as a vector 'X' of attributes of the choices made by producer 'i' and ε_i is a random disturbance that arises from unobserved variation in preferences, attributes of the alternatives, and errors in optimisation.

In line with [15], the usual discrete choice analysis and limiting the amount of non-linearity in the likelihood function, $EU_{mi}(W)$ and $EU_{ti}(W)$ may be written as in equation {1} and {2}:

$$EU_{mi}(W) = \alpha_m X_i + \varepsilon_{mi} \quad \{1\}$$

$$EU_{ti}(W) = \alpha_t X_i + \varepsilon_{ti} \quad \{2\}$$

Where:

$EU_{mi}(W)$ = Expected utility with modern technology
$EU_{ti}(W)$ = Expected utility with traditional technology

Combining equation {1} and {2}, the difference in expected profits may then be written as in equation {3}

$$\begin{aligned} EU_{mi}(W) - EU_{ti}(W) &= (\alpha_m X_i + \varepsilon_{mi}) - (\alpha_t X_i + \varepsilon_{ti}) \\ &= (\alpha_m - \alpha_t) X_i + (\varepsilon_{mi} - \varepsilon_{ti}) \\ &= \alpha X_i + \varepsilon_i \end{aligned} \quad \{3\}$$

A preference for the modern technology will result if $EU_{mi}(W) - EU_{ti}(W) > 0$; where as, a preference for the traditional technology will be revealed if $EU_{mi}(W) - EU_{ti}(W) < 0$.

The adoption choice of a technology (for example Direct Marketing Strategy) is hypothesized to be the end result of socio-economic characteristics of owner-managers and a complex set of inter-strategy preference comparisons made by the owner-managers of SME's [16]. The empirical analysis permits the investigation of the decision whether or not to adopt DMS and the sales level, if the initial adoption decision was made. Several hypotheses can be derived on these two sets of decision - factors that affect adoption and factors that affect sales level of the firm.

Owners/Operators age may negatively influence both the decision to adopt DMS and the sales level from DMS. It is likely that older owner operators are more risk averse and less likely to be flexible than younger farmers and thus have a lesser likelihood of adopting new technologies. Also, younger operators are constantly searching for information on production and marketing strategies that will make their business more profitable [17]. It is however possible that older owner/operators have more experience and are better able to assess the characteristics of DMS than younger owner/operators, and hence a higher probability of adopting the practice. Operators with more education should be aware of more sources of information, and be more efficient in evaluating and interpreting information about innovations than those with less education [18],[19]. Thus it is hypothesized that producers with more education are more likely to be adopters than producers with less education.

The decision to adopt any single innovation depends on the availability of interrelated inputs [20]. This suggests that the decision to adopt a current innovation may be conditional on the utilization of previously available complementary inputs. Packaging products in small convenient quantities, is considered as a complementary practice to retail marketing, and expected to influence adoption of direct marketing positively. Similarly, the production of processing level 3 products may influence the adoption of DMS positively, as both of them are considered as interrelated technological innovations.

[21] found direct retailing to consumers; selling of farm-related, value-added products; and urban location of farmers' markets would increase the odds of attaining higher income levels. Location of the enterprise is also one of the crucial factors influencing adoption; this is because access and proximity to urban areas reduce the transportation costs associated with supplying produce through direct marketing activities [22].

[23] site the ability of producers to receive a better price by selling directly to consumers and eliminating the intermediary in the supply chain as first, and the second is the desire on the part of the consumers for a product fresher than what they would ordinarily receive from traditional sources (i.e., grocery stores, wholesale providers, etc.). Another factor is the ability of the strategy to serve as a method to augment farm income [24].

Due to the heterogeneous nature of the agricultural sector, the type of agribusiness (i.e., farming, processing, marketing etc.) affects the adoption of direct marketing as a management strategy [25]. [26] explained that farm operators and spouses who work off the farm have a higher level of education, making them more aware of news and market information, and thereby allowing them to keep better abreast of consumer preferences as they relate to food, clothing, and other purchasing decisions; therefore more likely to adopt DMS. Typically, operations with Internet access are located near metro areas, smaller in size, and have operators and/or spouses who work off the farm [27].

2.2 Empirical Model

The double hurdle model as suggested by [28], suggest that two distinct model be used in order to obtain positive values of adoption. In the case of this study the hurdles have to do with:

(i) Whether or not the firm has adopted a DMS, (participation decision)
(ii) The sales achieved through participation in a DMS, (sales level)

The possibility of estimating the first and the second stage using a different set of explanatory variables is allowed with this model.

Given the existence of zero observations on the dependent variable, Tobit could be considered. Applying this model imposes the assumption that zero expenditure is attributable to non adoption alone. However, the double-hurdle model overcomes the problem of too many zeros in the survey data, which is an inherent restrictive assumption of the Tobit model, by means of estimating a participation decision model first and then the sales level. According to [29], zero values may be reported in both decision stages. The zero value reported in the first stage (participation decision) arises from non adoption of a DMS, and in the second stage (sales level) it comes from non-DMS adoption due to respondents' deliberate decisions or random circumstances.

The double-hurdle model is employed to estimate the empirical model, due to the fact that firms make two decisions with respect to direct marketing in an effort to maximize profits: whether to participate in direct marketing (participation decision), and how much sales they will make from participation in this activity. The likelihood ratio test reveals the double-hurdle as the appropriate methodology in modelling the adoption of DMS and sales made from this activity [30]. The use of two separate latent variables allows for the modelling of each decision process, with a binary choice model (probit) determining participation and a censored model determining the sales level (truncated regression). Following [31] and [32],

the decision to adopt DMS and the sales made from directly marketed products is modelled as:

$$y_{1i}^{*} = X_{1i}^{'}\beta_1 + v_i \quad participation\ decision \qquad \{4\}$$

$$y_{2i}^{*} = X_{2i}^{'}\beta + u_i \quad sales\ level\ or\ conditional\ equation \qquad \{5\}$$

And

$$y_i = x_i^{'}\beta + u_i \qquad if \quad y_{1i}^{*} > 0 \quad and \quad y_{2i}^{*} > 0$$
$$= 0 \quad \text{otherwise} \qquad \{6\}$$

Where:

y_{1i}^{*} is a latent variable describing the firm's adoption of DMS;
y_{2i}^{*} is the latent level (Cedis) of sales made from directly marketed products;
$X_{1i}^{'}$ is a vector of explanatory variables accounting for adoption of DMS;
$X_{2i}^{'}$ is a vector of explanatory variables accounting for the sales made from directly

marketed products; v_i , and u_i are respective error terms assumed to be independent and distributed as $v \sim N(0,10)$ and $u \sim N(0, \sigma^2)^3$.

One can obtain consistent estimates of the double-hurdle model by estimating (maximizing) the following likelihood equation:

$$LL = \sum_0 In\left[1 - \alpha\left(X_{1i}^{'}\beta_1\right)\pi\left(\frac{X_{2i}^{'}\beta 2}{\sigma}\right)\right] + \sum_+ In\left[\alpha\left(X_{1i}^{'}\beta_1\right)\frac{1}{\sigma}\varphi\left(\frac{y_{i-}X_{2i}^{'}\beta 2}{\sigma}\right)\right] \qquad \{7\}$$

The first term in Equation [7] corresponds to the contribution of all the observations with observed zero [33]. In this case, the zero observations are coming not only from having adopted direct marketing of farm products, but also from the income derived from direct marketing of farm products. Specifically, the probability density function for the double-hurdle equation {4} and {5} are given by 1 – Pr $(y_{2i}^{*} > 0)$ Pr $(y_{1i}^{*} > 0\ )$, [34].

2.3 Description of Variables used in the Model

Several variables were hypothesized as influencing the decision to participate and sales levels of DMS, as shown in Table 1.

Table 1. Table of variables, description, measurement and apiori expectations

Variables	Description	Measurement	apiori Expectation
AGE	Age of owner-manager (young)	Years	+ /-
AGESQ	Age Square of owner-manager (old)	Years	-
GENDER	Gender of owner-manager	1=Male, 0= Otherwise	+/-
EDUPRI	Primary educational level of owner manager	1=Yes, 0= Otherwise	+
EDUSEC	Secondary educational level of owner manager	1 = Yes, 0 = Otherwise	+
EDUTER	Tertiary educational level of owner manager	1 = Yes, 0 = Otherwise	+
MAR	Marital status of owner manger	1 = Yes, 0 = Otherwise	+/-
INTERNET	Access to internet	1= Yes, 0= Otherwise	+
LOCATION	Location of business	1= Urban, 0= Otherwise	+
PRODUCT LEVEL 1	Cleaning, grading and sorting	1= yes, 0= Otherwise	+
PRODUCT LEVEL 3	Extraction, cooking, pasteurization	1= Yes, 0= Otherwise	+
ORGSTRUC	Firm with three tier-organization structure	1=Yes, 0=Otherwise	+
PRODUCT TYPE	Fresh products	1= Fresh, 0= Otherwise	+
FREE ZONES	Free zones status	1= Free zones, 0= Otherwise	-
FIRM SIZE	Small size of Firm	1=Small, 0=Otherwise	+
WHOSALE	Use of Wholesaler/ Distributors	1=Yes, 0=Otherwise	-
PACKAGING	Packaged in small quantities	1= Packaged, 0= Otherwise	+
DMS	Adoption of a DMS strategy	1=Yes, 0=Otherwise	+
GROSS SALES	Gross sales of firm	Ghana Cedis	+

2.4 Data and Sampling

A multistage sampling procedure made up of purposive sampling, stratified sampling and snow balling was used to select the sample. The region where the study was carried out was purposively selected, because the Greater Accra region houses most of the agro industry SME's in the country. A preliminary search in the region, showed that most of the firms were engaged in the first three stages of processing that is processing level1 (which involves cleaning grading, sorting with products like eggs, fruits and vegetables), processing level 2 (which involves cutting, mixing, milling with products such as cereal mixes, spices, flours) and processing level 3 (which involves cooking, pasteurization, extraction, freezing, dehydration with products such as fruit juices, yoghurt, and shito). A list of agro SMEs was obtained from National Board for Small Scale Industries (NBSSI), Ghana Industrial and Commercial Estates Limited (GICEL) and Ministry of Trade and Industry (MOTI), and the

firms were stratified based on the processing levels engaged in. Using the stratified data, the study had to resort partially to snowball sampling method because some of the addresses in the list were either false or not traceable. The methods yielded a sample of 120 firms in the region with the following distribution of respondents; processing level 1 (39 firms), processing level 2 (39 firms) and processing level 3 (42 firms). Primary data were collected through the administration of structured questionnaires. Secondary data were also obtained from NBSSI, GICEL and Registrar General Department.

3. RESULTS AND DISCUSSION

3.1 Factors Influencing DMS Adoption

Out of the 120 firms interviewed, 79 (66 percent) had adopted DMS and 41 firms were non adopters (34 percent). Approximately 62 percent of the adopters used roadside stand or shops due to convenience and their proximity to buyers who use busy road; 24 percent preferred selling to restaurants and institutions due to stable income from those sources and 14 percent chose the market place due to proximity to community markets.

Table 2. T-Test of difference between gross sales of DMS adopters and non adopters

Dms Use	Frequency	Mean GH¢	*P*
Yes	79	69058.98	.07
No	41	46386.44	

Source: Author's Computations (2012)

A t-test of the mean difference of gross sales between adopting firms and non adopting firms (Table 2) showed that the difference is positive and significant at 10 percent with adopting firms having higher gross sales for the period 2009-2011, compared to the non adopting firms. This means adopting DMS increases gross sales of firms and is statistically significant at 10 percent level. Therefore the growth performance of agro SMEs is enhanced with the adoption of DMS as strategy.

The estimated log likelihood ratio and the pseudo R^2 indicate a reasonable explanatory power of the estimated models. From Table 3, Firms engaged in processing level 3 (that is, cooking, pasteurisation and extraction which produce products like fruit juices yoghurt, palm oil etc.) are more likely to adopt DMS in Ghana with the coefficient being statistically significant at 5 percent level.

The production of products from processing level 3 increases the probability of an operator adopting a DMS by approximately 31 percent. Firms that package their products into smaller sizes (less or equal to1kg) have a 54 percent probability of adopting DMS. This confirms the apiori expectation and is consistent with the fact that there is an increasing demand for products that are convenient, ready to eat and have a longer shelf life.

Results indicate that firms located in urban areas such as Dzorwulu, Madina, Adentan, Weija and Tema have 33 percent, probability of adopting DMS, compared with firms located in peri-urban areas such as Abokobi, Amasaman, Sege and Dodowa. This is due to the large customer base of the urban centres, [35], also indicated that those who reside in urban and suburban areas are more likely to buy from DMS operators. Also, the results show that organised firms with a registered office and paid staff are more likely to adopt DMS. This

may be due to the fact that such firms usually assign specific duties and responsibilities to specific members of staff, thus enhancing their efficiency.

Table 3. Factors influencing DMS adoption

variable	Coefficient	Marginal effects	P-value
Age	.0204864	0.006053	0.830
Age squared	-0.0001	-0.0000295	0.921
Gender	-.04354239	-0.1257444	0.310
Firm Size	0.5780782	0.1708008	0.206
Secondary School Education	0.4988504	0.1295895	0.276
Free zones Membership	-2.418134***	-0.7144697	0.003
Processing level1	-3.031279***	-0.8589708	0.005
Processing level3	1.223502**	0.3062185	0.046
Urban Location of Firm	1.129266***	0.3391379	0.007
Organized Firm	1.592936**	0.3412855	0.022
Use of Wholesalers/ Distributors	-1.592306***	-0.4312289	0.001
Small size Packaging	2.381215**	0.5495608	0.027
Internet	-1.740476***	-0.5911598	0.010
Constant	0.0609769		0.977
Regression results from STATA			
Number of observation =120			
LR Chi^2 (13) = 77.79			
Prob>Chi^2 = 0.0000			
Pseudo R^2 = 0.5047			

, **, and * indicate significance at the 10%, 5% and 1% level, respectively.*

Firms registered as free zones companies are less likely to adopt a DMS; this is probably due to the regulations governing such firms to export 70 percent of their output. SMEs' engaged in processing level 1 (that is, cleaning, grading, and sorting; and those with products such as fruits, vegetables, eggs etc) are less likely to adopt DMS. The nature of the products from such an industry is the most likely reason for non adoption. These products are bulky, highly perishable and seasonal thus producers would prefer to engage the services of wholesaler and or distributors in order to reduce the risks associated with managing postharvest losses. In the same vein firms that engage the services of wholesaler and or distributors have a probability of 43 percent of not adopting a DMS.

The use of internet in the operation of the firms did not confirm the apiori expectation and also contrasts [36]. Firms that use internet were less likely to adopt DMS, this result could be due to the fact that only 24.2 percent, of the respondents used internet in their operations, and of this percentage only 13.3 percent, are DMS adopters.

3.2 Effect of DMS on Gross Sales

Table 4 presents the parameter estimates and elasticities for factors affecting gross sales from DMS, after the SME operator has made the decision to adopt DMS. The age of the operator has an important role to play in the level of gross sales accrued from DMS. The results show that older operators are more likely to increase gross sales through DMS; this may be due to the fact that older operators are more likely to have experience in operating DMS more efficiently, and hence a higher probability of adopting the practice [37]

Table 4. Estimates and elasticities of factors affecting gross sales from DMS

Variable	Estimate	Elasticities	P-value
Age	-6301.076***	-16.24158	0.001
Age squared	64.36955***	7.625673	0.003
Processing level 1	-18586.89*	-0.3695421	0.085
Processing level 3	1930.515	0.0445729	0.817
Urban	9149.789	0.2582018	0.221
Small size packaging	20192.34 **	0.4403127	0.026
Wholesale / distributors	-664.5265	-0.0217359	0.930
Organizational structure	40762.84***	0.7058684	0.000
Small size firm	3280.49	0.0925736	0.543
Primary education	17929.14	0.1264876	0.144
Firm age	-241.2255	-0.1358355	0.600
Constant	140577.7		0.001
Regression results from STATA			
Number of observations =94			
Wald Chi^2 (11) =50.06			
Prob>Chi^2 =0.0000			

, **, and* indicate significance at the 10%, 5% and 1% level, respectively.*

Firms engaged in processing level 1 as anticipated have a negative impact on gross sales. The bulky, seasonal and highly perishable nature of products from processing level 1 could be a contributing factor. This is confirmed by [38], that producers of value added product such as jams, pies, fruit juice (processing level 3 products) are more likely to increase their sales through DMS. Also firms whose products are packaged into smaller sizes are also likely to increase sales by 0.44% for DMS adopting firms as compared to non-adopting firms whose products are packaged in small sizes(less or equal to 1 kg).

The results also show that firms with an organised office and staff are likely to increase the gross sales by 0.71 percent. This corresponds with the work of [39], which indicates that firm size may be associated with some other factors that are correlated with efficiency, such as managerial skill and technology.

4. CONCLUSION

It can be concluded that adopting DMS enhances the growth performance of Agro SMEs. Firms located in urban areas, with products that have longer shelf life and small packagings are more likely to engage in DMS. It can also be said that, the older the owner/operator the higher the likelihood of understanding and meeting the demands of their client. Adding value and differentiating products will improve sales using a DMS.

Government through MoTI, NBSSI and NGOs should encourage entrepreneurs to adopt DMS since it improves their gross sales, and therefore their growth performance. Given that the nature of the product (that is, level of processing of product) affects gross sales, firms should add value and differentiate products to improve sales using a DMS.

Direct marketing-specific training programs (on consumer relationship building, place, pricing, promotion, product handling, packaging and business skills) should be given by government and NGOs to both new and existing producers. Stakeholders should work

collaboratively with existing and new enterprises and organisations to organise, promote and manage events that promote direct marketing such as agro-based fairs, farmers markets and to develop strategies to enhance direct-market opportunities on a sector-wide basis.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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