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## Interactive Effects of Socioeconomic Conditions and Personal Attributes of Individuals on Microenterprise Establishment Decisions in the Mfantseman Municipality of Ghana

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### ABSTRACT

Microenterprises have been recognised as a considerable employment avenue and constitute a major means of livelihood among poor households. In the Mfantseman Municipality, the problem of unemployment persists despite the option for microenterprise establishment which is expected to have been enhanced under decentralised governance. This may be partly because, prevailing socioeconomic conditions may not be yielding the necessary motivation to establish enterprises among local dwellers who have varied personal attributes. To institute development interventions that effectively promote microenterprise establishment as a viable employment option, it is considered essential to evaluate the interactive effects of socio-economic conditions with personal attributes of individuals on their enterprise establishment decisions. This is because the interactive effects are expected to add onto or reduce the direct effects of the socioeconomic factors in the decisions made. The study which is quantitative in design, adopts a conjoint analytical approach based on data from a cross sectional survey of 800 economically active individuals in 20 rural communities in the Mfantseman Municipality in 2013. The interactive effects of personal attributes with socio-economic factors were found to be significant but with varied influence on microenterprise establishment decisions. The study recommends that microenterprise development policies and programmes should be well targeted by age, sex and educational attainment, focusing on creating access to institutional support services and markets for activities with high returns on investment.

### Introduction

Micro and small enterprises (MSEs) are considered as a source of economic relief amongst poor households, with greater ease

of entry than medium and large-scale enterprises. They therefore act as a safety net against shocks (Advani, 1997; Gomez, 2008). They provide an avenue for reducing low labour demand through generation of employment and income for significant proportions of workers in rural and urban areas (Gomez, 2008). Green, Kirkpatrick and Murinde (2006) argue that, the MSE sector develops in response to the growth in unemployment, functioning as last resort for people who are unable to find employment in the formal sector, including public or large private enterprises.

Micro and small enterprises allow millions of people, especially women, to enter the socio-economic mainstream of

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American society (Acs, Tarpley & Phillips, 1998). In most countries of the Organisation for Economic Cooperation and Development (OECD), micro and small enterprises account for about 95 percent of the total enterprise population (Lukacs, 2005). In East Asia, MSEs account for more than 60 percent of all regional enterprises and up to 50 percent of paid employment with increasing labour force participation among women (Harvie, 2003). Micro small and medium enterprises represent over 90% of private businesses and contribute over 50 percent of employment and GDP in most African Countries (UNIDO, 1999). In sub-Saharan Africa, MSEs have been used by governments to care for the poor in terms of employment (Potts, 2010).

In Ghana, the National Board for Small Scale Industries (NBSSI), defines a microenterprise as having up to nine workers and plant and machinery not exceeding GH¢1,000.00 equivalent to US\$ 9,506 using 1994 exchange rate of the cedi to the dollar (Kayanula & Quartey, 2000). Micro, small and medium enterprises contribute about 85% of manufacturing employment and account for about 92% of businesses (Aryeetey, 2001). The Ghana Statistical Service (GSS, 2014) notes that, 81.5 percent of people nationwide, and 89.9 percent of people in rural areas are employed in agriculture, forestry and fishing; wholesale and retail trade, and other service activities which fall within the category of MSEs. In the Mfantseman Municipality, 62.9 percent of the economically active population are employed whereas 4.1 percent are unemployed, which is higher than the regional average of 4.0 percent (GSS, 2013). This study adopts the definitional size parameters of the NBSSI noting however that, the reference to a production unit with annual turnover not exceeding one thousand Ghana cedis (GHS1000.00) in the definition, could be rendered unrealistic now.

An understanding of the importance of decision factors for microenterprise entry in a country context and in rural settings, is essential for proper targeting of support. It is a vital step in promoting small-business, ensuring sustainability that will contribute to reducing unemployment. Improperly assessed local development priorities may lead to low rural job creation opportunities and persistent poverty. Studies have been conducted on entry constraints of small businesses in general and why the already existing microenterprises were established (Davis & Pearce, 2001); the attitudes of owners, previous management experience, functional skills, (Storey, 1994); their training (Henry et al., 2005); and their social capital (Brush et al., 2004). The reviewed work seemed to miss the notion that the interactive effect of personal characteristics of individuals and socio-economic factors, can influence microenterprise establishment decisions.

A major impulsion for the choice of the Mfantseman Municipality for the study is the finding by Arthur (2004) that the District Assemblies' Common Fund (DACF) has not been effectively utilised to promote the general development of the Municipality which includes microenterprises. To provide essential reference material for development officials to address

any disincentive for rural business creation and associated unemployment, it is considered necessary to determine the socioeconomic decision factors important to rural dwellers, as well as the interactive effects with their personal attributes. The joint or interactive effects are expected to add onto or reduce the main effects of the decision factors in the decisions made. The general objective of the study is therefore to determine the interactive effects of socioeconomic factors and personal attributes of rural dwellers on microenterprise establishment decisions in the Mfantseman Municipality. The specific objectives are to:

1. Predict the probability of microenterprise establishment based on their personal attributes and socioeconomic decision factors.
2. Examine the interactive effects of their personal attributes and socio-economic factors on rural microenterprise establishment decisions.

### Theoretical Framework

Decision Theory forms the major theoretical foundation of this study. It draws a distinction between normative and descriptive decision theories. A normative decision theory is a theory about how decisions should be made to be rational, and a descriptive decision theory is about how decisions are made in the real world, as in this study. It employs psychological analysis to explain or predict the actual action of a decision maker. Hansson (1994) notes that, making a choice between options is usually with reference to some value-standard, implying that there must be sufficient information on all the possible choice options in the domain over which a preference relation is defined. Equally relevant to this study is Satisficing Theory, which indicates that, a decision factor may not exist fully in a choice scenario, but at levels sufficient or good enough to induce a positive decision. Furthermore, the presence of other enhancing factors may compensate the absence of others (Byron, 2004).

The decision problem of rural dwellers to invest in rural microenterprises, falls between the categories of risk and uncertainty which are derivatives of non-certainty under Decision Theory. Unlike decision-making under certainty with probabilities 0 or 1, decision-making under risk occurs if each action leads to one of a set of possible specific outcomes, each occurring with a probability assumed to be known to the decision maker. In the case of uncertainty, the probabilities are not known or even meaningful (Luce & Raiffa, 1957).

The underlying reason for an enterprise establishment decision may be related to a person's motivation and degree of belief. An important motivation theory is the Expectancy Theory proposed by Vroom (1964), that people are motivated by the expectation or probability that certain actions will achieve a desired outcome. Three supporting theories of 'needs' as a motivation factor by Maslow (1970), Alderfer (1972) and McClelland (1976) irrespective of perspective, agree on core needs as the cognitive antecedents that motivate a decision to act.

## Conceptual Framework

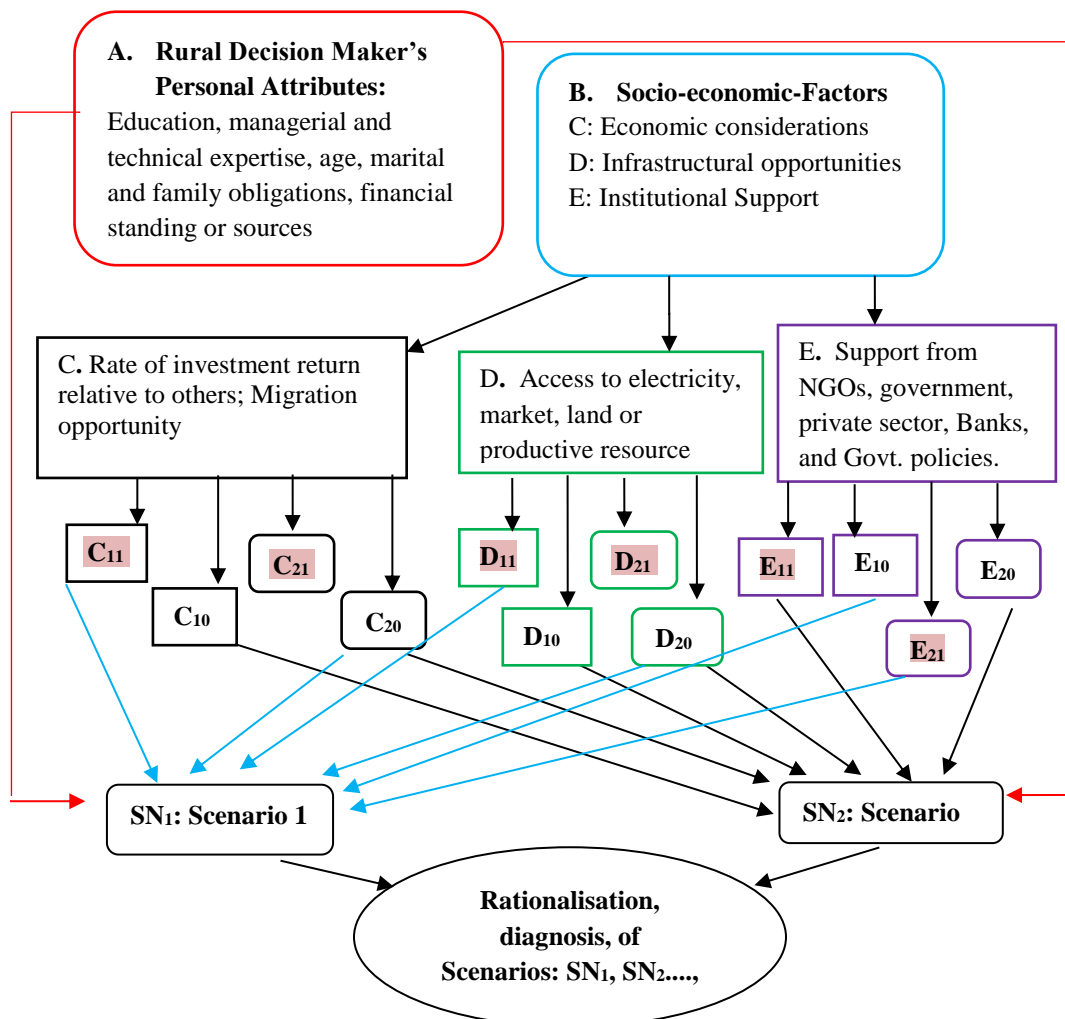
This study is based on the view that the motivation or ability of individuals to engage in any lucrative rural microenterprise may not depend only on the direct effects of opportunities provided by the prevailing socio-economic factors, institutional support as well as government policies, but also on the interacting effect with their personal attributes. This is because, individuals have unique characteristics, relating to age, sex, educational attainment, vocational and technical skills, experiences, perceptions, and other current dispositions.

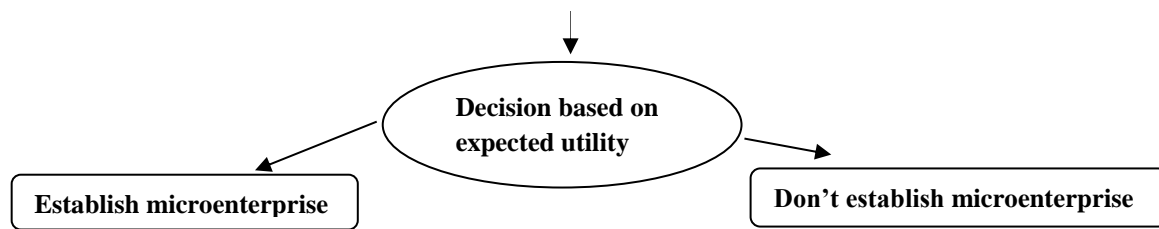
The general objective of decision making is to maximise utility for which the associated probabilities are evaluated for every decision maker. The combined effect of decision variables is expected to induce enterprise establishment based on the utility derived by the decision maker with unique attributes. According to Utilitarian Philosophy, all moral decisions should, at least in principle, consist of attempts to maximize the total utility or the 'moral' worth of an outcome (Mills, 1906). An utility function is therefore assumed to exist for each decision maker who is assumed to be rational and with additive utilities accruing from their choices.

Two main types of preferences are considered in determining utilities derived. These are stated preferences and revealed preferences. Stated preference methods estimate utility

of individual respondents based on their possible choice outcomes in a domain of hypothetical constructs with different combinations of factors, presented to them. According to Wardman (1988), the fact that it is based on what people say they would do, as opposed to what people are observed to do, is its principal draw-back. Revealed preferences involve inferring values from the choices of decision makers by observing their actual choices that were made in the past based on situations that existed. Kroes and Sheldon (1998) note however, that it fails to evaluate the choices of individuals based on all possible situations as presented in the stated preference approach.

A family of related techniques for measuring preferences or choice behaviour based on the joint effect of multiple attributes, called Conjoint Analysis is used in this study. It is derived from early work in mathematical psychology by Luce & Tukey (1964). Beside its original application in marketing research, conjoint analysis has been applied to determine the importance of certain farm decision variables including adoption of farm technologies; it has also been used in medical research to determine preferences for inpatient hospital facilities; studies on poverty reduction, gender equality; and in micro-credit administration. The direct application of Conjoint Analysis in microenterprises establishment decisions in this study may be considered a new dimension.





**Fig.-1: Framework for rural dweller decision making in microenterprise establishment**

Source: Adapted from Dijkstra and Timmermans (1996)

Following the example of Dijkstra and Timmermans (1996) in their exploration of the conjoint measurement as a decision-making tool, utilities were generated based on a combination of different attributes at various levels in analysing the decision behaviour of the rural dwellers in microenterprise establishment. The following steps were followed:

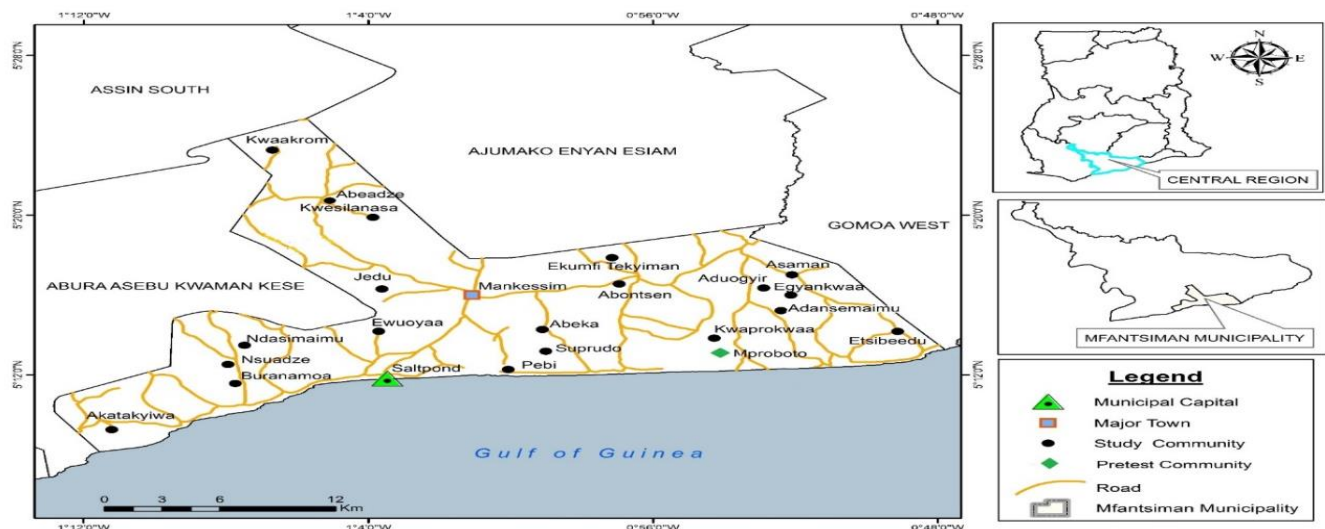
1. The personal attributes of the rural dweller, and relevant rural socio-economic conditions were selected and defined.
2. Levels of the attributes were defined. In this case, whether attribute is present or absent or present but in a reduced form.
3. Hypothetical scenarios containing one option or level of each attribute were created and formed the basis of decision making.
4. Each scenario, described with the aid of a separate card, were presented to each study respondent, asking which of the scenarios they would establish or not establish an enterprise.

6. Coefficients called 'attribute level utilities' or 'part-worths' were estimated for each attribute within the scenario and the overall utility obtained by summing up all the part-worths.

As depicted in Figure 1, the decision outcome of the rural community dweller depends on their personal attributes (A) which remains the same in the decision maker's consideration of various scenarios. The non-disaggregated or composite personal attributes combine with the disaggregated socio-economic attributes (B) which are further disaggregated into: C, encompassing return on investment, income, migration opportunity and other economic considerations; D infrastructural considerations; and E, policy and institutional support. The attributes C11 and C10 represent presence and absence respectively of the attribute in C1. Similarly, E21 and E20 represent presence and absence respectively of the attribute in E2.

## Research Methodology

### Study Area



5.

**Fig.-2: Map of Mfantseman Municipality showing study communities**

Source: Department of Geography and Regional Planning, University of Cape Coast, 2013

Figure 2 shows the 20 study communities in the Mfantseman Municipality. Saltpond, the municipal capital while Mankessim is the major market destination. The total rural population of the Municipality in 2013 was estimated at 97,495, forming 49.6 percent and the urban population of 99,068 representing 50.4 percent (GSS, 2013). The Municipality was divided into Ekumfi District and Mfantseman West Municipality in June 2012.

### *Study Design and Sampling Procedure*

The study was quantitative involving a cross sectional survey of individuals within the economically active age group of 15 to 65 years, from rural households within the Mfantseman Municipality. Sampling of individuals who were interviewed was first based on the stratification of the Municipality into 256 enumeration areas (EA) during the 2010 Population and Housing Census (GSS, 2013). Twenty (20) study communities were selected out of the 160 rural communities within the 134 rural EAs or strata based on a systematic random sampling technique. In each study community, 40 households were selected using pseudo random numbers. Simple random sampling was used to select and interview 800 economically active respondents from the study population of 52,506 at a significance level of 0.01; an error margin of 4.52 percent; and confidence level of 99 percent. Calculation of power or sensitivity, yielded 86.5 percent probability of correctly rejecting the null hypothesis in the binary hypotheses tests.

### *Variables under Study*

The dependent variable for the structural equation is a binary response variable expressed as a probability and represented by a dummy with a value of 1 if the individual decides to establish a microenterprise, and 0 if not. The logit model was adopted as the appropriate binary decision model in this study because of its advantage of overcoming the difficulty of modelling a variable within a restricted range of 0-1 to predicting the odds of an event within the real line. The independent variables were chosen from reviewed literature and an initial analysis that examined various combinations of regressors. The decision maker's personal attributes relevant for this study include: managerial and technical skills (Mts), education (Edn), age (Age), sex (Sx) marital and family obligations (Mf), and financial standing (Fs). The socio-economic attributes are: access to electricity (El), access to market (Mkt), access to institutional support (Ins), perception of migration opportunity with job prospects (Mg) and perception of quick and high return on investment (Roi). The socio-economic decision variables were each measured at two levels; represented by a dummy that takes the value of 1 if attribute exists, and value 0 if attribute does not exist.

### *Data Collection and Processing*

The study involved the collection of primary data through structured interviews of individuals using an interview schedule. The interviews took a lot of time to complete since time was spent trying to ensure very sincere responses. On the average each interview lasted for one hour and thirty minutes.

Interviews were carried out by five field assistants from the Ghana Statistical Service, Cape Coast, at the homes of respondents and at their convenience. Interviews were conducted by the team in each community on week days and weekends. During the week days, interviews were usually in the late afternoons by which time respondents had returned from farm or work. It took 42 interview days in March and April 2013 to complete the interviews in all the 20 study communities.

### *Processing and Data Analysis*

The entire research team edited the interview schedules, none of which was rejected. Computer-based software applications Microsoft Excel, Statistical Product and Service Solutions (SPSS) version 16, and Stata version 12 were used for data input, cross tabulations and estimation of analytical models. From the variables discussed, the probability that a decision maker would establish a rural microenterprise or not, can be specified as:

$$\log(P_i / (1 - P_i)) = \alpha + \beta_1 Mts + \beta_2 Edn + \beta_3 Age + \beta_4 Sx + \beta_5 Mf + \beta_6 Fs + \beta_7 El + \beta_8 Mkt + \beta_9 Ins + \beta_{10} Roi + \beta_{11} Mg + \varepsilon_i \quad (1)$$

Where  $Y_i = \log(P_i / (1 - P_i))$  is the logarithm of the odds that a potential rural decision maker will decide to establish a microenterprise.  $P_i$  represents the probability that an individual will make a certain choice given the independent variables. The  $\alpha$  measures the logit estimate of the rural dweller, who will invest despite unfavourable factors. The  $\beta$ 's represents the slope effects, the predicted odds of the investor associated with a change from an unfavourable to favourable attribute or opportunity. A negative intercept term is expected to reflect the negative influence on the logit when the socio-economic attributes do not meet the enterprise establishment expectations of the decision maker.

The probability that a rural dweller would decide to establish an enterprise  $P_Y$  was measured from the responses of respondents thus:  $P_Y = r_i / n_i$ . Where  $r_i$  is the number of people interviewed who decide to invest based on a scenario, and  $n_i$  is the total of people interviewed. The relative frequencies,  $r_i / n_i - r_i$  obtained from the responses were substituted into Equation 1, and based on a recommendation by Cox (1970) and Domencich and McFadden (1975), corrected for heteroscedasticity due to variance of the error term. Furthermore, the personal attribute variables of a decision maker remain constant as he or she examines all scenarios and were not included in the ordinary logistic equation. The estimated decision equation was therefore:

$$Y = \log[(r_i + 1/2) / (n_i - r_i + 1/2)] = \alpha + \beta_7 El + \beta_8 Mkt + \beta_9 Ins + \beta_{10} Roi + \beta_{11} Mg \quad (2)$$

To determine the interactive effect of the decision variables on enterprise establishment decisions, two complementary procedures were carried out. Firstly, the predicted probability of enterprise establishment for each scenario was determined based on Equation 2, from the expected values,  $E(Y)$  of the 31 decision scenarios. The predicted probabilities of all the

scenarios were then compared to see their relative importance to the decision makers.

Secondly, the decision maker in this study is implicitly comparing each of the defined scenarios with a scenario for which all socio-economic decision variables are absent. Ryan, McIntosh and Shackley (1998) note that individuals are used to making such choices, and that this choice approach is consistent with economic theory. Therefore, decision-making can be seen as being made between two utility functions to form a series of pairwise choices. The decision maker is expected to invest under a scenario with a set of attributes labelled B, which give an utility level that is significantly higher than a scenario A where all decision variables are absent expressed as  $U_B(x, h(\text{Attrib}^B)) > U_A(x, h(\text{Attrib}^A))$ .

The function  $U_j(.)$  represents the individual's indirect utility under scenario  $j$ , ( $j=A$  or  $B$ ),  $\text{Attrib}^j$  is the set of factors affecting microenterprise establishment derived from scenario  $j$ , and  $x$  represents consumption of other commodities. The underlying utility for a scenario is best known by the individual, but we observe this utility with an error. This introduces the concept of random utility. Under random utility, an error term is included in the individual's utility function to reflect unobservable factors, thus the individual is expected to choose B over A if  $V_B(x, h(\text{Attrib}^B)) + \varepsilon_B > V_A(x, h(\text{Attrib}^A)) + \varepsilon_A$ .

The function  $V_j(.)$  represents the measurable component of the individual's utility that is estimated empirically and  $\varepsilon_j$  is the unobservable component. Since  $\varepsilon_j$  is unknown, it is treated as random. Given a stated density function of the error term, probabilistic statements can be made about the individual's choice. The probability that an individual  $i$  will choose B over A is given by:

$P_{iB} = \Pr(\text{ob}(V_{iB} + \varepsilon_{iB} > V_{iA} + \varepsilon_{iA}))$  or  $P_{iB} = \Pr(\text{ob}(\varepsilon_{iA} - \varepsilon_{iB} < V_{iB} - V_{iA}))$ . This probability is a cumulative distribution showing the likelihood that each random term  $\varepsilon_{iA} - \varepsilon_{iB}$  is below the observed quantity  $V_{iB} - V_{iA}$ .

Thus, following Ryan and Hughes (1997) and Osei-Akoto (2004), a random effects logit model was used to estimate the interactive effects of the personal attributes of the individuals and the socio-economic factors. This is because a simple logit analysis can produce standard errors which overestimate the statistical significance of the independent variables. The random effects model accounts for the potential correlation for the same individual and thus corrects for the "vanishing" of personal attributes of the same respondent while examining the various scenarios.

Given that the difference between the unobserved utilities is a linear combination of the measurable part and the random part, the estimation model is

$$(U_{iB} - U_{iA}) = \sum_s \beta_s X_{sti} + \sum_k \lambda_k X_{sti} Z_{ki} + \mu_i + v_{ti} \quad (3)$$

Where the component  $\sum_s \beta_s X_{sti}$  represents the coefficients and the socio-economic factors as in Equation 1. The component  $\sum_k \lambda_k X_{sti} Z_{ki}$  represents the interaction term

between the socio-economic factors the personal attributes of the respondents and. Where  $i = 1, \dots, 800$  is the number of respondents,  $s = 1, \dots, 5$  is the number of socio-economic factors,  $k = 1, \dots, 5$  the number of individual attributes and  $t = 1, \dots, 31$  is the number of choices since each respondent was presented with 31 scenarios. The set of individual personal attributes is represented by  $Z_{ki}$  and the set of socio-economic factors is represented by  $X_{sti}$ .

The differences in utility are not directly observed, what is actually observed is the choice to invest or not, that is whether the hypothetical scenario labelled B will induce enterprise establishment or not compared to the constant scenario A. That is, choice to invest under any of the 31 scenarios, referred here in the decision relation as scenario B = 1 if  $(U_{iB} - U_{iA}) > 0$  and 0, otherwise. The component of the model which was measured is therefore:

$$(V_{iB} - V_{iA}) = \sum_s \beta_s X_{sti} + \sum_k \lambda_k X_{sti} Z_{ki} \quad (4)$$

The random component of the model is  $\mu_i + v_{ti}$ , where  $\mu_i$  is the random effect that arises because of the differences among respondents and  $v_{ti}$  is the error term that arises due to differences among observations. It is assumed that  $\mu_i$  is distributed as  $N(0, \sigma_\mu^2)$ . For binary dependent variables or discrete choice framework in general, the scale of utility does not matter (Hsiao, 2003; Train, 2003) and therefore the variance of the error term  $v_{ti}$  is normalised. The data obtained, was pooled for all 800 respondents irrespective of age or sex, and marginal effects were estimated based on the 31 scenarios. Marginal effect refers to the effect on the conditional mean of a dependent variable due to a unit change in one of its independent variables (Williams, 2013). For a dichotomous dependent decision variable, it gives a good approximation of the probability of a positive decision, from a unit change in the value of the regressor.

## Results and Discussion

### *Probabilities of Enterprise Establishment from Decision Scenarios*

This section presents the complementary results on the predicted probability of enterprise establishment decisions shown in Table 1. Regression results from the pooled data of all decision makers formed the basis for estimating the predicted probabilities of enterprise establishment among respondents. The predicted probabilities in the order presented, depict the logical preference order of the five socio-economic factor combinations for microenterprise establishment. Thirty-one possible decision scenarios denoted SN1 to SN31 were created from the various combinations or options of the five socio-economic decision factors.

The predicted probabilities of enterprise establishment for each of the 31 scenarios ranged from 0.367 to 0.89 indicating that there is no absolute certainty of establishment decision (with probability =1) or non-establishment decision (with probability =0) among the study group. Out of the 31 scenarios, 24 scenarios which had predicted probabilities of 0.5 or higher

were examined. This is because it is not advisable for enterprise development policies to be based on probabilities of occurrence which are lower 0.5 as in the last seven scenarios (Table 1). Out of the 24 scenarios, data on personal attributes for 10 Multi-attribute scenarios provided a good fit to the logistic model and are marked “^”. The remaining 14 of them did not provide a

good fit to the ordinary logit model and this implies that, for those scenarios, at least 50 percent of decision makers in the study area would be motivated to consider setting up microenterprises irrespective of differences in their personal attributes.

**Table-1: Predicted Probabilities of Enterprise Establishment for Thirty-one Scenarios**

Scenario No.	Socio-economic Factor Combination	Predicted Probability
SN6	El, Mkt, Ins, Roi	0.890
SN1	El, Mkt, Ins, Roi, Mg	0.881
SN11	Mkt, Ins, Roi	0.861
SN2	Mkt, Ins, Roi, Mg	0.850
SN14	El, Ins, Roi	0.818
SN3	El, Ins, Roi, Mg	0.807
SN12	El, Mkt, Roi	0.805
SN4	El, Mkt, Roi, Mg	0.793
SN21	Ins, Roi	0.775
SN26^	Mkt, Roi	0.762
SN7^	Ins, Roi, Mg	0.759
SN15^	Mkt, Roi, Mg	0.746
SN10	El, Mkt, Ins	0.743
SN5	El, Mkt, Ins, Mg	0.726
SN23	El, Roi	0.698
SN20^	Mkt, Ins	0.688

“^” indicates significance at the 0.05 level

Source: Field survey (2013)

The first nine scenarios in Table 1: SN6, SN1, SN11, SN2, SN14, SN3, SN12, SN4 and SN21 which are motivating to 77.5 to 89 percent of the decision makers were part of the 14 scenarios for which the data on personal attributes did not provide a good fit to the logistic model. Among the first nine scenarios, the first and best four scenarios: SN6, SN1, SN11 and SN2, all included the factors, Access to Market, Institutional Support and Return on Investment. Addition of the factor, Access to Electricity, improved the predicted probability to give the best motivating scenario for rural microenterprise establishment to 89 percent of the decision makers.

The second group involved the next fifteen scenarios: SN5, SN7, SN8, SN9, SN10, SN13, SN15, SN16, SN17, SN19, SN20, SN23, SN25, SN26, SN30 which were relatively less motivating, but good enough to motivate between 57.8 to 76.2 percent of decision makers to establish enterprises. The presence of the factor: Institutional Support, in scenarios with high predicted probabilities confirms studies by Naudé and Nagler (2014) that, the effect of institutional support in the form of credit increased the probability of households to be involved agribusiness and trade. Yang, Démurger and Fournier (2009) found that constrained access to credit deeply reduces the likelihood to participate in any microenterprise activity; whilst Storey (1994) proposed access to market, and profitability as shown in the findings.

Scenario No	Socio-economic Factor Combination	Predicted Probability
SN8	El, Roi, Mg	0.680
SN13^	Mkt, Ins, Mg	0.670
SN30	Roi	0.640
SN17^	Roi, Mg	0.619
SN25^	El, Ins	0.615
SN19^	El, Mkt	0.598
SN16^	El, Ins, Mg	0.595
SN9^	El, Mkt, Mg	0.578
SN29^	Ins	0.495
SN28^	Mkt	0.477
SN22^	Ins, Mg	0.469
SN24^	Mkt, Mg	0.461
SN27^	El	0.452
SN18^	El, Mg	0.431
SN31	Mg	0.367

### *Interactive Effects of the Personal Attributes with Socioeconomic Factors*

This section presents the general results on the interactive effects of the decision factors in the study (Table 2). This is followed with the results for specific socioeconomic factors in interaction with the personal attributes in the sub-sections that follow.

The estimates of coefficients of the attributes based on main and interactive effects from the random effects logit model were for 31 scenarios that were examined for the relative weights in the decision of 800 respondents to establish a rural microenterprise. This gave a total sample size of 24,800. The estimated correlation of observations within respondents, Rho ( $\rho$ ) was quite close for both models. The likelihood ratio test for  $\rho$  was significant at 1 percent level for both models, indicating that the random effects specification is better than a simple logit model. The models fitted the data well: the likelihood ratio test for each model versus a model which uses only the constant term had high significant probability.

The interactive effects of the explanatory variables were determined through their marginal effects from the random effects logit model. The effects are presented in Table 2 for only variables and their interactive effects, found to be significant. All the socio-economic factors were significant at the 0.01 level



in affecting enterprise establishment decisions. The results show that, a percent change in expected return on investment, institutional support, access to market, or access to electricity, increased the probability to invest in a rural microenterprise by 40.9 percent, 23 percent, 18.3 percent and 11 percent respectively. At the same time, it decreased the probability of enterprise establishment by 9.4 percent for the migration variable.

The magnitudes of the marginal effects indicate the importance of these socio-economic factors on enterprise establishment decisions and confirm findings by Naudé and Nagler (2014), Demissie and Legesse (2013), Yang et al. (2009) and Storey (1994). The respondents put more value on expected returns, institutional support, and availability of market, than on electricity and a migration option. The results are consistent with the predicted probabilities based on the individual factors in Table 1.

The results in Table 2 show that the interactive effect of the personal attributes differ with each socio-economic factor by age, sex, education and marital and family obligations. Depending on the sign of the coefficient, the various categories of personal attributes, either add unto or reduce the effect of the socio-economic factors with which their interaction was significant. The interactive effect of age was significant with all the socio-economic factors as expected in the conceptual framework. Similarly, the interactive effect based on the sex of respondents was significant for all the socio-economic factors except the availability of electricity. The results indicate the importance of age and sex in rural microenterprise establishment decisions and were consistent with findings by Demissie and Legesse (2013) who found that participation in off-farm employment activities were influenced by sex, age, educational level of household head, and family responsibility. Participation was higher for young males.

**Table-2: Marginal Effects from the Random Effects Logit Model**

Attribute Interaction	Main Effects and Interaction		Main Effects Only	
	dy/dx	Std. Err.	Coef.	Std. Err.
Access to Electricity (El)	0.110***	0.023	0.125***	0.009
No Marital and Family Obligations (Mf1) and El	-0.048***	0.014		
Tertiary Education _El	-0.078**	0.033		
Age3 (31-40)_El	0.042**	0.018		
Age4 (41-50)_El	0.089***	0.023		
Age5 (51-65)_El	0.073***	0.024		
Access to Market (Mkt)	0.183***	0.026	0.237***	0.014
Sex (female)_Mkt	-0.045***	0.011		
No Marital and Family Obligations (Mf1)_Mkt	0.072***	0.015		
Sec/Voc/Tech Education _Mkt	0.054***	0.024		
Age5 (51-65) _Mkt	0.061***	0.026		
Institutional Support (Ins)	0.230***	0.029	0.294***	0.017
Sex (female)_Ins	0.034***	0.011		
No Marital and Family Obligations (Mf1)_Ins	0.039***	0.015		
Moderate Marital and Family Obligations _Ins	0.057***	0.020		
Sec/Voc/Tech Education _Ins	-0.095***	0.025		
Age4 (41-50)_Ins	0.054***	0.025		
Expected Returns on Investment (Roi)	0.409***	0.039	0.387***	0.027
Sex (female)_Roi	-0.088***	0.013		
Good Financial Standing _Roi	-0.134***	0.019		
No Marital and Family Obligations (Mf1)_Roi	0.103***	0.018		
Moderate Marital and Family Obligations _Roi	0.068***	0.022		
Age2 (21-30)_Roi	-0.116***	0.017		
Age3 (31-40)_Roi	-0.145***	0.024		
Age4 (41-50)_Roi	-0.080***	0.029		
Age5 (51-65)_Roi	-0.147***	0.031		
Migration Option (Mg)	-0.094***	0.022	-0.069***	0.007
Primary Sch. Education _Mg	0.040**	0.019		
Good Managerial and Technical Skills (Mts2)_Mg	0.031***	0.011		
Age4 (41-50)_Mg	0.083***	0.022		
Age5 (51-65)_Mg	0.095***	0.025		

\*\* = Significant at 0.05; and \*\*\*=Significant at 0.01

Source: Field survey (2013)



The financial standing of respondents was significant only when the expected returns on investment or profitability issues were under consideration. This was expected since returns to investment partly depend on scale of production, which all things being equal, will require funds to inject commensurate quantity of production inputs. Similarly, respondents with high managerial and technical skills of respondents had an interactive effect with the migration option, consistent with findings by Caldwell (1968), Gbortsu (1995), and Ackah and Medvedev (2010) which indicate that a person's educational attainment, which may improve managerial and technical expertise, are important determinants of the migration.

Considerations of availability of electricity, institutional support and returns on investment were significant only as far as respondents who are single and without marital or family obligations (Mf1), or respondents who do not have more than three children to care for. This revelation confirms work by Naudé and Nagler (2014) that, the likelihood of operating an off-farm enterprise depends on individual capabilities, household characteristics and institutional factors.

#### ***Interactive effects of personal attributes with access to electricity***

The results of the interactive effects of socio-economic factors with personal attributes in Table 2 show that, for a person with no marital or family obligations, the interactive effect due to a one percent increase in access to electricity leads to a 6.2 percent (0.11- 0.048) increase in probability of a positive rural enterprise establishment decision, compared to 11 percent increase in probability among respondents with high marital and family obligations. In other words, it is 4.8 percent less probable for a person with no marital or family obligations to establish a rural microenterprise compared to one with high marital and family obligations. In line with this, the odds for rural enterprise establishment for the average of persons with no marital or family obligations is comparatively 1.546 (1/0.647) times less.

The higher probability of enterprise establishment among respondents with high marital and family obligations is because they have relatively more dependants who need to be catered for. They are thus, more likely to take advantage of new options for enterprise establishment compared to individuals without families. The interactive effect from an increase in availability of electricity is in line with studies that suggest a strong association with marriage and family formation as an indicator, and new venture creation which explore access to electricity and other opportunities (Armington & Acs, 2002).

The probability of a positive enterprise establishment decision due to interactive effect resulting from a one percent increase in access to electricity, was 15.2 (0.11+0.042) percent, 19.9 percent and 18.3 for respondents 31 to 40 years, 41 to 50 years and 51 to 65 years respectively compared to 11 percent among persons within the reference age group of 15 to 20 years and ages 21 to 30 years. Young people are more likely to be capital constrained being usually new entrants in business, and

are more likely to respond to opportunities that are less electricity dependent and which generally require less entry cost. Ampadu (2010) indicated that about 73.7 percent of entrepreneurs were within the youthful age of 20 and 35 years old and are involved small and micro-enterprises. Logically those providing services, such as hairdressing and barbering require electricity to operate. Chakraborty (2014) revealed that once rural people grow older than 40 years, no other alternative career option is available other than own enterprise.

#### ***Interactive effects of personal attributes with access to market***

The results show that access to market, was relatively more important among people with no marital and family obligations. The probability of a positive decision for a one percent increase in the interactive effect due to an increase in access to market is 25.5 percent compared to 18.3 percent among respondents with high marital and family obligations. Logically, younger people who are less likely to be married and thus less encumbered with family obligations, would be motivated to stay in their communities where market prospects are good, otherwise the alternative of a migration option with better prospects may be considered.

The probability of a positive decision resulting from one percent change in access to market is 13.8 percent for females compared to 18.3 percent for males. This may be because females may be more encumbered with domestic responsibilities compared to men who are able to better respond to the opportunities presented. These results conform with findings on the importance of access to market (Finnegan, 2000; Naudé & Nagler 2014; Demissie & Legesse, 2013). At later ages between 51 and 65, it is logical to expect people to respond to opportunities of market access as the results indicate, but this is related to the possibility that they may have the resources to respond to the opportunities relatively better than young entrants.

#### ***Interactive effects of personal attributes with access to institutional support***

The probability of a decision to establish a rural enterprise due to one percent increase in access to institutional support was 13.5 percent compared to 23 percent for the reference group without formal education. Furthermore, the probability of enterprise establishment increased by 26.4 percent for females compared to 23 percent for males. It increased by 28.4 percent for those between the ages of 41 to 50 years compared to 23 percent for those in the 15 to 20 year group. The probability of enterprise establishment from an interactive effect due to a one percent increase in access to institutional support, increased by 26.9 percent for people with no marital responsibilities compared to 23 percent among those with high marital obligations. People with high family obligations are mostly 30 years or more, who may have acquired the needed technical, managerial and social capital.

The findings are consistent with those by Akoten et al. (2006) that younger people who are likely to be single and

inexperienced and with little social capital, are more likely to be excluded from institutional support. Thus, they are more likely to place more premium on such institutional support (Naudé & Nagler, 2014).

#### ***Interactive effects of personal attributes with expected return on investment***

The interactive effects of all personal attributes contribute to the effect of return on investment in enterprises establishment except the respondent's managerial and technical skills. For a one percent expected change in return on investment, the probability of enterprises establishment due to an interactive effect with personal attributes, is 31 percent for females compared to 40.9 percent for males. Demissie and Legesse (2013) noted the importance of sex in enterprise establishment decisions consistent with this study, and that male headed households are more able to participate in all non-farm employment activities than female headed households.

For respondents in the age-groups 21 to 30, 31 to 40, 41 to 50, and 51 to 65, the importance of returns to investment is 11.6 percent, 14.5 percent, 8 percent and 14.7 percent less respectively, relative to the reference group of 15 to 20 years. The age group of 15 to 20 generally has individuals with less marital and family obligations and thus less urgency to obtain income just sufficient to meet current needs. For the older age groups, the primary concern, from satisficing theory, is to engage in enterprises with at least good enough returns to take care of pressing family obligations. The result agrees with arguments by Ray (1998) that the responsibility of a parent can be an incentive to establish an enterprise to earn income.

#### ***Importance of the Migration Option in Enterprise Establishment Decisions***

The probability of enterprises establishment due to a one percent increase in the migration option decreases by 1.1 percent and increases by 0.1 percent respectively for those in the 41 to 50 and 51 to 65 age groups respectively compared to 9.4 percent decrease for the 15 to 40 years age group. This is in line with findings by Yue, Li, Feldman and Du (2010) that the generation of 35 years and below tend to view migration as a form of investment with the accumulation of human capital. The study showed significant interactive effects of a migration option with personal attributes of respondents, including, age, managerial and technical skills, and to some extent, educational attainment. This confirms findings by Ackah and Medvedev (2010) that, a person's age, civil status, and educational attainment are important determinants of the migration decision, while gender is not.

#### **Conclusions**

With reference to the first objective of the study, it is concluded that irrespective of personal attributes, return on investment; access to institutional support services; access to market; and access to electricity, acting together, have a 77.5 percent probability of positively influencing microenterprise

establishment among rural dwellers in the Mfantseman Municipality.

From the second objective of the study, it is concluded that, the interactive effects of personal attributes: age, sex, educational attainment, financial standing and marital and family obligation with socio-economic factors, significantly influence rural microenterprise establishment decisions in the Mfantseman Municipality. Age is the most important personal characteristics, followed by marital and family obligations, sex and educational attainment, with females being less likely to establish local enterprises than males. Financial standing, managerial and technical skills are of influence, but relatively less important in the decisions.

#### **Recommendations**

Microenterprise development efforts by authorities in the Mfantseman Municipality, development partners and the private sector, should pay special attention to: high returns to investment, access to institutional support services; availability of electricity; and access to market irrespective of differences in personal attributes of potential beneficiaries.

Where specific individuals are targeted, special attention should be paid to the interactive effects of personal attributes with the socioeconomic factors. They should be well targeted by age, sex marital and family obligations and educational attainment of the potential rural beneficiaries. Managerial and technical skills should be addressed where new microenterprises are to be promoted by government and private organisations in the municipality, to enable some rural decision makers to venture outside agriculture and trading into areas of potentially high returns that require higher managerial and technical expertise.

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