The impact of transaction costs on the choice of cattle markets in Mahalapye district, Botswana

BY

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Dedication

This dissertation is dedicated to my late father

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THE IMPACT OF TRANSACTION COSTS ON THE CHOICE OF CATTLE MARKETS IN MAHALAPYE DISTRICT, BOTSWANA

by

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ABSTRACT

The objective of this study is to identify the transaction costs factors and household characteristics that influence the farmers' choice of cattle marketing channels in Mahalapye district, Botswana. The marketing channels are, typically, the Botswana Meat Commission and the local butchers. The study also identifies transaction costs influencing the level of cattle sales. It is expected that the identification of these transaction cost factors and the extent to which they influence farmers' choice of particular marketing channels could assist in the formulation of policy interventions.

Transaction costs emanate from several sources such as information asymmetries, negotiations and monitoring and enforcement of trade agreements.

The hypothesis of the study is that farmers' choice of cattle marketing channels is influenced by transaction costs and household characteristics. Households facing higher transaction costs and other inhibitive market conditions are excluded from using certain marketing channels. In order to test the hypothesis that transaction

costs affect households' decisions to choose marketing channels, a probit model was estimated to identify these transaction costs factors. The model was applied to a survey of 100 households selected using simple random sampling. A structured questionnaire was designed to capture the required data.

The results show that the herd sizes owned by households and access to market information positively and significantly increased the probability of households to sell to Botswana Meat Commission.

On the other hand the speed of payment, grade uncertainty and distance to the market were negatively associated with the probability of selling to the BMC. That is, they decreased the probability of households to sell to BMC.

The level of cattle sales to BMC was positively and significantly influenced by cattle herd sizes, age of the head of the household and distance to the market, while stock theft and animal diseases negatively and insignificantly influenced the level of sales.

The study provides recommendations, which might reduce the transaction costs, particularly by enhancing access to market information, and provision of farmer training (and cattle agents training) on marketing activities.

DIE EFFEK VAN TRANSAKSIE KOSTE OP DIE KEUSE VAN VEE MARKTE IN MAHALAPYE DISTRIK, BOTSWANA

DEUR

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OPSOMMING

Die doelwit met die studie is om faktore wat transaksie koste en huishoudelike aangeleenthede wat besluit neming by boere beinvloed om ‘n keuse te maak van watter mark kanale behoort van gebruik gemaak te word te identifiseer in Mahalapye, distrik van Botswana. Die mark kanale is, Die Botswana Vleis Kommissie en lokale slaghuise. Die studie identifiseer ook transaksie koste wat die verkope van beeste beinvloed. Dit word verwag dat die identifikasie van transaksie kostes faktore en die omvang van beinvloeding van boere se keuses van ‘n besondere mark kanaal, die formulering van beleids bepaling kan vergemaklik.

Die transaksie koste spruit voort uit verskeie oorde en die inligting is ongelykmatig as ook die onderhandelings, monitering en afdwinging van ooreenkomste.

Die veronderstelling van die studie is dat die boere se keuse van vee mark kanale wat transaksie koste beinvloed en huishodelike aangeleenthede hierdeur beinvloed word. Huishoudings ervaar groter transaksie koste plus ander inhiberende mark toestande en word uitgesluit van sekere mark kanale. Om die hipotese te toets dat transaksie koste keuses van huishoudings om verskillende mark kanale te kies, is ‘n eerlikheids model saamgestel om die identifikasie van die transaksie koste te bepaal. Die model was op 100 huisehoudings getoets deur n’ spontane keuse van huishoudings. Die vrae lys was metodies opgestel en ontwerp om alle relevante inligting te versamel.

Die resultate bewys dat kude grotes wat huishoudings besit en toegang tot mark inligting ‘n besliste en aansienlike verhoging in die waarskynlikheid het dat

huishoudings sal beinvloed word om aan die Botswana Vleis Kommissie beeste te verkoop.

Die tempo waarteen betaling geskied, die graad van onsekerheid en die distansie na die mark was negetief geassosieer met die waarskynlikheid om te verkoop aan BMC.

Die vlak van vee verkope aan BMC was positief en aansienlik beinvloed deur kude grotes, die senioriteit of ouderdom van die hoof van die huishouding en afstand na die mark, terwyl vee diefstal en vee siektes ‘n negetiewe en n’ aansienlike invloed gehad het op die vlak van verkope.

Die studie voorsien aanbevelings, wat moontlik die transaksie koste kan verlaag en in besonder by die vergemakliking van toegang tot mark inligting en die voorsiening van opleiding in mark aangeleenthede.

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

1.1.1 A BRIEF OVERVIEW OF AGRICULTURE IN BOTSWANA

Botswana is a landlocked country situated in southern Africa. It shares borders with Namibia in the west and north, Zambia in the north, Zimbabwe in the northeast and South Africa in the east and south. This country spans an area of approximately 581 730 square kilometres and has a population of slightly over 1.7 million people (estimated 2.9 persons per square kilometre).

The country is characterized by a semi-arid to arid climate with mean annual rainfall ranging from 650mm in the extreme northeast to a minimum of less than 250 mm in the southwest (including a large part of the Kalahari) occurring mostly during summer months (November to March). The high frequency of dry spells is considered to be detrimental to the establishment of a reliable arable sector in the country, a challenge compounded by short rain bursts during hot summer days (minimizing the effectiveness of rainfall).

It is therefore evident that the vast majority of the surface area of Botswana is natural rangeland suitable for the extensive grazing of ruminant livestock, particularly cattle (as opposed to arable production) and it is indeed found that after mining (diamonds) and tourism, beef exports account for an important source of foreign exchange. It should also be noted that mining provides little employment opportunities and that agriculture is still considered to be the main source of employment (approximately half the population), particularly the low and unskilled population group.

Whilst many economic and environmental challenges exist in Botswana, each of which has a dramatic effect on the contribution that agriculture can make to

the GDP of the country, the future of agriculture remains important to a substantial group of the local population.

Although agricultural production accounts for only 4-5% (a reduction from 40% at the time of independence) of the country's GDP, an estimated 25% of the total labour force is employed within the agricultural sector, and it remains an important source of food, income and provides a number of productive investment opportunities (Mbendi).

The agricultural sector provides important linkages with; and access to up- as well as down-stream industries within the economy, creating employment potential also in other sectors (National Development Plan 9, Mbendi).

Moreover, agricultural activity plays an important role in Rural Development where local economies are supported through the production of commodities as well as in the conservation of biodiversity, the maintenance of farmed landscapes and the provision of energy resources (NTC-IV Ministerial Meeting).

Historically, agriculture has been the main economic activity in Botswana. Since independence in 1966, the contribution towards the GDP of the country has diminished mainly due to the expansion of the mining sector. Whilst the agricultural sector cannot be viewed as a priority sector within the macro-economic perspective, it has an important socio-economic significance:

- Food security and domestic food production is at the heart of the Botswana Agricultural Policy.

- The policy on Food Security advocates the diversification of income sources as well as the efficient, competitive and sustainable production of local commodities.

- Agriculture is still a major source of employment, income and capital formation to the rural population.

Agriculture is considered to be a sector that underpins social and traditional values in Botswana. Whilst this sector is hindered by many environmental challenges and traditional practices, it has considerable potential in terms of the provision of local food, the creation of employment and the diversification of both up- and down-stream industries, also in other sectors.

1.1.2 LIVESTOCK PRODUCTION IN BOTSWANA

Cattle, sheep and goats are the major income earners in the agricultural economy of Botswana. Productivity in this sub-sector has been hampered by persistent drought.

Poultry earns considerably less whilst ostrich production is considered to be in its early stages of establishment in the country. Local poultry production has however increased over the past decade to a point where Botswana is almost self-sufficient.

In terms of the land tenure there are two distinct livestock production systems in Botswana. These are:

Commercial Farms: Table 1.1 provides an indication of the numbers of livestock found at commercial farms. In the order of importance 83% of all commercial cattle can be found in the Gaborone, Central, Southern and Western Regions of the country. Commercial ranching contributes eight per cent (8%) of the total land area. The most important sheep production areas are considered to be the Gaborone and Western Regions (79% of commercial sheep production) whilst most commercial goat production systems are found in the Gaborone, Western and Maun Regions (79%).

The Gaborone, Western and Southern Regions are considered to be main poultry production areas whilst commercial ostrich farms are found in the Southern Region.

TABLE 1.1: Summary of livestock numbers by region in commercial farming systems

Region	Cattle	Sheep	Goats	Chickens	Ostriches
Southern	25,649	1,282	2,774	1,741	917
Gaborone	45,729	5,941	9,471	2,888	108
Central	10,743	1,038	1,756	574	50
Francistown	5,153	36	1,534	50	0
Maun	11,632	859	5,264	298	34
Western	64,178	6,662	8,864	2,909	168
TOTAL	**163,084**	**15,818**	**29,663**	**8,460**	**1,277**

Note: Livestock represented as heads/number of birds
Source: Reworked from Agriculture Statistics Report: 1998 (June 2002)

Traditional Farmers: Traditional animal husbandry in Botswana consists mainly of Cattle, Sheep, Goats and Poultry (Table 1.2). An estimated 2,181,507 heads of cattle was recorded amongst traditional farmers during 1998. The Central Region of the country houses the largest number of traditional cattle (49%). Most of these traditional cattle are kept on communal grazing land with little inputs provided by farmers. Under this system land is communally owned with grazing land used collectively, which restricts the scope for improved management practices. Goats are the second largest commodities produced by Traditional farmers in Botswana. In the order of 2,168,962 goats have been recorded during 1998 with the Southern, Gaborone and Central Regions containing the largest numbers. A considerable number of poultry producers can be found in the Central Region of the country whilst sheep production is most prevalent in the Southern and Central Regions.

TABLE 1.2: Summary of livestock numbers by region in traditional farming systems

Region	Cattle	Sheep	Goats	Chickens
Southern	317,174.00	105,397.00	400,912.00	181,202.00
Gaborone	386,588.00	48,079.00	369,641.00	183,299.00
Central	1,058,233.00	172,859.00	953,862.00	235,718.00
Francistown	143,886.00	18,735.00	157,828.00	90,019.00
Maun	110,148.00	24,525.00	190,592.00	54,110.00
Western	165,478.00	7,165.00	96,127.00	23,614.00
TOTAL	**2,181,507.00**	**376,760.00**	**2,168,962.00**	**767,962.00**

Note: Livestock represented as heads/number of birds
Source: Reworked from Agriculture Statistics Report: 1998 (June 2002)

Another production system (not so distinct) is the Tribal Grazing Land Policy ranches. These ranches were introduced because of the perceived need to ensure conservation of Botswana's range resources and to simulate an increase in productivity and commercialization of the livestock industry. Producers have exclusive grazing rights, as land can be fenced, and may be classified as commercial.

1.1.3 A FOCUS ON CATTLE PRODUCTION

Commercial Farmers: At commercial cattle ranches, production is generally performed off-ranch, where animals are weaned in fattening camps, and either sold directly to the abattoir at around 2-3 years, or finished in feedlots. Many commercial ranchers, nowadays, favour a three-way cross using Brahman, Hereford and one other European breed. Commercial cows are crossed with purebred bulls, to maintain a uniform calf crop. All bull-calves, and poorer heifers are weaned and grown out for slaughter; while the best heifers are kept as replacements. Heifers generally calve when 27 to 33 months. Breeding cows are generally culled when they fail to produce a calf after one and a half, to two seasons. Cull cows are fattened on summer grazing, and sold before the dry season.

In commercial herds where young stock are removed from the range after weaning, more range is available for breeding cows and production rates are higher than standard, off-range production systems. The off-range production systems tend to run at around 30% cows, 30% young stock (1-2 years old) and 30% calves (<1 year old), with the remaining 10% being replacement heifers and bulls. The feedlot system runs off an approximate ratio of 50% breeding cows to 40% calves (<1 year old) and 10% bulls and replacement heifers. The negative side to this latter system, is the vulnerability of the herd to drought, and the need to slaughter a large proportion of the breeding herd, at below premium beef grades and prices (Country Pasture/Forage Resource Profiles, FAO).

Traditional Farmers: Traditional cattle production accounts for more than 80% of all cattle reared in Botswana. In the order of 2.2 million head of cattle are currently grazing on land with a carrying capacity of 3.2 million. This factor gives rise to concerns regarding overgrazing on the available veldt, considering that goats and sheep have not been added to the animal population. The problem of rangeland degradation is found especially around boreholes and water points, which in terms of the current spacing is approximately 8km apart. Although grazing rights by traditional farmers are not exclusive, ownership of borehole provides *de facto* rights the water and the surrounding resources. Cattle are kept on open grazing to the extent that increasing the net benefits of livestock farming would result in more cattle being kept, which in turn results in and overgrazing land degradation.

1.1.4 THE MARKETING OF CATTLE IN BOTSWANA

The Botswana Meat Commission (BMC) was established in 1966 to be solely responsible for the slaughter and marketing of all beef exports from Botswana. The Botswana Meat Commission Act defines that all cattle offered to the Commission for sale by local producers be bought, slaughtered and processed.

Two highly modern state-of-the-art abattoirs in Lobatse and Francistown are equipped to slaughter and debone around 1300 cattle a day. Although the BMC was established as a National Marketing channel in Botswana, cattle are also marketed through a number of other marketing channels. These channels include butchers, speculators, private buyers, co-operatives, municipal abattoirs, and through auctioneers. It should be noted that these alternative channels are gaining considerable popularity, to the extent where the operations of BMC is considered to have become either stagnant or declining.

A major factor influencing decisions regarding marketing channels is considered to be costs related to carrying out exchange of commodities. These costs are referred to as the transaction costs (Nkosi and Kirsten,

1993). It is argued that the level of transaction costs imposed on the seller influences his/her choice of the marketing channel. The extent to which these transaction costs affect farmers differs from area to area and from farmer to farmer within each area. Different signals are sent to producers, influencing their decisions regarding the appropriate channels to access at that specific stage (Feut *et al,* 1993). Transaction costs therefore have major influences on the utilization of BMC and linked to the number of alternative competitors, have played a major role in the decline of BMC over the past few years.

Furthermore, it is found that many traditional farmers regard cattle as a financial buffer mechanism, only to be used when cash shortages are experienced. This factor affects the continuity of marketing and causes producers to become inconsistent in terms of supply with a direct implication on sales through the various channels, including BMC and its obligation to fulfil quotas.

1.2 PROBLEM STATEMENT

Figure 1.1 provides an indication of the decline in throughput experienced by the Botswana Meat Corporation during the past 13 years making the commission run into viability problems because it could not reach its optimum killing capacity. Data suggest that a period of peak throughput has been experienced between 1991 and 1995, which coincides with a major drought experienced in the country. It should be noted that this peak has been caused by an increased of sales by producers reducing cattle numbers in an effort to survive the drought.

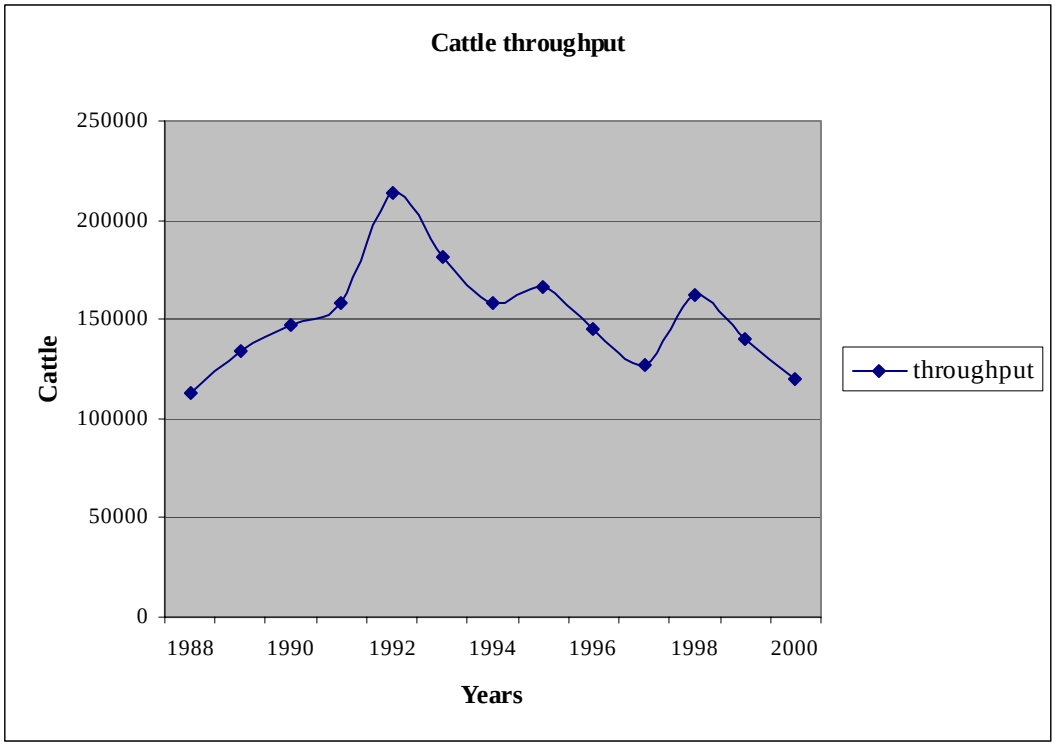

Figure 1.1: BMC throughput over a 13-year period.

Considering the operating capacity of the BMC over the same period, it is evident that BMC has operated at an average of 42% below capacity (Table 1.3). Upon exclusion of the data for the period of drought (1991 to 1995) it is found that an average of 48% under capacity is maintained. It is therefore concluded that the BMC have operated more than 42% under its potential capacity during the last 13 years.

Table 1. 3: BMC throughput over a 13-year period.

Year	Throughput (Number of cattle)	Optimum capacity (number of cattle)	Under Capacity (%)	Under Capacity Excluding Drought (%)
1988	112,498	260,000	57	57
1989	134,558	260,000	48	48
1990	146,729	260,000	44	44
1991	158,457	260,000	39	
1992	213,635	260,000	18	
1993	181,235	260,000	30	
1994	158,624	260,000	39	
1995	166,531	260,000	36	
1996	145,462	260,000	44	44
1997	127,381	260,000	51	51
1998	162,430	260,000	38	38
1999	140,245	260,000	46	46
2000	120,412	260,000	54	54
AVERAGE			**42**	**48**

Source: Reworked from proceedings of the 2nd National Conference on Livestock Marketing and Botswana Meat Commission reports (1999)

Considering the above, it is evident that the Botswana Meat Corporation experiences a considerable loss due to poor productivity of its abattoirs, resulting in a decline in sales and a potential loss of overseas markets. Continuation of such trends may have a serious influence on the economic viability of the organization and may result in the loss of an important National Marketing Resource.

1.3 HYPOTHESIS

Whilst in 1966 BMC purchases accounted for over 95% of all livestock purchases in Botswana, with the rest (5%) being purchased by other channels (e.g. municipal abattoirs and butcheries), to-date about 45% of all cattle sales go to other buyers (Machacha, 1999).

A study by Hobbs (1997) hypothesized that a producer's choice between live-ring auctions (live weight sales) and direct-to-packer (dead weight) sales is influenced by transaction cost and producer/farm characteristic variables.

It is hypothesised that a cattle producer's choice (between the Botswana Meat Commission and other marketing channels such as municipal abattoirs and butcheries) is influenced by different transaction costs during the marketing of cattle. These transaction costs may be in the form of negotiation-, information-, enforcement- and monitoring costs and may be influenced by producer/farm characteristic variables such as education, marketing experience, proximity to markets and herd size. These transaction costs and farm characteristics are hypothesised to have a negative impact on the number of cattle marketed through the BMC. In other words it is hypothesised that differential levels of transaction costs across producers and farm characteristic variables explain why producers habitually choose between marketing channels and accept widely different prices for a seemingly homogeneous goods (cattle) in the same location.

1.4 STUDY OBJECTIVES

The overall objective of the study is to investigate the extent to which transaction costs influence farmers' choice of marketing channels. The study has the following specific objectives:

- To identify the transaction cost factors that influence the choice of cattle marketing channels in the study area. The identification of these transaction cost factors and the extent to which they influence the farmers' choice of marketing channels can assist in policy interventions.

- Identify farmer characteristic factors determining the choice of one marketing channel over others.

- Recommend strategies for overcoming these transaction costs.

1.5 JUSTIFICATION OF THE STUDY

Livestock production plays a crucial role in the welfare of both rural and urban populations of Botswana. Humans derive many benefits such as income, rural employment, and animal food protein, from animal production. Cattle account for a large proportion of rural households wealth in Botswana. Most rural households have few asserts apart from livestock that can be liquidated to cope with adverse income shocks.

Understanding the nature, and effects of transaction costs on cattle marketing, and how it can be alleviated is cardinal to improving marketing channels as well as rural people's livelihoods. Transaction costs are a marketing or participatory constraint to smallholder farmers. In African economies that are only partially commercialised, smallholder farmers are likely to face higher transaction costs than large-scale farmers (Makhura, 2001).

This study is the first of its kind within the Department of Animal Health and Production. It is envisaged it will help the Botswana government to formulate a policy that will reduce transaction costs, and help farmers in general to improve their livelihood. To determine policy priorities to address transaction costs, it is necessary to understand how farmers are affected by these transaction costs. Such refinement is necessary to make it possible to identify particular intervention objectives that are practicable and cost-effective. Information on marketing and transaction costs influencing the choice of marketing channels in Botswana is scarce. The study will therefore seek to identify the transaction cost factors and study the extent to which they influence farmers' choice of marketing channels.

1.6 STUDY AREA

The selected study area is Mahalapye Veterinary District (Figure 1.2) in the eastern Botswana. The district comprises 17 villages and settlements of

varying characteristics, sizes and population densities. Like with the rest of the country rainfall in the study area is highly erratic. A cycle of low and high rainfall years exists. The vegetation is tree savannah.

The economy of the area is mainly based on livestock productions. Livestock farmer population is estimated at 5 244 while that of cattle is estimated at 295 745. Crop production, a seasonal activity, also constitutes an integral part of the farming system. The area is considered an area with high agricultural potential (Botswana Agricultural Census, 1993).

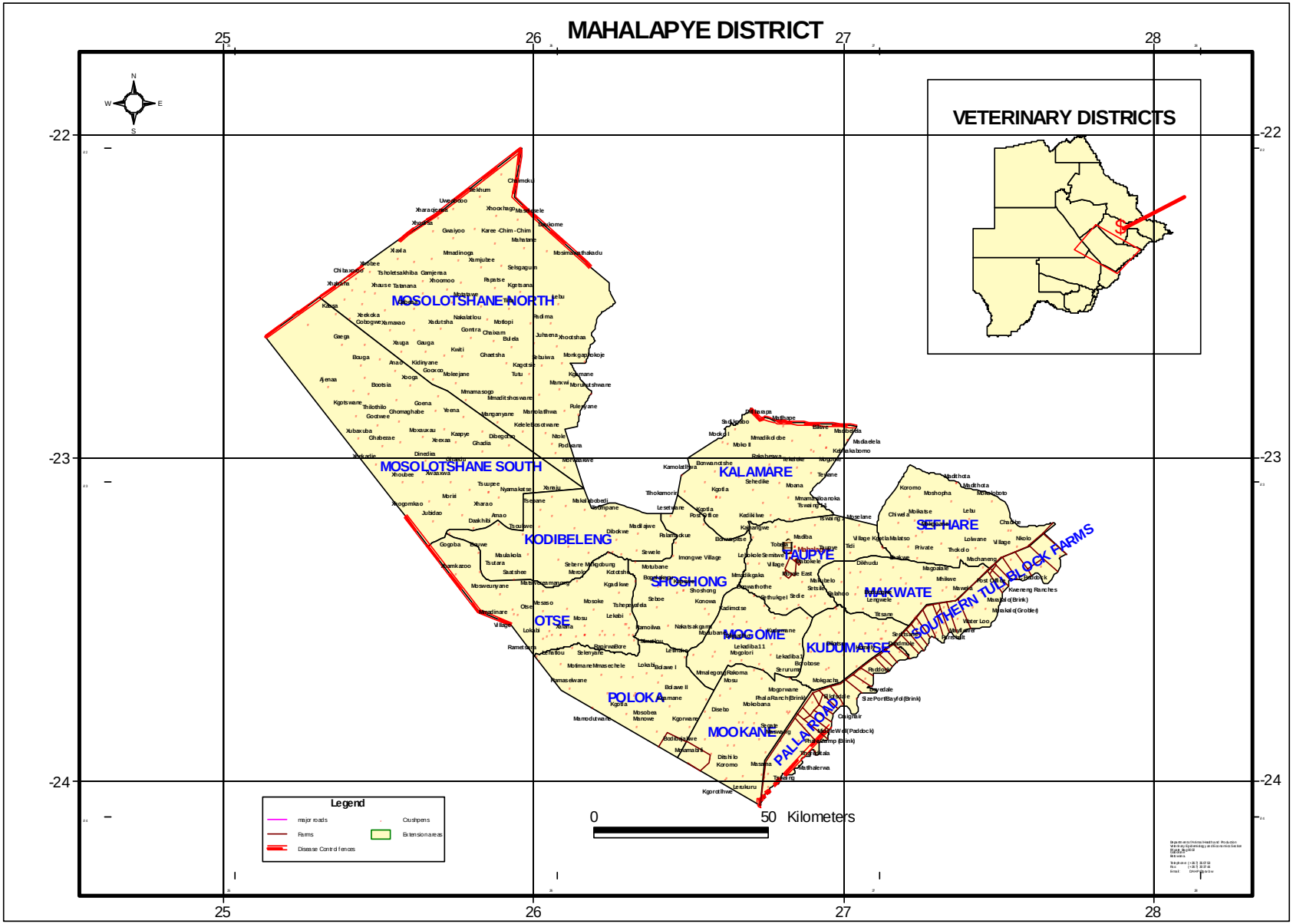

Figure 1.2: Mahalapye Veterinary District

1.7 METHODOLOGY

This section describes the survey methodology tool used in primary data collection in order to answer the key study questions.

1.7.1 SAMPLING PROCEDURE

A sample of 100 respondents was randomly selected from a list of cattle farmers provided by veterinary extension office. Respondents were selected using simple random sampling, with 89 respondents selected from the traditional farms and 11 from the commercial ranches. To avoid bias, sampling was done from both production systems.

When selected respondents were not present at the time of interview, farmers in the neighbourhood were selected to replace them. Interviews were done mostly at farmers' homesteads and marketing points. Most of the respondents were household heads. In the absence of household heads, the wife or any elderly member of the household was interviewed.

1.7.2 DATA COLLECTION

1.7.2.1 THE QUESTIONNAIRE

A structured questionnaire was designed to capture and identify factors (such as household structure, age of the respondent, gender, education level of the respondent, farming experience, proximity to markets) that influence farmers' selling patterns. The questionnaire consisted of both open-ended and close-ended questions to capture the respondent's own opinion or understanding of issues raised. The questionnaire also had questions that provided an opportunity to qualify one's ranking. Face-to-face interviews were conducted to generate these data.

A personally administered questionnaire was used for the following reasons:

- The presence of the interviewer increases the response rate. The interviewer can probe for more specific answers in the event the questions were misunderstood or misinterpreted and explain the purpose of the study. The reliability of responses is increased through the completion of responses by explaining and checking.

- To accommodate interviewees who can neither read nor write.

- The interviewer can observe non-verbal behaviour (attitude towards the transaction cost problem) of the respondent and assess the validity of the respondent's answers.

- The interviewer has control over the questioning and can ensure that the respondent does not answer out of context.

- Information obtained from one respondent is comparable with that of another.

- The interviewer can standardise the interview environment by making certain that the interview is conducted in privacy and making an assurance to the respondent that information provided will be treated with confidentiality.

- The interviewer can ensure that all questions are answered.

Primary data from the survey was complemented by secondary data solicited from relevant departments and other personnel. Literature was also explored for secondary data.

1.7.3 OTHER SURVEY METHODS

Other methods employed in gathering data were observations and informal discussions with farmers, marketing agents, transporters, buyers, extension officers and experts in the field of livestock marketing.

1.7.4 DATA ANALYSIS

The analysis seeks to identify transaction costs factors and farmer characteristics that affect the households' decisions to participate in a given marketing channel. Not all households use the same marketing channels. Some households may favour one channel while others may be excluded from using the same channel by market conditions that feature in high transaction costs.

The probit model is estimated to identify significant *ex ante* fixed transaction costs factors affecting the decision to participate in marketing channels. This model attempts to answer the question "what factors influence the probability of households selling cattle through given channels"? Those who participate assume a value of one and those who do not participate assume a value of zero.

The study will also identify significant *ex post* transaction costs factors that influence the level of cattle sales to the Botswana Meat Commission. If all households were participating in one market, ideally ordinary least squares (OLS) would be appropriate, but if OLS regression were estimated non-participants would be excluded from the analysis and sample selectivity bias introduced in the model.

To overcome this problem a Tobit model will be used. The tobit model is a tool that is hybrid the probit and the ordinary least squares. It is an appropriate

analytical approach for estimating data that is censored at both upper and lower limits (i.e. maximum likelihood regression). Tobit model takes into account sample selectivity bias.

1.8 OUTLINE OF THE STUDY

The study is organised into 5 chapters. The second chapter contains literature review of transaction costs in agricultural markets. The third chapter gives an overview of cattle marketing in the study area. The descriptive characteristics of households are presented in this chapter. Chapter four presents the results of the models used in the data analysis. This chapter synthesises the study findings in light of the established objectives. Finally, chapter five summarises the study findings and makes recommendations aimed at resolving the current problems.

CHAPTER TWO

TRANSACTION COSTS FACING FARMER HOUSEHOLDS:

A LITERATURE REVIEW

2.1 INTRODUCTION

Agricultural production and marketing is an expensive venture to undertake because farmers operate in an environment in which they face a number of transaction costs. Transaction costs are attributable to endogenous factors related to household characteristics and other factors that are exogenous to the households. In African economies that are only partly commercialised, smallholder farmers face higher transaction costs than large-scale producers, with the former having greater difficulty than the latter in adopting and profiting from new opportunities (Makhura, 2001). This has led to complaints by governments that farmers do not respond to government incentives and opportunities to adopt new technologies (de Janvry *et al,* 1991). This non-responsiveness, which is more prevalent with rural households, is explained partly by transaction costs. Lack of access to assets, credit and information, which feature in high transaction costs limit production and market growths in smallholder farmers.

This chapter reviews how transaction costs influence the economic behaviour of households on agricultural production, marketing and related services. A number of studies from various countries are reviewed.

2.2 DEFINING TRANSACTION COSTS

Different definitions of transaction costs (or market user costs) appear in the literature. Arrow (1969, cited in Benham *et al*, 1998) defines transaction costs as "the costs of running the economic system". Barzel (1997, cited in Benham *et al*, 1998) defines transaction costs as "the costs associated with the transfer, capture and protection of rights". Barzel concurs with Eggertson (1990) who observes that transaction costs are the costs that arise when individuals exchange ownership rights to economic assets and enforce their exclusive rights.

According to Coase (1960) transaction costs are the full costs of carrying out exchange and include marketing costs. These costs are associated with exchanging, including informational costs of finding out price and quality, service record, availability, durability record, etc, of a product, plus the cost of contracting and enforcing that contract (Besley, 1994).

Jaffee (1991, cited in Makhura, 2001) in his definition separates transaction costs into the following categories:

- **Search costs**. These are costs associated with identifying and contracting potential buyers and sellers, and quality of resources in which they have property rights. Search costs such as information costs, communication costs, arise *ex ante* of an exchange.

- **Bargaining costs**. These are the costs of gathering information on prices in other transactions and on factors that might influence the willingness to bargain by either party.

- **Monitoring costs**. These costs include the costs associated with monitoring the contract agreement to see that its conditions are fulfilled. Monitoring costs occur *ex post* a transaction.

- **Enforcement costs**. These are the costs of enforcing the exchange agreement. Enforcement costs occur *ex post* a transaction. These costs include the costs associated with default provisions in contracts, i.e. the collection of damages when partners fail to observe their contractual obligations.

Jaffee's classification of transaction costs is conceptually similar to that of Hobbs (1997), who classified transaction costs into information, negotiation and monitoring or enforcement costs. Dahlman, cited in Griffin (1991) also separates transaction costs into (a) search and information costs, (b) bargains and decision costs, and (c) policing and enforcement costs and then states that all of these costs "represent resource losses due to lack of information".

A list of relevant transaction costs affecting the exchange of agricultural and livestock products is non-exhaustive. Jaffee and Morton (1995) add two categories of transaction costs of marketing agricultural products. These are:

- **Transfer costs**: Jaffee's "transfer costs" category refers to costs of marketing services performed in physically handling the commodity, such as transport, storage, retailing and wholesaling. Examples of transfer costs are transportation costs, costs associated with risk attitude of farmers, and administrative costs.

- **Screening costs**: These are costs that are associated with gathering information about the reliability or trustworthiness of a particular party and the quality of goods being transacted.

It can be summed up that transaction costs include, *inter alia*, the costs of searching for a suitable partner with whom to exchange, screening trading partners to ascertain their trustworthiness, bargaining with trading partners to reach an agreement, transferring the product (this typically involves

transportation, processing, packaging and securing title, if necessary), monitoring the agreement to see that its conditions are fulfilled, and enforcing (or seeking damages for any violation of) the exchange agreement (Staal *et al,* 1996). Both fixed and proportional transaction costs play a significant role in explaining household behaviour.

2.2.1 FORMS OF TRANSACTION COSTS

Several forms of transaction costs are prevalent. Transaction costs can be classified into observable (explicit) and unobservable (implicit) or inhibitive transaction costs. The observable transaction costs, which include marketing costs such as transport, handling, packaging, and storage affect the magnitude of trade. The unobservable transaction costs, which include costs of information, search, bargaining, screening partners or customers, monitoring, coordination, and enforcement are inhibitive.

The other delineation of transaction costs is *ex ante* fixed and proportional transaction costs. *Ex ante* fixed transaction costs are the same regardless of the magnitude or level of transactions made. An example of *ex ante* fixed cost is information cost on finding market, which would remain the same regardless of the amount of produce a farmer sells after the market information has been obtained.

On the other hand proportional or *ex post* variable transaction costs vary with the level of, or the amount involved in, the transaction. In general, transaction costs rise with an increase in volume of trade.

2.3 SOURCES OF TRANSACTION COSTS

Transaction costs result from the complexities of transactions. Transaction costs in production, marketing and processing typically arise because market prices do not fully reflect the true costs and returns to all market actors, who have an equal initial endowments and for whom market solutions may not be

available to all. Some transaction costs are related to physical details of the transaction, such as transport, packaging or handling. Others result from information asymmetries and contract enforcement problems, which cause economic agents to incur expenditures associated with search, recruitment, coordination, supervision, management and litigation (Makhura, 2001). In many instances low market participation or market failures are a result of inhibitive transaction costs. Besley (1994), for instance, elaborated that transaction costs are used to explain why credit markets might be missing.

2.3.1 INFORMATION ASYMMETRIES

Asymmetric information refers to a situation where prices do not fully reflect quality because buyers and sellers do not have the same information. Before making a decision about how to market a product and to whom to sell it, producers must determine the price that they expect to receive. Eggertson (1990) argues that transaction costs arise when market information is asymmetric as this induces activities such as information searches, bargaining, market contracts, monitoring, enforcement and protection of property rights, which are, by nature costly.

These informational bottlenecks may be aggravated by an inadequate or poor rural road network, which hinders the flow of information. Households living in places where roads are impassable may not have easier access to up-to-date information about the markets and market prices.

2.3.2 CONTRACT MONITORING AND ENFORCEMENT

Transaction costs also result from contract monitoring and enforcement problems, such as the collection of damages when partners fail to observe their contractual obligations. Monitoring and enforcement costs occur ex post to a transaction and are the costs of ensuring that the terms of transactions, e.g. quality standards or payment arrangements are adhered to by other parties to the transaction (Hobbs, 1997).

2.3.3 NEGOTIATION

Exchange of property rights through negotiating has costs involved. These costs consist of the opportunity costs of the producer's (or seller's) time in negotiations. Physically carrying out the transaction may include the costs of negotiating the terms of drawing up contracts.

2.3.4 BARGAINING COSTS

The difficulties a farmer faces in finding reliable markets for products is one source of transaction costs, due to his low bargaining power. According to Makhura (2001) bargaining is needed to find the true position of contracting parties, especially when prices (including wages, interest rates) are not determined exogenously.

2.3.5 TRANSPORT AND COMMUNICATION COSTS

Transport and transportation costs feature as the most prominent source of transaction costs. These costs increase with distance from markets as well as unavailability of transport. Factors such as poor roads (or inadequate road network) make it costly for producers to take their products to the market or to sources of information. When the condition of the roads is poor, transporters increase fees to compensate for damages to their vehicles emanating from the use of such roads, hence reducing the price that traders are prepared to pay farmers.

Poor communication infrastructure (such as telephone services, inadequate computer network services and inefficient mail services) restricts access to information, making it difficult for farmers to compare prices being offered by traders. This raises transaction costs; in particular, search and monitoring costs by necessitating frequent physical visits to trading partners or government agencies.

2.3.6 PROPERTY RIGHTS

The enforcement and exchange of property rights typically involve costs. Property rights can take the form of property rules, liability rules or inalienate entitlements (Griffin, 1991). According to Delgado (1998) transaction costs facing households in Africa stem in large part from structural aspects of the economic and political environment facing African producers, and the absence of property rights and enforcement makes any form of contracting risky (moral hazard) and generally discourages commercial activities. Kahkönen and Leathers (1999) concluded from their study that sources of transaction costs associated with property rights on maize and cotton marketing in Zambia and Tanzania were largely due to institutional impediments in government bureaucracy and inappropriate legal environment.

2.3.7 NATURE OF THE PRODUCT

Transaction costs vary by product. The nature of the product determines the transaction costs of the product and its derivatives. Smallholders in Africa often face high transaction costs in production and marketing of agricultural products because of the nature of their products and the institutional environment in which they have to operate (Matungul *et al*, 2001). High value-for-weight and high value-added tradable commodities, whose potential profitability has been enhanced by structural adjustment, typically are among those items with the highest associated transaction costs, e.g. fish, vegetables, and meat (Jaffe *et al*, 1995). These highly perishable commodities limit marketing options for small and remote producers and imply greater losses due to spoilage than non-perishable commodities such as grain.

Other sources of transaction costs include uncertainty, complexity, opportunism, culture and asset fixity. Their effect on transaction costs, however, may not be as direct as, for example, observable transport costs would be or other socio-economic factors that influence the participation decision.

Opportunism manifests itself in moral hazard and adverse selection. Adverse selection arises when one party cannot ascertain the trustworthiness of the other party. For example, adverse selection may arise when moneylenders cannot ascertain the truthfulness of the borrower and hence the riskiness of the activity being financed. Moral hazards, in turn, allow borrowers to undertake riskier actions after funds have been disbursed. Once funds are disbursed borrowers tend to use the funds in riskier projects in which the funds were not initially intended.

When transactions are conducted under risk or uncertainty, it becomes very costly or impossible to anticipate all contingencies.
Barriers such as ethnicity increases a household's cost of observing market prices to make transaction decisions (Goetz, cited in Matungul *et al*, 2001).

As institutions grow and diversify their operations, complexities in management of contracts on both assets and liabilities increase, raising transaction costs.

2.4 EFFECTS OF TRANSACTION COSTS ON FARM HOUSEHOLDS

The existence and effects of transaction costs in agricultural production and marketing can be assessed through differences in marketing costs, marketing channels used, costs of inputs (including capital necessary for entry into marketing) and prices received for agricultural products. High transaction costs in either production or marketing of potentially remunerative commodities exclude poorer farmers from participating in growth opportunities. Their non-participatory behaviour implies that they are subjected to significantly different levels of transaction costs for producing and selling the same output mix (de Janvry *et al,* 1991). The real incentive they face is much lower than the nominal price in the market.

2.4.1 TRANSACTION COSTS AND INFORMATION

Due to high transaction costs, small and large farm households may not have access to the same technology, information, asset base, input supplies and profitable market outlets as households with lower transaction costs. Williamson (1979), following on Coase's research, elaborated the reasons for transactions being costly, noting that informational asymmetry was inherent in transactions. Leonard (2000) also adds that smallholder farmers who do not have full information as a result of transaction costs are unable to contract and enforce terms of exchange.

Transaction costs and information asymmetries may also inhibit liquidity and intensify liquidity risk as well as keep capital from flowing to its highest value use.

2.4.2 TRANSACTION COSTS AND MARKET PRICES

The presence of transaction costs is often reflected by the difference or discrepancy between perceived buying and selling prices (de Janvry, 1991,). Makhura (2001) adds that when these discrepancies occur, sellers experience low selling prices and consequently feel discouraged to sell, while buyers experiencing a high buying price become discouraged to buy. Generally, sales of a household facing higher transaction costs will be less than sales of a household facing lower transaction costs. Similarly a household tends to purchase less when faced with high transaction costs. This generates discontinuous behaviour in which the household is a net seller at a certain market price band and a net buyer at another price band. That is when transaction costs create a disutility greater than the utility gain farmers become discourage to participate in the market.

The every existence of transaction costs, *ceteris paribus*, also leads to a lower number of observable transactions than would have been the case if there had not been any transaction costs. The costs in exchange do not

benefit either of the parties to the transaction. High transaction costs simply make it difficult and less attractive to transact.

2.4.3 TRANSACTION COSTS AND TRANSPORTATION

Transportation costs, and related issues of time required to transport products to marketing centres imply that the ability of smallholders to access market outlets is limited. The greater the distance from market or service centres the larger the transaction costs which become prohibitive mostly to smallholders than large-scale producers /sellers. As Woods (2000) observed, transaction costs limited the availability of veterinary services for subsistence farmers in Uganda and Zimbabwe. Livestock owners must often travel a large distance to request the assistance of a veterinary technician for their sick animals. It is difficult for a smallholder to transport a large animal to a veterinary practitioner, so the practitioner has to travel to where the animal is. This imposes a double cost on the farmer as he/ she has to pay in time and money, i.e. time to get to the practitioner to report the case and the cost of the vet's trip out to the farm. The mobility costs involved in visiting the technician are often so prohibitive that the poor farmers are excluded from visiting the technician. In contrast the large-scale farmers would avoid multiple journeys by transporting his animal to the practitioner.

2.4.4 TRANSACTION COSTS AND MARKETING CHANNELS

Transaction costs have an effect on the choice of livestock marketing channels as shown by Hobbs (1997). Hobbs showed that some transaction cost variables (such as grade uncertainty, risk of not selling, time spent at the auction) were significant factors affecting the choice of either live-ring auction or direct-to-packer sales of cattle in Scotland. Farmers choose channels that are less costly. The basis is that transaction costs affect price, which in turn affects traded output and channel used.

In a similar study by Mathye *et al,* (2000) on smallholder farmers producing bananas and mangoes in some areas of the Northern Province of South Africa

(now Limpopo Province), it was found that not all farmers sell their products. Those who sell tend to use different channels such as fresh produce markets and direct sales to consumers depending on the magnitude of the transaction costs imposed on the sellers. The study also concluded that problems of transport, searching for markets and education tend to influence participation.

2.4.5 TRANSACTION COSTS AND FINANCIAL INSTITUTIONS

Transaction costs in agriculture may constrain supplies and demand for financial services in the rural areas. The costs of screening and monitoring borrowers may simply be too high for agricultural lending to be profitable, especially when there are numerous and heterogeneous small borrowers scattered across the country. Fenwick and Lyne (1998) suggested that high transaction costs faced by rural households in South Africa limit their access to formal credit markets. Lenders feel threatened by their less comprehensive knowledge of the riskiness of the borrowers' activities and by the ability of the latter to modify the level of risk (probability of default) in opportunistic attempts to profit that may hurt the lender (moral hazard). Under some restrictive assumptions, adverse selection and moral hazard could also prevent interest rates from equilibrating the supply and demand for credit.

2.4.6 TRANSACTION COSTS AND PROPERTY RIGHTS

If transaction costs are high relative to the benefits of secure and exclusive ownership, property rights and the related markets will fail to emerge. But well-defined property rights do not, however, bring markets into existence if the co-ordination and marketing costs necessary for the commodities to be traded voluntarily are very high. Even if the markets appear they tend to be thin and inactive.

The principal question is whether there is a way of reducing or eliminating transaction costs so that smallholder farmers can enter competitive markets on an equal footing with the other players?'' The following section briefly answers that question.

2.4.7 TRANSACTION COSTS AND HOUSEHOLD CHARACTERISTICS

Personal characteristics, such as age, level of education and gender, impact directly on transaction costs. Less educated farmers tend to face higher transaction costs than educated farmers because the former cannot assimilate information at lower costs. The level of education provides a proxy for information costs. Basic communication comes mostly in English and therefore requires an understanding of English in order to interpret information. Education reduces transaction costs by improving access to information that is disseminated through newspapers and bulletins.

The age of the head of the household (in years) normally provides a proxy for experience in farming. The age is considered a crucial factor since it determines whether the household benefits from the experience of an older person, or has to base its decisions on the risk-taking attitude of a younger farmer. Older and more experienced household heads tend to have more personal contacts (or stronger social capital and networks), allowing the discovery of trading opportunities at low costs. Age may also reflect increased trust and reputation (credibility within the networks) gained through repeated exchange with the same party (Goetz, cited by Matungul, *et al,* 2001). Older household heads are therefore expected to face lower transaction costs.

The gender of the head of the household also has impact on transaction costs. Male farmers are involved in agricultural activities than female farmers to the extent that when female farmers want to engage in agricultural activities they face higher transaction costs than men. Female farmers are known to face constraints such as weak land rights, limited access to common property resources, lack of equipment, limited contact with agricultural extension officers and lower levels of education (Matungul *et al,* 2001). Some authors argue that women face greater legal uncertainty than men in customary courts, and in the national courts when married under customary or common law, especially if separated from their husbands through migration, abandonment, divorce or death. Women therefore face higher *ex post* variable transaction costs than do men.

2.5 REDUCING HIGH TRANSACTION COSTS

There is no uniform strategy to reduce transaction costs. The strategy to reduce transaction costs depends on the transaction to which the costs are related. Reducing transaction costs entails reversing or correcting the sources of transaction costs by promoting or increasing access to assets, information, services and markets necessary to grow or increase producers' income and welfare.

One of the principal tools for reducing transaction costs is the construction of efficient farmer supporting institutions. Institutions are broadly defined here as a means of reducing information and transaction costs relative to the exchange of goods and services. Without these institutions, markets cannot perform either efficiently or equitably. The notation that the costs of arranging exchange may reduce or even prevent exchanges from occurring, and may give rise to institutions and organisations to offset their negative impacts is widely accepted (Jaffee *et al,* 1995).

North (2000) argues that institutions are formed precisely to reduce uncertainty in human exchange of goods and services. In the absence of formal institutions that regulate transactions, the farmer has to face costs to obtain information about different agents, to contract, monitor and enforce agreements. Access to perfect information allows producers to reduce adverse selection and moral hazards costs because producers are better informed for the screening and monitoring of potential partners. Access to information, both technical and market, may be improved by providing incentives for rich farmers to share their knowledge with the less well-off, (Delgado, 1998).

Institutions are also crucial in specifying property and enforcing contracts both of which promote specialisation and reduce the costs of market exchange.

It is, however, argued that it is not enough to create formal institutions, which lower transaction costs without an enabling political environment to sustain

the appropriate formal institutions. A country's legal system and political institutions certainly drive both financial and economic developments.

Other mechanisms through which transaction costs and risk can be reduced are provision of physical infrastructure, promoting access to credits by the government. It is argued that access to credit has comparative advantage in significantly reducing transaction costs in rural financial markets and improves income levels.

Investments in public goods such as roads, telecommunications and an efficient legal system (to uphold commercial contracts), as well as farmer support services (input supply, extension, marketing information and research), would probably raise farm and non-farm income by reducing transaction costs (Matungul *et al*, 2001).

The government should also intervene through protectionist policies that enhance the reduction of transaction costs for purchased. Government policies, education, knowledge and access to capital are important factors in market participation by small-scale farmers. Incentives should be created allow information or management-rich individuals to share their expertise with small-scale and poor farmers. Policies that reduce transaction costs in input and output markets may improve the welfare of all producers.

2.6 SUMMARY

The foregoing chapter provides a literature review of the role of transaction costs in the production and marketing of the agricultural products, as well as the choice of marketing channels. Transaction costs are barriers to the efficient participation of farmers in different markets. Producers will not use a particular marketing channel when the value of using that channel is outweighed by the cost of using it or when the disutility is greater than the utility of using it.

Transaction costs, (both observable and unobservable), emanate from different sources such as contract monitoring and enforcement problems, negotiations, information search, screening partners, handling commodities, supervision and incentive costs

Transaction costs vary with commodities and different farm households are subjected to significantly different levels of transaction costs for producing and selling the same products. The existence of transaction costs not only prevents farmers from producing sufficient products for commercial purposes due to lack of access to information, assets, etc but also reduces the volume of trade. That is the magnitude and impacts of transaction costs can be inferred through product marketing behaviour of various sizes in differing locations

High transaction costs associated with a marketing channel discourage farmers from using that particular marketing channel. Farmers use an alternative market instead. Remote location of farms, coupled with poor road infrastructure result in high transaction costs (especially transport costs), reducing the price that traders are prepared to pay farmers.

The effect of transaction costs on producers can be minimised or overcome by the reversal or correction of sources of transaction costs by promoting access to assets, information, services and markets necessary to grow producers' income and welfare.

The principal tool for reducing transaction costs is institutional innovations, which are a means of reducing costs relative to the exchange of goods and services. The institutional innovation can be external assistance in the form of capital, information and skills.

2.7 CONCLUSION

Transaction costs are real and unavoidable aspects of the economic system. The presence of high transaction costs does not imply that it is impossible to carry out exchanges. It implies that trading partners do not get the most out of their trade, as transaction costs tend to reduce the net benefits of exchange. That is, high transaction costs mean that it is not worthwhile for many rural households to participate in critical markets (especially credit) even if these markets do exist. When that happens, smallholder farmers will stop participating in the market, and subsequently persist with subsistence agriculture. This lowers the number of observable transactions than would have been the case if there had not been any transaction costs.

It is not possible to eliminate transaction costs. However, mechanisms can be put in place to reduce transaction costs and their effects.

CHAPTER THREE

AN OVERVIEW OF CATTLE MARKETING IN MAHALAPYE DISTRICT, BOTSWANA

3.1 INTRODUCTION

This chapter provides an overview of the cattle marketing channels in Mahalapye. The chapter starts by discussing the reasons for keeping cattle. This discussion is followed by an overview of the characteristics of the sampled households to assess the variables to be used for model specification in the subsequent chapters.

3.2 DATA SOURCE AND CHARACTERISTICS OF RESPONDENTS

Data were collected from 100 households, which were stratified into traditional and commercial farmers. Traditional and commercial sectors each represented a stratum in the sampling design because they differ with respect to livestock management. Households were listed and a simple random sample of 89 households and 11 households were drawn from the traditional and commercial strata respectively.

Data collection was carried out from July 2000 to January 2000. Due to time limitations and financial constraints the study made use of questionnaires as tools through which information could be elicited from farmers. The questionnaires were used for personal interviews. The questions were directed to the head of the household. The questions covered information on marketing activities and household characteristics. Household heads attributes such as education, farming experience, age and number of cattle owned were recorded.

Personal interviews were supplemented with informal conversational interviews with members of the Department of Animal Health and Production and friends.

3.3 REASONS FOR KEEPING CATTLE

There is a wide range of reasons for which households keep cattle. The reasons vary across households, and reflect the individual household's needs either directly (e.g. provision of meat and milk) or indirectly (e.g. income).

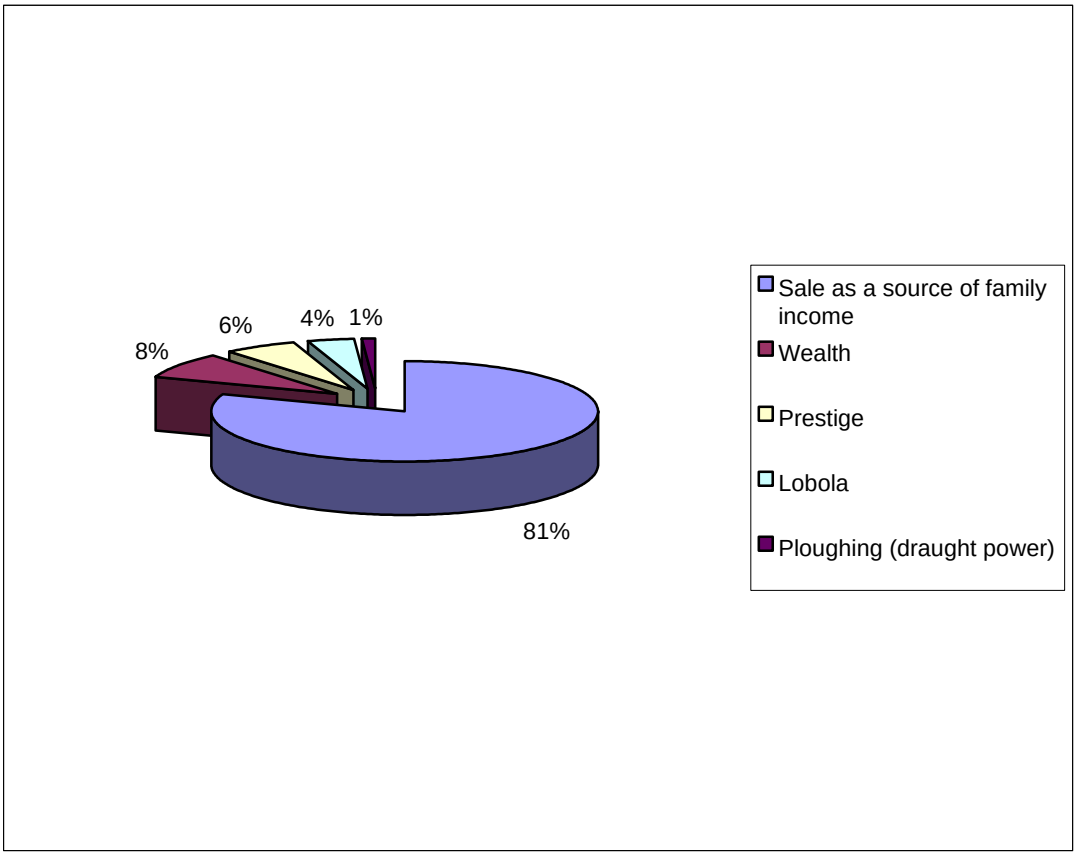

Figure 3.1: Reasons for keeping cattle

As indicated in figure 3.1 the principal contribution of cattle to rural households is the provision of family income (81%) and wealth (8%). The terms 'income' and 'wealth' are used with caution, as cattle are a store of wealth that can be readily liquidated into purchasing power at agreed prices to cope with adverse income shocks. Most rural households have few assets apart from livestock, particularly cattle. According to Mazonde (1994)

Batswana in the rural areas continue to use cattle as a source of income and wealth. Cattle also represent an essential part for household crop production by providing draught power for cultivating fields (1%).

The reasons for keeping cattle, however, cannot be ascribed to a single motive but rather a multiple of reasons, such as prestige (6%), lobola (4%), which cannot be easily quantified. If an individual keeps livestock for several reasons, livestock can be regarded as a means towards the realisation of several needs, and keeping of livestock can consequently be considered to be more attractive than if it had only one purpose (Düvel, 1994).

Although keeping cattle for lobola (cultural needs) and draught power (seasonal need) are sporadic rather than continuous they are certainly important to a number of respondents. As suggested by Williamson *et al,* (1978) work animals provide the cheapest and most dependable form of power in rural areas of Africa. However, only one respondent uses cattle for ploughing purposes because he cannot afford to hire tractors. Others are of the opinion that using animals for draught power erodes profit because animals lose weight during ploughing seasons, and if they are sold immediately after the ploughing season they would fetch lower prices.

Some studies show that reasons for keeping cattle vary across ethnic groups, countries and ecological conditions. In Kenya, for example, cattle are kept for a number of social, ritual and economic functions (Balyamujara, 1995). A study in Zimbabwe by Sanford (1992, cited in Balyamujara, 1995) found that draught power, manure and transport were the most important reasons, followed by provision of milk, meat and other products for home consumption. In the former homeland of Lebowa, South Africa, keeping cattle as a source of cash is regarded as the second important reason. Ramaboea (cited by Düvel, 1994) gives the priority list in Lebowa as:

1. Slaughter for ceremonies, funerals

2. Sales for cash

3. Milk, draught, repayment of debts, lobola

3.4 OTHER USES OF CATTLE

Cattle also contribute to household welfare in many ways, one of which is the direct provision of meat (for special occasions). Over half (52.4%) of the respondents indicated that they slaughtered cattle for various reasons (Figure 3.2), while 47.6% did not slaughter.

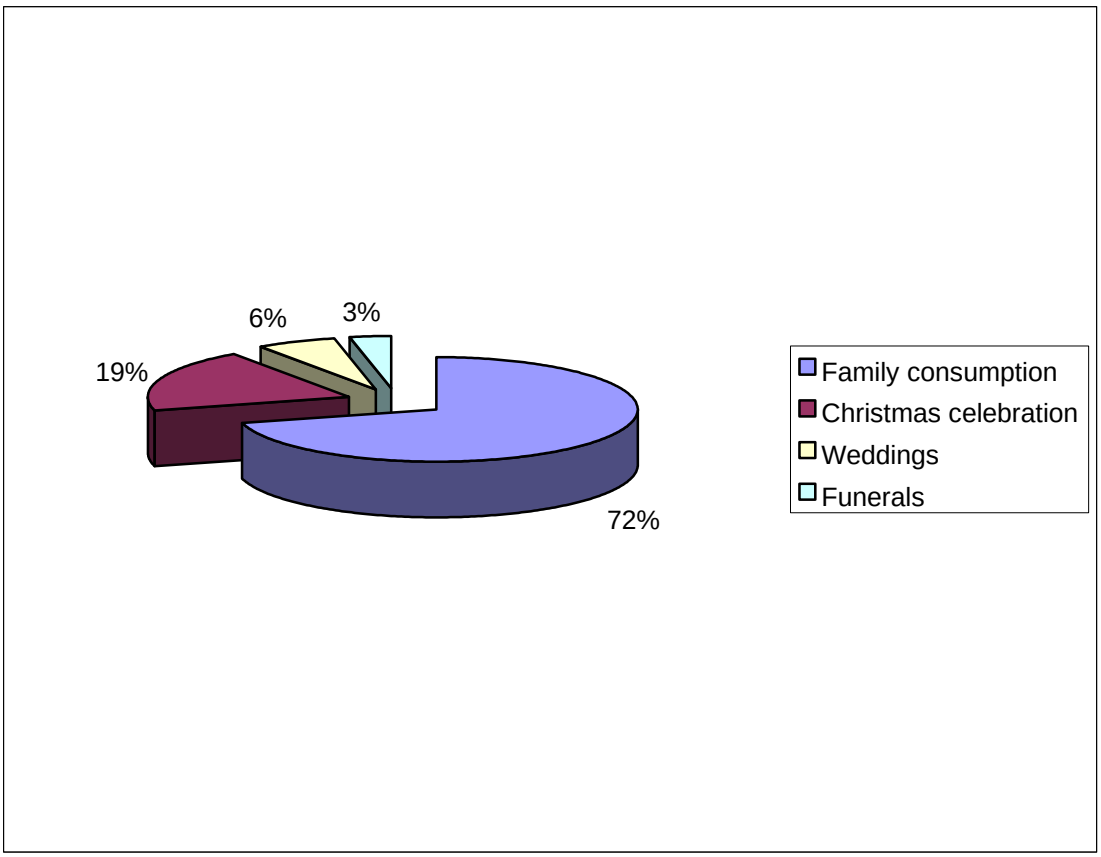

Figure 3.2: Reasons for slaughtering cattle at households

An overwhelming majority (72%) of the households typically slaughter cattle annually for family consumption and contribute some for traditional occasions such as funerals and weddings. It is interesting to note that typically poor households do not slaughter cattle for own consumption unless the animal has, for example, a fracture or is too old to reproduce. They, however, may contribute cattle for traditional occasions.

3.5 HOUSEHOLD CHARACTERISTICS

This section discusses a general profile of some household characteristics. The profiles are based on data collected from the respondents.

3.5.1 SEX AND AGE

Results from this survey show that both men and women keep cattle with the highest percentage (92%) of the respondents being male. Females account for eight per cent (8%). Ninety-eight (98%) of these males are household heads, who are responsible for the co-ordination of the household activities. Of all the female respondents, only two were functional (*de facto)* household heads because male heads had migrated elsewhere to seek employment.

The age of the head of the household is considered a crucial factor since it determines whether the household benefits from the experience of an older person or has to base its decisions on the risk-taking attitudes of younger farmers (Makhura, 2001). The sample households exhibited variations in their ages, ranging from 34 to 71 years (Table 3.1).

Table 3.1: Age distribution of respondents

Age	Number of respondents
1-40	8
41-50	29
51-60	43
> 60	21
Total	**100**

Most of the farmers (43%) are between 51 years and 60 years, followed by those between 41 and 50 years (29%). Only 21% of the respondents are over 60 years of age, while a small proportion (8%) is 40 years or younger. Table 3.1 shows that the majority (64%) of the household heads are typically heads 50 years of age.

3.5.2 LEVEL OF EDUCATION

The level of education of the heads of households who are usually decision makers is equally crucial. As discussed under section 2.4.7 education affords households to do basic communication and be able to understand and interpret market information. The ability to read and interpret market information reduces the cost of search for information. Education also increases the ability of farmers to use their resources efficiently and the allocative effect of education enhances farmers' ability to obtain, analyse and interpret information. For example, Hossain and Croach, 1992, cited in Alene, *et al,* (2000) concluded that farmers with higher level of education in Bangladesh have higher probability of adopting improved farming practices that those with lower level of education.

Overall, the majority of respondents in this study had elementary education with 46% having completed primary education, 15% completed secondary education, 13% have university education and 8% have postgraduate training. Only 18% had no formal education (respondents older than 60 years). This means that 18% of the sample was functionally illiterate.

The problem of household heads having never attended school is likely to diminish quite significantly over the years. Many of the existing household heads are elderly and today's youth will have had considerably more basic education by the time they become household heads.

3.5.3 LIVESTOCK OWNERSHIP

Although livestock is an important asset for rural households about 45% of all households in Botswana do not own cattle (Mazonde, 1994). Farmers interviewed owned cattle ranging from 5 to 850, with a mean herd size of 110. Livestock ownership is skewly distributed with 41% of the holdings owning less than 50 cattle while at the other extreme, two per cent (2%) of the holdings have more than 500 cattle (Table 3.2). The rest of the farmers fall

within this continuum. It is the commercial farmers who keep more than 500 cattle.

Table 3.2: Cattle distribution among respondents

Herd size	Number of respondents
1-50	41
51-100	15
101-150	10
151-200	9
201-250	7
251-300	5
301-350	3
351-400	3
401-450	3
451-500	2
> 500	2
Total	**100**

3.5.3.1 CATTLE BREEDS

The sample households keep three different cattle breeds. Eleven per cent (11%) of the households keep indigenous local Tswana breeds, six per cent (6%) keep exotic, and 83% keep exotic-mixed breeds. The advantages of both exotic and exotic-mixed are that a rapid improvement in productivity is achievable. These breeds possess desirable traits (such as productivity traits) unavailable in indigenous local populations. The breeds, however, have the disadvantages of poor adaptability, or are non-resistant to drought because they cannot walk long distances in search of grazing. They also require much better management than local breeds.

The advantages of indigenous breeds are that they are readily available and are acclimatised to the local environment. They are hardy and can survive on poor grazing, and long walks to water and in search of grazing. Their disadvantages, however, are that they mature slowly; hence improvement in productivity is slowed.

Despite the finding that all respondents had cattle, some continued to buy cattle to:

- Improve their existing breeds (50.9% of respondents)
- Increase herd sizes (32.7%)

- Resell to supplement income (16.4%) i.e. farmers buy cattle, keep them for a few months and sell them.

3.6 CATTLE MARKETING CHANNELS

This section discusses the various cattle marketing channels, the frequency of use and problems associated with each channel. Farmers use several marketing channels. These include direct selling to Botswana Meat Commission (BMC), direct selling to local butcheries, auctioneers, and private sales (i.e. private buyers and the public). The use of auctioneering has, however, diminished in Botswana although there are still a few centres where producers can sell cattle. The volume of cattle sold through each channel varies. Table 3.3 summarises the volume of sales through the various marketing channels during 2000.

Table 3.3: Volume of sales through different channels

Marketing channel	Number of cattle sold	Number of respondents using each channel	Percentage all sales by respondents	Off-take %
Botswana Meat Commission (BMC)	878	67	66.5	0.05
Butchers	396	32	30	0.02
Private sales	46	1	3.5	0.002
Total	**1320**	**100**	**100**	**0.072**

It is surprising that only 1 320 cattle were sold (average of 13.2 cattle per household per year), given that the region is ideally suited for livestock production. The off-take equally remains low. As evidenced from Table 3.3 the

main channel used was the BMC through which 66.5% of the cattle were sold in 2000.

3.6.1 BOTSWANA MEAT COMMISSION

The Botswana Meat Commission (BMC) is a parastatal marketing organisation that was established in 1966 to facilitate procurement, slaughtering, processing and marketing of beef in Botswana. This organisation exports 93% to 95% of beef channelled through its abattoirs. The BMC concentrates basically on the export markets, and sales to the domestic market have remained low (less than 5% of total turnover) although domestic demand for beef is increasing in Botswana.

Although 67 respondents sold their cattle through this channel, over half of them (52%) were dissatisfied with the channel for the following reasons:

- The majority (79%) of the respondents cited low prices as the main reason for their dissatisfaction with BMC. Farmers perceive prices offered by BMC as not necessarily an indication of the market value of their cattle. To test this farmer perception the respondents were asked if BMC prices were a problem in terms of farmers being happy or not happy about BMC prices. On a scale ranging from 1 (no problem) to 4 (serious problem), the average ranking was 3.0 with 77.3% of the respondents stipulating that it was a serious problem that needed to be addressed, and 22.7% indicating that it was not. These prices are below the farmers' expectations. (This is basically farmers' perceptions and not proven facts). The BMC is basically a residual buyer and sets price levels within Botswana. Interestingly, some farmers use BMC prices as a benchmark or yardstick for setting reserve prices when selling their cattle to other channels. Local butcheries as well, base their buying prices on BMC prices plus a small premium, if necessary, to take account of the expected BMC end of year bonus.

When asked to rate BMC prices with those of other marketing channels, 32.8% of the sample respondents were of the opinion that BMC prices were always lower than that of butcheries. This basically agrees with Deloitte and Touche's (1996) view that prices to cattle producers in Botswana appear to be lower than in neighbouring countries, especially Namibia and South Africa, even when the BMC bonus is taken into account.

- About 45% of the respondents were dissatisfied with high transport costs to BMC. Farmers pay for the transport costs.

- The other reason for dissatisfaction with the BMC is that BMC stopped paying bonus to cattle sellers at the end of each year as it used to do in the past (62% of the respondents). In reality BMC pays bonus only when it made surpluses. Bonus payment acts as an incentive for cattle producers to sell their cattle to BMC.

- Only one respondent (1%) was dissatisfied with monopolistic behaviour of BMC saying that it suppresses producer prices. BMC is a statutory body wholly owned by Government of Botswana, which has the monopoly power on the exportation of beef, its bye-products, processed meat and live cattle.

- The delay in payments was another case in point. Producers normally receive payments 7 to 14 days after slaughter, particularly those selling through the cattle agents or co-operatives.

On the other hand some cattle producers expressed satisfaction with BMC. Those satisfied with BMC indicated the following reasons:

- Households (2% of those selling to BMC) perceived prices to be reasonably higher than those offered by alternative channels.

- BMC is reliable and vital when it comes to marketing large numbers of cattle, as there is no risk of nonsale. This was indicated by 15.6% of

the respondents who sold cattle to BMC. BMC is statutory bound to buy all cattle available for sale in the country from all producers in all parts of the country (Fidzani, *et al,* 1997

- Fifteen respondents (33.3%) indicated that they were happy because BMC pays bonus at the end of the year (provided it made surpluses). The Botswana Meat Commission Act requires that BMC should balance its books every year. If the Commission makes a surplus after paying tax and appropriations to various reserves, it pays the balance as a bonus to producers who will have sold cattle to BMC during that financial year. Producers' attitude to the bonus varies but many would prefer to ensure that prices are maximised at the time of sale.

- BMC cheques are always honoured (4.2%).

3.6.1.1 BMC GRADING AND PRICING STRUCTURE

Grading and producer prices are virtually inseparable because the prices paid to the producers depend, among other things, on grade, which in turn is a function of carcass quality. Producer prices are dependent on a number of factors. These are selling prices in various markets, exchange rates, carcass grade, carcass weight, and disease condition (Mannathoko, 1999,), some of which can be controlled by producers. For example, grade, weight and disease are determinedon the management practices followed at farm. Beef producer prices are also based on the world market prices and are therefore outside the farmers' and the BMC's control.

Another important feature of the BMC price structure that originates from the limited slaughter capacity (that existed from the mid 1980s) is the use of seasonal pricing. The slaughter capacity constraint meant that there were some farmers who could not market during the period (February to August) when their cattle were in their peak condition. Selling after this period meant losses to the farmers since their animals would have lost weight. To compensate them for the periods during which animals are not in peak

conditions (October to December) prices are increased to the levels above those for the peak condition periods (Fidzani, *et al*, 1997). This policy is not for slaughter capacity reasons, but for the inducement of farmers to sell during the dry season. Seasonal pricing system encourages farmers to market at a time they otherwise would not have to.

Grading is a basic function in practically all transactions. It is a basis of judging the quality of a product in relation to its sales price. Put the other way round, price offers the nexus through which qualities, quantities or other attributes of goods are measured when they are bought or sold. Table 3.4 provides the grading and pricing structure.

Table 3.4: BMC grade structure and price per grade (price schedule)

Grade	Cold Dress Mass	January –June price (Pula)	July-September price (Pula)	October-December price (Pula)
SS	≥ 220 kg	719	737	773
SS	190 < 220 kg	654	670	703
SS	< 190 kg	589	603	633
S1	≥ 220 kg	654	670	703
S1	190 < 220 kg	595	609	639
S1	< 190 kg	535	548	575
S2	All animals	515	528	554
S3	All animals	477	489	513
S4	All animals	411	422	442
Canning	All animals	247	253	266
Detained				
DS	All animals	458	470	493
D1	All animals	416	427	447
D2	All animals	360	369	387
D3	All animals	334	342	359
D4	All animals	288	295	309
Canning	All animals	173	177	185
Condemned	All animals	150	150	150

Source: BMC price release.

N.B. These prices are in Pula per 100 kg.

BMC has 13 grading categories (Table 3.4), according to carcass quality. The categories are:

1. Super Super Grade (SS), which is divided into 3 sub-grades depending on the Cold Dress Mass (CDM).
2. Super Grade 1, which is also subdivided into 3 sub-grades
3. Super Grade 2, 3, and 4
4. Canning

Other categories are detained carcasses (DS, D1, to D4), canning, and condemned carcasses. The nomenclature for detained carcasses depends on the measles count. The more measles found the longer the detention period and the less price paid. More than 10% of carcasses are detained because of measles, and the price to producers is automatically reduced by 30% (Deloitte and Touche, 1996).

Producers state that the more rigorous approach by BMC to carcass assessment compared with the private sector represent an income loss. To test the farmer perception of grading by BMC, respondents were asked if BMC grades were a problem. This aspect scored a rating of 3.3 in which 76.3% of the respondents viewed the aspect as a serious problem. These farmers are of the opinion that BMC uses a grading structure that subjects them to be cheated (by under grading the carcasses), more so that the seller is unable to observe the grading process. While being present at the plant when cattle are graded may reduce information asymmetry, the opportunity cost of doing this in terms of a farmer's time may be high. However, it may do BMC well to enter into a process with farmers where agreement is reached in terms of grading. This is a once-off cost and can be written-off against increased sales due to increased farmer participation.

3.6.1.2 SOURCES OF BMC PRICES

A farmer choosing to sell his cattle to BMC is assumed to make that decision on the basis of information about the prices offered by BMC. This information is disseminated on a regular basis by BMC.

The results from this survey show that 44 respondents (44%) knew about prices offered by Botswana Meat Commission before selling to BMC, while the remaining 56 respondents (56%) did not. Sources of information are shown in Figure 3.3.

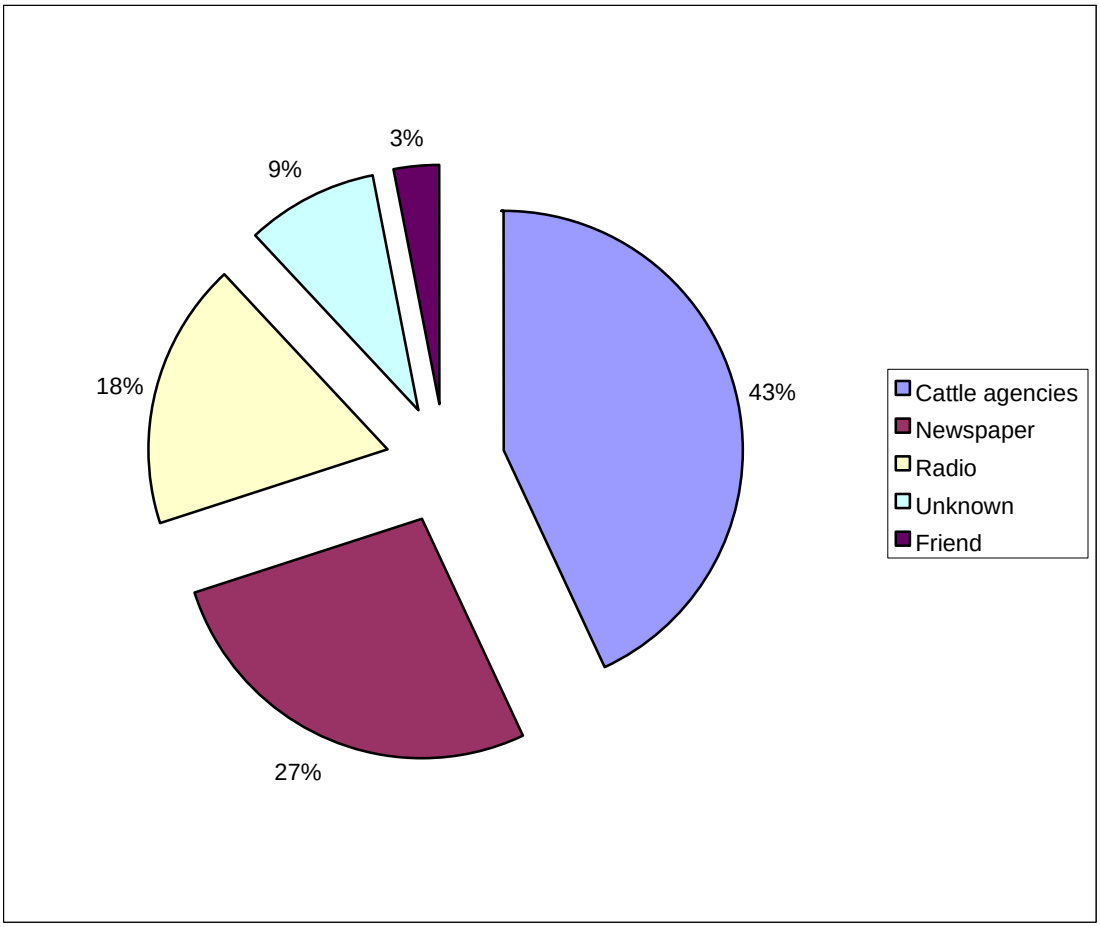

Figure 3.3: Sources of information to cattle producers about BMC prices

- Cattle agencies are a major source of information, followed by newspaper, radio, etc. This confirmed the extent to which farmers relied on cattle agencies for market information. The distance to the

cattle agents from the farmers is an important factor since the interaction of the farmers with cattle agents is crucial in making information available. Agents live together with farmers in the villages, and occasionally visit some farmers living at the cattle posts.

- Newspapers (27.3%)
- Radio (18.2%)
- Unknown (9.1%), and
- Friends (3.0%).

Unknown (9.1%) means the respondents knew about prices but were unable disclose sources of information.

Access to information has been viewed in different ways in the literature. A study by He and Young (1999, cited by Makhura, 2001) found that farmers in some regions of China obtained their market information:

(a) from neighbours or friends (31%)

(b) from television, newspaper or magazine (20%)

(c) through carrying out investigations on market (13%). In all these cases the transaction costs were lowered as a result.

3.6.1.3 CATTLE AGENCIES

Cattle agencies are individuals or group of individuals linking producers to buyers (BMC). Cattle agencies are important, accounting for 68% of total BMC intake (Deloitte and Touche, 1996). In addition to being a source of market information to farmers, cattle agencies assemble cattle from various farmers, obtain a quota from BMC and organise delivery (although transport has to be paid for by the producer) and payment. They are also instrumental in organising into groups those farmers with one or two animals to sell them

collectively so that shipments achieve minimum economies of scale. Cattle agencies therefore serve to reduce transaction costs (such as search costs) facing individual producers and lower unit transport costs.

Over the years close relationships have been built up between the farmers and the cattle agents, hence the farmer chooses the agency in which he has confidence. Sometimes the agencies offer loans to cattle producers who sell through them, strengthening their relationships. The loan is recovered from the farmer's proceeds upon selling.

Farmers with large numbers of cattle for sale sometimes deal directly with BMC. Producers selling cattle directly to the BMC incur quite different transaction costs than when selling through the cattle agencies. A farmer who sells directly to BMC takes the responsibility to transport and protect his cattle on their way to the BMC and assume the risks and costs involved. While direct selling reduces the use of cattle agencies and associated costs, such as commission costs, it increases time and other costs (such as the producer's time and effort in organising transportation to the market). In this survey only one respondent (one per cent) sold directly to BMC.

Cattle agencies charge a small commission of 2.5% of the gross proceeds of each animal. All respondents were happy with the 2.5% commission charges. This 2.5% commission charge is reasonably low compared to, for example, 7% of the gross value of each animal in the former South African homeland of Lebowa (now Limpopo Province) as reported by Nkosi *et al,* (1993), or 5% charged by cooperatives in Botswana.

On the other hand, however, cattle agencies complain that the 2.5% commission is too minimal. It has been 2.5% since early 1970's and agents suggest that it should be raised to at least 3.5%. It is understood that the business is not very profitable and a number of smaller ones have ceased operations in recent years. The agents believe that the raising of the maximum commission rates would to encourage them to source more cattle

for BMC especially in remote areas where numbers may not be so great and agents' costs consequently higher.

3.6.1.4 TRANSPORT TO BOTSWANA MEAT COMMISSION

The main methods of moving cattle from producing areas to consuming areas are trekking, road transport and rail transport. Results from the survey show that 62.2% of the sampled households used a combination of trekking and rail transport for hauling their cattle to BMC with estimate costs of P20.00 for trekking and P100.00 for rail per animal. Trekking is usually a low cost option and has a local function as a means of moving cattle to the railway loading points where they are finally railed to BMC.

Trekking is, however, declining with more cattle being transported through trucking. Some households were of the opinion that trekking induces loss of weight. Twenty-five respondents perceived cattle weight loss due to trekking to the railway line as a problem. The degree of weight loss varied, with 21% of the respondents reporting it to be a minor problem, about 79% were of the opinion that the problem was serious. Respondents furthest away from the railway line were the most concerned about weight loss because of the distance they have to haul or trek their cattle.

The distance from the cattle posts to the rail line and the number of cattle moved over this distance also influence trekking costs. About 45.5% of the respondents hired temporary labour for trekking their animals to loading points, while 33.3% used their full time herdsmen, and 21.2% trekked the cattle themselves. Large producers, not surprisingly, use considerably more hired labour because they have resources to hire non-household labour. Generally, small-scale cattle owners are not able to do so. The distance from the cattle posts to rail lines averaged 20 km.

Sometimes farmers truck their cattle to the rail loading points at an average cost of P50.00 per animal. Only 45% of the sampled households used a combination of truck and rail transport.

Speed and reliability are probably important service factors in determining the type of transport. The speed at which cattle are transported to a market has influence on their weight and grade. Fast delivery substantially reduces or minimises the amount of weight lost. Some farmers (37%) perceive transportation of cattle to the market as a problem, indicating that sometimes there were no rail trucks available at the time of loading, thus keeping cattle in kraals too long before entrainment. Cattle therefore lose weight as a result. The extent of the rail transport problem was, however, viewed as minor by 75.6% of the 37 farmers, while only 24.3 % thought it was a serious problem.

3.6.1.5 PERMITS

Farmers selling cattle to BMC are require removal permits from the Department of Veterinary Services. The animals are inspected by officials of the department for infectious diseases before permits are issued. The police also confirm the seller to be the rightful owner or owner representative. A valid brand certificate is produced and owner or owner representative identified by his or her ID book.

3.6.2 BUTCHERIES

Butcheries provide basic marketing services for farmers, particularly smallholder farmers, who are unable to market their cattle efficiently and profitably through other existing formal channels. That is, butcheries have the characteristics of operating where abattoirs are unable. They are more concentrated in villages, towns and peri-urban areas and form the main outlets for small farmers selling one or two animals or farmers in need of immediate cash.

Survey results show that thirty-two respondents sell cattle to local butcheries, with 72.2% of them being satisfied with the use of butcheries because:

- Butcheries are easily accessible. They are within their villages or in neighbouring villages.

- Buyers and sellers meet to negotiate buying /selling prices. The seller first sets the price that the buyer could accept, reject or negotiate. Sellers negotiate with one or more buyers and then sell to the buyer that offers the highest price. In general, farmers perceive butcher prices to be better than BMC prices because at least the price they get is the price they bargained and settled for.
- The buyer buys live animals; hence in the event that the buyer finds that meat or carcass quality is poor after slaughter he has no legal recourse to recover the loss or to get his money back. The seller is relieved of risk arising from carcass condemnation. This is in contrast with BMC where the carcass is inspected and graded first before the seller is paid.

- There are no commission charges that sellers have to pay.

- Payments are made immediately. Practically all farmers prefer to be paid immediately in cash as they have experienced problems with the use of cheques by some dishonest traders in which the cheques could not be honoured.

Table 3.5 summaries reasons for farmers' satisfaction with butcheries.

Table 3.5: Reasons for farmer-satisfaction with butcheries

Reasons	Percentage (%)
Butcheries are easily accessible	18
Buyers and sellers negotiate prices	56
No grading problems	2
No commission charges	4
Payments are made immediately	20
Total	**100**

However, farmers selling to local butcheries incur some transaction costs with respect to time spent searching and negotiating with a potential buyer (i.e. time costs, search costs and negotiation costs).

About 70% of the farmers did not sell to butcheries because:

- They lacked marketing expertise and bargaining power hence were afraid to sell to butcheries because prices are arrived at through negotiations.

- They were afraid that their cattle may not be bought and have to be transported back to the farm at additional costs (risk of nonsale).

- Some farmers had experienced problems with butchers who issue cheques, which may not be honoured by banks. Practically all the farmers prefer to be paid immediately in cash only.

3.6.2.1 RISK OF NONSALE

Local butcheries do not buy many cattle offered for sale resulting in farmers transporting them back to the farms. In this survey 53% of the 32 respondents who sell to butcheries indicated that they faced this risk, five of them rating this as a minor problem. Twelve respondents rated the problem as serious. The higher the risk the less likely will farmers sell to butcheries. The risk attitude of farmers emanates basically from two sources:

1. Both the seller and buyer not reaching a price agreement. Prices vary from day to day, hour to hour depending on the number of buyers, the number of cattle offered for sale, as well as the ability of the farmer to negotiate. Farmers complain that if more cattle are offered than buyers demand, buyers tend to reduce price.

2. The buyer not able to buy all cattle brought for sale even if the seller reasonably accepts the price, because the buyer has nowhere to keep

them for days before slaughter or have insufficient freezing / cooling capacity.

3.6.2.2 TRANSPORT TO BUTCHERIES

Historically the main method for moving cattle to the butcheries was trekking. Nowadays farmers either trek (using hired labour) or truck them (using hired- or own trucks).

Survey results show that transport to the butcheries does not pose a serious problem to most sellers. Ninety-eight per cent (98%) of the respondents indicated cattle might be trekked to the market.

Similarly ninety-eight respondents reported no weight loss by the time cattle reached the butcheries. This is in line with expectation that if cattle were walked a distance of 20 km one would not expect weight loss by the time they reached the butcheries. The remaining two per cent (2%) of the respondents were of the opinion that walking cattle makes them lose weight.

3.6.2.3 PERMITS

Farmers selling slaughter cattle to the butcheries do not require sales permits. It is the buyer who must provide a buyer's permit. The seller, however, has to produce a valid brand certificate confirmed by the police. The seller identifies himself or herself by an ID book. This is done to combat cattle theft. No removal permit is required.

3.6.3 PRIVATE SALES

Private sales are not a popular cattle-marketing channel. Individuals selling / buying cattle for various reasons, such as wedding, Christmas celebrations, funerals and breeding purposes use this channel.

Only one respondent indicated selling heifers for breeding purposes through this channel. Buyers buy at the seller's kraal, saving the seller transportation costs. Buyers tend to collect the cattle bought, or the seller can deliver them at extra costs to the buyer. Private sales are probably the cheapest and simplest form of market outlets to the seller. This channel also has the advantage that sellers determine the prices for their cattle, which at times is not negotiable.

3.7 SUMMARY

Farmers keep cattle for a variety of reasons. The principal reason is the provision of family income, followed by wealth. The extensive number and variety of reasons for keeping cattle confirms the importance of cattle to the households.

There are several cattle marketing channels such as Botswana Meat Commission (BMC), local butcheries and private sales. The majority of the respondents sell to the Botswana Meat Commission. Although the majority sell to BMC over half (52%) of them are not satisfied with BMC. Low prices, high transportation costs, monopoly by BMC, and the grading system were some of the reasons cited for their dissatisfaction.

Butcheries, (another important marketing channel) provide basic marketing services for farmers, particularly smallholder farmers, who are unable to market their cattle efficiently and profitably through other existing formal channels. Only thirty-two respondents indicated that they sell their cattle to the local butcheries. Over 70% of the respondents selling to butcheries were happy with the use of butcheries. Each of these marketing channels has transaction costs that are related to it.

Cattle producers selling to BMC obtain market price information through a number of resources. Cattle agencies are a major source of market information, followed by newspaper, radio and friends in that order. The

survey results show that 44% of the households knew about market price information through the cattle agencies, 27% knew about it from reading newspapers, while 18% and 3 per cent knew about it through the radio and by friends respectively.

CHAPTER FOUR

THE SIGNIFICANCE OF TRANSACTION COSTS IN THE SELECTION OF CATTLE MARKETING CHANNELS

4.1 INTRODUCTION

Chapter 3 presented the descriptive results of the data analysis. The chapter concluded that households keep cattle for a variety of reasons. It also concluded that of the several marketing channels in the district the Botswana Meat Commission and local butcheries are popularly used, and that the use of each channel has transaction costs related to it.

Chapter 4 departs from the assumption that the presence of transaction costs and household characteristics influence a producer's choice of marketing channels. Farmers can choose to sell all, a proportion or none of their cattle through any of these channels. It is found that one cattle producer may sell some or all of his slaughter cattle through one marketing outlet whilst another cattle producer may not sell through that marketing outlet at all, but instead use an alternative channel.

One explanation for a cattle producer's choice of marketing channels may be the transaction costs that alternative outlets impose on the farmer (Hobbs, 1997). These costs involve direct selling costs as well as costs for the gathering of information relevant to the final decision, and the risk involved in realizing an expected price. The costs are attributable to endogenous factors related to household characteristics and other factors, which are exogenous to the household (Makhura, 2001). The hypotheses developed in the theoretical

concept are that the presence of fixed transaction costs will inhibit decisions to participate, while the variable costs will influence the level of participation.

This chapter empirically tests transaction cost factors and farmer characteristics that are hypothesized to influence the household's decision to sell cattle to either BMC or butcheries. It attempts to determine factors (*ex ante* fixed transaction costs) influencing the households' decision to sell to a particular marketing channel or not to sell to it. The chapter also investigates variable transaction cost factors that influence the volume or magnitude of cattle sales to BMC.

This chapter is divided into five sections. The first section (4.2) provides variables used in the model estimation. The model estimation and the results are presented in sections 4.3 and 4.4 respectively, while the fourth section (4.5) discusses the variable transaction cost factors that influence the level or volume of cattle sales. The fifth section (4.6) gives a brief summary of the findings.

4.2 VARIABLES USED IN THE ANALYSIS

The hypothesis that a producer's choice between selling to the Botswana Meat Commission and selling to the local butchers is influenced by transaction costs and household characteristics is tested using the data collected from 100 cattle farmers. Empirically this was reduced to an analysis of ninety-nine respondents who sold either to BMC or to butchers, as only one respondent sold to neighbours ("private" channel).

The dependent variables (proportions of cattle sold) in the analysis are measured by the probability of selling cattle to the Botswana Meat Commission and the probability of selling to the local butchers. To determine factors affecting these dependent variables a number of independent variables (or explanatory variables) hypothesized to reflect the existence of fixed and variable transaction costs are included in the estimation model. These independent variables are

categorized into - information costs, negotiation costs, monitoring costs and household structure. The following variables were included in the models.

4.2.1 MARKET PRICE INFORMATION (KNOW)

The quality of the decisions made by households depends on their information base about the price offered by marketing channels. Information tends to improve decision-making skills. Before making a decision about how to market a product and to whom to sell it, it is assumed that beef producers first determine the price that they expect to receive. The search costs for price information depend on the extent to which there is readily available information on market prices. The more information a farmer has on a marketing channel, the less would the transaction costs be. The less costs increase the probability of using that marketing channel.

The data survey results on access to market price information varied across respondents, hence the variable (KNOW) was included in the model. This variable was measured by asking respondents if they knew what price BMC offered before selling their cattle. Access to information consists of contact with cattle agencies, contact with extension officers, listening to the radio, and reading newspapers and magazines. Contact with cattle agencies as shown earlier, is crucial, as it tends to improve farmers' access to market information and decision making whether to participate in a market or not. The contact, however, will not necessarily influence the level of sales. Access to market price information also consists of average education of the respondents, and proximity to markets. Education enhances farmer's ability to obtain, analyse and interpret information.

Although producers can determine general price trends prior to a sale, they cannot know the actual price that their cattle will fetch before they are sold. This creates price uncertainty (moral hazard) for the producers.

4.2.2 DISTANCE TO MARKETING OUTLETS (DIST)

The costs of transporting cattle to the markets are often considered in the analyses of marketing costs. The variable measuring the distance to the markets reflects how far cattle have to be transported (transportation costs). Transportation costs increase with increasing distance to the market. The closer the farms are to the markets the less costly it is to transport cattle and the lower the information-gathering costs.

The relative distance to markets varied greatly across the respondents. The variable distance to the markets (DIST) was included in the model since over 57% of the respondents viewed transportation costs as a problem in cattle marketing.

A related variable to distance is the condition of the roads to the markets. When the road infrastructure is poor, farmers are generally discouraged from using it because it is too costly to use poor infrastructure. Similarly, households having access to good road conditions but located far away from the markets will experience high transaction costs, such as transportation, search and monitoring costs.

4.2.3 SPEED OF PAYMENT (SPAYA)

The delay between when cattle are sold and when payment is received is an important negotiation cost. The variable SPAYA is a proxy for risk (moral hazard). The speed with which farmers received payment from BMC varied across respondents with farmers receiving payments between seven and fourteen days (with some it takes up to 21 days particularly when sold through the cattle agencies). Cattle agencies take a couple of days preparing cheques for the cattle producers. Speed of payments is assumed to discourage farmers in selecting a marketing channel.

Those selling to butcheries receive payment on the spot or at least within one working day of the sale.

4.2.4 MONITORING COSTS

Monitoring costs are not expected to be a major problem for producers selling through the local butchers because all sales are final as soon as the price negotiation is reached. The only monitoring costs (or price discovery) that may accrue to farmers could be in ensuring that cattle are handled and transported correctly when they are taken to selling points.

Producers selling to BMC may incur monitoring costs (price discovery costs) in ensuring that from the time cattle leave the farm to when they are slaughtered, the problem of shrinkage and carcass damage are minimized because payment is made on carcass grade basis. Carcass damage reduces the return to the producer. Monitoring costs may also be incurred in ensuring that producers are being paid on time.

4.2.4.1 GRADE UNCERTAINTY (GRAD)

One of the key monitoring costs (price discovery costs) that producers face is grade uncertainty. BMC sets the price per grade and the seller has no control over it. Although information on price per grade is published by BMC and made available to farmers through the cattle agencies, extension officers, and publications, farmers remain uncertain about the price they are likely to get until after selling. According to the respondents cattle are not graded as expected and as a result the producer's return is lower than anticipated. As indicated earlier, this aspect scored a rating of 3.3 in which 76% of the respondents considered grading to be a serious problem. Grading is one example of moral hazard.

4.2.5 HOUSEHOLD CHARACTERISTICS

Some empirical studies revealed that specific household characteristics contribute to the existence of transaction costs. This section highlights the household characteristics that are hypothesized to influence farmers' choice of cattle marketing channels. The household characteristics are presented in terms of demographic characteristics, such as the number of cattle owned (herd size).

4.2.5.1 HERD SIZE (HSIZE)

Cattle herd size is an indication of household wealth and a necessary condition for market participation. Cattle ownership or herd size was measured by asking respondents how many cattle they owned. Herd size was expected to be important because the larger the herd size, the more likely the household has a propensity to sell some and the more bargaining power the household has. Generally households with larger cattle herds tend to experience lower transaction costs because transaction costs are largely fixed costs that can be spread across more output on large farms. Farmers with larger herds also prefer the BMC because the BMC is obliged to accept all cattle whereas butchers tend to reject cattle in excess of the small number that they can process.

Not all the transaction cost factors and household characteristics were expected to influence the choice of cattle marketing channels. For empirical analysis only the above variables were included in the model. Ideally one would have included relative variables such as relative price (e.g. (price offered by BMC)/ (price offered for equivalent product by butchers)); relative commission (e.g. (commission paid to BMC)/ (commission paid to butchers)), but under Botswana situation this may not be possible, particularly on relative prices because farmers do not keep records. Although farmers sell cattle to BMC, during interviews they had no records on prices that were paid to them by BMC. As such data on prices

was not collected. The same holds true of prices offered by butchers for equivalent product.

Farmers selling to butchers do not pay any commission. Only those selling to BMC pay commission such that the relative commission could not be calculated. It is hypothesized that the presence of fixed transaction costs will discourage and inhibit farmers from selling through a given market while the presence of variable costs will influence the magnitude of sales. The hypothesized relationships between the explanatory variables (and their expected signs) and the decision to select a marketing channel are defined in Table 4.1.

Table 4.1: Hypothesized transaction costs and household characteristics influencing the choice of cattle marketing channels

Variable description	Variable name	Measurement	Expected sign (for BMC)	Expected sign (for butchers)
Herd size	HSIZE	Number of cattle a farmer owns	+	-
Distance to market	DIST	Distance from the farm to the market (in km)	-	-
Knowledge of price offered (price uncertainty)	KNOW	Did you know what price was offered before selling? yes =1 no =0	+	?
Speed of payment	SPAYA	Number of days to receive payment from buyers	-	-
Grade uncertainty	GRAD	Is it a problem that cattle may not grade as expected? yes =1 no =0	-	?
Risk of nonsale	NONSALE	Is there risk that cattle will not sell and have to be returned to the farms? yes =1 no =0	?	-

(Note: A positive sign implies that a unit increase in the independent variable leads to an increase in the probability of selling to a given channel. On the other hand, a negative sign means that a unit increase in the independent variable leads to a decrease in the probability of selling).

A model was developed to test transaction costs and household characteristics affecting farmers' choice of marketing channels. The model is briefly discussed below.

4.3 MODEL ESTIMATION

The objective of the study is to identify *ex ante* fixed transaction costs factors and farmer characteristics that explain the choice of marketing channel in a sample of 100 respondent households, all of whom sell cattle. Not all households use the same marketing channels. Some households may favour one channel while others may be excluded from using the same channel by market conditions that feature in high transaction costs.

The probit model was estimated to identify significant *ex ante* fixed transaction costs factors affecting the decision to participate in a marketing channel. This model attempts to answer the question "what factors influence the probability of households selling cattle through a given marketing channel"? Or what determines the decision by households to prefer one marketing channel to another? In other words, the model is designed to present factors (equivalent to the effects of fixed costs) that determine the probability of choosing a marketing channel. Data providing for where to sell tend to be censored at both an upper and lower limit with either zero or 100% of a producer's cattle sold to a particular channel. That is, the household may sell some of its cattle to one channel, while another may not sell to that channel at all.

The study further seeks to identify significant *ex post* transaction costs factors that influence the level of cattle sales in the market. If all households were participating in one market, ideally the ordinary least squares (OLS) technique would be appropriate, but if OLS regression were estimated non-participants would be excluded from the analysis and sample selectivity bias introduced in the model.

The problem of sample selectivity bias is overcome by either the tobit estimation procedure or the two-stage procedure (heckit) as suggested by Heckman (1979, cited in Makhura 2001). That is, both the heckit and tobit procedures account for censored sample selectivity bias (i.e. compensate for some households that do not participate in the market). However, the heckit procedure is a consistent but not efficient way to control for selectivity bias, while tobit procedure is efficient and consistent (Makhura, 2001). This concurs with Hobbs (1997), Alene *et al*, 2000, who indicated that the appropriate analytical approach for estimating data that is censored at both an upper and lower limit is the Tobit model using maximum likelihood regression estimation techniques. Tobit is a tool that is hybrid between the probit and the OLS. Ignoring the censoring of data and applying OLS generates coefficients that are downward biased relative to the tobit coefficients (Hobbs, 1997). In this study the tobit estimation procedure has been employed to estimate both fixed and variable transaction costs factors that are hypothesized to increase the level of cattle sales to BMC.

From a theoretical point of view the choice of marketing channels is hypothesized or expected to be the result of many factors and it is common to identify these factors by estimating the probit model.

The probit model is specified as:

B_{ic} = 1 for households selling cattle to BMC.

B_{ic} = 0 butcheries

Pr (CATBMC) = f (HSIZE, DIST, KNOW, SPAYA, GRAD)

This means that the probability of selling cattle to the Botswana Meat Commission is a function of a set of both fixed and variable transaction cost variables.

4.4 MODEL RESULTS

Table 4.2 presents the results of the probit model. Following the theoretical exposition and the view in the literature, these factors are related to fixed and variable transaction costs. Coefficient signs agree with a priori expectations. The significant positive coefficients support the hypothesis that the choice of marketing channels is significantly influenced by transaction cost factors and household characteristics. These coefficients are significant at the five per cent level or below. The estimated model predicts 69 per cent of the sample cases correctly.

Table 4.2: Relationship between the transaction costs and household characteristics and BMC (Probit results)

Factor	Coefficient	Marginal Effect (ME)	t-value	p-value
Constant	0.0151 (0.0232)	0.0076 (0.0157)	0.6518	0.5171
Number of cattle owned by household (HSIZE)	0.0380 (0.0088)	0.04110 * (0.0813)	4.3228	0.0001
Distance to the market (DIST)	-0.0097 (0.0059)	-0.0230 (0.0013)	-1.6234	0.1098
Knowledge of prices offered (KNOW)	1.6203 (0.5678)	0.0208 ** (0.2657)	2.8536	0.0060
Speed of payment (SPAYA)	-0.1324 (0.1059)	-0.01125 (0.0760)	-1.2505	0.2160
Grade uncertainty (GRAD)	-0.2186 (0.2111)	-0.0003 (0.0296)	-1.0356	0.3046
% Correctly predicted -- 69%				

(Figures in brackets are standard deviations)

* and ** = significant at 1% and 5% respectively

(Note that the variable NONSALE was not included in the model because all cattle sent to BMC do not risk nonsale. BMC act stipulates that all cattle sent to BMC should be slaughtered).

Two of the five variables were positive and significantly associated with the probability of selling cattle to the Botswana Meat Commission (BMC). These are average herd size (HSIZE) and information on BMC prices (KNOW). These variables tended to increase the chances of household selling to BMC. That is, their marginal effects have positive impacts on the choice of the BMC. The marginal effects account for the probability of choosing a marketing channel resulting from a unit increase in the explanatory variables.

The results also indicate that the choice of BMC is negatively influenced by the degree of grade uncertainty (GRAD), speed of payment (SPAYA) and distance to the market (DIST). These variables tended to decrease the likelihood of selling to BMC. That is, the marginal effects of these variables have negative impacts on the choice the BMC.

4.4.1 AVERAGE SIZE OF CATTLE HERD (HSIZE)

The average herd size has the largest marginal effect on the dependent variable. When a household owns a large herd of cattle it tends to increase the probability of selling to BMC where a large number of cattle can be sold at any given time. That is, a larger herd size provides a greater opportunity to sell many cattle at a time for which BMC would be preferred. This observation makes sense because the more cattle a household has the higher the propensity to sell some. The results suggest that a one-unit increase in the herd size leads to an increase in the probability of choosing BMC by 4 per cent.

A similar study in Namibia concluded that an increase in herd size led to a corresponding increase in the proportion of cattle sold to Meatco. A possible reason for this was that Meatco is a more suitable marketing channel for owners with large herds that want to sell large quantities of animals at once (Ministry of Agriculture, Water and Rural Development, 2000).

4.4.2 MARKET PRICE INFORMATION (KNOW)

Another positive and significant factor associated with the probability of selling to BMC is market price information (KNOW). This variable has the second largest marginal effect on the probability of selling to BMC. The decision to sell to BMC is influenced by access to information in terms of prices and marketing opportunities. This outcome makes sense that farmers seek information on prices before selling. If the prices are discouragingly low, farmers tend to withhold their cattle in anticipation that prices would rise when they would start selling. Even if the farmers do not have the latest information on prices they (farmers) do make their decisions based on the previous price releases by BMC.

Information increases the ability of farmers to make informed decisions at lower transaction costs. This is consistent with the findings of the cited literature. As expected, the results suggest that those households with information are more likely to sell their cattle to BMC relative to those without information. Households access price information and other marketing conditions through cattle agencies, extension officers, and newspapers. Contact with cattle agencies tends to remove fixed transaction costs and improve farmers' access to information. The results suggest that getting market information through cattle agencies and extension officers increases the chances of selling to BMC by 2 per cent (provided the prices are favourable). The results suggest that providing up-to-date information about markets should assist households in making their decisions. Farmers live in the same villages with cattle agencies making access to market information much easier for them.

4.4.3 DISTANCE TO THE MARKETS (DIST)

The distance reflects how far households must travel to participate in the formal markets. The results show that distance to BMC negatively affects the choice of selling to BMC. This variable is positively associated with transportation costs.

The larger the distance, *ceteris paribus*, the higher the transportation costs. This finding is in line with the theoretical expectation that the larger the distance from the market the higher the transaction costs which in turn negatively influence the households' choice of that marketing channel. As expected, the results suggest that those households located far from the market are less likely to choose the BMC in comparison with those close to the BMC. Owners of larger herds were mostly affected by this variable because they tend to have cattle posts or farms further away from BMC where there is reasonable grazing. Reasonable grazing, however, has the disadvantage of encouraging higher stocking rates and possible overgrazing. Every additional kilometer away from the market is expected to reduce the probability of choosing the BMC by approximately 2.3 per cent.

4.4.4 SPEED OF PAYMENT (SPAYA)

The results show that the variable (SPAYA) was negatively associated with the probability of selling to the BMC. The negative influence of this variable is as expected. An increase in the number of days before farmers receive their cheques would discourage them from selling to the BMC. Farmers, particularly small farmers, sell cattle in cases of emergency and who like to be paid immediately. BMC tends to "pay" producers between seven and fourteen days after slaughtering their cattle while butchers pay on- the- spot or at least within one working day. This variation is more likely to entice producers to sell to other marketing channels, other than the BMC.

In reality the delay is not with BMC but with the cattle agencies. While BMC itself pays promptly after slaughter, the time can be substantial between when cattle leave the cattle post or ranch and when producers receive their payments through the livestock agents or cooperatives. As indicated earlier, some cattle producers sell cattle to BMC through the cattle agencies. These cattle agencies have representatives at BMC who are responsible for all animals sent there by

their respective agencies. After all the animals from a given cattle agency have been slaughtered and graded (and priced) BMC issues one lump cheque to the cattle agency representative within two days (with a computer printout information on individual animals). The cattle agency representative, in turn, sends the cheque to the cattle agency head office.

At the head office individual cheques are hand written for each cattle producer who sold through the cattle agency. On average this takes three to four days (depending on how many cattle were sold) before the cheques are ready for collection. The farmer may not be aware of all these transactions to the extent that he feels BMC itself delays in paying them.

An interview with one of the cattle agencies indicated that it sometimes takes up to three weeks before cattle producers receive their cheques or payment. Farmers in general have the tendency to sell when they need cash for immediate use, such as for paying school fees, arranging for the funeral of a relative etc. Such farmers might therefore sell to alternative outlets such as the butcheries where they get their money as quickly as they would like to. Some farmers are aware of costs (such as commission charges, railage charges, bank charges and government levies incurred in selling to BMC) and would like to avoid them by selling to the butcheries.

4.4.5 GRADE UNCERTAINTIES (GRAD)

The grading system was negatively associated with the probability of selling cattle to the Botswana Meat Commission. As indicated earlier, farmers perceive BMC uses a grading structure that subjects them to be cheated because they do not observe the grading process. If the seller is unable to observe whether cattle are graded accurately, the buyer has an incentive to act opportunistically to undergrade carcasses. Even if the buyers do not act opportunistically, the potential to do so causes sellers to be suspicious.

An increase in grade uncertainty is assumed (not tested) to be associated with an increase in the distance from the cattle posts. If cattle are walked or transported over long distances they tend to lose weight, which might affect the grade. Despite these grade uncertainties, owners of larger herds still sell to BMC because it is currently the only market that buys in large quantities.

In light of the theoretical hypothesis the results provide some ideas about the role of transaction cost factors and household characteristics in the probability of selecting BMC or butcheries, thus confirming the hypothesis. These results suggest that the significant transaction cost factors affecting the households' decision to sell cattle to the Botswana Meat Commission include average herd size, and market price information. It is therefore probable that herd size in combination with knowledge of prices plays a distinctive role in the choice of the BMC. The assumption in the analysis is that a farmer who chooses to sell through one channel will continue to sell through that channel. In reality this is prone to change, because variables such as buyer behaviour, and distance to the market are prone to change. As a result a farmer can decide today on one channel and tomorrow on another, or both.

4.5 THE LEVEL OR VOLUME OF CATTLE SALES TO BMC

Both fixed and variable transaction costs are hypothesized to constrain farmers from selling more. This section determines the factors influencing the level or magnitude of cattle sales to the BMC. The hypothesized relationship between the explanatory variables and the level of sales is presented in Table 4.3

Table 4.3: Hypothesized transaction costs and household characteristics influencing the level of cattle sales to BMC

Variable description	Variable name	Measurement	Expected sign
Age of head of household	AGE (in years)	Age group ≤ 40, 41-50, 51-60, > 60	+
Herd size	HSIZE	Number of cattle owned by households	+
Drought situation in area	DROUT	Has any of your cattle died due to drought Yes =1 no =0	+
Stock theft	THEFT	Is stock theft a problem in your area Yes =1 no =0	-
Animal diseases	ANDIS	Are animal diseases a problem in your area Yes =1 no =0	-
Distance to the market	DIST (km)	Distance from the farm to the market	-
Knowledge of prices offered	KNOW	Knowledge of prices offered by BMC	+
Speed of payment	SPAYA	Number of days before receiving cheque from buyers	-
Grade uncertainty	GRAD	Is it a problem that cattle may not grade as expected? Yes =1, no = 2	-

(Note: A positive sign implies that a unit increase in the independent variable leads to an increase in cattle sales. On the other hand, a negative sign means that a unit increase in the independent variable leads to a decrease in cattle sales).

The model is specified as:

LECASALE = f (AGE, HSIZE, DIST, DROUT, THEFT, KNOW, SPAYA, GRAD, ANDIS)

(Where LECASALE is the level of cattle sales. The independent transactions cost factors are as shown in Table 4.3).

This means the level of cattle sales depends on the set of variable transaction cost factors and farmer characteristics as indicated.

Table 4.4: Factors influencing volume of cattle sales to the BMC (Tobit results)

Variable	Maximum Likelihood Estimates (MLE)	Marginal Effects (ME)	t-value	p-value	OLS
Constant	1.8007 (3.0112)	0.1900 (0.6111)	0.4011	0.4967	0.2027 (0.6743)
Age of head of household (AGE)	1.1011 (0.8710)	0.0301** (0.0810)	1.2412	0.2125	0.1617 (0.1262)
Number of cattle owned by household (HSIZE)	2.8500 (1.9200)	0.0412* (0.0081)	2.4210	0.0027	0.1504 (0.0512)
Drought situation in area (DROUT)	0.0651 (0.0404)	0.0006 (0.0050)	1.8582	0.1452	0.0009 (0.0007)
Stock theft (THEFT)	-0.0051 (0.1112)	-0.0042 (0.0022)	-0.9987	0.3812	-0.0188 (0.1408)
Animal diseases (ANDIS)	-0.0828 (0.0166)	-0.0614 (0.0034)	-0.9768	0.4405	-0.1109 (0.0149)
Distance to the market (DIST)	1.1929 (0.0581)	0.0266* (0.0001)	2.5432	0.0110	0.0294 (0.0311)
Knowledge of prices offered (KNOW)	0.1871 (2.030)	0.0056 (0.0011)	1.0014	0.3212	0.0421 (0.0063)
Speed of payment (SPAYA)	-0.1510 (0.0620	-0.0300 (0.0023)	-1.0500	0.3100	-0.1092 (0.0501)
Grade uncertainty (GRAD)	-0.6701 (0.0045)	-0.0461* (0.0012)	-1.1511	0.2418	-0.0910 (0.0040)
R-square 0.5018	Adjusted R-square 0.3667				
F-test 3.715**	Log of likelihood 2.12				

(Figures in brackets are standard deviations) * significant at the 5% level ** significant at the 10% level

The results obtainable from the tobit procedure are the maximum likelihood estimates (MLE) as well as the marginal effects (ME). The result shows that the MEs are smaller than the MLE coefficients because they take account of the probability of being in the non-limit portion of the sample (Hobbs, 1997). Interpreting the regression coefficients for a Tobit model is complicated by the presence of censoring. This therefore requires the calculation of ME. The marginal effects indicate the amount of sales resulting from a unit change in the explanatory variables. The marginal effects have the same interpretation as the ordinary least squares (OLS), but sometimes it is pertinent to compare the marginal effects to the ordinary least squares coefficients, although the latter are distorted (Makhura, 2001). For purposes of comparison, OLS results are also presented but not discussed.

The Tobit results presented in Table 4.4 indicate that the level of cattle sales is positively influenced by age of the head of household, average herd size, drought situation, distance to the market, knowledge of prices offered, and negatively by stock theft, speed of payment, grade uncertainty and animal disease situation. The model R-square and adjusted R-square were 50% and 37% respectively with an overall fit of 3.715. With the exception distance to the market (DIST) and animal diseases (ANDIS) the other coefficients all have the expected signs.

Three variables; herd size (HSIZE), age of the head of the household (AGE) and distance to the market (DIST) were positive and significantly associated with the level of cattle sales. The herd size had the greatest marginal effect on the level of cattle sales. Larger herds provide a greater opportunity to sell many cattle at a time. The size of the herd dictates that a significant part of the herd must be sold on a regular basis and in large numbers for household expenditure and for herd maintenance. A one-unit increase in herd size is expected to increase cattle sales by approximately 4.1 per cent. Interestingly, this is similar to earlier findings where herd size influenced the decision to sell to the BMC.

Simultaneously households with larger herds are expected to sell to the BMC in large quantities because they can spread fixed transaction costs over greater revenue. Small sellers cannot spread the fixed costs of transacting with BMC over sufficiently large revenues and therefore sell to butchers. This is in line with expectations. It is on same reasoning that owners of small herds assemble their individual animals (through the cattle agencies) to sell to the BMC. This non-linear relationship is more consistent with economic theory, i.e. the number of cattle sold increases as transaction costs fall, but at a declining rate.

Owners of smaller herds tend to sell only in cases of emergency or when there is a specific need, while owners of larger herds are more likely to sell for commercial reasons. The more cattle a farmer has the less time he has to devote to looking for a buyer such as butcheries which in most cases seldom buy more than two cattle at a time because they have nowhere to keep cattle waiting for slaughter. Selling to butcheries also risks nonsale. As indicated earlier, the BMC is obliged to accept all cattle whereas butchers tend to reject cattle in excess of the small number that they can process.

The age of the head of the household (AGE) was identified to have a positive and significant effect on cattle sales, implying that the older the farmer the higher is the probability of selling more. The variable has the second largest marginal effect. Each additional year increases the probability of selling more cattle by 3 per cent. Older farmers may be willing to dispose off some of their livestock to meet other cash requirements since they might not have other sources of income. Generally the older the farmer the more cattle he has because he accumulated them with age. Various demographic surveys undertaken reveal that people in agriculture are more likely to be elderly than young (de Villiers *et al*, 2004). Some people retire into agriculture.

The estimated parameter for distance is statistically significant but has the unexpected positive sign. That the distance is significantly positive seems

contradictory to the earlier probit results relating to the decision to sell where the variable was negative and insignificant. The results suggest that an additional kilometer away from the market is expected to increase in cattle sales by approximately 2.7 per cent. This variable has the third largest marginal effect on the level of cattle sales. What the result implies is that the distance may not contribute positively towards the decision to sell cattle to the BMC, but once the households have decided to sell, the distance may positively influence a farmer to increase cattle sales to avoid multiple trips if the farmers were to sell in small numbers. Given the distances involved, transport costs represent a major cost to producers well away from the markets and selling in large numbers may reduce the unit cost of transportation.

The positive non-significant variables included knowledge of market prices (KNOW). Although information was positively and statistically significant for the decision to sell cattle to the BMC (in the Probit model), it did not significantly influence the level of cattle sales. This suggests that information belongs to the fixed transaction costs, and is not an important factor determining the level of participation. That is, information does not influence the intensity of sales once producers have decided to sell to the BMC. For example, contact with cattle agencies (sources of information) will influence farmers to sell to the BMC but will not necessarily influence the level of sales there.

The other variables had negative influence. The parameter for grade uncertainty was statistically significant and had the expected negative sign. A one-unit increase in the grade uncertainty will lead to approximately 5 per cent decrease in cattle sales to the BMC, hence a key factor preventing producers from selling more of their cattle to the BMC. If farmers are suspicious that their cattle may be undergraded or detained they may not risk selling more cattle to the BMC, fearing that it might reduce their incomes. Inevitably producers complain about the grading system and interviews conducted on this study indicated unhappiness by some.

Other variables that had negative marginal effects but not significant in terms of influencing the level of cattle sales are stock theft (THEFT), speed of payment (SPAYA), animal disease situation (ANDIS), and drought (DROUT). The results suggest that an increase in stock theft leads to a reduction in cattle sales by 0.4 per cent. This impact is fairly small. Although some respondents complained of escalating stock theft as an important factor responsible for the decline in cattle production and sale, it was, however, difficult to determine the exact number of animals stolen as some are just reported to have gone astray. Under the circumstances it becomes difficult to accept or deny that stock theft is a serious problem without research. About 80% of livestock is reared in unfenced communal areas, making monitoring of livestock movement difficult. One would argue that what farmers would have sold is what is stolen, leaving them with less numbers to sell. Although stock theft is a problem farmers were quite positive that with the help of the police and community at large they could deal with it.

Some cattle producers are not happy with the delay in payments when supplying BMC. As indicated earlier, farmers, particularly small farmers, sell cattle in cases of emergency and who like to be paid immediately. A one-unit increase in the number of days before farmers are paid is expected to lead to a 3 per cent decrease in sales.

Although there has been growing fears of outbreaks of diseases of economic importance such as Foot and Mouth Disease and Contagious Bovine PleuroPneumonia spilling into Botswana from neighbouring countries, this did not influence farmers to sell more of their cattle. This outcome is not strange. The results suggest that with an increase in disease outbreaks the number of cattle sales declines by approximately 6.1 per cent. A possible explanation for this outcome is that subsequent to outbreaks in neighbouring countries or within the country, the government imposes strict livestock movements and even bans sales from certain areas.

Drought was held responsible for a number of cattle mortalities in the survey area in previous years. It is not surprising that during drought periods fewer cattle are offered for sale. A plausible explanation to this is that during the drought periods cattle are normally in bad condition to the extent they may not fetch good prices. Farmers therefore cling to their cattle hoping that drought would soon be over and therefore rebuild their stock from the remaining animals.

4.6 SUMMARY

Empirical analysis supports the hypothesis that transaction costs and household characteristics are primary determinants of the households' choice of cattle marketing channels and the level of cattle sales. These transaction costs affect the households basically in two ways.

- The fixed transaction costs affect the households' decisions to choose marketing channels. The herd size (HSIZE) and market price information (KNOW) positively and significantly influenced the households' choice of BMC. Herd size appears the most crucial factor influencing households to choose the BMC. An increase in herd size by one unit increases the probability of selecting the BMC by 4.1 per cent. However, to identify single variables that have the most significant influence may, however, be difficult because of the interaction between variables.

  On the other hand, the distance to the market (DIST), the BMC grading system (GRAD) and speed of payment (SPAYA) negatively and insignificantly decrease the probability of households selling cattle to the BMC.

- The variable transaction costs affect the level of cattle sales. Distance to the market (DIST), average herd size (HSIZE) and advanced age of the head of the household (AGE) positively and significantly influenced the

households to sell more of their cattle to BMC. Older heads of households are assumed to have accumulated more cattle with age, moreso that they are their sources of family income. Households with more cattle have a greater opportunity to sell some.

Distance surprisingly influences households to sell more of their cattle. This seems contradictory to earlier findings where the distance negatively influenced households to sell to the BMC. This outcome can be explained by the fact that once households have decided to sell, they sell in large quantities so that they can spread the costs over a large quantity, hence reducing the unit cost.

Other positive (but not significant) variables include knowledge of price offered (KNOW).

Stock theft (THEFT), speed of payment (SPAYA), grade uncertainty (GRAD), drought (DROUT) and animal diseases (ANDIS) tended to reduce the volume of cattle sold to the BMC. Of these variables grade uncertainty had the greatest negative marginal effect on the intensity of cattle sales to the BMC.

CHAPTER FIVE

SUMMARY AND CONCLUSIONS

5.1 INTRODUCTION

The problem and objectives of the study, as well as the theoretical framework of the role of transaction costs and household characteristics in the marketing of agricultural products, and the choice of marketing channels were introduced in the previous chapters. The main objective of the study was to investigate the effect of transaction costs factors and household characteristics on the farmers' choice of cattle marketing channels in Mahalapye district, Botswana. It also investigated the extent to which transaction costs and household characteristics influence the level of cattle sales to the Botswana Meat Commission (BMC).

It was hypothesized that a cattle producer's choice (between the Botswana Meat Commission and other marketing channels such as municipal abattoirs and butcheries) is influenced by different transaction costs during the marketing of cattle. To measure the effects of these transaction costs the study used data from a survey of 100 farming households who were selected using simple random sampling. A structured questionnaire was designed to capture and identify factors influencing the households' selling patterns. The data collection process involved personal interviews. A statistical analysis system (Probit) was used to identify the transaction cost factors and household characteristics that significantly influence farmers' choice of cattle marketing channels. The factors could be contributing to fixed transaction. Similarly a Tobit model was used to determine the significant factors influencing the level of cattle sales to the BMC

This chapter provides a summary and conclusions of the study. It also provides some recommendations arising from the study. The chapter is presented in four sections. The first section (5.1) gives the introduction; summary of the study is presented in the second section (5.2), whilst the third section (5.3) presents the conclusions. The fourth section (5.4) makes recommendations for reducing the transaction costs.

5.2 SUMMARY

Agriculture contributes to the national economy through both direct and indirect linkages. It contributes approximately four per cent (4%) to the Gross Domestic Product (GDP) of the economy, with the livestock sub-sector contributing more than 80% of the total agricultural contribution to GDP. Although the contribution of agriculture to total GDP is small, 70% of the people living in the rural areas are dependent upon agriculture for their livelihoods either directly or indirectly. The cattle industry has strong forward and backward linkages with the rest of the economy providing raw materials for meat processing and related industries such as tanning and soap manufacture.

Cattle producers keep cattle for a wide range of services. The principal contribution of cattle to rural households is the provision of family income. It has been shown from this study that 81% of the respondents keep cattle for family income. Households traditionally keep cattle not only as a source of family income, but also for social status (prestige), lobola, draught power for crop farming, and for the provision of food consumption items such as milk and meat. They also provide sources of employment in rural areas.

Livestock owners differ in terms of the size of the herd, their household status, and their relative wealth. More cattle are owned in the communal areas than in the commercial areas and the distribution in each area is skewed.

The results from this study show that most of the respondents (92%) are males. Of these males ninety-eight per cent (98%) are household heads that are responsible for the co-ordination of the household activities. Of all the female respondents only two were *de facto* household heads. The majority of the household heads (64%) are typically over 50 years, 29% are between 41 and 50 years, while 8% are 40 years or younger. The results further show that 82% of the respondents have basic education, while 18% have no schooling.

Cattle farmers often have a number of marketing channels such as the local butcheries, speculators, co-operatives, Botswana Meat Commission and "private" sales to the public. Although there are more than three marketing channels it has been established from the study that the respondents frequently use two; the Botswana Meat Commission (BMC), and local butcheries. Farmers seldom use "private" sales as a marketing channel as shown by the findings that only one respondent used this channel. Private buyers buy cattle directly from the farmers (sellers) at their farms or cattle posts, making this channel probably the simplest and cheapest to the sellers since they incur little transaction costs (negotiation costs). Buyers collect the cattle themselves. If sellers are to deliver the cattle to the buyer's premises they do so at extra costs to the buyer.

It was found that the majority of respondents (67%) use the BMC. The results also indicate that 66.5% of the cattle marketed by the respondents in the year 2000 where sold to the BMC. Although many farmers sold their cattle to the BMC, over one-half of them (52%) were not satisfied with this channel, citing low prices, an unfair grading system, and high transportation costs as some of the reasons for their dissatisfaction. The majority (79%) of the respondents cited low prices as the main reason for their dissatisfaction with the BMC. Surprisingly however, farmers use the BMC prices as a benchmark when selling to other channels.

Over 70% of the respondents sell their cattle to the BMC through the cattle agencies as intermediaries. Cattle agencies are important, accounting for 68% of the total BMC intake. They serve to reduce transaction costs (such as search costs) facing individual farmers. These cattle agencies are also instrumental in organizing into groups farmers with one or two cattle to sell, so that shipments or transportation achieve minimum costs.

On the other hand, however, some farmers (particularly those with large herds of cattle) sometimes sell directly to BMC without involving the cattle agencies. These farmers incur different transaction costs than when selling through the cattle agencies. Findings from this survey also show that cattle agencies serve as a major source of market information some households (44%).

Farmers also sell cattle to butchers. Butchers provide basic marketing services for farmers, particularly smallholder farmers, who are unable to market their cattle through other channels. Results from this study revealed that 32% of the respondents sold their cattle to butchers. Of all the respondents who sold their cattle to the butcheries, 72.2% expressed satisfaction with butchers. Some of the reasons for satisfaction are good prices that are reached through negotiations, accessibility of butcheries, absence of commission charges, less transportation costs, and the speed of payment.

However, some farmers were dissatisfied with butcheries mainly due to the fact that many of their cattle return unsold because the two parties could either not reach a price agreement or the butcher did not want to buy many cattle that day.

Transactions do not take place in costless environments. Transactions have costs related to them. It has been hypothesized that the presence of these transaction costs (and household characteristics) influences cattle producers' choice of marketing channels.

Transaction costs emanate from a number of sources such as information asymmetries or differential access to information (information costs), monitoring and enforcing trade agreement (monitoring costs), bargaining costs (negotiation costs). These costs vary across households. Transaction costs facing farmers are generally unobservable but do inhibit possible participation in market exchanges. Transaction costs may be fixed or variable. It is hypothesized that the presence of fixed transaction costs affect households' decision of whether to participate or not, while the variable transaction costs influences the degree at which households would participate.

The existence of transaction costs in agricultural production and marketing can be assessed through the differences in marketing costs, marketing channels and prices received for agricultural products. When the costs of transaction are higher than the value or utility derived from such transaction, farmers may not want to trade.

In order to test the concept of transaction costs on households, a range of variables was defined. These included cattle herd size, access to market price information, distance to the markets, speed of payment, grade uncertainty, drought situation in the area, stock theft, animal diseases, and age of the head of the household. In order to test these variables two methods were employed. The probit model was estimated to determine the significant fixed transaction costs factors that affect the households' decision of marketing channels. The Tobit model was also used to estimate the significant variable costs that influence the level of cattle sold to the BMC. The Tobit model took account of the sample selectivity bias.

The empirical results in the probit model show transaction costs and household characteristics have significant influence on farmers' choice of cattle marketing channels. Two variables were significantly and positively associated with the probability of selling cattle to the Botswana Meat Commission and increase the

likelihood of households selling to BMC. These are the herd size (HSIZE) and information on market prices offered by BMC (KNOW). The herd size had the highest marginal effect. The results suggested that a unit increase in the herd size increased the probability of households choosing the BMC by 4 per cent.

The decision to sell to BMC is also influenced by information on prices that the BMC was prepared to pay. Access to market price information had a significant effect on the proportion of cattle sold to the BMC and thus on the choice of the BMC. Knowing the prices that the BMC was prepared to pay farmers tended to increase the probability of households to sell to the BMC by 2 per cent, *ceteris paribus*. There is substantial *a priori* reason to believe that the availability of timely and accurate information could play a key role in improving the efficiency of the livestock marketing. Many households make sub-optimal decisions because of incomplete or incorrect information.

The likelihood of selling to the BMC was decreased, but not significantly by an increase grade uncertainty, an increase in distance, and by an increase in speed of payment. A one-unit increase in distance and grade uncertainty reduced the households' likelihood of selling to the BMC by 2.3 per cent and 0.03 per cent respectively, whilst an increase in speed of payment reduced the likelihood of choosing the BMC by 1.1 per cent. Farmers perceive that there is a considerable distrust in the manner in which the grading system is applied, especially in terms of its consistency. Farmers with large herds of cattle, however, prefer selling to the BMC even though they associate this marketing channel with grade uncertainty.

The level of cattle sales to the BMC was significantly and positively influenced by the age of the head of the household (AGE), herd size (HSIZE) and the distance to the market (DIST). Herd size had the greatest marginal effect on the level of sales. A one-unit increase in herd size was expected to increase sales by 4.1 per

cent. Households with larger herds have the advantage of spreading fixed transaction costs over greater revenue.

Age of the head of the household had the second largest marginal effect. Older farmers may be willing to dispose off some of their livestock to meet cash requirements since they might not have other sources of income. That is, older tend to sell significantly more compared to younger farmers.

The ability of the producers to market their cattle is also positively and significantly influenced by distance to the market. This outcome seems contradictory to the probit results relating to the decision to sell to the BMC where it was negative and insignificant. This implies that the distance may not contribute positively towards the decision to sell to the BMC, but once the households had decided to sell, the distance may positively influence an increase in sales. That is, when these farmers sell, they sell in large numbers to avoid multiple trips to the markets, hence high transportation costs. A one-unit increase in distance increased the number of cattle sold to BMC by approximately 3 per cent.

Knowledge of market price information (KNOW) positively but insignificantly influenced the level of sales. The non-significance of KNOW confirms that information costs are fixed costs.

The results also show the different transaction costs and household characteristics that negatively influence the level or magnitude of cattle sales to the BMC. These are stock theft (THEFT), grade uncertainty (GRAD), speed of payment (SPAYA), drought situation (DROUT), and animal diseases (ANDIS). These variables tended to reduce the number of cattle sold to BMC. Of all these variables GRAD had the greatest marginal effect.

5.3 CONCLUSIONS

It has been determined that market exchanges do not take place in a frictionless environment. Market exchanges involve transaction costs. These transaction costs can be fixed or variable transaction costs. Transaction costs and household characteristics as hypothesized affect the decision of household to select marketing channels. They can also influence the level of cattle sales.

An increase in herd size and market information significantly increased the probability of households to sell their cattle to the Botswana Meat Commission. An increase in speed of payment, distance to the market and grade uncertainty decreased the probability of households to sell to BMC (but not significantly).

Cattle sales to the Botswana Meat Commission significantly increased with an increase of age of the head of the household, number of cattle a household owned (or herd size), and with an increase in distance from the market. Herd size was the most consistent factor influencing both the decision to sell to BMC and level of cattle sales to the BMC. It was a significantly positive factor in the probit model, as well as for the level of sales. Sales also increased (but insignificantly) with an increase in market price information.

Grade uncertainty significantly decreased cattle sales to the BMC. An increase in stock theft, speed of payment, drought and animal diseases insignificantly reduced the level of cattle sales.

5.4 RECOMMENDATIONS

Considering the results of this study and the conclusions drawn above, the following recommendations are made. It is assumed that improving on some

factors will remove fixed transaction costs and reduce variable transaction costs, and hence stimulate the choice of the BMC.

5.4.1 Speed of payment

The delay between when cattle are sold and when payment is received is an important negotiation cost. The delay in payment is 7-14 days with the BMC and one day with respect to butchers. It is recommended that the delay in payment be reduced by encouraging the BMC to buy directly at the farmers' cattle posts or farms, in which case farmers have to be paid on the spot or at least within two days. This would also reduce the distance farmers have to transport their cattle to the BMC and therefore save on transportation costs.

5.4.2 Grading problems

Over 70% of the respondents viewed grading by the BMC as a serious problem. These respondents are of the opinion that the BMC uses a grading structure that is unfair to them, subjecting them to be cheated. BMC has 13 grading categories according to carcass quality. Some of the categories are subdivided according to carcass weight. Two recommendations are made here. The **first recommendation** is that grade subdivisions should be dealt away with. For example, all carcasses in grade SS (super grade) should fetch the same price (highest) per 100 kg (in this case P719.00). The **second recommendation** is to educate farmers on the grading system and other marketing activities. It is assume some farmers feel being cheated because they do not know how the grading system works.

The study has shown that farmers continue to sell to the BMC even though they face high transaction costs. If these costs could be reduced more farmers could sell to the BMC, thus offsetting the decline of sales to the Botswana Meat Commission. The BMC is its worst enemy. It is extremely conservative in its

dealings with producers and agents and should be encouraged to be more participative during the determination of price structures. It should encourage an improved relationship between itself (BMC), agencies and producers and find a way of working with its competition, rather than against it (i.e. butcheries and other abattoirs).

5.5 FUTURE RESEARCH

The findings of this study are specifically relevant to Mahalapye district farmers. The agricultural setting of Mahalapye may differ from other areas of Botswana. It is therefore proposed:

- That a similar study be done in an environment completely different from that of Mahalapye, for example, areas next to the Kalahari desert.

- That research on trust issues regarding prices and grading be done. That is, on how can more trustworthy relationships be achieved, because it was established from the study that some farmers mistrusted the BMC on issues like prices and grading.

- That the same farmers be examined over time to determine if they had not changed their marketing patterns or behaviour. The assumption in the analysis is that a farmer who chooses to sell through one channel will continue to sell through that channel. Farmers' behaviour over time was not taken into consideration. In reality this is prone to change. The levels of sales also change with time.

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APPENDIX 1.1

LIVESTOCK MARKETING QUESTIONNAIRE

The information revealed in the questions will be held strictly confidential.

Thank you for your honest response.

A. Background information

Date: ----------

Interviewer: ----------

Agricultural District: ----------

Name of village: ----------

1. Name of respondent: ----------

   Sex: --------- F/M ----------

   Age (years): ----------

2. If not head of household, what is the respondent's relationship to the household ----------?

3. (a) What is the head of household's principal occupation? ----------

   (b) For how long have you been in this occupation? ----------(in years)

4. What is the highest level of education the head of household (or representative) has completed?

   No formal education ---------

   Primary school only ---------

   Secondary school --------

University degree --------

Postgraduate training --------

5. How many family members are in the household at present? (Complete table below)

	Less than 13 years	13-60 years	60 and above	Total
Male				
Female				

6. Do you own cattle? Y/N ----------

If yes how many? Complete table below

	Number
Cows	
Heifers	
Bulls	
Oxen (or tollies)	

7. What breeds do you have? Tick as appropriate

Local Tswana

Exotic

Mixed exotic-local

8. Do you own any other livestock? Y/N --------

If yes complete table below

	Number
Sheep	
Goats	
Horses	
Donkeys	

9. Rank in order of importance why you keep cattle. (from 1-5)

   Prestige ------

   Wealth -----

   Lobola -----

   Commercial -----

   Ploughing -----

B. Cattle sales in 2000

10. Did you sell cattle in 2000? Y/N ---------

    How many?

	Number
Bulls	
Oxen	
Cows	
Heifers	

How many were sold to:

Botswana Meat Commission	
Local butcheries	
Auctions	
Friends	
Co-operatives	

11. Have you attended any livestock sale courses? Y/N

If yes, when ----------?

How long was the course? ----------

What did you learn? ----------

12. Where do you buy your cattle?

Do not buy	South Africa	Friends	Auction	Other (specify)

13. Indicate in order of importance why you buy cattle (1) ----------

(2) ----------

(3) ----------

(4) ----------

14. How many cattle did you buy in 2000?

Bulls	
Cows	
Heifers	
Oxen	

15. Which types of livestock marketing systems are available in your area? (Tick appropriate boxes)

Speculators	Butcheries	Auctions	Abattoir	Other (specify)

16. How often do you use each of the marketing systems? Tick as appropriate.

	Do not use at all	Not very often	Quite often
Speculators			
Butcheries			
Auctions			
National abattoir			
Other (specify)			

17. Are you satisfied with each of the marketing system in your area? Y/N

If not, which ones are you not satisfied with and why not?

(Indicate the reasons in order of importance).

---

18. How do you think the systems you are not satisfied with could be improved?

---

19. When are you paid by each of the marketing system? Tick as appropriate

	Within one working day	Within 7 days	Within 1 month
Speculators			
Butcheries			
Auctions			
BMC			
Other (specify)			

20. Would you be content with a delay of beyond one month? Y/N

If no, why not? ----------

21. How are you paid by each of the marketing system? Tick as appropriate

	Hard cash	Cheque	Other (specify)
Speculators			
Butcheries			
Auctions			
BMC			
Other (specify)			

22. How are your cattle transported to points of slaughter? Complete table below.

Order of importance (1= highest importance; 2= second highest etc).

	Road trekking	Truck	Train	Other (specify)
Speculators				
National abattoir(BMC)				
Butcheries				
Auctions				
Other (specify)				

23. How often do you use each of these?

	Do not use at all	Not very often	Quite often
Road trekking			
Truck			
Train			
Other (specify)			

24. How far are slaughter points from your cattle post?

(Complete table below)

	Kms	Time
Speculators		
Butcheries		
Auctions		
National abattoir		
Other (specify)		

25. How do you get in touch with truckers and train officials?

_____

C. Information on sales to the National abattoirs (Botswana Meat Commission)

If you have sold cattle to BMC please answer the following questions.

26. Did you know the prices offered by BMC before taking your cattle to that market? Y/N

If yes, how did you access that price information? ----------

27. How much does it cost to take animals to BMC? ----------

28. Who herds your cattle to the loading points? ----------

29. How much do you pay each person who you hire to herd your cattle? -----

30. How far are the loading points from your cattle posts? ----------

31. Is transport to BMC a problem? Y/N

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

32. How many times per year do you sell your cattle to BMC? ----------

33. Does having to take whatever price BMC offers present a problem? Y/N

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

34. How do the prices offered by BMC compare to those offered by other marketing channels? Tick appropriate box

	Always lower (1)	Often lower (2)	Equal (3)	Mostly higher (4)	Always higher (5)
Speculators					
Auctioneers					
Butcheries					
Private buyers					
Other (specify)					

35. Is the loss of weight of cattle through herding to loading points a problem? Y/N

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

36. Do you have specific reasons for preferring or not preferring to sell to BMC? -

---

37. Is it a problem that cattle may not be graded as you expected when selling to BMC? Y/N

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

38. Does your perception of the grade correspond with that of BMC? Y/N

If no, complete the table below (tick appropriate box)

Always differs 1	Mostly differs 2	Equals 3	Often agrees 4	Always agrees 5

D. Information on sales to butcheries

39. If you have sold any cattle to local butcheries please answer the following questions.

40. What is the herding cost of taking your cattle to the local butcher? ------

41 How much does it cost to truck cattle to the local butcher? ----------

42. What is the distance to the local butcher? ----------

43. Is transport to the local butcher a problem? Y/N

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

44. How much time do you spend finding a butcher? ----------

45. Is the loss of weight of cattle through herding to the buying point or butcher a problem? Y/N

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

46. Is the risk that cattle will not be sold and have to be taken back home a problem? Y/N -----

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

47. For cattle sold to butcher a permit has to be obtained from the tribal administration. Is obtaining that permit a problem? Y/N ----

If yes, is it a ----------minor problem?

----------serious problem?

---------- major problem?

48. How long does it take to get that permit? ----------

49. Do you pay for the permit? Y/N

50. How far is the tribal administration office from your household / cattle post? --

F. Information on private sales

51. Are there any extension officers in your area you make use of with regard to livestock marketing? Y/N

52. How often do you contact them?

53. Are you happy with the services they offer? Y/N

If not, why not? ----------

54. How do you think their services could be improved?

----

55. Are there cattle agencies in your area? Y/N

56. Do you ever use cattle agencies for marketing your cattle? Y/N

If yes, how often? ----------

If not, why not? ----------

----

57. Do they charge you for their service? Y/N

How much? ----------

58. In general is cattle marketing a problem for your household? Y/N

If yes, would say that cattle marketing is: (Tick)

-------a minor problem not requiring attention

-------a minor problem requiring attention

-------a moderate problem not requiring attention

-------a moderate problem requiring attention

-------a serious problem requiring attention

-------a critical problem requiring immediate attention

59. Would you like to register any positive or negative criticisms of any of the marketing systems?

Positive ----------

Negative ----------

60. Do you ever slaughter cattle at your household? Y/N

If yes, for what purpose?

----

61. For slaughtered cattle indicate what do you do with the hides? ----------

If you sell, at what price do you sell each of them on average?

62. Please feel free to make any additional comments. Your ideas are most welcome.