CHAPTER TWO

SMALLHOLDER MARKET PARTICIPATION UNDER TRANSACTION COSTS

2.1 INTRODUCTION

This study is about market participation behaviour of small scale and resource poor farmers in South Africa. It endeavors to determine the factors influencing the decision of these farming households to participate in the output market for agricultural products, that is, the decision to sell or not to sell. In the context of this study, those factors that influence the decision to participate as well as the level of participation are commonly referred to as transaction costs. These costs are attributable to endogenous factors related to household characteristics and other factors, which are exogenous to the household.

The study applies the Transaction Cost Economics (TCE) paradigm, which is part of the NIE or New Institutional Economics (Hubbard, 1997; Clague, 1997; Poulton *et al*, 1998). The NIE has moved to the centre stage of economics during the last two decades, and, just as TCE, it builds on the 1937 article of Coase: “The nature of the firm”. This article postulates that economic activity does not occur in a frictionless environment, the main reason for this is the costs of carrying out the exchange (Benham and Benham, 1998). Williamson (1979, 1993, 1996) coined the phrase “new institutional economics” to distinguish it from the “old institutional economics” pioneered by Commons and Veblen (Paarlberg, 1993). The old institutional school argued that institutions were a key factor in explaining and influencing economic behaviour, but there was little analytical rigor and no theory in this school of thought. It operated outside neo-classical economics, and there was no quantitative theory from which reliable generalisations could be derived or sound policy choices could be made. Neo-classical economics, on the other hand, ignored the role of institutions. Economic agents were assumed to operate almost in a vacuum.

The NIE encompasses both paradigms, or, better put, it is a bridge between the two. It acknowledges the important role of institutions, but argues that one can analyze institutions within the framework of neoclassical economics. In other words, under the NIE, some of the assumptions of neo-classical economics (such as perfect information, zero transaction costs, full rationality) are relaxed but the assumption of self-seeking individuals attempting to maximize an objective function which is subject to constraints, still holds (Matthews, 1986).

The purpose of the New Institutional Economics is both to explain the operation of institutions and their evolution over time, and to evaluate their determinant impact on economic performance, efficiency, and distribution (Nabli & Nugent, 1989). There is a sort of two-way causality between institutions and economic growth. On the one hand, institutions have a profound influence on economic growth, and on the other hand, economic growth and development often result in a change in institutions. It must be said, however, that not all institutional changes are beneficial. In fact, by influencing transaction costs and coordination possibilities, institutions can either facilitate or retard economic growth. This explains, for example, why we have institutions that develop differently in different countries and why we have different paths of economic development.

The NIE represents thus an “expanded economics” that focuses on the choices people make, while at the same time it allows for factors such as pervasiveness of information and human limitations on the processing of information, evolution of norms, and willingness of people to form bonds of trust (Clague, 1997). As such this paradigm seems ideally suited to explain the commercialization behaviour of smallholders.

The objective of this chapter is to review studies that have applied the TCE paradigm to explain the economic behaviour of small-scale farmers and those poor in resources in developing countries. Although transaction costs in the context of Coase and Williamson are used to identify alternative modes of governance or economic organisation, i.e. spot markets, contracts and firms; the paradigm is also well suited to evaluate the organisation of individual transactions. To clarify this

distinction the chapter starts with a brief review of the TCE paradigm and then discusses the various theoretical and empirical applications pertaining to the commercialisation problems of small-scale farmers in developing countries.

2.2 TRANSACTION COST ECONOMICS (TCE)

2.2.1 An overview

The general hypothesis of the TCE paradigm is that institutions are transaction cost-minimising arrangements, which may change and evolve with changes in the nature and sources of transaction costs. This work was pioneered by Coase. In his seminal article "The Nature of the Firm" (1937) Coase argued that market exchange is not without costs. He recognised the role of transaction costs in the organisation of firms, and other contracts. Transaction costs include the costs of information, negotiation, monitoring, co-ordination, and enforcement of contracts. He explains that firms emerge to economise on the transaction costs of market exchange and that the "boundary" of a firm or the extent of vertical integration will depend on the magnitude of the transaction costs. However, Fourie (1989) argues that the existence of the firm cannot be explained by transaction cost argument *per se*, but decisions to integrate and the extent of the integration can.

The work of Williamson (1979, 1993, 1996) on the economics of organization and contracts follows on from Coase's line of thinking. Williamson combines the concepts of bounded rationality and opportunistic behaviour to explain contractual choice and the ownership structure of firms. Opportunistic behaviour manifests itself as adverse selection, moral hazard, cheating, shirking, and other forms of strategic behaviour. In Williamson's framework, a trade-off has to be made between the costs of co-ordination and hierarchy within an organisation, and the costs of transacting and forming contracts in the market (Drugger, 1983). This trade-off will depend on the magnitude of the transaction costs.

In North's view (2000), institutions that evolve to reduce transaction costs are crucial to the performance of economies (Hirsch and Lounsbury, 1996). North sees the role

of the government as crucial in specifying property rights and enforcing contracts, both of which promote specialization and reduce the costs of market exchange. In other words, the inability of societies to develop effective, low-cost enforcement of contracts is an important source of stagnation and contemporary underdevelopment in the developing countries (*cf.* North, 2000).

Transaction Cost Economics is especially relevant for agricultural market analysis in developing countries because many of the institutions, or formal rules of behaviour, that are taken for granted in developed countries which facilitate market exchange are absent in low-income countries. The frequent occurrence of market failure and incomplete markets (i.e. caused by higher transaction costs and information asymmetries) in developing countries cannot be explained by conventional neo-classical economics and requires an institutional analysis. Therefore, the NIE and specifically TCE could help to determine what types of institutions are needed (either formal or informal) to improve the economic performance in developing countries.

2.2.2 The concept of transaction costs

The enforcement and the exchange of property rights typically involve costs. These are referred to as transaction costs. Eggertson (1990:15) defines transaction costs as "the costs that arise when individuals exchange ownership rights for economic assets and enforce their exclusive rights". In terms of the context of this study, only the transaction costs arising for individual agents or for basic economic units such as households are considered. This type of transaction costs includes expenses and opportunity costs, both fixed and variable, arising from the exchange of property rights. Transaction costs originate typically from the following activities (see Eggertson, 1990: 15):

- the search for **information** about potential contracting parties and the price and quality of the resources in which they have property rights (this includes personal time, travel expenses and communication costs),

- the **bargaining** that is needed to find the true position of contracting parties, especially when prices (incl. wages, interest rates, etc.) are *not* determined *exogenously*,
- the **making of (formal or informal) contracts**, that is, defining the obligations of the contracting parties,
- the **monitoring** of contractual partners to see whether they abide by the terms of the contract, and
- the **enforcement** of the contract and the **collection of damages** when partners fail to observe their contractual obligations.

Jaffee and Morton (1995) add a further two dimensions of transaction costs in the context of marketing agricultural produce:

- **Screening costs**: These refer to the uncertainty about the reliability of potential suppliers or buyers and the uncertainty about the actual quality of the goods,
- **transfer costs**: These refer to the legal, extra legal or physical constraints on the movement and transfer of goods. This dimension commonly includes handling storage costs, transport costs, etc.

Many systems are used to classify or refine the concept of transaction costs but generally transaction costs have been defined as the cost of information and/or cost of facilitating a transaction as outlined above. Another approach is to refer to transaction costs as perceived risk, transportation, and administrative costs (Drabenstott, 1995). In other cases the transaction costs were classified into observable and unobservable or inhibitive transaction costs (Staal, Delgado and Nicholson, 1997 and Delgado, 1995). The observable transaction costs include marketing costs such as transport, handling, packaging, storage, spoilage etc. (Delgado, 1995) and are observable when a transaction takes place. The unobservable transaction costs include cost of information search, bargaining, screening, monitoring, co-ordination, enforcement (Bardhan, 1994), and product differentiation (Benham *et al*, 1998). The latter are inhibitive and often cannot be

observed. According to Delgado (1997) these are costs of participating in the market process, whether or not a market exists. This study carried out in the context of the Northern Province endeavours to determine how unobservable transaction costs, amongst other factors, limit participation of small-scale farmers in the market economy.

Haddad and Zeller (1997) equated transaction costs with administrative costs of screening, delivery and the monitoring of implementing a program. This is conceptually similar to Hobbs (1997) who classified transaction costs into information, negotiation, and monitoring or enforcement costs. Information costs arise *ex ante* of an exchange and include the costs of obtaining price and product information and the cost of identifying a suitable partner. Negotiation costs are the costs of physically carrying out the transaction and may include commission costs, the costs of physically negotiating the terms of an exchange, and the costs of formally drawing up contracts. Monitoring or enforcement costs occur *ex post* a transaction and are the costs of ensuring that the terms of the transaction (quality standards and payment arrangements) are adhered to by the other parties involved in the transaction. The observable costs reflect explicit costs while unobservable costs are implicit (Cuevas and Graham, 1986).

In terms of transaction costs influencing modes of governance of firms and organisations Frank and Henderson (1992:941) argue that most of the influential transaction cost factors relate to uncertainty, input supplier concentration, asset specificity, and internalisation costs. This assertion is in line with Zaibet and Dunn (1998) who define transaction costs in terms of risk attitude of farmers. These authors differentiate between internal and external transaction costs. Frank Henderson (1992) determined the effect of transaction costs on vertical integration by grouping transaction inefficiencies into the categories 'uncertainty', 'concentration', 'idiosyncratic investments', and 'costs of administered vertical co-ordination'. For example, when transactions are conducted under uncertainty, it can become very costly or impossible to anticipate all contingencies (*ibid*). This view is, however, not relevant for this study.

Some of the costs are related to physical details of the transaction, such as transport, marketing, packaging or handling. Others result from information asymmetries and contract enforcement problems, which cause economic agents to incur expenditures associated with search, recruitment, co-ordination, supervision, management and litigation. The point is reiterated by Zaibet and Dunn (1998:833) who indicate that transaction costs include high transport costs due to the distance of the farm from the market, poor or non-existent infrastructure, high marketing margins due to monopoly power, and high costs of searching and monitoring contracts.

Hayes *et al* (undated) distinguish transaction costs in integrated agricultural markets from transaction costs in commodity markets. The former includes:

- The bureaucratic costs and distortions associated with managing and co-ordinating integrated production, processing and marketing.
- The value of time used to communicate with the participating farms and co-ordinate them.
- The costs of incentives employed to convince farmers to voluntarily participate in integrated production.
- The costs involved in establishing and monitoring long term contracts.
- The economies of scale forgone when batch production replaces commodity production

Transaction costs also result from information inefficiencies and institutional problems, such as the absence of formal markets. The presence of transaction costs is often reflected by the difference, or discrepancy, between perceived buying and selling prices (De Janvry *et al*, 1991). When these discrepancies occur, sellers experience low selling price and consequently might feel discouraged to sell, while buyers experiencing a high buying price, become discouraged to buy.

Thus, the market will fail when the cost of a transaction through market exchange creates a disutility greater than the utility gain that it produces. In other words, the

result is that the market is not used for the transaction (*ibid*; Fafchamps and Minten, 2001).

The other relevant delineation of transaction costs was used in Key *et al* (2000). They distinguish between fixed and proportional transaction costs. The fixed transaction costs are the same regardless of the level of transactions made. That is, the same costs are experienced once the decision to exchange has been made. For example, the information costs of finding the market will be the same regardless of whether the household sells more or less of a particular commodity. Once the information about the market has been obtained and contacts made with the buyer, a household can sell any amount without having to make extra efforts (or expend extra costs) for information about the same market. The fixed transaction costs are different from proportional transaction costs, which vary with the level of, or the amount involved in, the transaction. For example, the quantity of assets used to deliver products to the market will differ per amount of output marketed.

Development of formal models of TCE is still in an early stage. Some of the recent developments lean on the theory of incomplete contracts (Hendrikse and Veerman, 2001). The advantage of incomplete contract theory over transaction costs theory per se is that the behavioural assumption of opportunism is maintained in the analysis. Further, it sharpens the transaction costs argument by suggesting that the crucial difference between governance structures resides in the allocation of residual decision rights. However, the theory of incomplete contracts does not provide a formalisation of decision-making under transaction costs. The next section reviews theoretical frameworks for analysing transaction costs in smallholder farming.

2.3 TRANSACTION COSTS IN SMALLHOLDER FARMING

In their pioneering study, de Janvry *et al* (1991) examined the effect of “missing markets” using a household model calibrated to represent a generic African household. The study showed that in the absence of food markets households must be self-sufficient in terms of food, which confines their ability to reallocate land and labour to cash crops. Basically, these households tend to face wide margins

between low selling price and high buying price (Sadoulet and de Janvry, 1995). Transaction costs are used to explain why a market might be "missing", for example, in credit markets (Besley, 1994; Swaminathan, 1991), labour markets (Sen, 1966; Sen, 1981; Bardhan, 1984), land markets (Carter and Wiebe, 1990, Carter and Mesbah, 1993) as well as the product markets (Stiglitz, 1998; Holden and Biswanger, 1998). These market failures result in alternative institutional arrangements (Biswanger and Rosenzweig, 1986; Timmer, 1997; Delgado, 1999) such as sharecropping, interlinking and interlocking of markets (Bardhan, 1980; Clapp, 1988; Braverman and Stiglitz, 1982; Biswanger, Khandkar and Rosenzweig, 1993).

Transaction costs include costs resulting from distance from markets, poor infrastructure, high marketing margins, imperfect information, supervision and incentive costs (Sadoulet and de Janvry, 1995). This study aims to contribute to the understanding of the role of transaction costs in making one household more commercially oriented than another. It is hypothesised that transaction costs prevail in South Africa's developing areas as is reflected by the low market participation of small-scale farmers. The transaction costs emanate from a number of sources. In the first place, small-scale farmers are located in remote areas far away from service providers and major consumers of farm products. The distance to the market, together with the poor infrastructure, poor access to assets and information is manifested in high exchange costs.

In order to participate in the market, farmers must determine who it is that one wishes to deal with, what the terms are, they must conduct negotiations leading to a bargain, draw up a contract, and undertake the inspection needed to make sure that the terms of the contract are being observed (Hobbs, 1997; Coase, 1937). These operations are often sufficiently costly to prevent many transactions from taking place, which otherwise would have been carried out in a world in which the pricing system works without cost (Staal *et al*; 1997; Coase, 1937). Campbell (1978) illustrated the problem of transaction costs in market participation better: After deciding on a price, one needs to find a buyer. The longer one looks for ideal buyers, the higher the search costs incurred, which are part of transaction costs.

Transaction costs include, in addition to advertising, telephone and transport costs, also the actual time spent. These extra costs of search and information may rise so high that they exceed the gap between the price at which one would be willing to sell (buy) and the price asked (offered) by the end user.

Staal *et al* (1997) assert that the limited empirical evidence on the nature and importance of transaction costs is mainly caused by conceptual and measurement difficulties (see also Dorward, 1999). For example, when transaction costs are sufficiently high in order to prevent exchanges from occurring, then, by definition, these costs cannot be observed because no transaction took place. It follows that transaction costs of "observed" transactions are generally different from "prohibitive" transaction costs (Cuevas 1988a & 1988b).

A number of studies have attempted to address the question of transaction costs in market participation theoretically and empirically. Extensive work has been done in the area of finance (Zander, 1992; Cuevas and Graham, 1986; Saito and Villanueva, 1981; Cuevas, 1988, Fenwick, 1998). There is, however, a growing interest to understand how transaction costs affect participation in input as well as output markets.

To a greater extent these studies provided some understanding of the relationship between transaction costs and commercialisation. The high transaction costs in finance and input markets tend to reduce potential commercialisation. In addition, inhibiting transaction costs will inhibit a commercialisation process from taking place.

Williamson (cited in Frank and Henderson, 1992) argues that increases in transaction complexity, frequency, and uncertainty, accompanied by idiosyncratic investments, result in a shift in the co-ordination structure from classical to neo-classical to bilateral and, finally, to unilateral relational contracts. One party typically becomes dominant in this progression (*Ibid* 1992:942). That is, as transaction costs increase, marketing arrangements can either become less formalised, and/or farmers switch to other institutional arrangements if one of the parties involved in the transaction becomes dominating (Holden, 1997). In short, there are always some

transaction costs attached to any sale or purchase, but the greater the degree of organisation in the market, the smaller these transaction costs are likely to be and the easier it is to benefit from the exchange opportunity (Campbell, 1978).

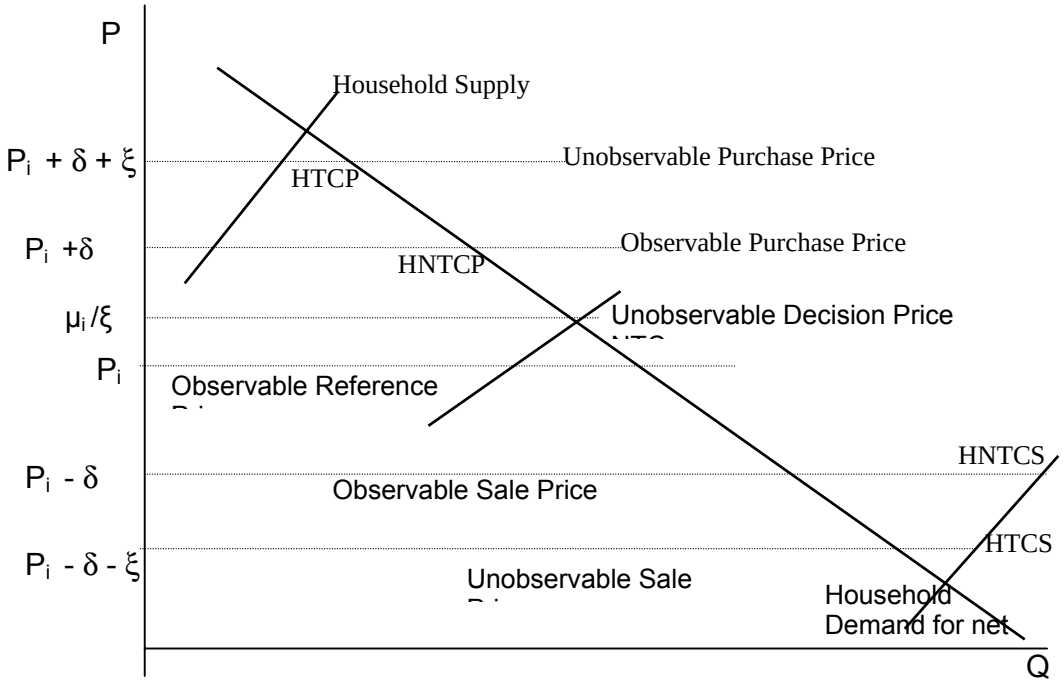
In many instances market participation declines as a result of inhibitive transaction costs. According to Staal *et al* (1997) a low proportion of products exchanged in the market reflects the existence of high transaction costs. Strasberg *et al* (1999) found that price and distance to a paved road (an indication of travel costs) both have a significant negative effect on fertiliser use, *ceteris paribus*. On the other hand, Zaibet and Dunn (1998) reflected on internal (endogenous) transaction costs, which involve intra-household factors such as the number of family members and the dependency ratio. These are likely to reduce market participation since capital embodied in market linkages is not individual specific but can be shared among immediate relatives (Goetz, 1992).

It is clear from the preceding review of literature that until recently there was no development of a conceptual framework of the TCE paradigm in smallholder agriculture. This lack was compounded by operational problems of empirical analysis since lack of participation implies that the transaction costs cannot be observed. The bottom line is that transaction costs tend to reduce the net benefits of exchange. When that happens, smallholder farmers will stop participation. Some theoretical perspectives, however, have been advanced recently, and are reviewed subsequently.

2.3.1 Theoretical foundation

The basic theoretical exposition of effects of transaction costs on participation in a competitive market have been proposed by Sadoulet and de Janvry (1995) and Delgado (1991), and Fafchamps, de Janvry and Sadoulet (1995). Fig 2.1 shows how observed transaction (marketing) costs and unobserved transaction costs affect household sales and purchases. The basis is that transaction costs affect price, which in turn affects traded output.

Fig 2.1: How observed transaction (marketing) costs (δ) and unobserved transaction costs (ξ) affect household sales and purchases



Adapted from: Sadoulet *et al* (1995), De Janvry *et al* (1991), Delgado (1991)

HTCS = sales by household facing high transactions costs
HNTCS = sales by household facing lower transaction cost
HTCP = purchases by household facing high transaction costs

The surplus-producing household, which sells produce (food), will receive an observed sales price of $P_i - \delta$, where δ represent the marketing costs. At that price the household will sell HNTCS, i.e. sales of a low transaction costs household. When the household faces more transaction costs (ξ), the unobserved decision price, $P_i - \delta - \xi$ will correspond to sales of HTCS, i.e. sales of a household facing higher transaction costs, which is less than the sales of HNTCS. So, the higher the transaction costs are, the less the households will sell. It is hypothesised that transaction costs are negatively related to market participation.

For deficit households which purchase food, the observed purchase price will be $P_i + \delta$, where δ is the observable (marketing) costs. At that price the household equilibrium conditions will be at HNTCP, that is, purchases by households facing low

transaction costs. However, if the household faces unobservable transaction costs (ξ), the decision price will be $P_i + \delta + \xi$, thus purchasing at HTCP or purchases of transaction costs facing household. Thus a household tends to purchase less when faced with high transaction costs as compared to when it is facing low or no transaction costs. It is therefore hypothesised that transaction costs are negatively related to market participation.

This framework provides insights in the possible behaviour of deficit and surplus producers when faced with transaction costs. It must be stated that the very existence of transaction costs leads to a lower number of observable transactions than would have been the case if there had not been any transaction costs. The hypothesis is that the hidden transaction costs will negatively affect commercialisation, or, in other words, reduce the potential for market participation.

The problem with this approach is that it is based on the strong assumption that only surplus producers will commercialise or sell their produce. That is, deficit producers will not be driven to participate in the market. Evidence from elsewhere, however, - in particular from Uganda - reflects that when conditions allow, households at different levels of production will commercialise (Ejupu *et al*, 1999). Similarly, the situation in South Africa is in line with the fact that a production level is a necessary but not a sufficient condition for commercialisation (Makhura, 1994). As such, the decision to commercialise is a decision related to the level of complexity of the household. This requires household models rather than a competitive market framework.

2.3.2 Household decision under transaction costs

Usually there is a range of factors affecting the behaviour of households in the decision making process with regards to market participation. Firstly, the risk or uncertainty of the outcome of participation may sometimes be a major source of transaction costs. However, their effect on transaction costs may not be as direct as

transport costs would be or other socio-economic factors that influence the participation decision.

2.3.2.1 Risk, uncertainty and transaction costs

Risk behaviour and market participation are interlinked (Ellis, 1993). On the one hand uncertainty is reduced by market participation, provided this is based on to improved information, communication, market outlets, and so on. On the other hand uncertainty is exacerbated by greater market participation, since the safety of subsistence is replaced by the insecurity of unstable markets and adverse price trends. There are two views of assessing risk in market participation (Dorward, 1999).

Firstly, risk enters market participation as an outcome of market conditions. Households will allocate their limited resources to subsistence and commercial production such that the disutility of risk is balanced against the utility of market goods (Von Braun *et al,* 1991). That is, since commercialisation is associated with risk, it can be assumed that the higher the risk the less commercially inclined the household will be. This view is useful in analysing the risk factor as an outcome of the commercialisation process. The link between risk and transaction costs, however, is not clear.

Secondly, risk and transaction costs are interlinked in market participation. Different factors affect the decision by small-scale farmers to participate in markets. Zaibet and Dunn (1998) developed a conceptual model considering only the uncertainty associated with commercialisation, very much like Von Braun *et al* (1991). Such uncertainty is represented by high transaction costs as a result of imperfect knowledge of the different participants in the market. The farmer needs to contract with other partners to sell output and purchase inputs. In the absence of formal institutions that regulate such transactions, the farmer has to face costs to obtain information about these different agents, to contract, to monitor, and to enforce the agreements. Such uncertainty is reflected in the utility maximisation problem of the household and can be likened to an individual‘s willingness to pay for participation in

the market and benefit from the transfers. In this context such efforts represent the value of assets spent to overcome the transaction costs. It is assumed that this amount is proportionally related to the volume of activities rendered on the market (Key *et al*, 2000).

The other kind of uncertainty in the view of Zaibet and Dunn (1998) is "social uncertainty" associated with collective decisions. Such uncertainties involve "internal" transaction costs, in contrast to the previously discussed "external" costs to the household. Internal transaction costs are not apparent but may represent a constraint to the decision-making process in extended households and may inhibit commercialisation. Zaibet and Dunn (1998) further suppose that there is a premium in a peasant's willingness to overcome these costs. Such premium is assumed to be proportionally related to the size of the household.

The importance of the framework arises from the analysis of strategic risk taking under risk aversion behaviour. According to Bromley and Chavas (1989) market participation "would be more likely to take place in situations where strategic uncertainty is relatively small". So, given identical probabilities concerning information available about the market, the individual with a lower risk premium will be less risk averse and more likely to participate in the market than the individual with a great risk premium. The hypothesis of internal transaction costs is that where the nuclear units are allowed ownership of assets (such as plots), the decision to hire labour or *sell output* would imply lower transaction costs than would be the case for an extended family. Consequently, transaction costs are hypothesised to be higher in the case of an extended family ownership system as a result of the higher monitoring costs in the larger family.

This approach clarifies the association of transaction costs with risk attitude. By implication risk variables are components, which can partly explain transaction costs. This view distinguishes between "internal" and "external" transaction costs and thus allows for consideration of both intra-household and inter-household factors. The most relevant factor, however, is the size of the household and its possible characteristics in processing information or overcoming transaction costs.

2.3.2.2 Transport costs as direct transaction costs

To show household decisions regarding consumption, production, purchases and sales of a particular crop, Omamo (1998) recognises that transaction costs will differ and depend on whether the household is a self-sufficient, a deficit or a surplus producer. The hypothesis is that high transaction costs will influence the commercialisation pattern of the household. This is caused by both the net buyers of staples, who will prefer to buy less by producing more themselves, and the sellers of cash crops, who will prefer to sell more and produce less for own consumption.

The limitation of Omamo's approach is that it only considers observable transaction costs incurred by transport. Again, it must be emphasised that the observable transaction costs are only realised when the household participates in the market, and will thus only affect the magnitude of commercialisation. Looking at the South African situation this is, therefore, not really appropriate, for here the concern is to alleviate constraints, which inhibit, and sometimes even prohibit, participation in markets. Omamo's model does not incorporate unobservable transaction costs, thus this model has limited use with respect to its applicability to South Africa.

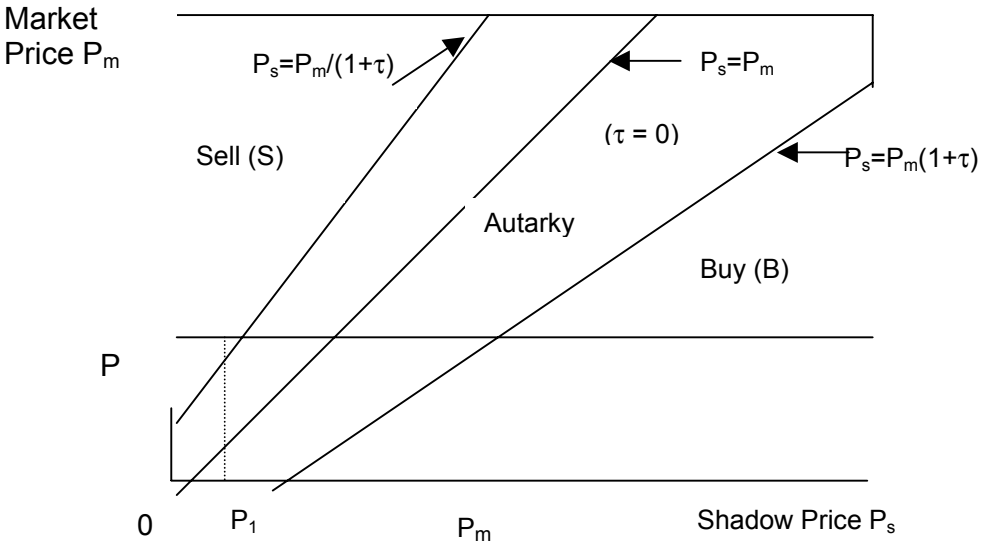
2.3.2.3 Fixed transaction costs, buying and selling price gap

It is possible, though, to modify the framework proposed by Omamo so that it models situations where households make trichotomous decisions on buying, or selling, and/or not participating at all in the market. The selectivity model of household food marketing behaviour is proposed by Goetz (1992) following the formulation by Strauss (1984). Goetz makes the proposition that failure to participate in specific commodity markets results from high fixed transaction costs. Furthermore, he asserts that factors affecting the amount to buy or sell are the same as those affecting the decision of whether to participate in the market as a buyer or seller. The opposite is not true.

Goetz proceeds to illustrate the relationship graphically by showing the market price of food paid or received by a household participating in cash markets (vertical axis in fig 2.2). The horizontal axis shows the value (price) of food to the household. If there are no fixed transaction costs (τ), the household equates its shadow price with the market price. Thus, we can infer from this that market participation behaviour is continuous (as opposed to discrete, or subject to a threshold) as the price varies (Goetz, 1992; Makhura *et al*, 1996).

Fixed transaction costs may prohibit households from participation in the market (Goetz, 1992; Key *et al*, 2000). This leads to the proposition that: *Failure to participate in specific commodity markets results from high fixed transaction costs* (Goetz, 1992). In principle, variables affecting the amount to buy or sell are the same as those affecting the decision whether to participate in the market as a buyer or seller. The opposite is not true, however: There are fixed cost-type variables affecting participation decisions, but they do not affect the extent of participation since this depends on the labour-leisure choice *(ibid, 1992).*

Fig 2.2: Market participation behaviour of households



Source: Goetz (1992)

2.4 EMPIRICAL STUDIES ON TRANSACTION COSTS

Relatively few studies have undertaken empirical work to determine the effect of transaction costs on market participation by farmers. This section reviews some empirical studies analysing transaction costs in agriculture. It gives an overview of their role in output markets, input markets, and how they are constructed. The section closes with some studies focusing on South Africa.

2.4.1 Transaction costs in output markets

A number of studies have presented the effect of various factors on agricultural output markets. Only a few studies have discussed the effect of transaction costs on output markets (Goetz, 1992; Omamo, 1998; Key *et al*, 2000; and Gabre-Madhin, 2000). A growing interest is shown in transaction costs in milk marketing (Staal *et al*, 1997; Holloway *et al,* 2000; and Staal *et al*, 2000).

In his study of household food marketing behaviour, Goetz (1992) used a range of factors to reflect the effect of transaction cost factors on the market participation in course grain, both for buying and selling. The factors included proxy variables for fixed transaction costs, which included ownership of carts for transportation of grain to the market, physical distance from the market, and regional dummy variables. Ownership of assets is considered important in reflecting market access. The study found a significant relationship between the grain price and the probability of buying, and the quantities bought and sold. The results further showed that apart from these there are other factors, unrelated to the relative changes in output price, which stimulate market participation. Better information, for example, significantly raises the probability of market participation for potential selling households, while access to coarse grain processing technology raises quantities sold by sellers, that is provided they participate in the market.

Key *et al* (2000) extended Goetz's analysis by focusing on participation in maize markets in Mexico. Their study found that both fixed and proportional transaction costs play a significant role in explaining household behaviour. With respect to this the proportional transaction costs played a more significant role in the selling rather than the buying decisions. Specifically, selling to official sources tended to significantly increase the production and selling threshold for the sellers. At the same time, the ownership of a pick-up truck, for example, is associated with a lower production-selling threshold. This implies that ownership of assets tends to reduce entry barriers into the market.

A similar study was conducted by Holloway *et al* (2000). Their study sought to identify alternative techniques for effecting participation among peri-urban milk producers in the Ethiopian highlands. The study concludes that institutional innovations to promote entry into the market should be accompanied by a mix of other factors such as improvements in infrastructure, knowledge, and asset accumulation in the household. Furthermore they found that by locating

producers, the time required to market milk could be minimised. This increased the number of participating producers and the level of marketable surplus. The results somehow confirmed Staal *et al*'s major finding (1997), which emphasises that transaction costs increase with distance, most likely faster than could be expected from mere transportation costs. This is caused by the increased costs of information, and risk of wastage or spoilage when a buyer is not found in good time. Staal *et al* (2000) further discusses the spatial aspects of producer milk price formation in Kenya. In their study the GIS-derived variables for distance and transport costs are combined with survey-derived variables for household characteristics to model market participation and the formation of farm-level milk prices. Their results differentiate between the effects of roads by type and distance, and highlight the importance of milk production density and market infrastructure.

Omamo (1998) used the transaction costs approach to determine households' decisions to rather devote resources to low-yielding food crops than to cash crops with higher market returns in the Siaya district in Kenya. The analytical results and simulations used indicate that transport costs matter and are sufficient to explain the cropping choices in a deterministic setting. The results imply a particular spatial configuration of the production pattern, in that relatively more land is devoted to cash crops and less to food crops the closer the households are to markets. Fafchamps (1992) in his study of cash crop production found similar results when he looked at food price volatility and rural market integration. The study found that whereas better roads and transportation tended to equalise price movements across a larger regional and even international market, the food prices become increasingly dissociated from local supply and demand conditions. Further, Minot (1999) also found that transaction costs (particularly transportation costs) not only decrease market surplus but that they can substantially reduce the elasticity of supply and demand.

The use of the transaction costs approach to inform action is not limited to crop choice, but has been empirically applied in the choice of livestock marketing channels (Hobbs, 1997). The study revealed that some transaction costs variables (such as grade uncertainty, risk of not selling, time spent at the auction) were a significant factor affecting the choice of either live-ring auction direct-to-packer sales. A similar study by Mathye *et al* (2000) addresses the choice of marketing channels for smallholder farmers producing bananas and mangoes in some areas of the Northern Province and found that not all farmers sell their product. Those who do sell tend to use different channels such as a fresh produce market, an achaar market and direct sales to consumers. Different factors affect the choice of the market channel, but the study found that problems of transport, searching for markets and education tend to influence participation.

Gabre-Madhin (1999) addressed another side of the output markets by focusing on the transaction costs in the choice of market institutions such as grain brokers in Ethiopia. In this case traders first choose where to trade and then choose whether to use a broker to search on their behalf. The study found that high transaction costs shown by traders' individual rationality in selecting brokerage is linked to increased broker use, while high social capital reduces the use of brokers. Social capital or networks play an important role in the resolution of dispute among traders, that is, trust-based relationships are the dominant contract enforcement mechanism among traders (Fafchamps and Minten, 2001). Fafchamps and Minten measured social capital in terms of the number of relatives in agricultural trade, the number of traders known, the number of people who can assist, the number of suppliers known personally, as well as the number of clients known personally. Using the value of annual losses due to theft as a proportion of annual sales, their study sought to analyze property rights in the Malagasy flea market. They found that the incidence of breach of contract is low, and losses resulting from such instances are small. Traders preferred to depend on trust-based relationships for contract enforcement, rather than rely on formal legal institutions such as the police and courts. Ostensibly, the costs of involving

the justice system are more problematic for grain traders than legal risk and delays are.

In their study on investments, governance structures, and prices in evolving markets, Beckmann and Boger (undated) use case studies of hog transactions in Poland to determine factors influencing the contracts used. These studies also show distinctions between different groups in production behaviour. Following the TCE, the results show four groups with similar marketing behaviour. The first group did not invest significantly, traded on spot markets and received a relatively low price. The second and third showed significant investments, and secured their investments either through neo-classical or relational contracts and received significantly higher prices. However, the fourth group of hog farmers with high, focused investments in production did not receive higher prices and did not obtain a safeguard of their investment through contracts.

2.4.2 Transaction costs in input markets

Most of the early empirical evidence of transaction costs involved credit provision. For example, Ahmed (1989) compared transaction costs of borrowing from formal and informal sources in rural Bangladesh. The study found that transaction costs resulting from loans from formal lenders are higher than those of loans from informal lenders are. He further concluded that transaction costs per unit of loan decrease with loan size, and also that this was much faster for formal than for informal loans. These conclusions are in line with Saito *et al*'s (1981) findings that rural banks tend to have much lower administrative costs since many of them are owned and managed by those who were originally the local moneylenders. This leads to the conclusion that the relatively low transaction costs of the rural banks' lending operations clearly indicate that this kind of institutionalisation of the informal sector is an appropriate way of extending credit to the small-scale sector.

Other studies in finance focus on the transaction costs for the borrower (Zander, 1992). According to Gunawardena (cited in Zander 1992) used travelling costs,

opportunity costs of labour, interest payments and other expenses as components of transaction costs. He found the rather puzzling result that the transaction costs for borrowers from formal banks were considerably lower than for customers of moneylenders and traders. In contrast with this, Herath (1989, cited in Zander, 1992) found that loans are advanced by informal sources at a proportion of the transaction costs of formal lending. Zander (1992) carried out a comparative analysis, which suggested that the distance between households and financial intermediaries did not influence the borrowers' decision for or against certain lenders. Instead, other factors, such as the nature of collateral, loan amount and the speed of transaction tended to be influential.

Other substantial work in the area of credit market is due to Cuevas (1988a, 1988b), and Cuevas and Graham (1986). They set out to investigate the role of transaction costs attached to borrowing as a rationing mechanism in agricultural credit markets in developing countries. The results suggest that the loan amount, interest rate, and loan source are significant determinants of the level of transaction costs. Transaction costs as a percentage of the loan amount tended to decrease with loan size, and decline with increases in interest rate. They are higher for private bank loans than for development bank loans. It is clear that the transaction costs of borrowing play an important role as implicit factors in determining prices in rural credit markets.

Other studies considered other input markets such as the use of fertiliser (Strasberg *et al*, 1999; Zaibet and Dunn, 1998), mechanisation, and labour (Zaibet and Dunn, 1998). Zaibet and Dunn used size and ownership of land, regional location, number of plots, and existence of annual crops as proxies for transaction costs. The study was set up to test the proposition that larger family ownership systems, as opposed to restricted family ownership systems, and farm size are sources of increased risk aversion and transaction costs, and factors in market participation. Only in the case of the fertilisers it was found that the nuclear family ownership system was found to have a significant and positive correlation with fertiliser purchasing. In the case of mechanisation and labour hiring, the estimate of ownership was positive but not significantly different from zero. A large farm size was found to be significantly and

positively correlating to mechanisation and labour use. According to Strasberg *et al* (1999) the use of fertiliser nutrients depended mainly on the distance to a motorable road, assets such as the value of agricultural equipment owned, value of the livestock owned, and human resource factors.

The transaction costs are also prevalent in input markets, whether the focus is on capital (credit), mechanisation or fertiliser, land or labour. Generally ownership of assets tends to influence the participation in such markets.

2.4.3 Transaction cost factors

There are two approaches to studying transaction costs (Hirsch *et al,* 1996): either as explanatory factors to explain certain behaviour (according to Williamson), or as a response variable affected by a range of factors (according to North). The latter is discussed in the subsequent paragraphs.

Since transaction costs are sometimes unobservable, several authors use household characteristics to measure their contribution to transaction costs. A number of empirical results have emanated reflecting the process of capturing these costs. This is applicable since market failure is household-specific (de Janvry *et al*, 1991; Goetz, 1992) as well as commodity specific (Delgado, 1999; Grosh, 1994; and Key *et al*, 1999).

A major element of transaction costs relates to *market information.* These are costs associated with lack or access to sources of market information. It has been found in Abdulai and Delgado (1999) that the decline in the cost of information and transport flows as a result of a good infrastructure reduces transaction costs. Strasberg *et al* (1999) found that increased human capital has significant positive effects on the effective use of inputs since the chances are that better management skills are available, and thus there is a greater propensity to seek information on operations of the market.

The access to information has been viewed in different ways in the literature. For example, Makhura (1994) defined access to information amongst others as having the opportunity of listening to the radio for agricultural information. The study found that access and use of such information differentiated between farmers selling more agricultural produce from those who are selling little. He and Yang (1999) found that farmers in some regions of China obtained their market information a) from neighbours or friends (31%), b) from TV, newspaper or magazine (20%), and c) through carrying out investigations on markets (13%). In all these cases the transaction costs were lowered as a result. The study by He *et al* (1991) posed that the actual costs of accessing such information were generally very low. These farmers did have high transaction costs caused by a small transaction scale, outdated information, and a disorderly marketing system.

2.4.4 Previous studies in South Africa

The application of TCE in South African research into agriculture has not really taken off. So far only few studies have addressed the issue of transaction costs directly. Perhaps the one study that attempted to provide a measure of transaction costs was advanced by Fenwick (1998) and Fenwick and Lyne (1998) who computed a transaction costs index from variables reflecting gender and education of the head of the household, length of residency, migrant workers, district dummy as well as ownership of a car. The index is computed as the standardised values of each variable in the index as the sum of gender and education, plus length of residency and the log of migrants. This sum is deflated by a district dummy and car ownership. The results suggested that high transaction costs faced by rural households limit their access to formal credit markets.

Some studies used proxy variables to indirectly assess the effects of transaction costs. Most of the studies pertaining to market access of small-scale farmers tended to identify factors that affect agricultural market access. Although not formally referred to, some of these factors tended to reflect the transaction costs. For example Makhura (1994) determined factors affecting commercialisation of small-scale farmers in the former Kangwane area of Mpumalanga. The study suggested

that access to agricultural information, the use of formal marketing channels and information management were distinguishing factors indicating that farmers belonged to one group, as compared to another, on the basis of their market participation. These factors, however, were not significant for determining the level of their participation. Other factors relating to assets, location factors and household structure significantly affected both association with particular groups, as well as the level of market participation.

There are currently a few ongoing studies in South Africa, which show there are some emerging patterns. The study by Karaan (1999) was set to describe the transaction costs associated with mussel mariculture in Saldhana Bay. This study aimed at identifying an appropriate farm model. Four models were compared and agricultural franchising was found to be the most suitable model since the advantages of the efficiency of small-scale production are retained while high transaction costs are circumvented through a more effective vertical integration.

The other study by Matungul (2000a) examines household decisions relating to the sources of purchased food in two KwaZulu-Natal districts. The results show that the vast majority of respondents engage in both personal and impersonal transactions, and that between 30 and 40% of the respondents purchase staple foodstuffs from neighbours. Most households purchased food in towns where they had formal bank accounts. Outlets without banking facilities and supermarkets were avoided. Matungul's study further aims to assess the marketing patterns for crops and vegetables in the study area (Matungul, 2000b).

Research by Mathye *et al* (2000) and Mathye (2001) apply the transaction cost problem to market access in the Northern Province. These studies seek to determine how transaction cost factors influence farmers choice among marketing channels for mangoes and bananas. The current study differs from Mathye (2000; 2001) and earlier efforts in South Africa by showing that households face a two-stage decision problem in accessing output markets. The first decision is whether or not to trade (depending on fixed costs of market participation), and the second is how much to trade, which sets the conditions for participation as a seller.

2.5 SUMMARY

This chapter has provided a literature review of the role of transaction costs in smallholder agriculture. In fact, it attempted to explain different reasons for smallholder farmers not to participate fully in agricultural markets. TCE asserts that farmers will not use the markets when the value of participating is outweighed by the costs of undertaking the transaction. Transaction costs emanate from different sources. Generally these are household, location and commodity specific. These costs can be distinguished as observable costs, such as transport and administrative costs, and unobservable costs, such as cost of information and contract management.

In the literature the general impression is conveyed that the empirical development of the transaction costs approach has not kept pace with the theoretical development. Even though there is some development, at present merely theoretical models to analyse smallholder farmers' behaviour exist and major development is needed. In general, the practice is to apply neo-classical principles to develop transaction costs models for smallholder systems. Recently, there has been an avalanche of studies trying to contribute both to the theory and empirical understanding of transaction costs. In South Africa, however, such studies are still very limited.

This study attempts to add to the theoretical, but most importantly, to the empirical analysis of transaction costs behaviour of smallholders. In the subsequent chapters, the theoretical and empirical models will be developed to analyse the data collected in the Northern Province of South Africa.