

**Trader Behaviour and Performance in Live Animal Marketing
in Rural Ethiopian Markets**

Mohammad A. Jabbar

International Livestock Research Institute

PO Box 5689, Addis Ababa, Ethiopia

Samuel Benin, Eleni Gabre-Madhin, Zeleka Paulos

International Food Policy Research Institute

2033 K. Street, N.W., Washington D C 20006-1002, USA

Poster paper prepared for presentation at the International Association of Agricultural Economists conference, Gold Coast, Australia, August 12-18, 2006

©Copy right 2006 by Mohammad A Jabbar, Samuel Benin, Eleni Gabre-Madhin and Zeleka Paulos. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that the copy right notice appears on all such copies.

Introduction

Well functioning markets facilitate easy conversion of products to cash, which further facilitate other exchanges of goods and services required for increased production and consumption. Markets promote specialisation and increased productivity and growth through realisation of comparative advantage and accessing regional and global markets.

Commercialisation and market expansion are essential for exploiting the potential of any commodity in the economic development process. Commercialisation implies greater demand for inputs, information, credit and other services including rules and norms for arranging contracts and their monitoring and enforcement to facilitate exchanges. Where one or more these supporting institutions are either absent or costly, exchanges either do not take place or are very limited (North, 1990; Nabil and Nugent, 1989). However, any particular institution, narrowly defined, may not be indispensable for market development and growth rather very different institutional structures may reasonably substitute for each other, both in dissimilar as well as similar contexts (Engerman and Sokoloff, 2003). The problem then is to identify the appropriate institutional form(s) for market development for a specific commodity in a given social, economic and political setting.

Ethiopia has a large livestock population performing multiple functions in the economy but potential contribution of the sector to the economy is not fully exploited due to problems related to both domestic and export markets. Some studies have described the structure of livestock marketing as consisting of four tiers or layers from producers to consumers (Kebede *et al.*, 1988; Kebede and Lambourne, 1985); others have shown that price differences between markets could be explained by transfer costs (Andargachew and Brokken, 1993) but a recent study shows that prices differ significantly between seasons and intermarket price differences are significantly influenced by presence or absence of export buyers and processors, among other things (Ayele *et al.*, 2005). But little is known about how the different layers actually function,

how market actors at different layers gather and exchange information, interact, negotiate and effect transactions, settle disputes, how costly and effective the transactions are, how effectively consumer prices are transmitted to producers and who benefits how much from market transactions, what kind of organizational and institutional arrangements support or hinder these transactions. Once trade linkages expand beyond local level across space and time, transaction costs related to monitoring and enforcement increase sharply, and the local social network or relationship needs to be replaced and complemented by formal organizations and institutions enforced by the state (North, 1989).

Traders perform a key role in the Ethiopian livestock markets linking rural producers with rural and urban consumers. In this paper, performance of a sample of traders in terms of their costs and margins were assessed, how these were influenced by their assets and trading practices were analysed, and the implications of the findings for policy were outlined.

Traders' Performance : A Conceptual Framework

It is generally well known that in a competitive market a trading firm's temporal or spatial arbitrage performance depends on its financial, physical and human capital as well as its ability to minimise costs. There are physical marketing costs, e.g. transport and storage, and transaction costs that arise from the coordination of the exchange among relevant market agents and include the costs of obtaining and processing market information, negotiating contracts, monitoring agents and enforcing contracts. Transaction costs are unique and specific to individual market agent, so each agent in the market conducts transactions on the basis of his/her own costs. When transaction costs are very high, market become thin or even fail (North, 1989; Hoff and Stiglitz, 1990; Williamson, 1985; Gabre-Madhin, 2001).

In some recent studies, the role of social capital in reducing transaction costs has been emphasized under the conditions of imperfect markets, weak property rights and contract enforcement conditions. It is argued that social capital creates trust among economic agents

which helps to reduce transaction costs and improve profit margins (Fafchamps and Minten, 1999; Kranton, 1996, Landa, 1994). To these, Gabre-Madhin and Negassa (2004) have added the role of trading practices in trading performance. They define trading practices or the way exchanges are conducted as observable market behavioural outcomes of underlying market institutions. Market institutions encompass ‘rules of the game’ – rules and laws, informal norms, formal and informal organisations and associations. These institutions may determine trading practices with respect to, among others, mode of purchase and payment, inspection of goods, negotiation and enforcement of contracts, contract violations and means of settlement. Some examples of trading practices include use of regular suppliers and customers, and brokers/agents for purchase and sale, volume of purchase and sale through regulars and agents, cash or credit purchase and sales etc. Trading practices may also be determined by type and composition of assets as firms operating under the same set of underlying market institutions often do not follow similar trading practices. In turn, trading practices may impact on traders’ performance through its influence on transaction costs. However, most trading practices are observable and measurable in some form but most transaction costs may not be observable and measurable.

Thus, the relationships between trading performance, assets, trading practices and transaction costs outlined by Gabre-Madhin and Negassa (2004) may be specified in the following way:

$$(1) Y = f(A; T, C),$$

$$(2) A = f(M, K, H, S),$$

where Y is a measure of performance of a trader (volume of business, margin or profit); A represents assets; M, K, H, S are respectively measures or proxies of physical, financial, human and social capital; T is some indicator of trading practice(s) and C is transaction costs. Thus, a trading firm’s performance can be measured by profit subject to fixed resources, trading practices and costs. However, in empirical specification of any model to estimate

parameters of these variables, two aspects need to be remembered. First, if Y is influenced by A only because of their impact on T, then inclusion of T in an equation will result in insignificant coefficients for A because of the existence of multicollinearity between T and A. However, if all trading practices that matter can't be identified and defined in the function, then inclusion of both T and A may not hamper results. Second, since T influences C and Ts are more easily observable and measurable than Cs, Ts may be considered as proxies for Cs. In this paper we use this framework for assessing the performance of traders in live animal marketing in rural Ethiopian markets.

Data source and general characteristics

A sample of 26 primary and 12 secondary rural livestock markets in the Tigray, Amhara and Oromiya highlands were surveyed in 2002. Primary markets were defined as those serving local communities and an assembly point for supplying animals to secondary markets. Tertiary or terminal markets were not present in any of the districts surveyed. Each livestock market was located on one side of larger multi-purpose market. In some secondary markets, there could be some fence or other demarcation mechanism to separate the livestock section from other commodity sections. Some primary markets met once a week, while other primary markets and all the secondary markets met twice a week on designated days. From the 38 livestock markets, 131 traders were selected: 63 (48%) were mainly or exclusively cattle traders and 68 (52%) were mainly or exclusively shoat traders. Most of the traders operated in more than one market. Data were collected using structured questionnaires on general characteristics of the traders, their assets and business practices and detailed information on their arbitrage behaviour, transaction costs and margins with respect to the most recent completed purchase and sale transactions.

The sample traders were generally young and they came from varied occupational backgrounds with only a few with either own or family background in trading. Most traders

started business themselves with own capital as access to credit, especially formal credit, was limited. The livestock market was characterised by non-standardised products and lack of information in the public domain about supply, demand and prices, so trading was largely a personalised business though intermediaries, especially brokers, were used by about 28% traders for trading in distant markets and they conducted about 48% of volume of transactions through brokers. Traders also used a network of intermediaries, especially regular buyers and sellers, a form of social capital, with whom they had business relationships principally based on trust and without strong ethnic, religious or family ties. About 27% of the traders had regular suppliers and 37% had regular customers. Personal observation through physical presence was the dominant mechanism to gather information on price, supply and demand in local markets: about 85% and 57% of traders obtained price information in local and distant markets in this manner. Formal sources (radio, television and newspapers) were used by a few for national and export market related information.

Even though most transactions were conducted in physical presence of parties, contract violations were common, especially in case of credit transactions: sample traders experienced on average 23 contract violations per trader in 12 months preceding the survey. Most of these were resolved through informal negotiations as formal courts or other formal organisations were not easily accessible for quick resolution of disputes. Theft of animals either from stocking yards or en route to market was a major problem of property rights: 40% of the sample traders suffered from theft of animals during 12 months preceding the survey and they lost on average Birr 1345 (\$157) per cattle trader and Birr 523 (\$61) per goat trader. Traders adopted various non-conventional means to avoid losses from this problem. In case of most recent transactions, 56.5% of the traders traded goats and 43.5% traded cattle (14.5% traded *yefarang*¹, and 29% traded other cattle). Forty six and 42% of cattle and goat traders earned negative gross margin (gross revenue - variable costs) of different

¹ A local expression used to refer to fattened and/or crossbred/exotic animals.

magnitude; the average gross margin was -14% and -4% for cattle and shoat traders respectively. The structure of variable costs shows that transport (22%) travel (18.2%), market levies (15.9%) and feeds and water (14.9%) were major items of cost for cattle traders while these items accounted for 11.9, 20.5, 16.1 and 30% of cost for shoat traders. Net profit was not calculated because adding fixed cost, especially capital cost for the search period of holding stock, would further reduce the gain or increase the losses as the case may be.²

Explaining trader's performance : Empirical model

Profit is the ultimate objective of a firm though performance can be assessed by volume of business or cost per unit. In the present study, profit was not calculated as explained above. However, gross margin is a measure of return on own labour and capital, so can be a good indicator of business performance as minimisation of variable costs will lead to increased gross margin. Also variable costs may be influenced by various factors including assets and trading practices. Therefore, both variable cost and gross margin per traded animal were considered as indicators of performance and a model of the following form was used to identify their determinants:

$$(3) \quad VC/\text{animal} = f(\mathbf{X}_1, \mathbf{C}_1, e_1)$$

$$(4) \quad GM/\text{animal} = f(\mathbf{X}_2, \mathbf{C}_2, e_2)$$

where \mathbf{X} is a set of qualitative (discrete) variables each with more than one category, \mathbf{C} is a set of quantitative variables (covariates), and e is an error term. \mathbf{X} and \mathbf{C} include asset variables, variables representing trading practices as proxies for transaction costs (as trading practices were observable and measurable but most transaction costs were not), and other general variables. Two specifications of equation 4 were estimated : (a) \mathbf{X}_2 was the same as

² However, the apparent negative and low returns could be due to over-reporting of costs or under-reporting of prices or reporting transactions on which margins were low, or these transactions took place at times when the market in general was low. More such case studies might provide clearer answers.

X_1 assuming that the variables that were significant in equation 3 would serve as proxies for variable cost, (b) the variables in X_1 that were statistically significant at least at 10% level were excluded and VC/animal was included as an explanatory variable in order to avoid problems of endogeneity.

Double log formulation could give direct estimates of elasticities but could not be used as gross margin was negative in a good number of cases. So, GLM procedure in SPSS V.12 was used to estimate parameters separately for cattle and shoats as it gave better fits than OLS. For equation 4, option b gave better fits though both options have been used for interpretation of results (Table 1 and 2).

The set of variables significantly influencing unit cost and margin, and in some cases the nature of influence, varied between cattle and shoat trade. The model for cattle explained 54% of variation in variable costs and 62% of variation in gross margin (Table 1). Other things being equal, none of asset variables- human, financial or social- significantly influenced unit variable cost but size of working capital significantly reduced unit gross margin and non-specialisation in livestock trade and number of workers engaged in trade significantly increased unit margin. Theoretically larger working capital would normally be expected to permit larger volume of business and economy of scale and specialisation in livestock trade would be expected to generate better profits due to better knowledge and skills in trade negotiations, therefore the coefficients of these variables were contrary to expectations. The significant positive effect of labour and negative impact of working capital on margin indicate the relative importance of labour in the highly personalised business and the need for personal involvement in collection of information, searching buyers and sellers, making negotiations, ensuring contract enforcement – all of which may increase unit cost and reduce margin. Borrowing and knowledge about a larger network of traders and brokers did not have any significant effect on unit variable cost or gross margin.

Table 1. Determinants of variable cost and gross margin per cattle

Variables	Variable cost	Gross margin 1	Gross margin 2
	<i>B(St error)</i>	<i>B(St error)</i>	<i>B(St. error)</i>
Intercept	109.963 (141.482)	-18.927 (194.687)	-106.383 (187.053)
Asset variables			
Schooling of trader (years)	0.437 (4.692)	4.446 (6.668)	-2.606 (6.756)
Business age/experience (yrs)	-2.969 (4.045)	3.619 (5.890)	-6.080 (5.793)
Occupation other than livestock trade (yes=1, no=0)	-81.986 (57.111)	229.168*** (77.669)	181.472** (79.018)
No of workers	-64.223 (49.279)	108.072* (65.771)	161.332** (73.466)
Working capital (birr)	0.002 (0.002)	-0.009*** (0.003)	-0.006** (0.003)
Borrowing (no=0, yes=1)	-25.225 (80.668)	33.898 (101.322)	126.522 (112.614)
N of traders/brokers known	0.000 (0.426)	-0.471 (0.533)	-0.473 (0.574)
Trading practices variables			
Purchase/sale to regulars (no=0, yes= 1)	-7.197 (67.931)	-92.844 (84.364)	-152.105** (78.231)
Use of broker (no=0, yes=1)	263.389*** (87.629)	-236.819** (118.527)	na

Purchase and sale market distances (km)	0.641* (0.357)	0.073 (0.494)	na
Days between purchase and sale	14.881*** (3.094)	-16.213*** (3.874)	na
Other variables			
Variables cost/animal (Birr)	na	na	-0.744*** (0.168)
Cattle type (other =1, <i>yefrang</i> = 0)	123.685* (73.653)	29.586 (100.505)	217.034** (85.226)
Market traded (primary =0, secondary =1)	-92.614 (77.785)	-87.050 (114.504)	234.728** (109.917)
Oromiya region ⁺	2.912 (89.193)	180.673 (111.681)	121.550 (116.214)
Amhara region ⁺	61.690 (116.320)	68.041 (145.646)	230.222* (135.14)
R ²	0.54	0.56	0.62
Adj (R ²)	0.36	0.37	0.56

+ Tigray region is the base

***, ** and * indicate significant at 1, 5 and 10% levels using Bonferroni confidence interval.

Source: Field survey and authors' estimates

Among the variables related to trading practices, use of brokers in purchase or sale transactions and longer temporal arbitrage significantly increased unit cost and reduced gross margin; purchase and sale to regulars had no significant effect on unit cost but significantly reduced unit gross margin. Longer spatial arbitrage significantly increased unit cost and indirectly contributed to lower margin. In theory, use of brokers and business with regulars

are supposed to reduce unit cost by minimising transaction cost, especially search, negotiation, contract violation and settlement costs. However, if these functions can't be done personally due to labour constraint so brokers and regular buyers and sellers are used, then chances of making less margin compared to personalised business with larger labour input (see above) could be high. Compared to *yeferang*, both unit costs and gross margins were higher for other local cattle perhaps because unit costs for *yeferang* were far too high in relation to the final revenue.

Although unit costs were not significantly different between trading activities in primary and secondary markets, unit margins were significantly higher in the secondary markets perhaps because of better price margins between primary and secondary markets. Unit costs did not vary significantly between the three regions but unit margin was mildly significantly higher in Amhara region.

The model for shoats explained 35% of variation in variable cost and 78% of variation in gross margin per unit (Table 2). Other things being equal, among the asset variables, larger size of working capital significantly reduced unit cost and increased unit margin, which would be expected, but knowledge about a larger network of traders/brokers significantly increased unit cost and reduced margin. In case of the latter, perhaps the knowledge about a large network was not conveniently used to reduce costs or get better prices by gathering information, making negotiations, enforcing contracts, minimizing contract violations and settling disputes. It was shown earlier that students and some better educated people were engaged in livestock trade, this could be mainly due to lack of alternative job opportunities. However, education level did not affect unit cost but significantly reduced unit margin, indicating that perhaps in the rural market environment, formal education might not confer any particular advantage. Business experience and number

Table 2. Determinants of variable cost and gross margin per shoat

Variables	Variable cost	Gross margin 1	Gross margin 2
	<i>B(St.error)</i>	<i>B (st. error)</i>	<i>B(St.error)</i>
Intercept	-17.151 (22.226)	8.462 (24.402)	-5.689 (14.682)
Asset variables			
Schooling of trader (years)	0.118 (0.579)	-0.721 (0.636)	-0.618* (0.354)
Business age/experience (yrs)	0.226 (0.525)	-0.066 (0.576)	0.007 (0.331)
Occupation other than livestock trade (yes=1, no=0)	7.643 (7.270)	-10.226 (7.981)	-2.174 (4.778)
N of workers	-2.060 (2.913)	1.787 (3.199)	-0.079 (1.842)
Working capital (Birr)	-0.001* (0.000)	0.001*** (0.000)	na
Borrowing (no=0, yes=1)	1.983 (7.886)	-2.207 (8.658)	-2.178 (5.158)
N of other traders/brokers know	0.184*** (0.067)	-0.228*** (0.074)	na
Trading practices variables			
Regulars used in purchase/sale (no=0, yes=1)	-10.293 (7.095)	15.472** (7.790)	4.686 (4.573)
Broker use in purchase/sale	-5.085	-2.011	-3.638

(no=0, yes=1)	(12.374)	(13.586)	(7.951)
Purchase and sale market distances (km)	0.115*** (0.040)	-0.142*** (0.044)	na
Days between purchase and sale	-0.083 (0.169)	-0.101 (0.186)	-0.176 (0.110)
Other variables			
Variable cost/animal (Birr)	na	na	-0.959*** (0.079)
Market traded (Primary =0, secondary = 1)	1.122 (8.517)	-9.448 (9.351)	-3.686 (5.094)
Oromiya region ⁺	-4.335 (13.522)	-12.155 (14.146)	-15.944* (8.844)
Amhara region ⁺	-15.517 (13.282)	-0.684 (14.583)	-14.280 (8.817)
R ²	0.35	0.41	0.78
Adj R ²	0.19	0.26	0.73

⁺ Tigray region is the base

***, ** and * as in table 9.

Source: Field survey and authors' estimates

of workers engaged in the business did not significantly influence unit cost or margin. The insignificance of labour may be partly because of the fact that compared to cattle, a single person can handle a larger number of shoats, so economy of labour economy may not show until the number of animals handles is fairly large.

Among the variables related to trading practices, use of regulars in purchase and sale had no effect on unit cost but significantly increased margin; but broker use had no significant effect on unit cost or margin. Longer spatial arbitrage significantly increased unit

cost and reduced unit margin but longer temporal arbitrage did not affect unit cost or margin. Unit cost and margin did not differ significantly between primary and secondary markets or between the three regions but unit margin was mildly significantly lower in Oromiya.

Summary and conclusions

A survey on 131 livestock traders in 38 rural primary and secondary markets in the highlands of Ethiopia in 2002 provided data for assessing trader performance. Estimated costs and margins of recently completed transactions showed low returns and losses on investment in about 40-45% cases. Analysis of the structure of variable costs showed that most costs were physical marketing costs. Multiple regression analyses using variable cost per animal and gross margin per animal traded as indicators of performance showed that traders' financial and human capital, especially labour, and trading practices like use of brokers and regular suppliers and customers as proxies for transaction costs had significant effects on costs and margins with some differences between cattle and shoat trade.

Unstable price, multiple taxes, non-transparent tax system, limited access to credit and weak demand for the products traded were perceived by traders as major problems of marketing, all of which are amenable to public policy for improving the market environment and marketing efficiency. Inadequate market information, infrastructure, government support, and existence of unlicensed traders and weak legal system, were mentioned as problems by very few traders. Alleviating these constraints along with improving market information and upgrading marketing infrastructures will potentially increase the welfare of smallholder producers and urban consumers. Rationalising taxes will improve traders' income and that will allow them to offer better prices to producers. Also more trader awareness about market demand and price will increase their ability to transmit information to producers to improve production, both in terms of quantity and quality, thereby benefiting consumers.

Price instability for crops is a major problem affecting food security, poverty alleviation, agricultural growth and overall performance of the economy. Given strong

linkages between crop and livestock production and marketing decisions, the issue of price stabilisation needs to be addressed simultaneously for both crop and livestock sub-sectors.

Acknowledgements : The authors are grateful to the Governments of the Netherlands and Italy, and ILRI for funding, Wolday Amha for fieldwork supervision, Elias Mulugeta for assistance in data analysis, Belachew Hurrissa and Teressa Adugna for comments on an earlier draft. Usual disclaimer applies

References

- Andargachew, K., Brokken, R.F. 1993. Intra-annual sheep price patterns and factors underlying price variations in the central highlands of Ethiopia. *Agric. Econ.* 8, 125-138.
- Engerman, S. L., Sokoloff, K. L. 2003. Institutional and non-institutional explanations of economic differences. Working paper no 9989, National Bureau of Economic Research, Cambridge, MA., USA.
- Ayele, G., Jabbar, M. A., Teklewold, H., Mulugeta, E., Kebede, G. 2005. Seasonal and inter market differences in prices of small ruminants in Ethiopia *J. Food Products Marketing.* 12(4), in press
- Fukuyama, F. 1995. Social capital and the global economy. *Foreign Affairs* 74(5),89-103.
- Gabre-Madhin, E. 2001. Market institutions, transaction costs, and social capital in the Ethiopian grain market. Research Report 124, International Food Policy Research Institute, Washington, DC, USA.
- Gabre-Madhin, E., Negassa, A. 2005. Linking trading practices and arbitrage behaviour in the Ethiopian grain market. Mimeo.
- Greif, A. 1993. Reputation and coalitions in medieval trade : evidence on the Maghribi traders. *J. Econ History* 49(4), 857-882.
- Hoff, K., Stiglitz, J. 1990. Introduction: Imperfect information and rural credit markets – puzzles and policy perspectives. *World Bank Econ Rev.* 4(3), 235-250.

- Kebede, B., Lambourne, L. J. (eds.). 1985. The status of livestock, pasture and forage research and development in Ethiopia. Proc workshop held in Addis Ababa, Ethiopia, 8-10 January 1985. Institute of Agricultural Research, Addis Ababa, Ethiopia.
- Kebede, Z., Sintayehu, G M., Airey, J.L., Paul, I., and Schildkamp, M.A. 1988. The livestock marketing information service: Its structure, method, goals, and the possibilities it offers the end users. Proc. Second National Livestock Improvement Conference, IAR, Addis Ababa, 24-26 February 1988. pp. 111-114
- Nabil, M K., Jeffrey, N. 1989. The new institutional economics and its applicability to development. *World Dev*, 17(9), 1333-1348.
- North, D. C. 1989. Institutions and economic growth – an historical introduction. *World Dev*. 17(9), 1319-1332.
- North, D C. 1990. *Institutions, institutional change and economic performance*. Cambridge University Press, Cambridge, UK.
- Williamson, O. 1985 *The economic institutions of capitalism*. Free Press, New York.