Analyses of markets and value chains for chickpea in Ethiopia

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Abstract

Chickpea is one of the main annual crops in Ethiopia both in terms of its share of the total cropped area and its role in direct human consumption. Improvement in productivity and subsequent effective marketing of chickpea produce in potential producing areas can be a major milestone in the fight against poverty in the country. The study has found that inadequate horizontal and vertical linkages among chickpea market participants, limited participation in valued addition and processing and limited access to information, credit and related business services continue to stifle the marketing system. Addressing these issues along the supply chain requires interventions at different levels, ranging from improving productivity, quality, reliability of supply, and the direct and indirect costs of marketing.

Key words: Chickpea, value chains, market participants, Ethiopia

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Introduction

Ethiopia is one of the sub-Saharan countries of Africa which liberalized their economies and developed poverty reduction strategies that underpin market-led strategies for broad-based agricultural development and economic growth. In particular, the liberalization of the Ethiopian grain economy has undergone successive adjustments in lifting restriction on private trade, rejection of government trading monopolies and removing official price setting (Dadi et al., 1992; Gebremedhin, 2001). While the agricultural development policy of Ethiopia is designed to support market-led agricultural development, competitiveness of smallholder producers and commercialization of small-scale production depends on the development of viable and remunerative market linkages. Competitiveness in globalizing markets is particularly important for exportable (tradable) high value crops and livestock products. Some of the major factors that limit competitiveness and lead to market imperfections are related to high marketing costs resulting from high transaction costs and poor market infrastructure, low marketable surplus and poor quality products that do not meet market preferences (de Janvry et at., 1991; Minten, 1999; Fafchamps, 2004; Fafchamps and Gabre-Madhin, 2006).

The globalizing markets demand consistent supply of higher quality products that meet new standards for food quality and safety and hence increase the comparative advantages of large scale commercial farmers, processors and supermarket chains. Small and medium scale operators and smallholder farmers that supply them find it difficult to penetrate and exploit international markets which require value added products, in situations where local capacity and participation in the value addition process is limited by insufficient innovative product development and diversification to meet market requirements. The full exploitation of opportunities presented by these markets will require development of innovative market linkages and addressing specific consumer needs and diversification of agricultural products. This means that while the removal of trade barriers and increased competition has opened some flexibility for farmers to choose buyers for their products and suppliers of key inputs, the structure and performance of emerging rural markets remains to be a concern for accelerated commercialization of smallholder agriculture. High transaction costs and problems of asymmetric information continue to bedevil smallholder farmers, especially those with poor access to markets for products, inputs and services. These factors deprive farmers the underlying incentives to produce and supply quality and differentiated products with desirable market traits in addition to their inability to penetrate high value niche markets (Jones et al., 2002). This indicates that

small-scale farmers growing low quality products are unlikely to exploit market opportunities as they cannot attain the required grades and standards and achieve the necessary economies of scale in competitive markets.

One of the key policy questions therefore is better understanding of how rural grain markets function in the context of market liberalization and how the emerging architecture of marketing channels determines the flow of outputs and prices among the different participants in the marketing chains. We explore these issues using the case of chickpeas, one of the newly emerging export commodities being promoted for expansion in Ethiopia (Shiferaw et al., 2007). Despite the policy interest to expand chickpea production for exports, there is lack of empirical evidence on the structure, conduct and performance of the chickpea marketing systems in the country. This study attempts to narrow this gap by examining the chickpea marketing system and provides new insights on how the performance of the marketing system may be enhanced to improve competitiveness. Using primary data collected from a survey of marketing channels in one of the major chickpea growing areas in the country (Ada-Liben), we map the marketing channels and value chains for chickpeas and estimate the determinants of prices in the marketing systems.

Conceptual framework

Value chain analysis examines the full range of activities required to bring a product or service from its conception to its end use, the firms that perform those activities in a vertically coordinated chain and the final consumers for the product or service. The activities include design, production, marketing and support to get the final product or service to the end consumer (Kaplinsky and Morris, 2000). In this study we adopt a broader concept of a value chain to assess the constraints and opportunities that underpin the chickpea marketing systems in Ethiopia. The marketing of commodities typically involves many intermediaries: assemblers, wholesalers, retailers, and the ultimate end users (i.e., consumers). The performance of the marketing system of any commodity depends on the organization of its marketing channels. In particular, the number of actors involved and the degree of coordination and information sharing within the channel will determine the marketing costs and margins.

Chickpea production

Chickpea is one of the major pulses grown in Ethiopia, mainly by subsistence farmers usually under rain fed conditions. It is the one of the main annual crops in Ethiopia both in terms of its share of the

total cropped pulse area and its role in direct human consumption. The crop provides an important source of food and nutritional security for the rural poor, especially those who cannot produce or cannot afford costly livestock products as source of essential proteins. The consumption of chickpea is also increasing among the urban population mainly because of the growing recognition of its health benefits and affordable source of proteins. In the export market, chickpea contributes a significant portion of the total value of pulse exports. For example, chickpea constituted about 48% of the pulse export volumes in 2002. During this period of time, the exported volume accounts about 27% of the total quantity of chickpea production while the balance remains for domestic market (Shiferaw et al., 2007). Two types of chickpea, Kabuli and Desi, are currently under production in Ethiopia. Kabuli or garbanzo type is usually large seeded with seed size ranging from 6-8 mm and smooth cream white seed coat color. The production of Kabuli types is currently limited to few pockets, primarily in Eastern Shewa region where access to improved varieties has been promoted through better linkages with the research and extension system. Desi type chickpea, traditionally widely grown in the country, is small seeded with seed size 3 - 6 mm, hard and reddish-brown colored seed coat.

Data and Methods

This study was conducted using Ada-Liben district as the focal reference point in tracing the relevant marketing channels and actors involved, prices and transaction costs in the chickpea marketing system. In terms of market access, Ada-Liben district is located along the main road linking Addis Ababa and Nazareth, making it generally well linked with the main markets in both cities. The capital of the district, Debre Zeit town, also lies on this major highway and offers good market opportunities to the farmers in the district. The district has also a good marketing network with the surrounding districts. A survey was conducted along the value chain that links producers in the primary markets with domestic consumers and exporters in tertiary markets (Addis Ababa and Nazareth). As key marketing reference points, nine major rural markets in the district were identified and included in the survey (*Godino, Tulu Dimtu, Hidi, Dire, Bekejo, Adulala, Wonber*, *Denkaka-ude* and *Dukem*). At the secondary market level, the survey included several wholesalers including one farmers' union (EFU) and retailers in the district town (Debre Zeit). The survey extended to the major markets linked to the district and included Addis Ababa and Nazareth as tertiary chickpea markets. The survey overall included 68 traders in the primary markets, 13 traders in secondary markets and 41 traders in tertiary markets. The average number of assemblers operating in the surveyed nine primary markets is about 37. All the 14 primary cooperatives dealing with chickpeas were included. The survey also included

nine of the 27 wholesalers in Debre Zeit town. Similarly, the survey included nine wholesalers in Nazareth and in Addis Ababa, but the total number of chickpea wholesalers operating in each of these markets was about 43 traders.

Data collected included information on chickpea marketing operations, the number and relative importance of various participants in terms of volume of flow; the profile of market participants and the level of their participation; the flow of information on production and market conditions; the degree of partnership and relationship between buyers and seller; frequency of transactions; the points of transaction in grain buying and selling; quantity and quality of the traded grain or product; seasonality of transactions; the cost of grain handling, cleaning and processing; marketing costs and margins; and information on perceived strength and weakness of the chickpea business operation.

The identified marketing channels are mapped to show the complexity of the marketing structure and to determine the different actors involved and the strength of the linkages in the value chain. It is generally hypothesized that any good is valued for its utility generating attributes where purchasers evaluate product quality attributes when making a purchase decision (Rosen, 1974). Hence, the observed market price is the sum of the implicit prices paid for each quality attributes. However, in most empirical studies, the observed price may reflect not only consumer preferences but also attributes of buyers and sellers (Parker and Zilberman, 1993). Therefore, the market price of chickpea is the sum of the prices purchasers are willing to pay for each characteristic that enhances utility and the characteristics of markets, sellers and buyers.

We use a hedonic type price determination model to identify the role of chickpea quality parameters and the characteristics of markets, sellers and buyers to the observed price of chickpeas along the market chain. The price function for chickpea can then be described as a function of qualitative and quantitative variables as:

$$P = f(X, Z) + e \quad \textbf{(1)}$$

where, P is the observed price of chickpea, X is a set of covariates (quantitative factors), Z is the set of discrete (qualitative) factors and *e* is the error term.

The search for alternative functional forms indicated that a logarithmic specification would be a better fit for the data in estimating the regression parameters:

$$\ell n P = \alpha + \beta \ell n X + \delta Z + e \quad \textbf{(2)}$$

In this format, the coefficient of the continuous variables represents the elasticities for the variables. On the other hand, the estimated parameters of the qualitative characteristics measure the impact of the presence or absence of the discrete indicator variables. For these dummy variables the elasticities are computed as $\varepsilon_i = 100[e^{(\delta_i - 0.5 \operatorname{var} \delta_i)} - 1]$. The interpretation of these elasticity values is the relative change (percentage change) in the dependent variable per change in the independent variable (Garderen and Shah 2002).

Results and Discussion

Socio-economic profile of chickpea traders

The socioeconomic profile of the traders involved in chickpea trading is presented in Table 1. A significant share the chickpea businesses in the primary and secondary markets are run and managed buy family workers; about 79% of the businesses in the primary and 86% of those in the secondary markets have at least one full time family worker while 20% and 14% have less than one family worker, respectively. This compares with about 42% having at least one full time family worker in the tertiary markets and about 17% with less than one family worker. None of the businesses in the primary and secondary markets have more than full time family worker. About 40% of the businesses in the tertiary markets have more than one full time family worker, but only 10% had more than three workers. This shows the small-scale nature of these grain trading businesses both in terms of the volume of trade and the amount of financial and human capital needed to run them. The available data also shows that about 21% of the traders in the primary markets, 77% in the secondary markets, and 34% in the tertiary markets maintain up to five fulltime non-family employees to run the business. However, none of the surveyed traders in the primary markets had more than five hired employees. This compares with about 8% of the traders in the secondary markets and about 50% of those in the tertiary markets who had more than five permanent employees. Some of the larger traders and processors (e.g. East Africa and Fafa) have more than 250 permanent employees, while the Ethiopian Grain Trade Enterprise has more than 1500 employees.

In terms of the gender balance, about 66% of the businesses in the primary markets were either owned or managed by male workers, while female workers account for the remaining balance (34%). The share of the female managers/owners declines substantially as one moves from the primary to the secondary and tertiary markets. This may be a reflection of the capital and other entry barriers that may particularly affect female traders as the volume of trade and degree of specialization increases.

This seems to pick up slightly in the tertiary markets as some of the baltinas and mini-markets are managed or owned by females. As far as the educational level of the managers or owners is concerned, the survey results indicate that on average 10% of the traders were illiterate with this value ranging from 5% in tertiary markets to 15% in primary markets. Interestingly, all the traders in the secondary markets were found to be literate. The most educated traders were found in the tertiary markets where up to 15% had a university level education. In all the three markets, about 43% of traders were found to have secondary level of education.

Table 1. Characteristics of chickpea traders (% of respondents)

Variable	Units	Market type			Total (N=122)
		Primary (N=68)	Secondary (N=14)	Tertiary (N=40)	
Family workers in the business (full time equiv.)	< 1.0	20.6	14.3	17.5	18.9
	1.0	79.4	85.7	42.5	68.0
	2.0	0.0	0.0	15.0	4.9
	3.0	0.0	0.0	15.0	4.9
	4.0	0.0	0.0	2.5	0.8
	≥ 5.00	0.0	0.0	7.5	2.4
Non-family workers (full time equivalent)	0	79.4	15.4	34.1	57.4
	1–5	20.6	76.9	17.1	25.4
	6–25	0.0	7.7	22.0	8.2
	26–250	0.0	0.0	22.0	7.4
	>250	0.0	0.0	4.9	1.6
Sex of the respondent (%)	Male	66.2	100.0	90.0	77.9
	Female	33.8	0.0	10.0	22.1
Education level of the respondent (%)	Illiterate	14.7	0.0	4.9	9.8
	Elementary (1-4)	25.0	7.7	9.8	18.0
	Junior secondary (5-8)	11.8	38.5	12.2	14.8
	Secondary (9-12)	47.1	46.2	34.2	42.6
	College/university	1.5	7.7	39.0	14.8
Role in enterprise	Owner manager	79.4	85.7	55.0	72.1
	Hired Manager/employee	20.5	14.2	45	27.9

When we look at ownership of warehouse facilities about 70% of the traders in the primary markets and 8% in the secondary and 34% in the tertiary markets do not own any storage facilities. The proportion of warehouse ownership seems to vary from 26 to 30% among the different markets. However, less than 3% of those in the primary markets had rented a warehouse, which compares with about 54% in the secondary markets and 22% in the tertiary markets. About 17% of the traders in the tertiary markets reported that they have access to a rented facility while they also have their own

storage. The quality of warehousing facilities is generally very poor except few traders (exporters and processors and the farmers union) who own relatively well maintained and equipped warehouses. Another asset that was examined is the ownership of weighing equipment; about two-thirds of the traders operating in the primary markets do not own a weighing scale. Most of these traders serve as agents of the wholesalers based in the secondary and tertiary markets, hence they use weighing scales provided by their contractors. About 15% of those in the secondary and 22% in the tertiary markets do not also own a weighing scale – indicating that rental of weighing scales is also not uncommon for these groups of traders. The study also found that among the sampled traders, none of the traders in any of the markets specialized on chickpea business alone. In addition, traders in all markets expressed that they get into the chickpea marketing business after they have earned some experience in other grain marketing activities. As in the case of educational skills, the level of experience in chickpea marketing increases as the volume of trade and level of sophistication increases from the primary to tertiary markets. This shows that as traders accumulate capital and essential experience, they tend to climb the ladder – moving from the primary rural markets to tertiary urban markets. It was also observed that about 18% of traders in the tertiary markets had more than 20 years of experience in chickpea business (Table 2).

Table 2. Experience in grain business

Experience, years	Primary	Secondary	Tertiary	Total
Chickpea trading	5.53 (3.44)	7.64 (4.33)	9.56 (12.28)	7.09 (7.79)
Other crops trading	5.72 (3.28)	7.93 (4.10)	12.29 (11.79)	8.13 (7.85)

* Figures in parenthesis represent standard deviation

Market structure and functions of different participants

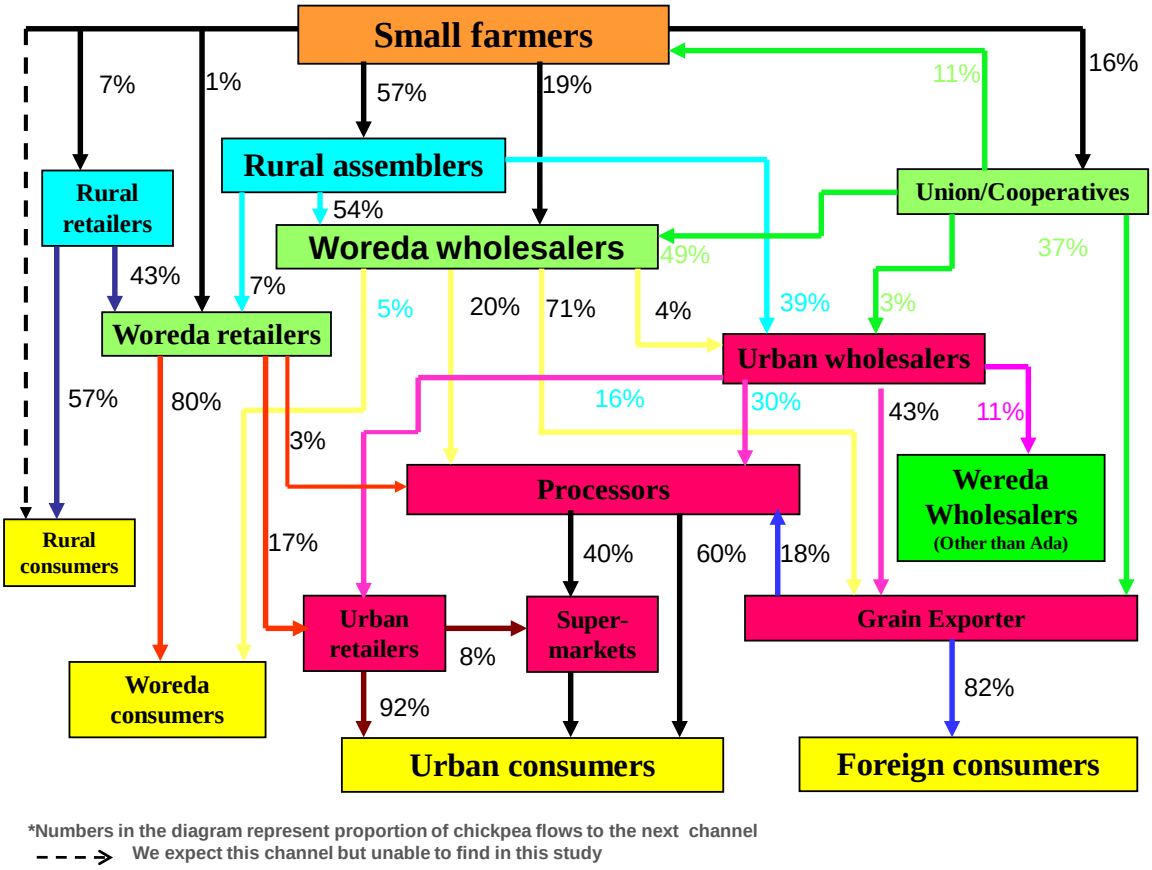
The analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from their origin (producer) to their final destination (Scott, 1995). Marketing of chickpea generally starts with the collection of grains from the farm-gate and village markets (primary markets) moving on to the district towns (secondary markets) and then on to terminal markets in the cities. In the marketing chain the product passes successively through a number of market actors (representing the links in the value chain) before it reaches the end user (Figure 1). The main actors include a network of assemblers, retailers, wholesalers, farmers union, exporters, and processors operating at different levels in the value chain.

A number of grain assemblers and few wholesalers from the secondary markets operate in the collection of grain from the smallholder farmers. About 57% of the marketed surplus is sold to rural assemblers, and about 20% to district wholesalers, 16% to farmer cooperatives and the union, 7% to rural retailers and about 1% to district retailers. In Ada-Liben district there are about twelve primary (village) markets, of which about nine are active for chickpea marketing. Traders in the primary and secondary market have identified up to eight points of origin in Ada-Liben where chickpea is collected. The assemblers collect about 85% of the desi and 80% of the Kabuli traded volumes from these village markets. Some of the assemblers also collect from the primary markets in the neighboring districts (Akaki and Gimbichu) as well as some farmers who directly bring their produce to Debre Zeit town. On the other hand the rural retailers in Ada-Liben purchase all their produce from the local village markets, showing more permanence and limited mobility for these buyers. On the other hand, district wholesalers collect about 55% of their volumes directly from the village markets, while 40% is collected from Debre Zeit town, where these traders are based. The district retailers collect about three quarters of the traded volume in Debre Zeit town while the balance mainly comes from the village markets in the district. On the other hand, the urban wholesalers in the city of Nazareth and Addis have the option of procuring produce from a wider set of suppliers across the country. The results show that these traders procure some 30% of their desi and almost all of the Kabuli traded volumes from the secondary markets in Debre Zeit town. Some of the desi volume is procured directly from village markets in Ada-LIben (6.5%), from Becho (16%), Mojo and Ejere (15%), Minjar (8%), and as far as Gojjam (11%), and Gondar (7%). Recently, there is a shift in chickpea flow to the Nazareth tertiary market than the Addis Ababa market, particularly for chickpea produced from Ada-Liben, Akaki, Gimbichu and the surrounding districts.

Unlike the district wholesalers, the farmers union and cooperatives do not engage in marketing Desi chickpeas and specialize only in trading Kabuli types. About 56% of the volume is sourced from Ada-Liben through the primary cooperatives therein. About 26% is sourced from Akaki district and the remaining 18% from Gimbichu districts. This confirms the relative dominance of Ada-Liben as a major supplier of both Kabuli and Desi chickpeas. When it comes to the surveyed supermarkets in Nazareth and Addis Ababa, 96% of the Desi and 92% of the Kabuli supply is sourced from Akaki town. About 8% of the Kabuli is sourced from wholesalers in Addis Ababa. In relation to the processors, almost 100% of the Desi supply is sourced from Addis Ababa, while all of the Kabuli is sourced from Akaki town. The grain exporters source their Desi supplies from different locations;

Debre Zeit (25%), Addis Ababa (17%), Becho (14%), Akaki (11%), Nazareth (6%) and the balance from different markets including markets in Gojjam, Gondar and Dessie. For Kabulis, the exporters rely on Debre zeit town (68%), Akaki (12%) and other markets in the surrounding areas where Kabuli production has taken off.

Fig. 1 Marketing channels and value chains of Chickpea Grain



*Numbers in the diagram represent proportion of chickpea flows to the next channel

- - - → We expect this channel but unable to find in this study

When we look at the selling patterns of different market participants, the rural assemblers supply about 54% of their purchase to district wholesalers, 39% to urban wholesalers, and about 7% to district retailers. The chickpea collected by district wholesalers in the secondary market has diverse market outlets in other parts of the country including Addis Ababa, Nazareth, Awassa, Mekele and Welayeta Sodo. The district wholesaler in Debre Zeit sells more than 70% of the volume to the grain exporter and 20% to the processors in Addis Ababa and Nazareth. On the other hand, the farmers union sells 37% of the volume to exporter while 39% is sold to district wholesalers who in turn supply exporters, processors and urban wholesalers. In the case of tertiary market, the urban wholesalers who source their supplies from assemblers, district wholesalers and from the farmers union distribute their

stocks to grain exporter (43%), processors (30%) and retailers (16%) in Addis Ababa and Nazareth, while 11% is marketed to wholesalers in other parts of the country that need chickpeas for domestic consumption. The grain exporters send about 82% of their stocks to foreign markets; Desi type chickpea was exported to Pakistan, India, Bangladesh and Dubai; while Kabuli types are exported to Pakistan, India, Saudi Arabia and Turkey. Exporters also supply the balance to domestic processors, which provides an alternative trade outlet to exporters especially when the grain fails to meet international quality standards or when export prices are too low to make Ethiopian exports competitive.

In the case of the processors, representing the small and medium scale food processors (*baltinas*) and other commercial processors, their marketing channels involve selling to urban consumers (60%) and supermarkets (40%). Some of these processors may have their own outlets for retailing their value added produce (e.g. *shiro*, *kolo* etc) directly to consumers. The small-scale urban retailers target consumers directly while some of their stocks may also be sold to supermarkets, who otherwise depend on the processors for their supply of value added chickpea products. As expected, the urban consumers represent the only outlets for supermarkets. For traders in the tertiary market, there were two chickpea buying points and one chickpea selling points in Ada-liben. Contrary to this, traders in the tertiary markets have an access of up to nine chickpea buying points out side Ada-Liben, namely Akaki, Minjar, Betcho, Mojo, Addis Ababa, Welonkomi, Gojam, Gondar and Dessie. Selling points of chickpea for traders in the tertiary markets include both domestic and export markets. This includes Addis Ababa, Nazareth, Awassa, Dilla and Yirgalem as major domestic markets and Turkey, Saudi Arabia, Pakistan, Bangladesh, India and Dubai as important export markets.

Determinants of chickpea prices

Table 3 provides summary statistics of the variables used in the price formation model. Of the 2978 recorded chickpea transactions used in the model, 62% were Desi and 38% Kabuli. Plot of average monthly price data for Desi and Kabuli indicated that Kabuli price were higher than Desi throughout the year. Hence, initially the entire sample of chickpea (Desi and Kabuli) transactions was analyzed using Desi and Kabuli as a factor, and significant price differences were observed between them. However, because certain attributes (such as quality) of the two chickpeas are quite different where their effects could not be properly captured in the overall equation, separate regressions were estimated for Desi and Kabuli.

Table 3. Descriptive statistics for parameters in the price formation model for chickpea (aggregated) and individually for Kabuli and Desi

Parameters	Values	Crop sold		
		Total (N=2978)	Desi (N=1835)	Kabuli (N=1143)
Sex of the respondent (dummy)	1=if male	79.62	79.89	79.18
Access to information (dummy)	1=if owned telephone	60.28	58.37	63.34
Frequency of transactions (dummy)	1=if long standing customer	38.89	42.29	33.42
Market type (dummy)	1=if primary	69.98	66.32	75.85
	1=if secondary	16.25	17.33	14.52
Quality (dummy)	1=if grade 1	73.07	83.92	55.64
Time of sale (dummy)	1=if 1997	72.90	72.15	74.10
Seasonality (months of transaction) /dummy/	1=if sold in Jan, Feb, March	49.90	50.08	49.61
	1=If sold in April, May, June	18.94	19.67	17.76
Buyer type dummy	1=if rural consumer/farmers	10.81	14.71	4.55
	1=if district wholesalers	26.26	22.78	31.85
	1=if district retailers/consumers	26.76	24.25	30.80
	1=if urban wholesalers	13.67	14.71	11.99
	1=if exporter	9.20	9.59	8.57
Education level of the respondent		7.96 (4.52)	7.41 (4.63)	8.84 (4.20)
Years of experience in crops trading		7.85 (4.75)	7.96 (5.18)	7.67 (3.95)
Amount sold (100kg)		65.03 (298.19)	84.80 (362.47)	33.30 (138.44)
Transaction cost, Birr/100kg		7.89 (8.87)	7.42 (8.35)	8.64 (9.61)

***** Figures in parenthesis are standard deviation; N - refers number of transactions

Table 4 summarizes the results of the price determination models for chickpea (aggregated and separate for Desi and Kabuli). The value of the F-statistics in all cases is very high indicating the over all significance of the model. Hence, the coefficients of all variables are jointly statistically different from zero at 1% significance level. The explanatory power of the model was relatively good for the pooled data (R-squared = 0.72) compared to the models for Desi (R-square=0.4) and Kabuli (0.6). The estimated coefficients generally have the expected signs. The pooled model shows that about 72% of chickpea price variation in the different markets is explained by the model variables. The model results show that, other things being equal, there was no significant difference between price received by male and female traders as sellers of Kabuli. In case of Desi, male traders sold at significantly lower prices than female, which could be partly because male traders with bargaining or negotiation ability may try to sell at the lowest price margin possible. Of the sample sellers, the proportion of male was about 80% in case of both Desi and Kabuli. Of the total chickpea available to the market, 42% and 33% of Desi and Kabuli chickpea respectively were transacted with those who have a long standing relationship with the sellers, the remaining were for the new customers.

Table 4. Determinants of Desi and Kabuli Chickpea Prices

Variables	Overall			Desi			Kabuli		
	Parameter estimate	Robust Standard errors	Elasticity at means [a]	Parameter estimate	Robust Standard errors	Elasticity at means [a]	Parameter estimate	Robust Standard errors	Elasticity at means [a]
Intercept	6.11	0.078***	-	5.61	0.090***	-	6.23	0.079***	-
Crop sold (Desi=1)	-0.45	0.017***	-36.25	-	-	-	-	-	-
Sex (Male=1)	-0.06	0.024***	-5.85	-0.08	0.025***	-7.72	0.04	0.034	4.02
Ln (Education of the trader)	0.003	0.003	0.003	0.004	0.002*	0.004	-0.01	0.004	0.01
Ln (Experience on grain trading, yrs)	-0.04	0.013***	0.04	-0.04	0.016***	0.04	-0.02	0.016	0.02
Access to information (Owned telephone=1)	-0.02	0.023	-2.01	-0.03	0.024	-2.98	-0.01	0.028	-1.03
Ln (Amount sold, 100kg)	-0.01	0.005***	-0.01	-0.003	0.006	0.003	-0.02	0.005***	0.02
Transaction frequency (Long standing customer=1)	-0.02	0.019	-2.00	-0.03	0.019*	-2.97	-0.01	0.025	-1.03
Primary market dummy[a]	-0.11	0.044***	-10.50	-0.05	0.056	-5.03	-0.19	0.071***	-17.51
Secondary market dummy[a]	-0.08	0.031***	-7.73	-0.07	0.033**	-6.81	-0.16	0.044***	-14.87
Quality (1^{st} Grade = 1)	0.08	0.018***	8.31	0.07	0.019***	7.23	0.05	0.026**	5.09
1^{st} Grade X primary market dummy	-0.05	0.024**	-4.90	-0.14	0.039***	-13.13	-0.06	0.031**	-5.87
Time of sale (1997 = 1)	-0.21	0.029***	-18.98	-0.15	0.024***	-13.95	-0.14	0.022***	-13.09
Transaction in Jan, Feb & March dummy[b]	-0.08	0.017***	-7.70	-0.05	0.013***	-4.89	-0.09	0.023***	-8.63
Transaction in April, May & June dummy[b]	-0.09	0.012***	-8.61	-0.05	0.011***	-4.88	-0.14	0.012***	-13.07
Ln (Transaction cost, Birr/100kg)	0.14	0.019***	0.14	0.13	0.028***	0.13	0.09	0.023***	0.09
Rural consumer/farmers as buyers dummy[c]	-0.05	0.030*	-4.92	-0.002	0.030	-0.24	-0.09	0.065	-8.80
District wholesalers as buyers dummy[c]	-0.06	0.024***	-5.85	-0.02	0.028	-2.02	-0.11	0.056**	-10.56
District retailers/consumers as buyers dummy[c]	-0.08	0.022***	-7.71	-0.05	0.025**	-4.91	-0.12	0.049***	-11.41
Urban wholesalers as buyers dummy[c]	-0.09	0.026***	-8.64	-0.06	0.033**	-5.87	-0.13	0.057***	-12.33
Exporter as buyers dummy[3]	0.02	0.038	1.95	0.04	0.043	3.98	-0.02	0.038	-2.05
R^2		0.724			0.399			0.595	
F-statistic		182.59***			19.13***			58.82***	
Number of observations		2978			1835			1143	

Note: *, ** and *** indicate levels of significance at less than 10%, 5% and 1% level respectively.

[a] Tertiary markets are considered as reference category;

[b] Grain selling during June-Dec is considered as reference category;

[c] Other urban buyers (processors and supermarkets) considered as reference category

Other things being equal, sellers who made their Desi chickpea transaction with their long standing customers significantly reduced the price they received than those who sold Desi for the new customers. This is due to the fact that, for those who developed trusted contacts, the cost of searching a trading partner could be lower. In fact, as indicated by Gebremedhin (2001), market search costs are a function of the opportunity cost of a trader's time, the time spent for searching and the amount of search labor. In case of Kabuli, frequency of transactions did not significantly affect price. As would be normally expected, differences in chickpea prices between markets followed to some extent the expected differences between primary, secondary and tertiary markets, indicating clear price progression along the initial to the terminal market chain For instance, other things being equal, Kabuli prices were significantly lower in the primary and secondary markets compared to prices in the tertiary markets. The same pattern holds true for Desi except the non-significant price difference between primary and tertiary markets.

Chickpea quality is an important decisive factor to determine price of the grain. The offer of premium for good quality chickpea is expected. Quality in chickpea marketing is considered as the composition of various grains attributes such as color, grain size, extent of foreign matter and shrivelness seed. Chickpea of a higher grade, for instance Kabuli chickpea, is composed with the presence of high proportion of white and big size grain and low or absence of foreign matter and shriveled seed. Of the total Desi and Kabuli chickpea transacted, 84% and 56% respectively were considered as grade one chickpea. Other things being equal, sellers sold quality Desi and Kabuli chickpea at a premium and hence grade one Desi and Kabuli commanded significantly higher price. However, this is in contrary at primary market level. The result indicated that at primary market, quality Desi and Kabuli chickpea don't give premium. This is probably because grading is not as such important consideration for chickpea at primary market level.

One important market trend observed in chickpea is that both Desi and Kabuli prices have shown continuous increment during the last few years. The model also enabled the comparison of prices offered at the different years. Both Desi and Kabuli chickpeas were sold at significantly lower prices in 2004/05 cropping seasons than the latter year, 2005/06. In the regression models, the harvest season (January – March) represents the peak in local grain supply; the dry season (April – June) and the remaining months (July – December) corresponds to the rainy season and the time where grain supply is at lowest level. Since chickpea is basically produced under rainfed conditions, it is logical to expect seasonality in supply and price progression for chickpea through these periods of time. The

results also show that compared to the season from July - December, significantly lower prices of Desi and Kabuli chickpeas were observed during the remaining season, January – June. The transactions show that among the buyers of Desi chickpea, 15% were rural consumer/farmers, 23% were district wholesalers, 24% were district retailers/consumers, 15% were urban wholesalers, 10% were exporters and 14% were other urban buyers such as urban consumers and supermarkets; For Kabuli chickpea buyers, the percentages were, respectively, 5, 32, 31, 12, 9 and 12 (Table 3). After controlling for markets and the quality of the grain, the results show that district retailers/consumers and urban wholesalers paid significantly lower prices for both Desi and Kabuli chickpea compared to processors, supermarkets and other urban retailers. In addition to this district wholesalers also paid significantly lower prices for Kabuli chickpea.

Among the covariates, experience in grain trading business and education had significant effects on prices received. The result indicated that those with higher level of education sold Desi chickpea at significantly higher prices than those with lower level of education. On the other hand, those with longer experiences in the business seem to be more competitive and sell at relatively lower prices, especially for Desi chickpea. This is probably due to the fact that through staying in business for long time, the experienced traders are likely to have identified low cost marketing channels that would allow them sell at lower prices, hence making them more competitive in the grain trading business. The regression result also indicated that as expected prices increase with observed marketing costs.

Availability of business services in chickpea marketing

Financial services

The surveyed traders indicated that credit availability problems were a major hurdle in expanding of the chickpea marketing business. Provision of credit both from formal and informal sources for purpose of grain trading is not a very regular and well established practice. During the study period, sampled traders at all market levels had limited access to both formal and informal credits. The result indicated that about 25% of the sample traders had access to credit for their grain trading business. This is composed of about 25% of the sample traders in the primary markets, 15% in the secondary markets and 27% in the tertiary markets. Among the traders in the primary markets, who had access to credit, farmers cooperatives operated in grain trading had a better access to credit than individuals operate in the same market. These cooperatives have a direct credit access from commercial banks through their union. As compared to other credit sources, banks play relatively important role in

extending credits particularly for traders in the tertiary markets and farmers' cooperatives. Likewise for the traders in the secondary market bank is the sole source of credit. A good proportion of traders who got credit from different sources use the fund for grain purchasing including chickpea (Kabuli and Desi), tef, lentil and wheat. Some traders, most of them from the tertiary markets, had access of funds for their business from their family or relatives with zero rate of interest. In addition to the unavailability of the credit, the high rate of interest and the lack of collateral were the main constraints for accessing credit. Some traders were avoiding credit for fear of risk. Even those who had thought about maintaining or expanding their grain trading operations and even those who had identified possible sources of credit explained that they were concerned about the implications of not being able to pay back their loan if circumstances got bad.

Information Services

In general access to market information is extremely limited in the Ethiopian grain market (Gebremedhin, 2001). Many of the service markets supporting the chickpea value chains are underdeveloped. The study indicated that differences in information for marketing services for chickpea was related due to size and type of markets. Traders in the primary and secondary markets had better information on farmers' cost of production and storage practices of Kabuli and Desi chickpea than traders in the tertiary markets. Contrary to this, access to information about food safety issues, export market information, export quality standards, grading, labeling and certification were relatively good for traders at the upper end of the chickpea value chain. However, still such information is largely unavailable to most of these traders. Surprisingly, domestic chickpea market information was accessible to all traders at all market levels. The available information was obtained from different sources. Information about cost of production to the traders, particularly at the primary market level, more often than not obtained from chickpea producers. For the other services, information is obtained from individuals such as traders, brokers or exporters, and sometimes from different local organizations. The larger proportion of traders in the tertiary markets and to some extent in the secondary markets received these services such as good storage practices, food safety, export market, export quality standards, grade and certification from the ministry of agriculture and rural development office (MoARD), Ethiopian pulse and oil crop export association, Ethiopian chamber of commerce, Export promotion agency and Quality and standards authority of Ethiopia. However, in general, except information about cost of production, storage practices and domestic

market information, the availability of other services were not in a position that satisfies the interest of the traders.

Other limiting factors and opportunities

A summary of the key constraints faced by chickpea traders is summarized in Table 4. Unreliable and deficient supply, liquidity problems, lack of market information, price volatility and supply of low quality chickpea especially Kabuli targeted for export markets are some of the major limiting factors in the chickpea business. As previously noted chickpea is produced at small scale level. Given the growing demand in domestic and international markets, traders at all levels complain about low quality as well as unreliable and inadequate supplies to the market. The limited supply is particularly the case for Kabuli types, but this has shown a significant growth in the past couple of years as farmers adopted new varieties, and will be expected to grow even further in the future as the crop expands across the chickpea growing areas of the country.

Table 5. Weakness/constraints of traders in chickpea marketing (% of respondents)

	Desi Chickpea				Kabuli chickpea			
	Primary N=68	Secondary N=14	Teritary N=40	Total N=122	Primary N=68	Secondary N=14	Tertiary N=40	Total N=122
Unreliable/shortage supply	30	23	46	33	40	54	39	42
Shortage of operating capital	67	46	54	61	54	46	62	54
Lack of market information	47	39	19	39	32	31	8	28
Price instability	8	54	58	26	22	15	39	24
Low product quality	16	31	42	24	14	0	46	17

In general, information about chickpea marketing practices is unevenly distributed with those traders who operated at secondary and tertiary markets have better access to information than traders at primary market level. This on the other hand indicated that information dissemination among market players at different market level is limited. This inadequate access by market participants to timely and accurate information about prices, quality–price relations, and demand patterns in various markets, has recently lead to highly speculative behaviour and extreme uncertainty in chickpea markets. Poor flow of information on market relevant quality traits from tertiary markets and end users to farmers and traders in the primary markets is also leading to undervaluation of quality at the farm-gate, which may gradually crowd out suppliers of superior quality grain.

Shortage of operating capital limits the scale of individual trading business, leading to significant cost inefficiencies at all market levels. This is particularly important given the high economies of scale in this business. Very few traders reported access to formal credit, although some traders particularly from primary and secondary markets borrow informally at low or no interest from friends and family. As discussed above high costs for borrowed capital also increase the risks faced by traders and discourage borrowing.

While these constraints remain important bottlenecks for development of the private chickpea marketing system, the policy interest on commercialization of chickpea production and competitiveness in export markets open new opportunities for expanding the participation of the private sector at each point in the production, value addition and marketing value chain. The traders also expressed interest for increased participation and outlined several issues that show their strength and comparative advantage. The growing effort of traders to supply quality products, ability to assess the structure and functioning of the market, identifying and targeting productive areas that supply quality chickpeas, availability of warehouses, and ability to sell at relatively stable prices were stated as indicators of strength for some of the traders (Table 6). However, the low responses for many of the indicators clearly indicate the overall deficiencies in the chickpea trading system in the country.

Table 6. Strength/opportunities of traders in chickpea marketing (% of respondents)

	Desi Chickpea				Kabuli Chickpea			
	Primary N=68	Secondary N=14	Tertiary N=40	Total N=122	Primary N=68	Secondary N=14	Tertiary N=40	Total N=122
Supply quality product	65	38	57	60	57	50	67	58
Customer handling (stable price)	0	25	95	17	0	38	33	6
Ability to assess the market condition	2	13	26	9	5	13	25	11
Identify areas having quality chickpeas	35	88	52	45	37	63	50	46
Enough warehouses	4	.0	9	5	5	0	0	4

The constraints reported by the respondents clearly identify the policy relevant issues that need to be addressed in developing viable value chains and enhance the competitiveness of Ethiopian chickpea exports. This is particularly relevant given the extreme fluctuation in the domestic price of chickpeas observed during the 2007 season and the lack of objective market information that leads to extreme speculation and pricing patterns in chickpea markets. There is also strong interest to improve the

contractual relationship between processors, exporters and the farmers' union. This would enhance the opportunities to strengthen the existing weak linkages characterized by scepticism and mistrust, preventing exchange of information and partnerships needed in establishing well coordinated value chains.

Conclusions and recommendations

Improvement in productivity and subsequent effective marketing of chickpea produce in potential chickpea producing areas such as Ada'a-Liben district can be a major milestone in the fight against poverty in the rural areas. As is the case for other crops, there is no doubt that there are many challenges associated with developing market opportunities and profitable value chains for chickpea. First and foremost is the need to secure a consistent supply of chickpea grain that meets required quality standards and quantity requirements as well as price and cost structures that make chickpea production economically viable to smallholder producers. This is critical in establishing a recognizable brand of high quality for Ethiopian chickpeas trusted by buyers in domestic and international markets. Improved market linkages that increase the volume and value of traded chickpea produce between rural agricultural households and the rest of the domestic, regional and international economy would benefit both smallholder producers and consumers. Production of chickpea can be boosted using existing technologies such as improved chickpea cultivars and associated cultural practices. But there is a need to improve the availability of large-seeded Kabuli types and seed and input supply systems to smallholder producers. This is important for meeting Desired quality standards in international markets. However, this study has shown that existing marketing systems in the country do not always value quality properly, especially at the lower end of the value chain. This makes it difficult for farmers to appreciate and internalize quality issues as prices may not always reward good behaviour in maintaining quality.

Based on these findings, we propose the following recommendations and suggestions for policy:

- Collaborative efforts are required to introduce appropriate technologies and market information systems that improve productivity and help to meet quality and quantity requirements of different end-users in both domestic and international markets. This may require expanding the existing extension systems on agronomic practices by integrating issues on market information, market preferred varieties, and grain quality parameters.

- Establishing quality-based marketing systems that create self-enforcing incentives for producers to supply high quality produce is not, however, possible in situations where asymmetric information prevents farmers from receiving better prices for their produce. There is a need to address the low price premium for quality at the farm-gate and in the primary markets. This may first require formalizing the existing quality grades and providing information to smallholder farmers on how prices relate to quality grades in different markets and along the value chain. The traders should also offer fair, competitive and differentiated prices for products that differ in observable quality parameters. Market actors who deliberately defraud other buyers or sellers and tamper with quality traits through various means should face a penalty for their corrupt behavior that distorts the functioning of markets.
- There is a need for increased participation of the private sectors (including cooperatives) in strengthening business support services to traders along the value chain. This should include enhancing to the availability and dissemination of market information to all stakeholders involved in production, processing and marketing activities. Such business services and information should also include good practices in labeling, storage, product certification, demand creation, and provision of credit, especially to actors in the primary markets.
- The strength of market linkages between farmers and traders operating at the upper end of the value chain needs to be enhanced through better market linkages and development of mutually beneficial contractual arrangements. Better farmer–trader linkages would ensure reliable supply of good quality products and enable farmers to cushion themselves against widely fluctuating prices while guarantying an outlet for their surplus production. Appropriate institutional and legal frameworks are needed to stimulate the development of out-grower schemes and self-enforcing and flexible contracts based on objective assessment of market conditions on both sides (farmers and traders). The farmers' cooperatives/unions are instrumental in cultivating trust and establishing the missing link between the farming and business communities.
- There is a need for institutional innovations to reduce transaction costs through better coordination of marketing activities of smallholder farmers and increased exchange of information along the value chain. The corollary to this would be enhanced availability of better farm–to–market road links and transport and storage facilities.

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