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## **Agricultural Markets in Benin and Malawi**

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# Agricultural Markets in Benin and Malawi\*

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## Abstract

Based on original trader surveys, this paper examines how agricultural traders operate in Benin and Malawi. Results indicate that the largest transactions costs are search and transport. The use modern technology is limited. Search methods rely principally on personal visits by the trader. Quality control requires the presence of the trader at the time of purchase. This raises costs as the trader has to travel a lot, and makes it difficult for trading enterprises to grow. Since enterprises remain very small, personal transport and search time represents a non-negligible share of marketing costs.

## 1. Introduction

Many studies have investigated the integration of agricultural markets in post-market reform sub-Saharan Africa (e.g. Badiane and Shively 1998, Dercon 1995). These studies rely primarily on the analysis of price co-movements at the market level. While such analysis can document

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market segmentation, it does not explain why markets are poorly integrated or what constraints economic agents face.

An enduring puzzle in the market literature in sub-Saharan Africa is that, despite liberalization and reforms, agricultural markets have remained relatively unsophisticated and marketing margins have remained high (e.g. Beynon, Jones and Yao 1992, Jayne and Jones 1997). Relatively few studies have addressed the microeconomic behavior of individual traders (e.g. Bryceson 1993, Barrett 1997, Gabre-Madhin 1998, Fafchamps and Minten 1999, Fafchamps, Gabre-Madhin and Minten 2005). These studies highlight the importance of transaction costs, the role of intermediaries, and the importance of relationships and social capital.

The present paper attempts to throw some new light on agricultural market performance by providing a detailed description of trader characteristics and behavior. Using survey data from Benin and Malawi, we examine how traders' assets – including financial, physical, human, and social capital – influence their commercial activities and, ultimately, their capacity to undertake spatial and temporal arbitrage. We empirically investigate traders' assets and trading practices and link these not only to evidence on traders' gross margins but also to their net margins using detailed data on marketing, operating, and transaction costs.

This approach is important for a number of reasons. First, despite reforms, agricultural traders in liberalized markets across sub-Saharan Africa continue to operate in an environment of suspicion, viewed by policymakers and laypersons alike as speculative, usurious, and benefiting from excessive profits. Second, an emerging conclusion of the post-reform era is that market liberalization is necessary but not sufficient to bring about efficient markets. Thus, a closer look at the individual determinants of performance is warranted. Finally, in the wake of reforms, it remains unclear what is the appropriate role of the public sector. Understanding the constraints faced by market participant can serve to highlight areas where intervention can have an impact.

In this paper we compare the performance of traders in Benin and Malawi. Benin, in Francophone West Africa, represents an environment in which private market activity has a long history and in which government intervention has traditionally been limited, with the exception of cotton (Kherallah, Delgado, Gabre-Madhin, Minot and Johnson 2000). In sharp contrast, Malawi, along with others in Eastern and Southern Africa, has experienced, up to recently, extensive state intervention in marketing, with the state purpose of protection smallholders (Jayne and Jones 1997). The comparative focus provides insights on the role of history and tradition in shaping trading norms and practices.

## **2. Agricultural Markets in Benin and Malawi**

The two study countries differ markedly in their history of policy intervention in agricultural markets. In Benin, the Office National des Céréales (ONC) was created in 1983. With the help of local organizations known as Centres d'Action Régionales pour le Développement Rural (CARDER), it attempted unsuccessfully to control 25% of the cereals market, reaching only 5% in 1990 due to a lack of human and financial resources (Badiane, Goletti, Kherallah, Berry, Govindan, Gruhn and Mendoza 1997). With the exception of the 1976-77 period, market prices of cereals were never controlled and private traders largely dominated food markets, even prior to liberalization. The market reforms launched in 1990 effectively dismantled the ONA and the CARDERs, transforming the ONA into the Office National d'Appui à la Sécurité Alimentaire (ONASA), responsible for supporting food security and for providing market information and extension to farmers. In the wake of market reforms ONASA's marketing role is extremely small, controlling only 0.15% of the annual traded volume of maize, the main staple crop.

In Malawi the government established the Agricultural Development and Marketing Corporation (ADMARC) as a monopsonistic buying agent for smallholders' maize, at guaranteed

fixed prices. ADMARC provided pan-territorial and pan-seasonal prices for farmers, requiring it to subsidize maize prices with export earnings from tobacco. As the world prices for tobacco deteriorated in the early 1980s, its ability to continue maize subsidies was eroded. In 1981, Malawi embarked on a series of structural adjustment programs, which entailed adopting a flexible exchange rate regime and moving slowly toward liberalizing its price and marketing policies. Although the World Bank initially supported ADMARC's activities, it disagreed on the level of food prices relative to export prices (Seppala 1997). In 1987, a new series of structural adjustment loans were launched, with the conditionality of complete privatization of maize marketing. However, although private trading was allowed in this period, producer prices remained fixed by the government until as late as 1995, when a price band was established (Badiane et al. 1997). At the time of our survey, ADMARC was in charge of administering the price band and of acting as buyer of last resort. Despite privatization and the closing of a number of ADMARC buying centers, ADMARC remains dominant in the maize market, with private traders engaged in bulking for delivery to ADMARC (Beynon et al. 1992).

### **3. The Survey**

Surveys of traders of domestic agricultural products were conducted in 1999/2000 in Benin (August-September 1999) and Malawi (August 1999-February 2000). A market-level survey was also conducted in order to obtain information on the marketing environment. The work was coordinated by the International Food Policy Research Institute (IFPRI), Oxford University, and the World Bank. Data collection in the field was directed by the Laboratoire d'Analyse et de Recherche Economique et Sociale (LARES) in Benin, and by the Agricultural Policy Research Unit (APRU) in Malawi.

Both surveys focus on agricultural traders at both the wholesaler and retailer level.<sup>1</sup> Survey sites are market towns active in agricultural products. 24 markets were selected in Benin and 40 markets in Malawi, based on their trade importance and the availability of secondary price data. Due to the absence of reliable census information on the population of traders in both countries, a census of traders was conducted in each selected market.

In Benin, the survey team counted all traders present on the market in a given day. This count was supplemented by lists of traders obtained from the ONASA (Office National d'Appui à la Sécurité Alimentaire) and the regional bureaus of the Ministry of Commerce. These lists include larger traders who need not have a stall on the market itself. The two lists and the count were combined to construct a frame from which a sample was randomly drawn, resulting in a total sample of 663 agricultural traders.

In Malawi, a reconnaissance survey of traders was conducted in July-August 1999 to count and identify traders according to their status (independent, buying agent, or selling agent), their level (retail or wholesale), and the types of products they trade. The information on the name, type, and location of traders from the reconnaissance survey were entered into a spreadsheet and the sample was drawn randomly from the census data. A total sample of 738 traders was interviewed in Malawi. For both countries, the total sample of independent traders is 1371.

The questionnaire covers the following main areas: (a) characteristics of the trader and

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<sup>1</sup>Efforts to include agricultural inputs and cash crops into the survey were largely unsuccessful. In Benin, it became clear at the piloting stage that fertilizer and seed trade are closely linked to the production of cotton. Cotton marketing is under the monopoly of a parastatal enterprise, the Société Nationale de Promotion Agricole (SONAPRA). Input trading is done primarily through village cooperatives called Groupements Villageois (GV), rather than by individual traders. The GVs purchase inputs from 9 government-licensed fertilizer importers and distribute these inputs among their members. The marketing of cotton, the dominant export crop, goes entirely through SONAPRA.

In the case of Malawi, the distribution of fertilizer and other agricultural inputs is dominated by few very large firms, such as OPTICHEM and Norsk/Hydro. Inputs are distributed throughout the country by traders operating as selling agents for large corporations. A specific survey was organized for these selling agents, who do not conduct purchases but sell independently. Results are not discussed here because they are not immediately comparable with those for individual traders. A handful of independent tobacco traders are recorded in the Malawi survey.

trading enterprise; (b) factors of productions and operating costs; (c) trading activities and marketing costs; (d) relationships and coordination costs. Data are also collected on search behavior and costs, quality inspection, contract enforcement and dispute settlement, information, and property rights enforcement.

#### **4. Characteristics of the enterprise**

We begin by providing an overview of the main characteristics of trading enterprises in the two surveyed countries.

##### **4.1. Specialization**

Surveyed traders deal primarily in maize, beans, and roots and tubers. Together, these crops account for 80 to 90% of the main crops traded. None of the surveyed Beninese traders deals in cotton, the main cash crop of the country. At the time of the survey, cotton marketing was entirely in the hands of the government marketing board. A small number of surveyed Malawian traders deal in tobacco, the principal export crop. This is the result of a relatively recent liberalization in tobacco marketing. Less than five surveyed traders sell chemical inputs such as fertilizer or pesticides.

Some traders – 12% in Benin, 25% in Malawi – sell products other than agricultural, but on average surveyed traders derive 95% of their trade revenue from agricultural trade. Traders are thus moderately specialized by sector. But they do not specialize by crop: two thirds of all surveyed traders sell more than one agricultural product; 45% sell more than two. In addition, 23% (Malawi) to 30% (Benin) of traders have an activity other than trade. In Benin, this activity is overwhelmingly farming; in Malawi, it is overwhelmingly non-agricultural trade.

Nearly all traders have a principal market from which they organize their activities. In that

market, most of them have a place – stall, store, shed – for their exclusive use. Three quarters of surveyed traders also operate in other markets – on average 1.3 to 1.6 purchase markets and 0.3 to 0.5 sales markets. This suggests that traders normally base their operation at their sales market and purchase from one or two other markets.

Traders are not fully specialized by function in the marketing chain. Most traders are retailers but half of Beninese retailers and a quarter of Malawian retailers also operate as wholesalers. One sixth of Beninese traders and one fourth of Malawian traders specialize in wholesale only. Most traders purchase at least some of the quantities they sell directly from farmers. In fact, 48% and 74% of all retailers in Benin and Malawi, respectively, purchase from farmers. This apparent lack of functional specialization makes it hazardous to categorize respondents by their function in the marketing chain. A very small proportion of surveyed traders also operate as buying or selling agent for other traders.

## **4.2. Ownership**

The overwhelming majority of independent trading enterprises are held in sole ownership by a local resident who is also a national of the country studied. Only 30 of the 1400 surveyed traders are foreign nationals, of which all except one are African. In Benin, 80% of traders are women vs. 36% in Malawi. This reflects a long tradition of female involvement in trade along the West African coast. Nearly all traders are married. Malawian traders are on average younger – 33 vs. 41 – and much better educated – 5.6 years of schooling in Malawi vs. 2.0 in Benin. Two thirds of surveyed Beninese traders have no education as opposed to only 10% of Malawian traders.

Religion varies between the two countries, with 82% of Malawian traders describing themselves as Christian vs. 43% and 41% of Beninese traders depicting themselves as Muslim and followers of traditional beliefs, respectively. In terms of wealth, one quarter of Beninese re-

spondents own their home, vs. three quarters of Malawian respondents. At \$13,700, the value of a Beninese home, however, is about 12 times higher on average than a Malawian home ( $t$  value of 6.81) – which may explain why fewer Beninese respondents can afford a home. Higher population density and urbanization in Benin probably account for the difference in property values.

The owner of the trading business has typically initiated the business himself or herself. The overwhelming majority of respondents started the enterprise without help from anyone. Ten to twenty percent of respondents received financial assistance from their family at start-up. For those respondents who did not start the business themselves, they either inherited it or received it as a gift. Virtually no one purchased their enterprise, suggesting that goodwill and reputation are not attached to a specific location, trademark, or business name (Tadelis 1999). A similar survey in Madagascar indeed showed that African agricultural traders never sell under a trademark or business name (Fafchamps and Minten 1999)

### **4.3. Experience**

Most traders start with some business experience. Half of the respondents have worked in another business before initiating their current trading enterprise. Beninese traders are more experienced than their Malawian counterparts, with about twice the number of years of experience both in the current enterprise and in a previous business. Beninese traders are also much more likely to have worked in their parents' business (67% of those with previous business experience) than Malawian traders (4%). Malawian traders acquired prior experience nearly exclusively through another business of their own. Another difference between the two countries is that one sixth of Beninese traders have worked as an agent prior to initiating their current trade operation, vs. only 3% in Malawi.

With respect to the last occupation prior to becoming involved with agricultural trade, in both countries one third of traders previously worked in agriculture or food processing, one third in trade, and one third in other non-farm occupations. Previous trade experience is nearly always in non-agricultural trade in the case of Malawi, against one third of respondents with previous trade experience in Benin. Malawi traders are also more likely to have been wage workers or students prior to entering agricultural trade. Malawi traders arrive to agricultural trade from quite a different starting point. This possibly reflects the impact of trade liberalization that was still recent at the time of the survey.

In terms of parental background, the two countries differ little as far as fathers are concerned: they are overwhelmingly farmers. Mothers have different occupations, though, with over half of them involved in trade in Benin vs. ten percent in Malawi. Beninese mothers also have a much longer experience in trade than their Malawian counterparts: 21 years of experience on average vs. 9 in Malawi. Family size differs across the two trader populations, with Beninese traders having more sons, daughters, brothers and sisters. Family involvement in trade similarly varies: Beninese traders have more than twice as many close relatives involved in trade than Malawian traders.

Results therefore suggest that involvement in trade is more ancient in Benin. Traders are older, have more experience, and have had much exposure to trade from their parents and close relatives. One would consequently expect Beninese traders to be more sophisticated and more efficient. Because their background is very ‘traditional’, however, the sophistication they can achieve is likely to follow informal avenues – building up social networks, and achieving trust through personal relationships (e.g. Fafchamps and Minten 1999, Fafchamps and Minten 2001).

In contrast, Malawian traders are younger, better educated, and more likely to come from a non-agricultural or wage employment background. We would therefore expect them to be

more ‘modern’, that is, more inclined to experiment with new marketing techniques and modern technology such as motorized vehicles, telephones, and formal contracts. Better education may also enable Malawian traders to delegate authority to subordinates and thus to grow and have larger firms.

#### **4.4. Finance**

Working capital – the money traders use to purchase agricultural products and pay marketing costs – is fairly large by the standards of the countries concerned: \$1470 in Benin, \$560 in Malawi (Table 1). This is equivalent to two or three times the annual GDP per capita. The median is much smaller, at \$333 and \$136, respectively. We see that, contrary to expectations, working capital is 2 to 3 three times larger in Benin than in Malawi: if profits are larger in Malawi, it is not because Malawian traders use more finance. The majority of respondents report augmenting their working capital relative to the previous year, reflecting the reinvestment of past earnings.

Most working capital comes from internal sources. External finance is extremely limited. Current dues to lenders are but a tiny fraction of working capital. Although one fifth to one third of respondents have a bank account, only a tiny fraction of them have an overdraft facility. Surprisingly, those with an overdraft facility do not appear to make use of it – perhaps because the interest rate is high. Loans from financial institutions are rare and heavily concentrated on a small number of large traders. In Malawi, most formal loans come from a parastatal.

The only source of external finance that is used by a sizeable proportion of respondents is loans from friends and relatives. A large proportion of surveyed traders (50% in Benin, 75% in Malawi) know a friend or relative they could borrow from. The amount they could borrow is moderate – \$250 to \$300 – and the average duration of the loan limited to 3 months. Although the proportion of traders who claim they could borrow is large, in practice very few of them do

– 8% of the sample in Benin, 21% in Malawi – and they borrow relatively small amounts: \$947 on average in Benin, \$55 in Malawi. This suggests that loans from friends and relatives play primarily an insurance role (e.g. Udry 1994, Fafchamps and Lund 2003).

Regarding alternative savings instruments, 70% of Beninese traders are members of a rotating saving and credit association (ROSCA) vs. only 2% in Malawi. Supplier credit is a much more frequent form of credit than any form of external finance. We revisit this issue when we discuss relationships with suppliers and clients.

#### **4.5. Equipment and buildings**

In terms of equipment, surveyed traders appear surprisingly unequipped (Table 1). The overwhelming majority of them do not own (serious) weighing equipment, transportation, or storage facilities. At the time of the survey, only 3% of the total sample had a telephone. In terms of value, vehicles are clearly the most important equipment item. But ownership of vehicles is heavily concentrated, with a large proportion of surveyed traders without vehicles – 85% and 94% in Benin and Malawi, respectively. The total value of vehicles is about 9 times higher in Benin than Malawi. Contrary to working capital where we see evidence of increase over time, equipment appears very stable, with virtually no change relative to the previous year – a 6% increase only in the total number of vehicles, compared to a reported 29% increase in total working capital. These gross investment figures overstate aggregate investment, however, since they ignore agents who leave the business. Based on other data on enterprise turnover in sub-Saharan Africa (e.g. Daniels 1994, Barrett 1997), we suspect that a sizeable proportion of traders exit the business in any given year.

In terms of buildings, 59% of Beninese traders and 35% of Malawian traders buy and sell from their residence. Half of them store at their residence as well. 24% and 39% of Beninese

and Malawian traders, respectively, store in a specially dedicated facility outside their home – that they either own or rent from someone else. The combined storage capacity of exclusive use facilities is on average 7 metric tons in Benin and 12 metric tons in Malawi, but the median is much smaller: 1.4 tons in both countries, or roughly 15 bags of grain. Half of Beninese traders and one third of Malawian traders also have access to a collective storage facility, usually located at or around the market. The cost of storage in these facilities is about 25 cents per day per ton in Benin. In Malawi traders quote a rate of \$3 per day per ton, which seems high.

#### **4.6. Human resources**

In terms of human resources, traders in both countries display similar features to those described for other African countries (e.g. Fafchamps and Minten 1999, Gabre-Madhin 1998). Apart from the trader himself or herself, surveyed enterprises do not employ an abundant manpower (Table 1). The average total manpower of surveyed firms is 2.2 individuals in Benin and 1.5 in Malawi. Most employees are family workers. Non-family employees only amount to 0.4 to 0.5 persons on average. Employment levels also appear extremely stable, with no perceptible trend in employment over time.

Wages paid are very low. A large proportion of family workers receive no wage – around 70% in Benin, 40% in Malawi. In contrast, non-family workers nearly always receive a wage. Cases when they do not receive a wage probably correspond to apprenticeship contracts. For those non-family workers who receive a wage, the remuneration level is around \$7 per month in Benin and \$27 in Malawi. The large discrepancy in wage levels may be due to the presence of a small number of large, formal employers in Malawi sample of traders. Contrary to microenterprises where wages are notoriously low, large African employers are known to pay higher wages (e.g. Mazumdar and Mazaheri 2002, Velenchik 1997, Fafchamps and Soderbom 2006).

Traders operate long hours. Surveyed trading firms operate an average of 4.7 days a week in Benin, vs. 6.1 days a week in Malawi. Trading enterprises are very centralized. In addition to the owner, 1.1 persons on average are authorized to buy for the firm in Benin, and 0.6 persons in Malawi. Similar though slightly lower numbers are reported for those authorized to sell for the firm. On average, the owner is absent for 12 days a year in Benin, and 46 days in Malawi. Absences are mostly motivated by the need to visit distant purchase and sales market. In most cases, the firm continues to operate in the trader's absence, in which case the business is normally run by an employee of the firm, preferably a relative – 45% of the cases in Benin, 17% in Malawi. It is common for the trader to rely on someone external to the firm – either a friend or a relative – to look after the business in his or her absence. This occurs in 48% of the cases in Benin and 64% of the cases in Malawi. If such a person cannot be found, the business closes.

## 5. Sales and Margins

Now that we have a better sense of what the trading enterprises look like, we examine their activities. Median sales do not differ much across the two countries, with the median trader selling for \$5,300 to \$6,700 worth of merchandise per year (Table 2). However, the gross margin – the difference between the value of sales and purchases – varies significantly between the two countries: it is 2.4 times higher in Malawi than in Benin (t-value of 4.83). Median margins differ by the same order of magnitude. Since total sales do not differ markedly between the two countries, higher gross margins in Malawi must come from a larger difference between buying and selling price.

This is indeed the case: the ratio of selling price over buying price is 1.23 on average in Benin (median of 1.19) while it is 1.53 in Malawi (median of 1.40). In other words, the selling price is on average 23% above the buying price in Benin but 53% above in Malawi. This difference

is quite significant, with a  $t$ -value of 11.7. This difference constitutes prima facie evidence that agricultural trade is in general less efficient in Malawi.

This is somewhat misleading, however. Using the proportion of traders falling in different categories, Fafchamps et al. (2005) construct from the same data set a rough estimate of the average number of transactions between farmer and consumer. They obtain an average of 3.4 transactions in Benin and 2 transactions in Malawi. Differences are primarily due to the proportion of traders who buy from farmers and sell directly to consumers. These estimates are then be used to guess the average spread between producer and consumer price. The lower number of transactions in Malawi implies that this spread need not be larger than in Benin even though the average margin is higher. If all traders charge the median margin, the consumer price in Benin would be 76% of the producer price. These calculations, however heroic they may be, suggest that differences in gross margin rates across countries largely reflect different levels of vertical integration: Malawian traders undertake more of the different tasks required to bring a crop from producer to consumer. This in turn may be related to the fact that, unlike their Beninese counterparts, Malawian agricultural traders are predominantly male and therefore are more mobile.

Differences in gross margins across countries mask dramatic variation in volume of activity within each country: the Gini coefficient of the total value of annual sales is 0.60 in Benin and 0.38 in Malawi. In both country, the largest surveyed trader sells for 2.6 to 2.8 million dollars a year while 17% of the sample sells for less than \$1000 of merchandise in a year.

Margins vary dramatically across traders. Some respondents appear to be making massive losses while others make windfall profits. Part of this variation undoubtedly comes from measurement error – since respondents do not hold accounts, annual sales and purchases must be extrapolated on the basis of a few key indicators. But the variation also suggests that unit

margins are extremely volatile. Regarding their last transaction, close to 3% of surveyed traders report selling at or below the purchase price. At the other end of the spectrum, some traders report selling at close to 10 times the purchase price.

When variable marketing costs are deducted (e.g., transport, loading and off-loading, bagging), 17% of surveyed traders report a negative net margin. If we further subtract fixed operations costs and wages to construct an approximate annual net margin figure, differences are even more striking. After eliminating the upper and lower one percent of the distribution, we find that 21% of surveyed traders do not cover their operations and wage costs out of annual sales (28% in Benin, 15% in Malawi).

Annual net margins also vary dramatically across countries, with the median net margin in Malawi – \$1003 – nearly ten times higher than in Benin – \$119. For most Beninese respondents, trade provides but a small return on entrepreneurship and capital. This suggests that competition is fierce in Benin, less so in Malawi.

### **5.1. Last purchase**

Information was collected on the last purchase undertaken by respondents. A ‘purchase’ is essentially a load or consignment that is assembled by the trader in the supply market, transported to the sales market, and sold over a period of time. The average distance between the purchase and sale market varies between 53km in Malawi and 69km in Benin. Median distances are much shorter, however – 15km in Malawi and 23km in Benin. This means that most agricultural traders only travel short distances to their supply market.

On average, the consignment is purchased from 5 different suppliers in Benin – 15 in Malawi. The load is then sold to an average of 10 (Benin) to 50 (Malawi) different clients. In two third of the cases, the trader himself or herself traveled to the supply market or markets to oversee

the purchase. In nearly all cases, the respondent supplies his or her own bags or containers at the time of purchase, i.e., agricultural products are transferred from the seller's to the buyer's bags.

On average, the quantity purchased is remarkably similar across the two countries: around 2.5 metric tons of agricultural produce. The value – around \$400 – is also surprisingly similar. Medians, however, are quite a bit smaller: 1 ton in Benin, 420 kg in Malawi. This is but a reminder that the size of businesses covered by the survey varies widely.

Not all quantities purchased had been sold by the time of the survey. On average, surveyed traders had sold 85 to 90% of the quantities purchased by the time of the interview and had, on average, recouped the value of the purchased goods. The number of days elapsed since the last purchase varied significantly between the two countries, however: 22 days on average in Benin vs. 8 in Malawi ( $t$  value of 9.6). Medians were sizably lower – 8 and 3 days respectively. Ninety percent of surveyed traders keep goods for less than a month. This suggests that whatever storage is done by agricultural traders, it is concentrated in the hands of a few traders. The majority of traders keep the products for a short period only, typically the time it takes to sell the batch of purchased goods. We return to storage practices below.

## **5.2. Variable costs**

Detailed information was collected on the various costs incurred in the process of assembling, transporting, and selling the last consignment (Figure 1). In the remainder of this section, we refer to these costs as variable marketing costs because they vary with the amount purchased and the number of consignments sold by the trader over the year. Variable marketing costs represent \$18 per ton in Benin and \$31 in Malawi ( $t$  value of 8.43). Corresponding medians are \$16 and \$21. This compares to a median purchase price of \$145 and \$162 per ton in Benin and

Malawi, respectively. Thus, for the median trader, variable marketing costs are equivalent to 11-13% of the purchase price in both countries.

Transport represents by far the largest component of variable cost: 50% in Benin, 39% in Malawi. If we add loading and off-loading costs, the commission paid to transport brokers (if any), and payments at road-blocks, we get a transport share of 60% in Benin and 49% in Malawi. The second most important component of variable cost is the travel cost incurred by the trader. This cost alone represents 15% of variable costs in Benin and 37% in Malawi. Transport of goods and of the trader himself or herself is thus the most important financial outlay associated with an individual purchase.

Bagging represents another important category of variable costs. The value of bags varies around \$4 to \$6 per ton. Bags are recycled and re-used an average of 5 (Benin) to 9 times (Malawi), which brings down bagging costs. The pro-rated cost of bags and the labor cost of bagging together account for 7% to 10% of total variable costs. Taxes assessed on quantities traded account for a very small fraction of variable costs: less than 3% of variable costs in both countries. Commissions and tips account for 8% of variable costs in Benin but are negligible in Malawi. This reflects a major difference in the role of intermediaries between the two countries. More about this later. Storage, telephone, and other costs account for less than 5% of variable costs in both countries.

### **5.3. Operating costs**

Data were collected on fixed operating costs. Average operating costs amount to round \$550 per year in Benin vs. \$190 in Malawi. Survey results show that, in Benin, fixed operating costs are dominated by vehicle maintenance and insurance. These costs, however, are incurred only by a very small fraction of the trader population, those with vehicles. The next most important

fixed cost category is storage and pest control. These costs account for 21% (Malawi) to 34% (Benin) of fixed operating costs, but they affect only a fourth to a third of surveyed traders; others stock at their residence or at their own storage facility.

Taxes and fees amount to 44% of operating costs in Malawi, but as little as 5% in Benin. Even in Malawi, however, the burden of taxation remains small: \$84 a year, compared to an average annual turnover of around \$43000. While few traders pay income tax, market fees are paid by most of them – 50% in Benin, 80% in Malawi. For small traders, market fees are the only form of operating cost they incur. Since market fees do not increase proportionally with trade volume, they are relatively more important for small to medium-size traders. Market fees are thus a regressive tax. Given that transport represents a large component of traders' costs and that taxes represent a large share of gasoline prices, we suspect that traders probably pay more taxes through gasoline than through all other forms of taxation combined.

Other categories of operating costs such as wages and losses due to theft make small contributions to costs. Total wages represent an extra cost of \$50 per year in Benin and \$110 in Malawi. This amount is very small because so few traders employ paid workers and when they do, they pay them very little. Very few traders borrow money. When they do, they borrow for such short periods that interest charges are, on average, negligible. Losses due to theft average \$22 a year in both countries.

It is useful to compare fixed operating costs with variable marketing costs. Annualized marketing costs average around \$2800 in Benin and \$9200 in Malawi. The difference is due in part to the fact that unit variable costs are higher in Malawi, and that Malawian traders have a larger turnover on average. What is clear, however, is that variable costs represents the bulk of traders' costs.

We also collected detailed information on commissions paid to various intermediaries. These

costs are in principle included in variable costs, but we also collected the information separately. The data confirm that commissions are much more frequent in Benin than in Malawi. This is particularly true for buying agents and consignment agents. Beninese traders spend on average four times more on commissions than Malawian traders. To verify the information on the costs incurred for personal travel, the information was collected separately as well. Results confirm that personal travel represents a sizeable share of total costs: 17 to 18% of total variable costs in both countries.

To summarize, the structure of costs is dominated by transport costs. A large share of this transport cost covers the travel of the trader to the place of purchase or sale. The need for thousands of traders to travel in person to purchase and sale markets – instead of placing an order over the phone – undoubtedly contributes to higher trading costs. We examine trading practices more in detail in the next section.

#### **5.4. Profits**

To conclude this section, we estimate profits from trading. Profit is computed as the annual sales minus annual purchases minus annualized variable costs minus wages paid minus operating costs. In case agricultural trade only represents part of the revenue of the surveyed trader, annual purchases and sales are inflated accordingly. Traders who derive less than 10% of their annual revenue from agricultural trade are omitted. The resulting profit represents payments to self-provided factors of production such as working capital, owned storage facilities, equipment, vehicles, and unpaid labor by the entrepreneur and family helpers.

Computed profits suffer from severe measurement error. This is because they are obtained by subtracting poorly measured costs from poorly measured revenues. Measurement errors therefore tend to compound themselves and individual measures of profit should be regarded

with caution. Average profits, however, should provide a reasonable approximation of what profits from trading must look like in the two surveyed countries.

Results suggest that traders' profits are not negligible: \$1340 on average in Benin, \$6140 in Malawi. The difference between the two countries is significant ( $t$  value of 6.03). Median profits, however, are much lower: \$120 in Benin, \$1140 in Malawi. This corresponds to an average profit rate on turnover of 6% in Benin and 14% in Malawi. Profits amount to 32% of the gross margin (difference between buying price and selling price) in Benin; the corresponding figure for Malawi is 57%.<sup>2</sup> Median profit rates are 37% and 64%, respectively. Since, if anything, Malawian traders have less equipment and working capital and use less family labor than their Beninese counterparts, higher profit rates cannot be explained as higher payment to self-provided factors of production. It therefore appears that agricultural trade is less competitive in Malawi than in Benin. This may be because population density is much lower in Malawi, raising the cost of search and helping segment the market.

These average profit rate figures mask a great deal of variation across traders. A large proportion of surveyed traders – 20% – appear to be making losses. On the other hand, some traders appear to be making astronomical profits. It is unclear how much of this variation is due to measurement error, but the extent of the variation suggests that profits from trade are likely to be very variable. Agricultural trade is a risky venture.

## 6. Trading practices

We have seen that agricultural traders vary dramatically in terms of turnover and profitability. Survey results also suggest that agricultural trade differs significantly between the two countries, Benin and Malawi. We now examine whether these differences are related to differences in

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<sup>2</sup>To minimize bias, this figure is obtained after eliminating traders who do not derive all their revenue from agricultural trade.

trading practices. We begin with ‘technological’ issues such as weights and measures, transport, and storage. We follow with information gathering, relationships, and contractual practices.

### **6.1. Weights and measures**

Given that only a handful of traders have proper weighting equipment, most trade takes place by volume. In practice, volume may be a better way of measuring the value of an agricultural product than weight. Indeed, the weight of a crop can be artificially inflated by adding water. Since excess moisture raises storage losses, buying by weight generates adverse incentives for farmers not to dry their crops properly before offering them for sale. Most crops also tend to desiccate over time without losing (much) of their caloric content. Since water can be added when food is prepared for consumption, this is usually not a problem – at least for cereals, pulses, groundnuts, roots and tubers. The same holds for most cash crops. The main exception is fruits and vegetables. By focusing on volume instead of weight, traders insure themselves against most storage losses, which are weight losses due to dessication.

In the two studied countries, burlap and plastic bags of various sizes serve as measures of volume. The weight in a given bag obviously varies by crop but, for a given crop, a standardized-size bag can serve as measurement unit. No less than 11 different types of bag sizes are used in the two studied countries. The bags are usually named after the amount of maize they would contain – from 20 kg to 200 kg. Benin favors 100kg and 200kg bags; Malawi favors 50kg, 70kg, and 90kg bags. Weight measures such as kg or ton are used as well, but in less than 10% of all purchases.

In practice, burlap and plastic bags are not perfect measures of volume. The first reason is that burlap bags tend to loosen over time so that older bags tend to contain more than new ones. The second reason is that the volume contained in a bag varies with the way it is filled

and sealed. Measures are thus somewhat subjective in the sense that they depend on the state of the traders' bags and on the way they are filled. This subjectivity may explain why traders nearly always transfer purchased goods from the bags of the seller to their own bags. This is a time-consuming and cumbersome process, but it may be essential to an assessment of volume by the buyer. It also enables the buyer to assess the quality of the product since, in the transfer process, what was at the bottom of the seller's bag ends at the top of the buyer's bag and can thus readily be inspected.

## **6.2. Transport**

We have seen that transport represents the main cost of trading in agricultural products even though most traders source their agricultural products in nearby villages. One fifth of surveyed traders claim not to undertake any transport, by which they mean that they buy and sell from the same market. The others transport products across markets, nearly always with a external transporter.

Most transport (86%) takes place in trucks. Half of these trucks are small pick-ups. Some 13% of all transport takes place with non-motorized means of transport such as handcarts and oxcarts – usually in and around markets. Train transport is not used by respondent traders in either of the countries studied.

Measured in dollars per ton per Km., transport costs average \$0.43 and \$0.70 in Benin and Malawi, respectively. Transport charges vary dramatically by mode of transport, however. Non-motorized transport costs on average \$1.78 (Benin) per ton/Km. and \$1.20 (Malawi). In contrast, motorized transport costs \$0.28 and \$0.63 in Benin and Malawi, respectively. The latter is similar to the motorized transport cost of \$0.67 reported for agricultural products in Madagascar Fafchamps et al. (2005). The difference between the three countries is probably

due to population density, which is much higher in Benin. Because traffic in passengers and agricultural commodities is much higher in Benin, transporter idle time is minimized. This reduces transport costs.

To test for transport efficiency, we regress transport costs on distance and means of transport. We suspect that truck transportation has a higher fixed cost but lower cost per km. than non-motorized transportation. To test this hypothesis, we let  $c_i^t(q_i, d)$  denote transport costs per Kg and assume (Fafchamps et al. 2005):

$$c_i^t(q_i, d_i) = \theta q_i^\alpha d_i^\delta e^{u_i} \tag{6.1}$$

where  $\theta$ ,  $\alpha$  and  $\delta$  are parameters to be estimated,  $d_i$  is distance,  $q_i$  is load size, and  $u_i$  is an error term. In the absence of fixed transport costs with respect to distance,  $\delta = 1$ . In areas with a low density of trade, more time is required to fill a large truck since the frequency of transactions is low. Consequently, we expect  $\delta$  to be further below 1 in low trade density areas. For the test to be valid, we need to control for load size. Indeed, if transport is inefficient, large loads cost less per Kg than small loads and the coefficient on load size is significantly negative. Transport efficiency requires that  $\alpha = 0$ .

We estimate equation 6.1 in log form. Results are shown on Table 3. As expected, distance travelled has a strongly significant effect on transport cost but  $\delta$  is significantly smaller than one in both countries, suggesting the presence of large loading and off-loading costs. These costs are larger in Malawi than in Benin, possibly because of the lower density of population and agricultural trade, and thus a higher waiting time for transporters.

While we find no evidence of returns to load size in Benin, the load size coefficient is significant in Malawi: in that country, individual traders transporting larger loads face lower transport costs. Again, this might be due to the fact that population density is much lower in Malawi.

As a result of increased frequency of transport, truckers more easily fill their vehicle with loads from multiple traders. With enough competition, this ensures that Beninese traders with small loads are not penalized. Our results suggest that transport cost per Kg could be reduced in Malawi by organizing larger loads.

To investigate these issues further, we examine whether transport costs vary by mode of transport. To this effect, we reestimate equation 6.1 separately for motorized and non-motorized transport. We expect to find a large  $\delta$  and correspondingly large  $\theta$  for non-motorized transport. For this estimation to yield meaningful results, we need to correct for selection bias: presumably traders choose the cheapest mode of transport available. To control for this possibility, we estimate a two-step self-selection model (see Maddala (1983), page 257-258). Let  $c_n$  and  $c_m$  denote the cost of non-motorized and motorized transport, respectively. We have:

$$\log c_n^t = X' \beta_n + u_n$$

$$\log c_m^t = X' \beta_m + u_m$$

Define  $z = \frac{X' \beta_n - X' \beta_m}{\sigma}$  and  $u = \frac{u_m - u_n}{\sigma}$  with  $\sigma^2 = \text{var}(u_n - u_m)$ . A trader selects non-motorized transport if  $c_n < c_m$ , that is, if  $u > z$ . Vice versa for motorized transport. We thus have:

$$E[c_n^t | u > z] = X' \beta_n + \sigma_{nu} \frac{\phi(z)}{\Phi(z)}$$

$$E[c_m^t | u < z] = X' \beta_m - \sigma_{mu} \frac{\phi(z)}{1 - \Phi(z)}$$

with  $\sigma_{nu} = \frac{\sigma_{nm} - \sigma_n^2}{\sigma}$  and  $\sigma_{mu} = \frac{\sigma_m^2 - \sigma_{nm}}{\sigma}$  (Maddala 1983). The above equation suggests a method for obtaining a consistent estimator of  $\beta_n$  and  $\beta_m$ : regress the choice of mode of transport on a vector of instruments, e.g., trader characteristics; compute the Mills ratios; and regress  $c_n$  and  $c_m$  on  $X$  and the Mills ratios.

Results from this procedure are shown on Table 4. Instruments include trader characteristics that may affect the choice of transport mode. In both countries, distance travelled raises the probability of using motorized transport. Self-selection has a strong effect on the choice of non-motorized transport in Benin: without self-selection, the average cost of non-motorized transport would be higher. The self-selection correction is not significant for Malawi. Previous results regarding load size are confirmed: non significant in Benin; significant and negative in Malawi. Load size has no significant effect on the choice of transport mode, but it has a strong negative effect on transport cost in Malawi.<sup>3</sup>

We conduct a similar analysis for the choice between small and large trucks, conditional on using motorized transport. Results (not shown here to save space) show that, in both countries, large trucks are more likely to be used on long distances. In Benin, they are also more used for large transactions. The self-selection correction is large and significant for small trucks in Malawi: if traders did not self-select away from small trucks, transport in small trucks would be more expensive.

Taken together, our results suggest that transport follows some economic rationale. Non-motorized transport has lower fixed costs and is used primarily on short distances. Motorized transport is used on longer distances when it is cheaper. The quantitative importance of short hauls, small trucks, and non-motorized transport probably contribute to high marketing costs. Increasing returns to load size are present in Malawi where traders transporting larger loads pay less for transport. This may be due to lower population density leading to a lower frequency of transactions, longer waiting time, and a higher likelihood that trucks do not travel full. In such an environment, traders bringing large loads pay less for transport. In Malawi, transport cost per Kg could be potentially reduced by organizing larger loads.

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<sup>3</sup>Keep in mind that load size here refers to the load carried by the trader, not the total load on the truck, which often is larger because truckers combine loads from several traders.

### 6.3. Storage

We have seen that most surveyed traders do not store products for an extended length of time. They typically purchase a consignment and hold onto it until it is sold, after which they visit their sale market to replenish their stock. Contrary to common beliefs, the great majority of traders do not undertake speculative or seasonal storage. The average stock held is a tiny fraction of annual sales – of the order of 1% on average.

There is, however, a small minority of traders who are involved in arbitrage across time. Some 10% of traders hold stocks for over a month. To estimate returns to storage, we regress the logarithm of the ratio of selling price over buying price on days elapsed between purchase and sale. This yields an estimate of the increase in gross margin associated with storage. Because of the presence of outliers, the regression is estimated by minimizing least absolute deviations instead of least squares, i.e., we report median regression results. To avoid omitted variable bias, we control for the size of the transaction and the distance between the place of purchase and the place of sale. We also include crop specific dummies, region dummies, and dummies for the type of trader (e.g., retailer, wholesaler, or collector).

Results are presented in Table 5. Experimenting with different specifications shows that best results are achieved when time enters the regression in log form. This means that returns to storage fall over time. Results indicate that the return to one week of storage is positive and significant but small: 1% in Benin and 2.3% in Malawi. Over 90 days, the estimated average return to storage by traders is quite low – 2.1% in Benin and 4.9% in Malawi. The difference between the two countries is quite small in magnitude. It may be due to the fact that Benin has two rainy seasons and thus that food supply is more evenly distributed over the entire year.

These results indicate that average returns to storage are not as large as often reported in the popular press, which is probably why so few traders bother to stock over long periods.

Storage is also a very risky activity since realized returns can vary widely around these expected returns. Larger returns can probably be achieved by rotating one's working capital faster instead of immobilizing it in idle stocks.

#### **6.4. Suppliers and clients**

Another important dimension of trade as a business is the relationships traders have with their suppliers and clients. The overwhelming majority of surveyed traders have regular clients and suppliers. The number of regulars is fairly large: 6.5 regular suppliers and 7 clients in Benin; 11 suppliers and 15 clients in Malawi. Respondents do close to half of their business with these few individuals. Trade is thus very personalized, as already emphasized by Fafchamps (2004).

Networks of traders play an important role in the movement of agricultural products. As far as the composition of these networks is concerned, ethnic concentration appears less prevalent than often assumed Fafchamps (2002). Less than half of the regular suppliers and clients are from the same ethnic group or religion as the respondent. Only a tiny proportion of regulars are relatives. Contrary to what is claimed by Fisman (2001) regarding manufacturing networks in Africa or by Granovetter (1995) regarding immigrant business networks in the U.S., business relationships among African traders are not primarily built on the family. Fafchamps and Minten (2002) come to a similar conclusion.

Respondents meet outside business with about a quarter of their regular suppliers and clients in Benin, but only 8 to 15% of them in Malawi. Social interaction is primarily through business. Some 12% of Beninese suppliers and clients sell exclusively to or buy exclusively from the respondent. The equivalent figure for Malawi is 23%. In contrast, respondents nearly never see themselves as bound to buy only from or sell only to regulars. Relational contracting does not imply vertical integration.

Regarding transaction methods, payment in cash is universal. Payment in foreign currency or in kind occurs only very rarely. Payment by check is unheard of. Supplier credit is moderately common in Benin but fairly rare in Malawi. In Benin, respondents state that close to one quarter of their purchases and sales are made on credit. Sixty percent of respondents claim to be given credit by at least some of their suppliers. Three quarters of them extend credit to at least some of their clients. Corresponding numbers in Malawi are much lower: purchases on credit account for only 3% of total purchases; credit sales amount to only 11% of all sales. Some 85% of Malawian traders claim to never receive credit from suppliers; one third never grant any credit to clients.

Outstanding balances to suppliers are very small: \$24 in Benin, nothing in Malawi. This is probably because trade credit is of very short duration: 6 to 8 days on average with suppliers, 9 to 11 days on average with clients. In the overwhelming majority of cases, traders do not charge a different price if they sell cash or on credit. Discussions with respondents suggest that sales on credit correspond to large quantities. Credit seems to be used to incite the buyer to buy more. In this context, waiving interest on trade credit is like offering a quantity discount.

Some traders also extend credit to farmers: 25% of traders in Benin, less than 10% in Malawi. Purchase with advance payment to farmers represent a minute proportion of total purchases – 4% in Benin, 2% in Malawi. Crop prices are either set in advance (40% of the cases in Benin, 75% in Malawi) or set equal to the market price at the time of delivery. Prices are negotiated at delivery only in a handful of cases. Only in 16 to 24% of the advance payment cases do credit and cash prices differ. When they do, median cash prices are 14% higher than credit prices. Credit duration is a bit longer than with traders – 14 days on average with a median of 7 days – but it is certainly shorter than the agricultural season. Surveyed traders therefore are not in the business of financing agricultural production. Advances to farmers appear like a way for traders

to secure sufficient quantities and plan their activities from one week to another. We therefore find little evidence that advances to farmers hide ‘exploitative’ practices by traders (Crow and Murshid 1994).

### **6.5. Networks and associations**

We have seen that traders maintain close relationships with a small number of suppliers and clients. Their network, however, is not limited to trading partners. Respondents know on average 37-42 other traders split more or less equally between purchase and sales markets. Median figures are 23 for Benin and 20 for Malawi. The two countries, however, differ in the number of traders respondent knew at start-up: 17 on average in Benin vs. 6 only in Malawi. This is undoubtedly a reflection of the fact that Beninese respondents had much more prior exposure to agricultural trade than their Malawian counterparts.

The two countries also differ in the extent of associative life. Two thirds of Beninese traders are member of a trader association compared to only 3% of Malawian traders. They have been members for 7 years on average instead of 3 in Malawi, and Beninese associations count many more members – 188 on average vs. 29 in Malawi. Beninese traders agree to pay association fees equivalent to \$6 a year, while Malawian traders pay nothing. The average number of association members who are also trading partners of the respondent is 34 in Benin compared to 7 only in Malawi. Traders’ associations thus play a much more prominent role in Benin.

Regarding the perceived advantages of being part of an association, by far the most important reasons are internal to the traders’ community: access to market information; mutual insurance; resolution of commercial disputes. These reasons account for 55% of the responses in Benin and 46% in Malawi. Restricting competition is also in traders’ mind, especially in Benin: 29% of Beninese traders and 16% of Malawian traders cite various restrictions on competition (e.g.,

price fixing, restricting entry, coordinating purchases and sales) as the main advantage they derive from their membership in traders' associations. Dealing with external forces is also an important motivation (e.g., negotiating with government, access to credit, group orders). It accounts for 15% (Benin) and 35% (Malawi) of the responses given by respondents.

## **6.6. Intermediaries**

Intermediaries – brokers, buying agents, and consignment agents – are a substitute for networks: instead of knowing lots of potential buyers, a trader might choose to know a single agent who sells to all of them. To investigate these issues, data were collected on the use of intermediaries. Results indicate that intermediaries are much more frequently used in Benin than in Malawi: 31% of Beninese traders use buying agents; 26% use consignment agents. The corresponding numbers are 6% and 0% in Malawi. The only category of intermediaries where the two countries are more or less similar is brokers: 8% of Beninese traders use them, vs. 3% of Malawian traders. Some 70% of Beninese traders also use an intermediate category called 'apprentice'. Although not strictly speaking agents, apprentices straddle across the employee and agent category. In practice they are encouraged to use their initiative and are used as selling agents. In two third of the cases, apprentices are close relatives. On average Beninese traders deal with 2 such apprentices.

Similar figures arise if we focus on the last purchase only. We find that 31% of Beninese traders used an agent to purchase agricultural products vs. only 3% of Malawian respondents. On the selling side, 27% of Beninese traders used an agent vs. 3% in Malawi. In Benin, the selling agent is half the time a broker, half the time an apprentice.

The total number of agents used also varies significantly across the two countries, with a much larger number of agents – especially buying agents and apprentices (selling agents) – used

in Benin and a longer period of acquaintance – 2.2 years for buying agents in Benin vs. 1 month in Malawi. Malawian agents are portrayed as rather similar to the respondent in terms of origin, ethnicity, and religion. Social interaction outside business is also more likely than in Benin, and agent are more likely to be close relatives and to operate exclusively for the respondent. In contrast, Beninese agents appear to be as different from the respondent as are regular clients and suppliers.

From this information, we conclude that in Benin the use of intermediaries is more common and agents more easily trusted than in Malawi. In contrast, Malawian respondents deal with few agents and do so only sporadically. When they do, the agent is someone with whom they can identify more easily than with the general trader population.

### **6.7. Information gathering and search**

Next we examine how traders collect information about prices and market conditions, and how they search for suppliers and clients. The average agricultural trader follows (a little over) two agricultural products regularly. He or she also follows regularly two supply markets and (a little over) one sales market. This is consistent with the observed pattern by which most surveyed traders are located in their sales market and source their products from a small number of nearly supply markets.

Surveyed traders regularly consult an average of 3 people in Benin – 7 people in Malawi – to collect information about prices. More people are consulted on the trader’s main market (which is typically a sales market) than on other markets (which are typically supply sources). This is probably because the trader spends more time on his main sales market. Tracking the ongoing selling price closely is essential to get the highest possible margin without losing customers. An average of (a little over) one worker participate to the collection of price information, which

imply that most employees of the trading enterprise are involved in one way or another in monitoring price movements. In 54% of cases, Beninese traders estimate that they are able to collect reliable information about current prices on supply markets without having to visit them; 78% of Malawian traders make the same claim.

We asked respondents to report the main source of information on prices in their main market and other markets. Talking to other traders is by far the major source of information on prices either in one's home market or in other markets. In the home market, 64% of Beninese traders and 84% of Malawian traders report conversations with other traders, including clients and suppliers, as their main source of information about prices in their home market. Surprisingly, intermediaries are hardly ever mentioned. Surveyed traders do not appear to rely on agents to quote reliable prices. In Malawi, 7% of respondents respond that they do not need to collect information because they set their own price.

Regarding other markets, talking to traders is again the main source of information. Suppliers are reported as a major source of information by one third of Malawian traders. This is a priori surprising since suppliers have an incentive to overestimate the price. The radio is cited as a main source of information by 8% of Malawian traders. One quarter of Beninese traders and ten percent of Malawian traders rely on personal observation – which means that they physically visit the market, eavesdrop, and act as a potential customer to get price quotes.

Keeping in touch with other markets takes more effort than just talking with a few traders. One important factor in this state of affairs is the extremely low usage of telephones: at the time of the survey, agricultural traders were placing, on average, 4 to 8 business-related calls a *year*. This is an extremely low frequency which is likely to have changed since cellular phones have become more widely available in Africa.

Personal visits to other purchase and sales markets make up for lack of telephone. Surveyed

traders make an average of 250 trips a year to purchase and sales markets in Benin and 92 trips a year in Malawi. The corresponding medians are 133 (Benin) and 52 (Malawi). In Benin, most trips are to sales market; in Malawi, three quarters of the trips are to supply markets. As mentioned earlier, the cumulated annual cost of these trips represents a major cost for traders.

The high frequency of travel means that traders are often absent from their home market. Given that they do not use telephones, they cannot easily keep in touch with conditions in their home market while they are away. The need to travel frequently to supply markets probably explains why traders source products primarily from nearby markets.

## **6.8. Contractual performance**

We have already discussed many of the dimensions of exchange – prices, quantities, credit, intermediaries, etc. A few issues nevertheless remain regarding contractual performance. We begin by noting that surveyed traders trade in non-standardized products. By their own account, three quarters of surveyed traders deal in products with multiple varieties. Two third also state that the product they sell vary by quality. Variation in variety and quality is associated with price differences. The coefficient of variation of prices due to quality and variety differences is 0.13 in Benin and 0.10 in Malawi (median 0.12 and 0.07). This means that a trader could lose most of his or her margin by purchasing a product of poor quality or of the wrong variety. Assessment of the product is thus essential.

Direct inspection is the only method by which surveyed traders assess quality. Only a handful of traders (10 out of more than 2000 responses) declare relying on the supplier to identify the variety and assess the quality. Only one respondent stated that he relies on the packaging. These findings are similar to that reported by Fafchamps and Minten (2001) for Madagascar. They stand in contrast with results reported by Tripp and Pal (1998) regarding agricultural seeds in

India. Inspecting each purchased load for quality is likely to be time-consuming. Since it requires experience and familiarity, it may be hazardous to delegate this function to unexperienced or unmotivated employees. Quality control is thus likely to represent a major obstacle on business expansion.

Next we examine the incidence of contractual disputes. Respondents were asked to report the number of cases of contract non-performance they encountered in the year preceding the survey. Results indicate a much higher incidence of contractual non-performance in Malawi than in Benin (Table 6). In Benin, traders only report a handful of cases of bad quality, disagreement over measures, or ex post price renegotiation with suppliers. In contrast, Malawian traders report close to 200 such occurrences per year – roughly 6% of purchases. Because Malawian traders are more likely to place orders with suppliers, they are also more likely to encounter late or non-delivery problems. In fact, the probability of non-performance appears to be quite high on orders. Given that the placement of orders is more likely when the market is tight, this is hardly surprising. But it serves as a reminder that contracts are conceived by surveyed traders as rather flexible. This finding is similar to those reported by Bigsten et al. (2000) for African manufacturing.

The two countries are more similar on the selling side, although the frequency of payment problems is about twice as high in Malawi than in Benin. Malawian traders are also much more likely to mention efforts by clients to renegotiate prices ex post. The frequency of payment problems is very low in both countries – of the order of 0.5 to 0.6% of transactions. Surveyed traders have on average one person in the firm dealing with debt collection. The fear to lose one's reputation might be a deterrent to non-payment: 53% of Beninese traders and 70% of Malawian traders state that other suppliers would get to know if a client would not pay the respondent.

## **6.9. Protection of property**

We end with a short description of how surveyed traders protect their property. In the year preceding the survey, 16% of Beninese traders and 33% of Malawian traders were victims of theft. This is higher than the incidence of theft reported in Fafchamps and Minten (2001) for Madagascar. The value of stolen property was fairly low, however: \$22 per year on average. Some traders, however, incurred much higher losses – of the order of \$2500 in each country.

Few respondents directly blame employees for the thefts, but only 62% of Beninese traders are confident that employees were not involved (72% in Malawi). Contrary to what Fafchamps and Minten (2001) report for Madagascar, fear of pilferage does not discourage traders from hiring employees: only 3% of Beninese respondents and 11% of Malawian respondents state they refrain from hiring additional employees for fear of theft.

The methods most commonly used to protect one's property is to lock the store at night (75% of those who store in Benin, 87% in Malawi), hire a

guard (40% and 28% respectively) and sleep on the premises (19% and 48% respectively). For those who transport, some protection is occasionally sought as well: some traders travel in convoy (10% in Benin, 19% in Malawi); some avoid particular routes (8% in Benin, 17% in Malawi); and some hire guards during transport (4% and 17%). Protection during transport thus appears slightly more problematic in Malawi, possibly because the country is less densely populated and ambush is easier to organize.

## **7. Conclusions**

We have given a detailed description of how agricultural traders operate in Benin and Malawi, two countries fairly representative of Western and Eastern/Southern Africa. Many of the features we have documented were well known – small size of businesses, lack of equipment, rudimentary

business practices, dominant role of transport costs. Other features were less well known, such as the importance of personal travel, bagging practices, the short distance over which most traders operate, and the incidence of theft and breach of contract.

We were also able to dispel some myths. For instance we documented the absence of speculative, inter-seasonal storage for the overwhelming majority of traders, and the relatively low returns to storage in general. We showed that advances from traders to farmers are of short duration – one to two weeks. Their main purpose is not to exploit farmers’ need for cash in order to finance agricultural production, but rather a means for traders to secure future deliveries.

The picture that emerges from this analysis is one that is dominated by search, quality control, and transport – for goods and for people. Because trading enterprises are small, the quantities they can gather from any one market are limited by what the trader can reliably locate, finance, and inspect. As a result, transport takes place in small vehicles – pick-up trucks for the most part. An inordinate amount of personal travel takes place as well, since traders must inspect the goods they purchase and payment is normally in cash upon delivery.

As found by Fafchamps et al. (2005), surveyed traders appear to work effectively under the constraints they face, which are many – e.g., limited finance, no brand names and trademarks, no certified quality, no organized commodity exchange, extremely decentralized production and consumption. They rely on networks to share information and discourage breach of contract and are able to perform an essential trading function in a flexible and expeditious manner. But the end result nevertheless is a costly system that provides a limited service to consumers and producers.

The modernization of agricultural trade in the studied countries requires that original solutions be found to the genuine problems traders face. The only ‘modern’ technologies traders seem to be using at the time of the survey are motorized transport and, to a lesser extent, pest

control. Telephones and banks are ignored. Brand recognition, grading, and quality certification are inexistent. Brokers and agents are not organized in commodity exchanges. Quantities are not pooled for transport and storage so as to achieve returns to scale. Inter-seasonal and inter-regional arbitrage is outside the purview of most traders, who prefer to operate in a small territory on a day-by-day basis. An entire continent is fed using a market set-up similar to that described, for instance, by Greif (1993) and Braudel (1986) for Europe and the Mediterranean hundreds of years ago.

## **8. Policy implications**

The results presented here suggest that policy interventions can be envisaged in four main areas: increasing traders' access to modern marketing equipment; reducing transaction risk by improving contract enforcement institutions; promoting more sophisticated business practices such as grading, quality certification, and trade credit; and reducing physical marketing costs by improving roads and transport services.

We were surprised by the virtual absence of scales and processing equipment (such as grain dryers and grading machines) and the reliance on small-scale home storage. One possible interpretation is that traders do not invest in such equipment because it is not profitable. This may be true for small traders but is unlikely to be correct for large trading firms. We believe that these avenues should be explored. One should keep in mind, however, that better equipped and hopefully more efficient large traders should drive out of business some of the small traders, who predominantly tend to be women.

Improving access to external finance should also be attempted. It is shocking, for instance, to note that large traders do not even have an overdraft facility. For certain traders – those with adequate experience and good business contacts – access to more finance would undeniably help

them grow and prosper. But we are not convinced that increasing widespread access to external finance would improve the efficiency of agricultural markets in general. Easier finance may help some traders increase their market share and eliminate competitors. But this need not result in lower prices for consumers or higher prices for producers if there are no increasing returns in agricultural trader. The work of Fafchamps et al. (2005) suggests that, at the low levels of technology found in the two studied countries, there are no increasing returns to agricultural trading. We suspect this is because business practices remain quite rudimentary, making it difficult for trading operations to grow beyond a certain size while remaining competitive.

The results presented here and in Fafchamps (2004) shows that rudimentary business practices can largely be blamed on transaction risk. Payment takes place at delivery, a practice that precludes invoicing and payment by check and complicates accounting. Goods have to be inspected upon delivery because the supplier is not trusted to provide a reliable account of the quality and quantity sold (Fafchamps, Vargas-Hill and Minten 2006). Grain has to be physically moved from one bag to another at each sale transaction. This facilitates inspection but raises costs and slows down trade. Business networks have developed as a partial palliative to these problems, but they are insufficient to eliminate them.

It is not entirely clear how in practice transaction risk can be reduced. The court system by itself is unlikely to suffice because agricultural market transactions are seldom large enough to justify court action, assuming that a breach of contract could be demonstrated and that the defendant has assets that could be foreclosed upon. One institutional innovation that could potentially reduce transaction risk is for market authorities to take a pro-active stance. Membership in traders associations could in principle be used as a guarantee of good conduct. Traders shown to breach contracts would be ousted from the association. The existence of trader associations in Benin suggests that such approach might be possible by strengthening and advising

existing associations.

Traders associations could also intervene in grading and quality certification. An association equipped with a grain dryer and simple grading equipment could bag and certify its products in a manner that is difficult to falsify. Reassured about the quality of the goods they purchase, buyers may be more willing to place orders by phone, thereby saving on transactions costs.

Another approach is to focus on agents and brokers who could, in principle, serve as essential link between unknown buyers and sellers. Gabre-Madhin (1998) has documented how this system works in the case of the Ethiopian grain market. A core of experienced brokers would be required before a commodity exchange could be set up. The existence of such an exchange would in turn facilitate the circulation of information by publicizing current and future grain prices. As a first step towards the creation of a commodity exchange in Benin and Malawi, it is desirable to assist the emergence of grain brokers coupled with grading and quality certification by traders associations.

It is also important to promote sound business practices. Beninese and Malawian traders manage to feed the population of their respective countries by collecting and distributing food among millions of producers and consumers. They do so in difficult circumstances and demonstrate great ingenuity. Perhaps even more remarkably, many of them appear to make a living from their trading activity. All this notwithstanding, business practices appear inefficient. Exchange takes a cumbersome form that allows myriads of small traders to compete with larger ones. The cumbersome practices increase the cost of the entire marketing system.

The question is how to capture increasing returns to scale from modern trading practices. Put differently, how can we enable large traders to adopt modern transaction methods so that they can reduce their costs and drive small traders out. One possibility is to favor large traders directly, for instance through credit programs and restriction to entry. These policies have been

tried elsewhere and have generally failed to induce large traders to modernize and become more efficient. Another approach is to support the modernization of trading practices irrespective of firm size. If modern practices are, as we expect, efficiency enhancing, those traders who begin using them should grow and eventually displace others. One example of such approach would be to upgrade markets by providing cheap good quality sacks and facilitating loading and off-loading. Simple processing equipment could be made available to traders in exchange for a user fee. Some experimentation is required to identify the right sequence of innovations.

Physical marketing costs constitute the bulk of traders' costs. Many of these physical costs are ultimately the result of transactions costs (e.g., the need for traders to travel to the point of purchase and sale). But there is ample scope for lowering marketing costs by reducing transport costs. Various policies could be used to address the high cost of transport. Direct measures such as reducing gasoline taxes would undoubtedly have an effect, but at the expense of much needed government revenue. Measures to improve the maintenance of rural feeder roads are urgently needed. Devolving maintenance to local administration is an option worth studying. So is the creation of toll roads to finance maintenance costs.

Another innovation worth exploring is the expansion of transport brokerage services. We have shown that transport costs can be reduced by using large trucks over longer distances. This is currently difficult because of the small size and decentralized nature of traders' operations. Transport brokers would take possession of cargo, rent out space on large trucks, and deliver to traders in their sales market. These practices are already present but insufficiently widespread. We suspect that the fear of breach of contract is a strong obstacle to the development of these practices. Better trust between traders and transport brokers would simplify the organization of transport, thereby reducing cost.

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**Table 1. Characteristics of surveyed traders**

	<b>Benin</b>			<b>Malawi</b>		
	Mean	Median	Std.dev.	Mean	Median	Std.dev.
<b>Working capital:</b>						
Startup capital (in US\$)	166	50	926	80	11	342
Current capital (in US\$)	1471	333	9341	560	136	1965
<b>Equipment: number of:</b>						
Scales	0.13	0	0.52	0.51	0	1.71
Processing equipment	0.11	0	0.58	0.01	0	0.18
Non-motorized transport	0.20	0	0.57	0.82	1	0.96
Motorized transport	0.32	0	1.04	0.08	0	0.39
Shop and storage facility	0.13	0	0.44	0.13	0	0.37
Telephone	0.03	0	0.18	0.01	0	0.12
<b>Human capital</b>						
No education:	68%			10%		
Number of spoken languages	2.65		1.39	2.14		1.15
<b>Manpower:</b>						
Owner(s)	1.2	1	2.7	1.0	1	0.1
Family employees	0.8	0	1.9	0.2	0	0.6
Non-family employees	0.4	0	1.2	0.5	0	1.7
Total manpower	2.2	1	3.7	1.5	1	1.3
<b>Social capital</b>						
Membership in trader association	62%			3%		

Source: survey data

**Table 2. Annual Sales and Margins**

	<b>Benin</b>			<b>Malawi</b>		
	<b>Mean</b>	<b>Median</b>	<b>Std. dev</b>	<b>Mean</b>	<b>Median</b>	<b>Std. dev</b>
Annual purchases (\$)	18147	4255	91508	32732	4343	142790
Annual sales (\$)	22872	5323	114660	43611	6729	182197
Annual gross margin (\$)	3123	814	6663	7387	1732	20453
Gross margin ratio on annual sales	22%	20%	12%	48%	39%	35%
Gross margin rate on last purchase	23%	19%	24%	53%	40%	61%

Source: Survey data

**Table 3. Determinants of transport costs**

(dependent variable is the log of transport cost; estimator is OLS with robust standard errors)

	Unit	Benin		Malawi	
		Coef.	t-stat.	Coef.	t-stat.
Transaction size	log	0.015	1.120	-0.091	<b>-4.410</b>
Distance travelled	log	0.749	<b>16.770</b>	0.351	<b>4.860</b>
<b>Type of transport (non-motorized= omitted category)</b>					
Pickup truck	yes=1	0.416	<b>4.010</b>	0.023	0.100
Truck	yes=1	0.501	<b>4.520</b>	-0.424	-1.490
Distance x pickup truck	logxdum	-0.333	<b>-7.840</b>	0.049	0.610
Distance x truck	logxdum	-0.352	<b>-8.890</b>	0.130	1.460
<b>Type of product (cereals = omitted category)</b>					
Beans and peanuts	yes=1	0.194	1.470	0.549	<b>1.810</b>
Roots and tubers	yes=1	0.624	<b>3.670</b>	0.558	<b>1.920</b>
Fruits and vegetables	yes=1	0.508	<b>2.760</b>	-0.306	-0.880
Distance x beans and peanuts	logxdum	-0.032	-0.920	-0.105	-1.570
Distance x roots and tubers	logxdum	-0.169	<b>-3.850</b>	-0.076	-1.020
Distance x fruits and vegetables	logxdum	0.038	0.800	0.264	<b>2.680</b>
Intercept		0.096	0.670	1.460	<b>6.630</b>
Number of observations		803		728	
R-squared		0.779		0.391	

**Table 4. Transport costs for motorized and non-motorized transport**

		Benin				Malawi			
<b>A. Transportation cost</b>		Non-motorized		Motorized		Non-motorized		Motorized	
(dependent variation is transport cost in log)		Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Distance travelled	log	-0.147	-0.600	0.661	<b>5.820</b>	0.333	1.470	0.383	<b>3.250</b>
Distance squared	log ^2	0.145	<b>2.190</b>	-0.034	<b>-2.540</b>	0.038	0.580	0.005	0.230
Transaction size	log	0.004	0.060	0.020	1.250	-0.196	<b>-2.420</b>	-0.070	<b>-2.640</b>
Beans and peanuts	yes=1	0.630	<b>2.820</b>	0.062	0.610	0.243	0.440	0.162	<b>1.650</b>
Roots and tubers	yes=1	0.786	<b>3.050</b>	-0.097	-0.740	0.202	0.670	0.327	<b>3.440</b>
Fruits and vegetables	yes=1	0.451	1.630	0.438	<b>2.480</b>	-0.418	-1.120	0.706	<b>5.250</b>
Mills ratio (from selection equation)	see text	-0.449	<b>-3.640</b>	-0.022	-0.690	0.371	0.670	-0.038	-0.350
Intercept		0.759	1.640	0.124	0.540	1.759	1.510	1.348	<b>4.790</b>
Number of observations		74		502		85		627	
R-squared		0.756		0.539		0.373		0.310	
<b>B. Selection equation</b>		Benin				Malawi			
(dependent variable is 1 if used motorized transport)		Coef.	z-stat.	Coef.	z-stat.	Coef.	z-stat.	Coef.	z-stat.
Distance travelled	log	2.144	<b>4.540</b>			0.244	1.190		
Distance squared	log ^2	-0.217	<b>-2.710</b>			0.110	<b>2.430</b>		
Transaction size	log	0.004	0.020			0.092	1.180		
Beans and peanuts	yes=1	-1.166	-0.630			0.573	<b>1.950</b>		
Roots and tubers	yes=1	-0.365	-0.160			0.142	0.580		
Fruits and vegetables	yes=1	-1.001	-0.380			-0.089	-0.280		
<b>Instruments</b>									
Gender	female=1	-0.677	-1.120			-0.221	-1.030		
Age	level	-0.010	-0.580			-0.018	<b>-1.910</b>		
Working capital	log	0.129	0.590			0.121	1.300		
Manpower	log	0.523	<b>1.680</b>			-0.086	-0.420		
Business contacts	log	0.220	1.440			-0.112	-1.260		
Value of vehicles	log(x+1)	-0.136	-1.470			0.064	1.170		
Value of non-motorized transport equipt.	log(x+1)	-0.052	-0.400			-0.091	-1.840		
Number of suppliers		-0.054	<b>-1.940</b>			0.001	0.330		
Intercept		-1.999	-0.680			-1.244	-1.440		
Number of observations		580				727			
PseudoR-squared		0.835				0.423			

**Table 5. Return to storage**

(dependent variable is log of ratio of sales price over purchase price; estimator is median regression)

	Unit	Benin		Malawi	
		Coef.	t stat.	Coef.	t stat.
Days between purchase and sale	log(x+1)	0.005	<b>2.870</b>	0.011	<b>3.440</b>
<b>Transaction characteristics</b>					
Transaction size	log	0.001	0.440	-0.007	<b>-2.950</b>
Distance between purchase and sale (km)	log(x+1)	0.004	<b>4.240</b>	0.006	<b>4.300</b>
<b>Marketing task (collector-retailer=omitted category)</b>					
Collector	yes=1	-0.001	-0.210	-0.033	<b>-4.310</b>
Retailer	yes=1	-0.019	<b>-2.810</b>	-0.019	<b>-2.130</b>
Wholesaler	yes=1	-0.025	<b>-4.250</b>	-0.036	<b>-2.500</b>
<b>Crop type (cereals=omitted category_</b>					
Beans and pulses	yes=1	-0.015	<b>-3.050</b>	0.018	<b>2.340</b>
Roots and tubers	yes=1	0.006	1.070	0.111	<b>13.270</b>
Fruits and vegetables	yes=1	0.014	<b>2.010</b>	0.039	<b>2.770</b>
<b>Region dummies (north=omitted category)</b>					
Central	yes=1	0.018	<b>4.360</b>	0.003	0.470
South	yes=1	0.021	<b>5.500</b>	0.008	0.970
Intercept		0.054	<b>5.990</b>	0.139	<b>9.400</b>
Number of observations		517		518	
Pseudo R-squared		0.114		0.155	

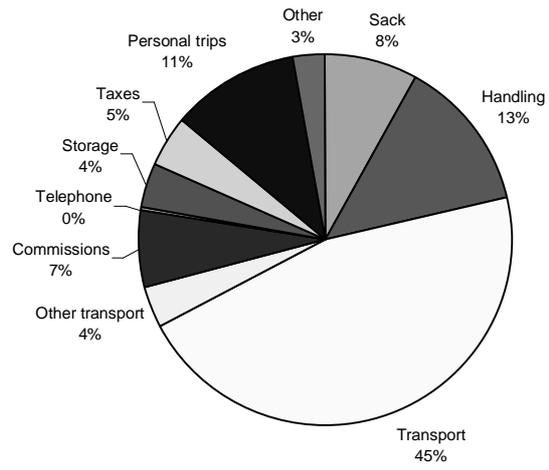
**Table 3. Contractual Disputes**

	<b>Benin</b>	<b>Malawi</b>
<b>With suppliers:</b>		
<b>Percentage of traders experiencing cases of:</b>		
Bad quality	3%	41%
Disagreement over measuring	7%	35%
Renegotiate price	12%	25%
<b>Placing orders:</b>		
% of traders who place orders	6%	32%
Proportion of purchases on order	1.20%	6.30%
<b>Of those placing orders, % of traders experiencing:</b>		
Late delivery	18%	41%
Partial delivery	20%	31%
No delivery	16%	27%
<b>With clients:</b>		
<b>Percentage of traders experiencing cases of:</b>		
Late payment	24%	42%
Partial payment	21%	34%
Non payment	20%	25%
Attempt to renegotiate price ex post	5%	20%
<b>Average number of:</b>		
Cases of late payment per year	10.8	15.2
Cases of partial payment per year	9.8	14.9
Cases of no payment per year	0.9	7.1
Cases of price renegotiation per year	0.4	116

Source: Survey data

**Figure 1. The Composition of Marketing Costs**

**a. Benin (N=609)**



**b. Malawi (N=622):**

