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Livelihoods, Growth, and Links to Market Towns in 15 Ethiopian Villages

Stefan Dercon and John Hoddinott

2033 K Street, NW, Washington, DC 20006-1002 USA • Tel.: +1-202-862-5600 • Fax: +1-202-467-4439 • ifpri@cgiar.org
www.ifpri.org

Abstract

Rural and urban spaces are usually regarded as "separate" in both development theory and practice. Yet there are myriad links between them. Urban areas, including regional urban centers such as local market towns, provide households with new opportunities to sell goods and services. These opportunities increase household income by employing previously unemployed household resources or because households reallocate household resources so as to take advantage of new, more profitable activities. Links to market towns improve the prices received by rural households because households can benefit from increased demand for their goods or because the larger market is better able to absorb production from rural areas without causing prices to decline. These links allow households access to a wider variety of productive inputs and services, to better quality inputs or to inputs that are available on a timely basis. Benefits in terms of price, variety, and quality also apply to the purchase of goods for consumption.

Despite the many potential benefits, the importance of local and regional urban centers (towns and small- and medium-size cities, as opposed to large cities and metropolitan areas) to rural livelihoods remains largely under-researched. Knowing more about the nature of links of rural households to market towns is important for guiding regional development policies and poverty-reduction strategies.

This paper uses longitudinal data from 15 villages in rural Ethiopia to explore the nature and consequences of these links. It addresses the following questions: (1) What are the links between rural households and local urban centers? (2) Does better access to local market towns affect household economic behavior? and (3) Does better access to local market towns make households better off?

Three core findings emerge. First, rural households undertake a significant proportion of their economic transactions in local market towns. These localities are the site for about half the purchases of inputs used in agricultural production, from a quarter to three-quarters of sales of crops and livestock. They are the primary location of the sale of artisanal products, particularly by women. More than half of household purchases of consumables and various types of foods occur in these market towns. Strikingly, these

are, largely, the only urban localities in which these rural households undertake economic activities. Apart from remittances, there are few direct links with more distant urban centers or the capital city. Second, access to market towns affects economic activity in rural areas. The more remote they are from these towns, the less likely households are to purchase inputs or sell a variety of products. Third, improved access to market towns has positive effects on welfare. Improving the presence of roads and their quality and improved transport increases consumption outcomes: the effects are substantial and strongly significant. Furthermore, communities with better roads have persistently higher growth rates than others. More remote communities in terms of distance to town have a (relatively weak) tendency to grow slower, beyond any of the effects related to infrastructure.

Development debates are predicated on the separateness of urban and rural spaces. But while one should be cautious in overinterpreting the results from this study, given the relatively small number of localities, the results suggest that local market towns and cities play a key role in providing space for the economic activities of *rural* households. Their role in connecting urban and rural areas suggests that drawing too strong a divide between rural and urban localities, and envisioning that economic activities are confined to respective urban and rural areas, are misleading.

Rather than seeing the urban and rural sectors as being distinct, a more fruitful approach is to see them as a continuum, running from the capital city, to larger regional centers, to smaller market towns, to the rural spaces in which our respondents live. The extent to which a strategy focusing more on urban or rural localities will "spill over" onto the other will depend on how closely they are tied together. In our results, market towns and cities are an important source of demand for products produced in rural areas, and rural residents are a source of demand for goods sold in urban areas. Improving the presence of roads, their quality, and improved transport are important factors that will further bind these spaces together and improve rural welfare.

Key words: livelihoods, transport, poverty, rural-urban linkages, Ethiopia

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Stefan Dercon
University of Oxford

John Hoddinott
International Food Policy Research Institute

1. Introduction

Development theory and practice have often treated rural and urban spaces separately. Sectoral models such as those pioneered by Lewis (1954), Harris and Todaro (1970) and their myriad extensions take rural and urban localities as having distinct growth and development trajectories. Economic flows between sectors are limited; for example, to the movement of labor from rural to urban areas. Development practice often takes a similar view. Rural development projects often make little reference to links, opportunities or constraints posed by urban markets. Projects designed to improve urban areas typically need to defend themselves against charges of urban bias that implicitly suggest that benefits will largely accrue to (wealthy) urban dwellers.

While the treatment of these spaces as separate entities is the norm, there are some notable exceptions. Work by Stark and his collaborators (see Stark 1991 and references therein; also Collier and Lal 1986) notes that urban-to-rural remittances can act as a source of capital, funding investments in rural areas while simultaneously allowing rural households to diversify livelihoods and thereby reducing their exposure to risk in rural areas. Hazell and his collaborators (see for example, Haggblade, Hammer, and Hazell 1991) have emphasized that growth in agriculture has multiplier effects such that increases in agricultural output increase demand in the rural nonagricultural sector.

Arguably, however, the links between rural and urban areas are more varied than those suggested by Stark, Hazell, and others. In particular, links to urban areas, for example via local market towns, convey a myriad set of benefits to rural localities. These include larger markets for agricultural and nonagricultural goods produced by rural households; improved access to inputs needed for agricultural production; improved access to services such as health, education, and contract enforcement and additional sources of livelihoods such as remittances and markets for off-farm labor, and better access to goods for consumption. Benefits from these links operate through several channels. First, they provide households with new opportunities to sell goods and services. These opportunities increase household income either because they result in the

employment of previously unemployed household resources or because households reallocate household resources so as to take advantage of new, more profitable activities. Second, potentially these links can improve the prices received by rural households. This comes about either because households can benefit from increased demand for their goods or because the large market afforded by access to market towns acts as "vent for surplus"—a larger market is better able to absorb production from rural areas without causing prices to decline. Third, these links may allow households access either to a wider variety of productive inputs, to better quality inputs or to inputs that are available on a timely basis. Benefits in terms of price, variety, and quality also apply to the purchase of goods for consumption. Other links may be more subtle but just as important. Stark (1991) has observed that urban-rural remittances can effectively substitute for missing credit markets. A more diversified portfolio of income-generating activities is both directly welfare enhancing (via the reduction in the variability of income) and indirectly, but permitting households to enter riskier, but higher return, activities.

Yet despite these myriad benefits, the importance of links between households in small rural villages and local and regional centers (towns and small- and medium-size cities, as opposed to large cities and metropolitan areas) remains largely under-researched (though Satterthwaite and Tacoli 2003 is a notable exception). This paper, drawing on data from 15 villages in rural Ethiopia, attempts to partially fill this lacuna. Specifically, it addresses the following questions: (1) What are the links between rural households and local urban centers? (2) Does better access to local market towns affect household economic behavior? and (3) Does better access to local market towns make households better off?

2. Data and Setting

Ethiopia is a federal country divided into 11 regions. Each region is subdivided into zones and the zones into *woredas*, which are roughly equivalent to a county in the

United States or United Kingdom. *Woredas*, in turn, are divided into Peasant Associations (PA), or *kebles*, an administrative unit consisting of a number of villages. Peasant Associations were set up in the aftermath of the 1974 revolution. Our data are taken from the Ethiopia Rural Household Survey (ERHS), a unique longitudinal household data set covering households in 15 areas of rural Ethiopia. Data collection started in 1989, when a survey team visited 6 Peasant Associations in Central and Southern Ethiopia. The survey was expanded in 1994 to encompass 15 Peasant Associations across the country, yielding a sample of 1,477 households. An additional round was conducted in late 1994, with further rounds in 1995, 1997, 1999, and 2004.

As part of the survey re-design and extension that took place in 1994, the sample was re-randomized by including an exact proportion of newly formed or arrived households in the sample, as well as by replacing households lost to follow-up by others considered broadly similar to them in demographic and wealth terms by village elders and officials. The nine additional PAs were selected to better account for the diversity in the farming systems found in Ethiopia. The sampling in the PAs newly included in 1994 was based on a list of all households that was constructed with the help of the local Peasant Association officials. The PA was responsible for the implementation of land reform following 1974 and held wide-ranging powers as a local authority. All land is owned by the government. To obtain land, households have to register with the PA and, thus, lists are maintained of the households who have been allocated land. These household lists were a good source of information for the construction of a sampling frame. The sample was stratified within each village to ensure that a representative number of landless households were also included. Similarly, an exact proportion of female-headed households were included via stratification.

Table 1 gives the details of the sampling frame and the actual proportions in the total sample and Table 2 provides some basic characteristics of these localities. Using Westphal (1976) and Getahun (1978) classifications, Table 1 also shows that population shares within the sample are broadly consistent with the population shares in the three

Table 1—The sampling frame of the Ethiopian Rural Household Survey

Farming system		Population share in 1994	Sample share in 1994	Number of villages
		(percent)	(percent)	
Plough-based cereals farming systems of the Northern and Central Highlands	Northern Highlands	21.2	20.2	3
	Central Highlands	27.7	29.0	4
Mixed plough/hoe cereals-farming systems	Mixed plough/hoe cereals-farming systems found east and south of Addis Ababa (Arsi/Bale)	9.3	14.3	2
	Mixed plough/hoe sorghum-farming system found in Hararghe	9.9	6.6	1
Farming systems based around *enset* (with or without coffee/cereals)	All areas in southern part of Ethiopia	31.9	29.9	5
	Total	100.0	100.0	15

Source: Dercon and Hoddinott (2004).

Notes: Percentages of population share relate to the rural sedentary population; they exclude pastoralists who account for about 10 percent of total rural population.

main sedentary farming systems—the plough-based cereals-farming systems of the Northern and Central Highlands; mixed plough/hoe cereals-farming systems; and farming systems based around *enset* (a root crop also called false banana) that is grown in southern parts of the country. Note, too, that in 1994, the Central Statistical Office collected a data set as part of the Welfare Monitoring System. Many of the average outcome variables, in terms of health and nutrition, were very similar to the results in the ERHS, suggesting that living conditions in our sample did not differ greatly from those found more generally throughout rural Ethiopia (see Collier, Dercon, and Mackinnon 1997).

For these reasons, it can be argued that the sampling frame to select the villages was strictly stratified in the main agroecological zones and subzones, with one to three villages selected per strata. Further, sample sizes in each village were chosen so as to approximate a self-weighting sample, when considered in terms of farming system: each person (approximately) represents the same number of persons found in the main farming systems as of 1994. However, results should not be regarded as nationally representative. The sample does not include pastoral households or urban areas. Also, the practical

aspects associated with running a longitudinal household survey when the sampled localities are as much as 1,000 kilometers apart in a country where top speeds on the best roads rarely exceed 50 kilometers per hour constrained sampling to only 15 communities in a country of thousands of villages. Therefore, while these data can be considered broadly representative of households in nonpastoralist farming systems as of 1994, extrapolation from these results should be done with care.

Table 2—Characteristics of the sample sites

Survey site	Location	Background	Main crops	Perennial crops?	Mean rainfall (mm)
Haresaw	Tigray	Poor and vulnerable area.	Cereals	no	558
Geblen	Tigray	Poor and vulnerable area; used to be quite wealthy.	Cereals	no	504
Dinki	N. Shoa	Badly affected in famine in 84/85; not easily accessible even though near Debre Berhan.	Millet, teff	no	1,664
Debre Berhan	N. Shoa	Highland site. Near town.	Teff, barley, beans	no	919
Yetmen	Gojjam	Near Bichena. Ox-plough cereal farming system of highlands.	Teff, wheat and beans	no	1,241
Shumsha	S. Wollo	Poor area in neighborhood of airport near Lalibela.	Cereals	no	654
Sirbana Godeti	Shoa	Near Debre Zeit. Rich area. Much targeted by agricultural policy. Cereal, ox-plough system.	Teff	no	672
Adele Keke	Hararghe	Highland site. Drought in 85/86	Millet, maize, coffee, chat	yes, no food	748
Korodegaga	Arssi	Poor cropping area in neighborhood of rich valley.	Cereals	no	874
Turfe Kechemane	S.Shoa	Near Shashemene. Ox-plough, rich cereal area. Highlands.	Wheat, barley, teff, potatoes	yes, some	812
Imdibir	Shoa (Gurage)	Densely populated *enset* area.	*Enset*, chat, coffee, maize	yes, including food	2,205
Aze Deboa	Shoa (Kembata)	Densely populated. Long tradition of substantial seasonal and temporary migration.	*Enset*, coffee, maize, teff, sorghum	yes, including food	1,509
Addado	Sidamo (Dilla)	Rich coffee producing area; densely populated.	Coffee, *enset*	yes, including food	1,417
Gara Godo	Sidamo (Wolayta)	Densely packed *enset*-farming area. Famine in 83/84. Malaria in mid-1988.	Barley, enset	yes, including food	1,245
Doma	Gama Gofa	Resettlement Area (1985); Semi-arid; droughts in 85, 88, 89, 90; remote.	*Enset*, maize	yes, some	1,150

Source: Community survey ERHS, Webb and von Braun (1994), Bevan and Pankhurst (1996).

3. Describing Sales and Purchase Links Between Rural Villages and Market Towns

Peasant Associations generally have rudimentary amenities. A typical PA in our sample has a primary school, a health post, and some government agricultural services such as extension agents or cooperatives. Only three of the 15 PAs in the sample have any electricity and only one has access to telephone services. About half have a periodic, weekly market. Local market towns are the urban localities containing a wider variety of services than those found within the PA. Thirteen out of 15 are electrified, 14 out of 15 have telephone services, and 11 have a post office. Most have daily markets. Populations of local market towns vary from a few thousand to, in the case of Debre Zeit, a large town near our survey site of Sirbana Godeti, about 60,000. Village households live anywhere from 0.5 to 20.0 kilometers from these urban centers.

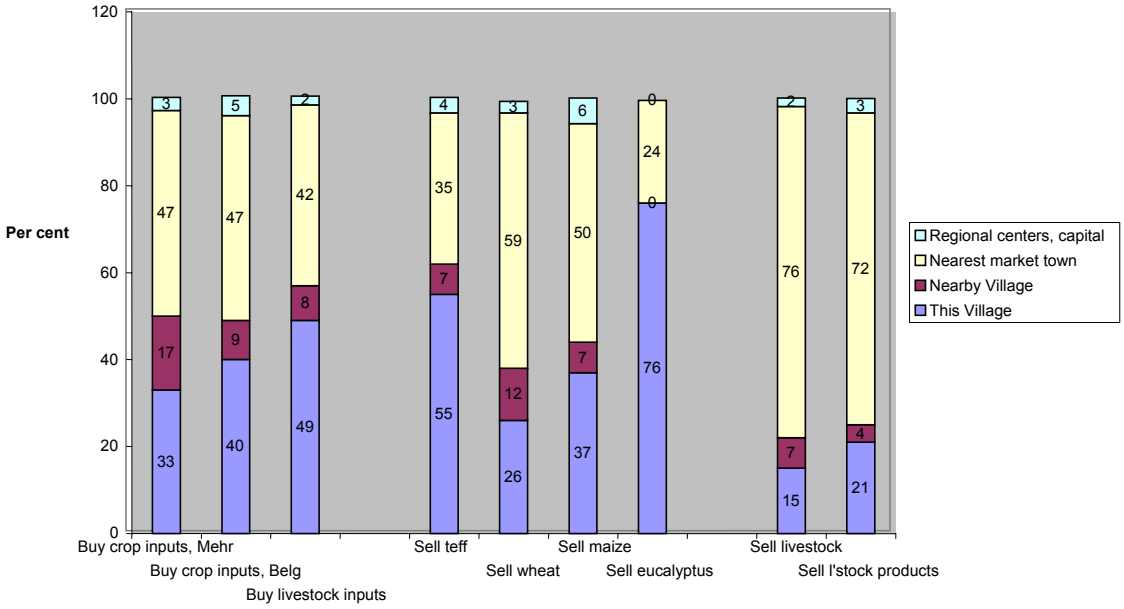
The 2004 survey instrument contained a series of questions about the physical location in which a variety of economic activities took place: village of residence within the PA; nearby villages; the local market towns described above; regional centers beyond this local market town; and the capital city, Addis Ababa. These questions were inserted into questionnaire modules pertaining to the purchase of inputs for crops and livestock, the sale of crops, and livestock sales. They were also included in questions about the location of off-farm wage work, the sale of artisan products and processed foods as well as the location of individuals sending remittances and gifts to the household. Lastly, households were asked where they typically purchased consumable items such as batteries and matches, and where they bought various types of food, including grains, fruit and vegetables, meat and dairy products, sugar and salt, and processed foods such as biscuits and sodas.

Descriptive Analysis

Full details on the location of these purchases and sales as well as disaggregations by distance to local market towns and road access are provided in Appendix Tables 5-24. Given the large number of tables these disaggregations produce, we summarize the basic findings in Figures 1a, 1b, and 1c.

Figure 1a shows that roughly half of households purchasing inputs for crops in the *meher* (long rain) and *belg* (short rain) seasons do so in local market towns. About 40 percent of households purchase inputs for livestock such as feed in these localities. For four crops grown widely in this sample (teff, wheat, maize, and eucalyptus), there is considerable variation in location of sale, ranging from 24 percent (eucalyptus) to 59 percent (wheat) being sold in local market towns.[1] Most notably, the vast majority of livestock and livestock products are sold in the local market towns.[2]

Figure 1a—Purchase and sale of agricultural items, by location

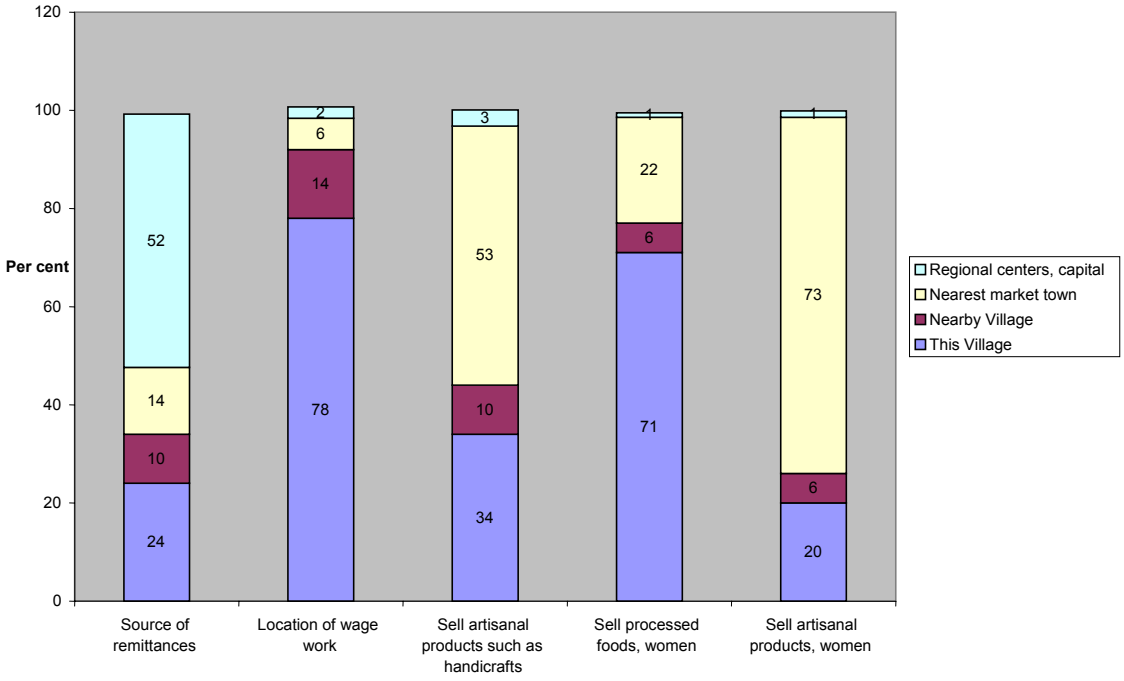


[1] Coffee and chat, two commercial crops, are only really grown in one village each.

[2] In retrospect, we rather regret that we did not think to ask *why* households chose to make purchases and sales where they did. Our suspicion is that myriad reasons are at play. For example, fertilizers are industrial goods that are not produced in these villages, so someone who wishes to buy fertilizer either needs to go to a local market town or buy it from someone else who has gone to that town. Conditional on a household purchasing fertilizer, increased distance to local market towns reduces the likelihood that households buy fertilizers in those towns. By contrast, eucalyptus is sold largely to individuals wishing to construct or improve dwellings; given the bulkiness of eucalyptus, it is not surprising that much of it is sold locally and the rest sold in local towns. For crop sales of teff and other cereals, there will be buyers both within the village and in local market towns, so factors such as the price offered in each as well as the immediacy of the need for cash may play a role. A fuller investigation of all determinants of choice of location of sales and purchases is a topic for further research.

Figure 1b looks at the locations where incomes from nonagricultural sources are generated. Two-thirds of remittances originate in the capital, Addis Ababa, or regional centers beyond these local market towns. Artisanal products made by villagers, such as handicrafts, are typically sold in local market towns. Both casual and more formal wage labor is undertaken almost entirely locally. Strikingly, in this sample there are only a few cases where households obtain wage incomes in local market towns. Looking specifically at nonagricultural activities undertaken by women, Figure 1b shows that local market towns are an especially important locale for the sale of artisanal products made by women.

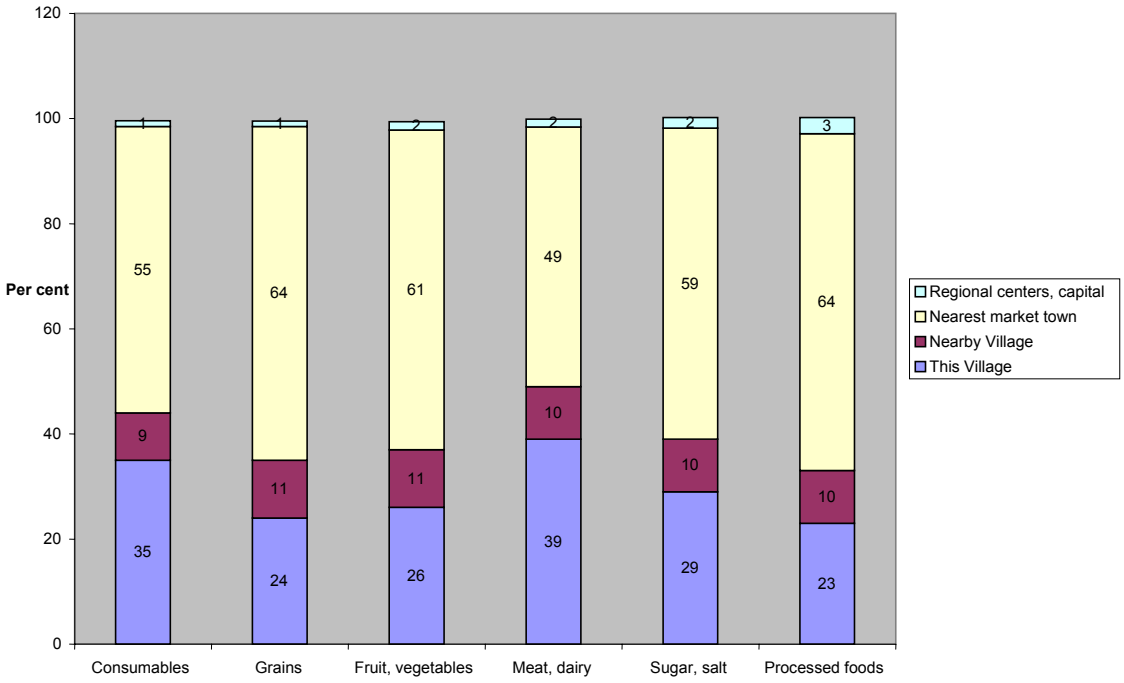
Figure 1b—Nonagricultural incomes, by location



Lastly, Figure 1c shows that typically, more than half the purchases of goods for consumption occur in local market towns. The actual percentages vary from 49 percent for meat and dairy products to 64 percent for grains. There is remarkable consistency in these percentages across goods. One possibility is that given the length of time it takes to

reach these towns, households purchase a variety of goods at the same time. A piece of evidence consistent with this conjecture comes from cross-tabulating where households buy grain and where they buy vegetables. Not surprisingly, households who report they buy grains in local towns are also very likely to report that they buy vegetables and other items in local towns. (These tabulations are available on request.)

Figure 1c—Location of expenditures



Market towns are clearly important for purchases and sales of many goods, but so are the residents' own villages. But is easier access to these market towns actually associated with an increase in purchased inputs, or greater sales of agricultural and nonagricultural products, which might then lead to improved well-being?

In answering this question, it is helpful to recognize that the phrase "easier access" can mean several things, including physical distance, the quality of the roads and bridges used to travel to these towns, the provision of bus and transport services, and/or

the time it takes to reach these towns. Our survey instruments collected data on distances, the materials from which roads are constructed (i.e., is the road tarmacked, made of stones, dirt, and so on), the quality of these roads (ranging from easily accessible to any vehicle to reasonable access to trucks and buses only to being only suitable for foot traffic) in both the rainy and dry seasons and whether transport services to towns beyond the local towns have been improved. We note that since there is no reliable bus or transport services to and from the villages within our Peasant Associations, travel to local market towns is done largely on foot. Hardly any households own a bicycle, while some do use donkeys for transport. We do not have systematic data on the time it takes to reach these market towns; qualitative data suggest considerable variation depending on distance, topography, the time of year, and road quality.

Our descriptive analysis focuses on two dimensions of access—distance and road quality. To start, we divide the sample into two groups: households living less than eight kilometers from the local market town and households living further than eight kilometers. We use eight kilometers to divide the sample for two reasons: half our localities are located less than eight kilometers from a town, half are located more than eight kilometers; and eight kilometers corresponds to about a four-hour round trip or half a days travel. Appendix Tables 5-24 show that households less than eight kilometers from a local market town are more likely to purchase inputs for crops and livestock and sell teff, wheat, maize, and eucalyptus, livestock, and livestock products in local towns than households living more than eight kilometers away. Local market towns are more likely to be the site of sale of artisanal products when they are closer than eight kilometers to a particular village. These statistics then suggest that easier access to these towns is indeed associated with an increase in purchase of inputs and market sales, which could lead to improvements in the welfare of rural households.

Regression Analysis

Still, a limitation of this cross-tabular analysis is that other factors may correlate with dimensions of ease of access and confound the links described here. For example, if market towns are more likely to spring up or grow in areas where agroecological potential is higher, and households in higher agroecological potential areas are more likely to use purchased inputs, then the relationship between purchased inputs and proximity to market towns may be merely capturing the correlation between use of inputs and agroecological potential. To examine this possibility, we estimate a series of probit regressions. Dependent variables take on the value of one if the household engages in a particular type of transaction (e.g., buys fertilizer for the *meher* or long-rain season), zero otherwise. We consider two dimensions of access: the distance from the village to the closest market town; and the quality of the road leading to that town. In order to ensure that these results are not biased by the presence of other confounding factors, we control for agroecological potential via including mean long-term levels of rainfall and the extent to which land is irrigated in the village as covariates. We also include a number of household characteristics that might be associated with these activities, age, sex and education of the head, land and number of cattle owned. To avoid simultaneity between these outcomes and covariates, we use the 1999 values for these household characteristics.[3]

Results of these probits in cases where there is a statistically significant relationship between outcomes and our measures of access are found in the Appendix Tables. To make these results more easily interpretable, we take the estimated coefficients, transform them into their marginal effects and multiply by ten. The resulting figure is the change in the likelihood that a household undertakes this activity (buys inputs, sells processed foods, etc.), given an increase of 10 kilometers in the distance from the rural village to the closest market town. These are shown in Figure 2.

[3] That is, if access to towns increases current incomes and current wealth, then wealth itself is an outcome and not a causal factor. To avoid this possibility, we use past levels of wealth.

It shows that an increase of 10 kilometers in the distance from the rural village to the closest market town has a dramatic effect on the likelihood that the household purchases inputs, controlling for the effect of other factors. It also reduces the likelihood of sales of livestock and livestock products as well as reducing the likelihood that women engage in and sell processed foods.

Figure 2—Impact of 10-kilometer increase in distance to local market town on likelihood of:

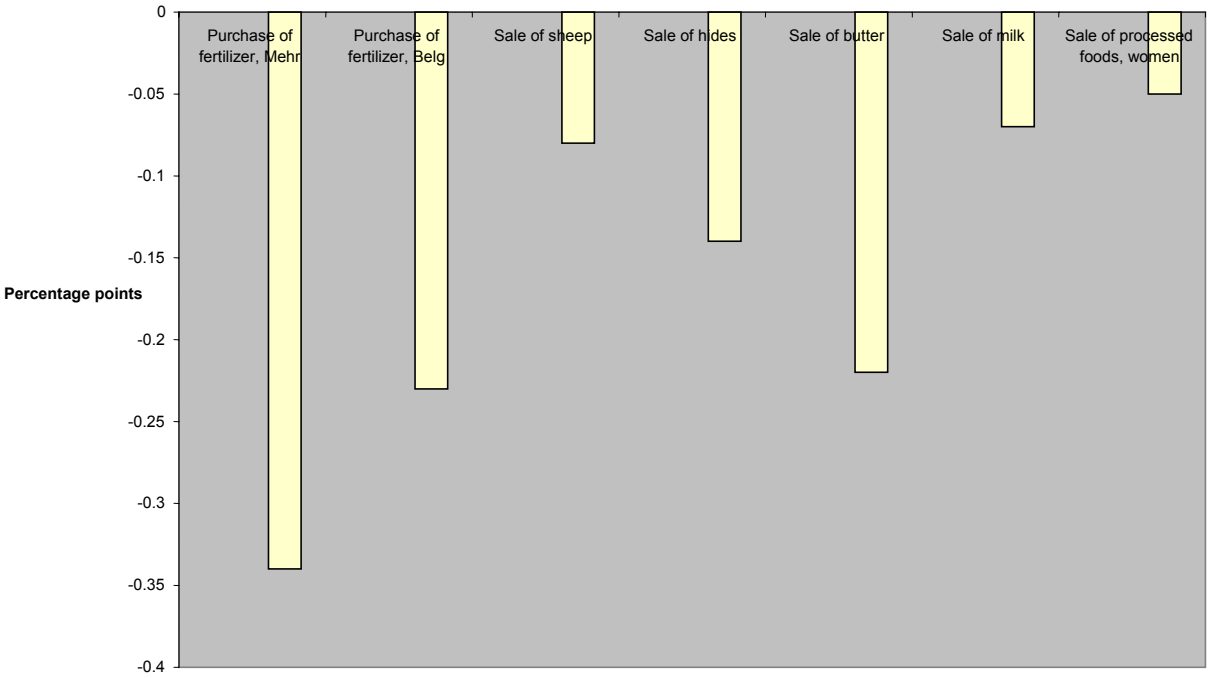
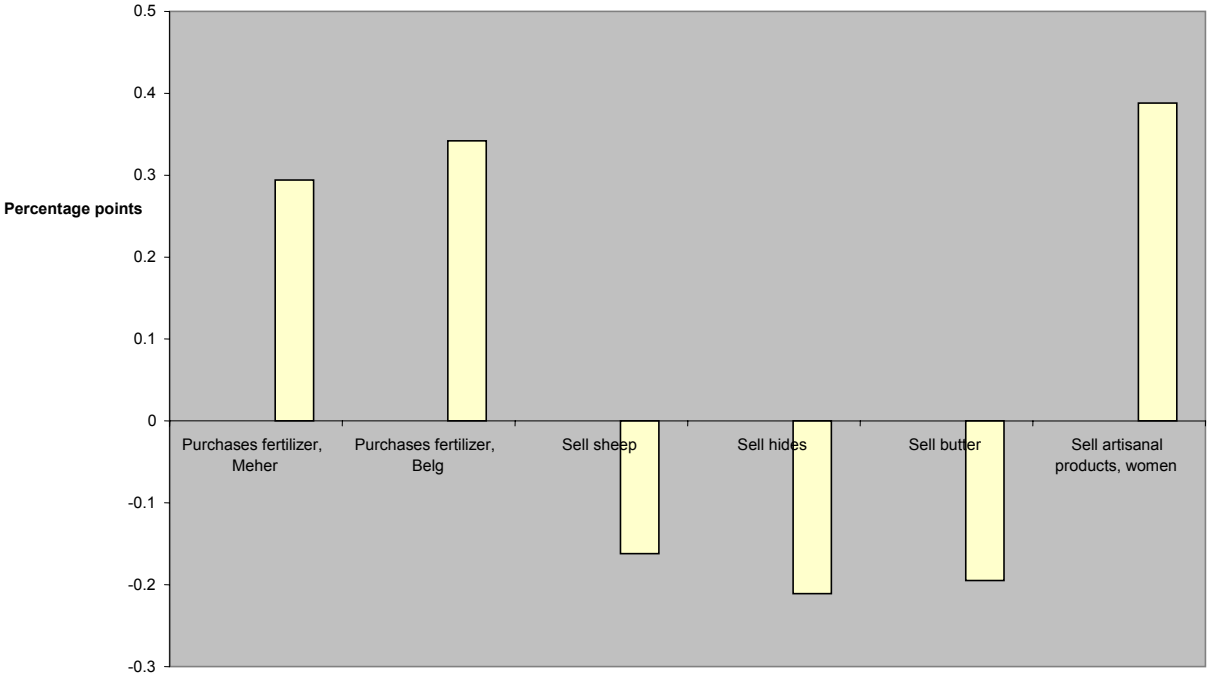


Figure 3 illustrates the impact of improving road quality. Using our probit results, it shows how the likelihood of engaging in various activities changes if roads of poor quality (accessible only to carts, animals, or people) were replaced by good quality roads (reasonable access to any vehicle). Here the results are mixed. Improvements in road quality increase the likelihood of purchasing crop inputs (by 29 to 34 percent, depending on the season) and, for women, selling artisanal products (by 39 percent) but, puzzlingly, reduce the likelihood of selling sheep and livestock products.

Figure 3—Impact of improved road quality on likelihood that household:



4. Access to Market Towns and Changes in Consumption

While the information found above is instructive, it tells at best a partial story. If our ultimate interest is in raising well-being, then we would like to know whether improvements in access to these towns are associated with making households better off. We thus examine here some determinants of growth in living standards between 1994 and 1999. Our focus is on the relative accessibility in terms of roads, transport, and general remoteness, and the associated changes in monetary living standards in this period. Using the ERHS data from 1994 to 1999, we extract information on annualized growth in consumption, mostly measured in two yearly intervals for 14 villages and 1,224 households with complete information. Mean growth in this period was about 2.2

percent per year in the sample (growth in per adult equivalent consumption),[4] but with high variability between villages, with growth extremes of -28 and 23 percent in this period. We will explore whether these growth rates can be explained, including by remoteness and infrastructure.

In order to impose some structure on our econometrics, we borrow from the conceptual frameworks used to understand growth at the national or cross-country level such as that found in Mankiw, Romer, and Weil (1992). Applying these to our rural Ethiopian households, growth rates in consumption are negatively related to initial levels of consumption and other characteristics that affect growth. For example, if past rainfall shocks have caused some households to fall into a poverty trap, then these past rainfall shocks should appear as a regressor. In the context of panel data on per adult equivalent consumption, y_{it}, of N households i (i=1,...N) across periods t, a version of this empirical model can be written as (see, e.g., Islam 1995):

$$\ln y_{it} - \ln y_{it-1} = \alpha + \beta \ln y_{it-1} + \gamma k_{it-1} + \theta \Delta Z_{it} + \delta X_i + u_{it}. \quad (1)$$

ΔZ_{it} are changes in time-varying characteristics of households and communities that help to explain growth and X_i are fixed characteristics of the household and the community. Examples of ΔZ_{it} could be changing levels of different (exogenous) assets (i.e., not due to investment decisions, but exogenously changing endowments at the household and community). We also include exogenous shocks in the specification, for example, rainfall shocks. The presence of X_i would suggest that different types of households may have a particular growth path, linked to fixed characteristics (such as ability, background, distance to towns, etc.). A standard question that is explored using the empirical growth model is whether there is conditional convergence: a negative estimate for β would suggest convergence, allowing for underlying differences in the

[4] Using per capita consumption does not produce meaningful differences in these results.

steady state.[5] A relevant question in this respect is at which level this convergence is occurring, and which variables are responsible for this. To handle this, we add further "initial" conditions to the specification, i.e., variables related to assets whose presence may have growth effects ($k_{it\text{-}1}$). Examples are levels of landholdings or infrastructure at t - 1.

Two additional points should be noted. First, some factors may cause levels of household consumption to diverge across time or space. For example, exploiting insights from endogenous growth theory, it is possible to allow for growth rates to be increasing functions in some endowments of factors of production, while decreasing in other factors. For example, if infrastructure variables have positive growth effects, this would be a sign of external effects in infrastructure.[6] Second, several recent critical reviews of this framework, such as those by Temple (1999) and Easterly and Levine (2001), highlight the importance of applying this framework with care in either a macro or micro context, given the theoretical and empirical assumptions implied by this model and a raft of potential econometric concerns.[7]

We use equation (1) for our test to see whether infrastructure and accessibility matter for understanding growth in consumption outcomes in this period. Because we want to focus on the impact of PA-level variables, it makes sense to run our regressions using the most complete controls for household-level variables that do not change over time. This is accomplished by estimating a fixed-effects regression—essentially including a dummy variable for each household in the sample—that controls for all household characteristics that might affect the growth of consumption but do not change

[5] Convergence in this context is the movement toward a common level of per adult equivalent consumption across all households. Assessments of unconditional convergence arise where these growth models contain only $y_{it\text{-}1}$ as a regressor. In tests of conditional convergence, other covariates are included so that tests of convergence are conditional on the presence of controls for other characteristics.

[6] Ravallion and Jalan (1996) exploit a similar idea in the context of a spatial divergence test, by distinguishing regional versus household initial levels of capital, building on models such as Romer (1986), to conclude that locality effects have external effects.

[7] Of which endogeneity, omitted variable bias, and the presence of a lagged dependent variable are but three.

over time. Consequently, all our covariates are identified using changes over time. The attraction of such an approach is that we avoid some standard issues, such as placement effects due to fixed factors and other sources of endogeneity affecting accessibility. However, while desirable in terms of ensuring that we can confidently identify the impact of variables that change over time, this approach comes with a cost: that we cannot identify factors that *do not* change over time, including distance to the local market town. In our sample, neither rural villages nor market towns move over time! However, we will be able to get some sense of the impact of distance by retrieving the "fixed household-level effect" from the regression and examine its correlates.

Table 3 gives the results of the model that explain the growth in per adult equivalent consumption between 1995-97 ("*t* - 1") and 1997-99 ("*t*"). It is regressed on a number of "initial conditions," variables at *t* - 1: lagged consumption, lagged road quality, sex of the head of the household at *t* - 1 and landholdings in hectares at *t* - 1. Road quality is based on questions at the community level asking (in each period) how well the community is connected to the nearest town—using codes 1 to 6, in which 1 is a road fully accessible for any vehicles during the rainy season, while 6 is access by walking only (so an increase in the index is a reduction in the quality of the asset). The regression includes changes in landholdings, changes in road quality, and reported changes in accessibility due to better transport. The latter variables measure how a *change* in the asset base affects growth—the expectation is that any (exogenous) increase in assets increases incomes and consumption. Note that landholdings are exogenous since there is no legal land market—so that only allocated or inherited land can account for increases in landholdings. Initial levels of these assets could have either negative or positive signs, reflecting either processes suggestive of convergence (e.g., linked to decreasing marginal returns to these assets) or divergence (linked to increasing returns to these assets, or forms of external affects, correlated with these assets). Finally, the regression controls for "shocks": rainfall, crop damage/pests shocks, and some shocks to

livestock.[8] If the model is interpreted as a standard micro-growth model, then a shock is equivalent to a temporary shift in the initial efficiency in production ("the constant in a standard production function"). A further control included is linked to the seasonality in the data collection: in some years the consumption data were collected in the postharvest period (up to four months after the main harvest), a period in which a substantially higher consumption in quantity tends to be found in any study on Ethiopia (see Dercon and Krishnan 2000).

Table 3—Explaining growth in consumption

Variable	Coefficient	z-statistic	Significance
Ln consumption at t - 1	-0.508	-14.90	**
Road quality at t - 1 (6 is worst, 1 is best)	-0.077	-3.67	**
Landholding in hectares at t - 1	0.034	1.55	
Change in landholding at t, t - 1	0.027	1.89	
Change in road quality index t, t - 1	-0.035	-2.41	*
Change in accessibility due to better transport t, t - 1	0.061	2.49	*
Rain shock (rain at t – rain at t - 1)/mean rain	0.319	4.27	**
Crop damage and disease shock t, t - 1	-0.088	-2.07	*
Livestock losses due to water shortage t, t - 1	-0.015	-0.60	
Livestock losses due to disease t, t – 1	-0.068	-2.24	*
Data collected during postharvest (t – t - 1)	0.114	8.61	**
Constant	2.472	13.04	**
N = 2,212, number of groups = 1,200			
R-square within 0.7215, between 0.2271,			*=5%
overall 0.4181			**=1%

Notes: Dependent variable: growth in real consumption per adult equivalent (annualized) 1995-1999. Fixed effects IV regression. Consumption at t - 1 is instrumented using consumption at t - 2. Regression controls for changes in male adults, female adults, elderly males (65+), elderly females, young children (-5), children (5-15), change in head of the household (sex), and the sex of the household head at t – 1.

[8] Livestock shocks and crop shocks are based on self-reported shocks. Livestock shocks are 0 if there is no problem whatsoever and -1 if serious problems. The crop damage index is 1 if there are no problems and 0 if there are serious problems.

The findings from the regression can be summarized as follows. Shocks affect overall growth with the expected sign.[9] More rainfall has a strong effect on output growth. There is a sign of a strong seasonality (about 11 percent higher consumption in the postharvest period, on average) but this is in line with other studies. Landholdings seem to matter for growth: increases in landholdings increase consumption, albeit only significant at about 6 percent.[10] There is only very weak evidence of "divergence" linked to landholdings.

Increases in road quality have strong positive growth effects: improvement in roads leading to local towns, say from a road poorly accessible to buses and trucks to one reasonably accessible for buses and trucks in the rainy season results in 3.5 percent higher growth. Improvements in accessibility due to better transport have a further impact, resulting in a 6.1 percent higher growth rate in this period. Furthermore, there is a persistent and divergent effect linked to road quality: the better *level* of past road quality increases *growth*. Note also the other side of this: these higher growth rates linked to transport and access imply substantially lower growth rates for those areas that are "remote" as defined in terms of road quality and transport access.

As noted above, this approach does not allow us to identify the effects of any time-invariant variables, such as "remoteness"—the impact of distance to towns, irrespective of infrastructure. However, we can do the following. From our regression results, it is possible to retrieve the household fixed effects—the magnitudes of the impact of all household fixed characteristics on consumption growth. We regress these on a set of time invariant characteristics including distance to the closest market town and the means values of time varying household characteristics such as land and demographic

[9] The idiosyncratic shocks, such as livestock disease or pests, do not have the expected signs and some are significant. This is a puzzle. Part of the reason appears to be that shocks such as livestock only affect those with livestock, so the absence of a shock could be a sign of not being able to afford livestock. Furthermore, the idiosyncratic shocks do not appear to affect our conclusions regarding accessibility and road linkages: dropping the idiosyncratic shock variables leaves the size, signs, and significance of these variables unaffected.

[10] Recall that the fixed-effects specification implies that the coefficients on levels are capturing changes in those variables relative to the mean.

characteristics. Table 4 gives the results; the clustered nature of the sample is taken into account in the calculation of the standard errors. We only find a significant gender effect: male-headed households have significantly higher underlying growth rates. There is some tendency of a nonlinear effect on distance: from about 13 kilometers onwards, each kilometer further from a town reduces growth. Note, however, that the sample (15 villages) is small to identify in what is now effectively just a cross-section of "fixed" household growth effects. Still, it adds to the cost of remoteness and accessibility described in Table 3.

Table 4—Explaining household-level fixed (growth) effects, OLS with robust standard errors controlling for cluster effects

Variable	Coefficient	z-statistic	Significance
Distance to town in kilometers	0.0357	1.74	
Distance to town in kilometers squared	-0.0014	-1.54	
Landholding in hectares	-0.0398	-1.31	
=1 if male-headed household	0.1625	3.67	**
N=1224	0.0036	0.04	
R-sq 0.2090			*=5%
			**=1%

Note: The regression controls for mean levels of household demographics: male adults, female adults, male and female children, and elderly variables.

5. Conclusions

Rural and urban spaces are usually regarded as "separate" in development theory and practice. Yet there are myriad links between them, particularly between households in rural areas and local market towns. Using longitudinal data from 15 villages in rural Ethiopia, we have explored the nature and consequences of these links.

We have three core findings. First, rural households undertake a significant proportion of their economic transactions in local market towns. These localities are the site for about half the purchases of inputs used in agricultural production, from a quarter to three-quarters of sales of crops and livestock. They are the primary location of the sale of artisanal products, particularly by women. More than half of household purchases of

consumables (batteries, matches, fuel, etc.) and various types of foods occur in these market towns. Strikingly, these are, largely, the only urban localities in which these rural households undertake economic activities. Apart from remittances, there are few direct links with more distant urban centers or the capital city. Second, access to market towns affects economic activity in rural areas. The more remote they are from these towns, the less likely households are to purchase inputs or sell a variety of products. Third, improved access to market towns has positive effects on welfare. Improving the presence of roads, their quality and transport options, in general, increases consumption outcomes; the effects are substantial and strongly significant. Furthermore, communities with better roads have persistently higher growth rates than others. More remote communities in terms of distance to town have a (relatively weak) tendency to grow slower, beyond any of the effects related to infrastructure. These results are consistent with the linkages hypothesized in the introduction. For example, access to inputs allows farmers to generate increases in output; access to larger markets facilitates sale of nonagricultural products and both are means by which consumption growth can be generated. We note, however, that we do not elucidate the direct links between improved access to sources of income growth and thence onto consumption growth; this is a topic for future research. And, of course, other non-economic linkages, such as access to health facilities and government officials and so on, may also play a role in the growth observed here.

A lively debate is currently underway in Ethiopia over the appropriate locus of development efforts. While the government has, for a number of years, been committed to emphasizing rural localities and agricultural growth as the centerpieces of its efforts to reduce poverty and hunger, this strategy—called Agricultural Development Led Industrialization (ADLI)—is now being questioned. Specifically, given stubbornly high rates of poverty and hunger, together with the perceived failure of ADLI following the 2002 drought, it has been suggested that an industrial, urban based development strategy might be more appropriate.

Such debates are predicated on the "separateness" of urban and rural spaces. But while one should be cautious in overinterpreting the results from this study, given the

relatively small number of localities included, the results suggest that local market towns and cities play a key role in providing space for the economic activities of *rural* households. Their role in connecting urban and rural areas suggests that drawing too strong a divide between rural and urban localities, and envisioning that economic activities are confined to respective urban and rural areas, is misleading.

Rather than seeing the urban and rural sectors as being distinct, a more fruitful approach is to see them as a continuum, running from the capital city, to larger regional centers, to smaller market towns, to the rural spaces in which our respondents live. The extent to which a strategy focusing more on urban or rural localities will "spillover" onto the other will depend on how closely they are tied together. In our results, market towns and cities are an important source of demand for products produced in rural areas and rural residents are a source of demand for goods sold in urban areas. Improving the presence of roads, their quality, and transport options, in general, are important factors that will further bind these spaces together and improve rural welfare.

Appendix Tables

Table 5—Purchase of crop inputs in the long (*Meher*) rains season and access to local market towns

	Where do you buy crop inputs for the long (Meher) rains season (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	32.8	16.5	51.8	33.5	49.3	17.8
In other village	16.8	12.1	21.9	23.1	5.2	11.8
In local market town	47.4	67.1	24.9	40.3	43.4	67.1
In regional town or capital	3.0	4.3	1.4	3.1	2.2	3.3

How does distance to local market town affect likelihood of purchasing fertilizer (Marginal effects computed from probit regression)	(1)	(2)	(3)
Distance to local market town	-0.036		-0.034
	(2.86)**		(3.71)**
Road quality: Some accessibility by trucks or buses		-0.281	-0.097
		(1.40)	(0.52)
Road quality: Accessible only to carts, animals or people		-0.359	-0.294
		(2.78)**	(2.66)**

Note: Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 6—Purchase of crop inputs in the short (*Belg*) rains season and access to local market towns

	Where do you buy crop inputs for the short (*Belg*) rains season (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	39.5	6.3	79.7	26.1	66.4	0
In other village	8.8	8.4	9.3	12.3	5.9	0
In local market town	47.1	77.6	10.2	54.4	26.7	95.5
In regional town or capital	4.6	7.7	0.8	7.3	1.0	4.5

How does distance to local market town affect likelihood of purchasing fertilizer (Marginal effects computed from probit regression)	(1)	(2)	(3)
Distance to local market town	-0.016		-0.023
	(1.00)		(1.77)
Road quality: Some accessibility by trucks or buses		-0.078	0.103
		(0.34)	(0.44)
Road quality: Accessible only to carts, animals or people		-0.362	-0.342
		(2.29)**	(2.39)**

Note: Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 7—Purchase of inputs for livestock and access to local market towns

	Where do you buy inputs for livestock (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	48.9	42.3	57.5	53.0	65.0	28.9
In other village	7.5	7.3	7.7	6.5	6.2	9.9
In local market town	41.6	49.6	31.4	38.5	26.1	60.0
In regional town or capital	2.0	0.8	3.4	2.0	2.7	1.2

How does distance to local market town affect likelihood of purchasing inputs (Marginal effects computed from probit regression)

	Feed for livestock			Veterinary services		
	(1)	(2)	(3)	(1)	(2)	(3)
Distance to local market town	-0.004		-0.008	-0.004		-0.005
	(0.43)		(1.15)	(0.57)		(0.87)
Road quality: Some accessibility by trucks or buses		0.159	0.197		0.031	0.060
		(1.10)	(1.57)		(0.26)	(0.52)
Road quality: Accessible only to carts, animals or people		-0.140	-0.114		-0.087	-0.070
		(1.23)	(1.07)		(0.76)	(0.63)

Note: Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 8—Sale of crops—teff, by access to local market towns

	Where do you sell teff? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	54.9	59.2	54.1	61.8	68.2	0
In other village	6.8	2.1	9.4	7.3	8.2	2.1
In local market town	34.7	38.7	33.5	28.0	23.5	97.9
In regional town or capital	3.6	0	3.0	2.9	0	0

Table 9—Sale of crops—wheat, by access to local market towns

	Where do you buy/sell wheat? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	26.3	16.0	54.2	30.8	13.3	0
In other village	12.3	13.0	10.4	13.7	0	11.1
In local market town	58.7	67.2	35.4	52.1	86.7	88.9
In regional town or capital	2.7	3.8	0	3.4	0	0

Table 10—Sale of crops—maize, by access to local market towns

	Where do you sell maize? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	37.3	18.4	60.2	17.2	84.2	21.0
In other village	6.5	11.7	1.1	15.5	1.8	3.7
In local market town	50.3	67.0	34.4	55.2	14.0	75.3
In regional town or capital	5.9	2.9	4.3	12.1	0	0

Table 11—Sale of crops—eucalyptus, by access to local market towns

	Where do you sell eucalyptus? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	76.4	71.4	90.6	82.8	80.8	52.4
In other village	0	0	0	0	0	0
In local market town	23.6	28.6	9.4	17.2	19.2	47.6
In regional town or capital	0	0	0	0	0	0

Table 12—Sales of livestock and access to local market towns

	Where do you sell livestock? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	15.2	13.0	16.9	14.1	34.4	11.1
In other village	6.6	3.9	8.7	5.2	5.4	9.4
In local market town	76.2	81.4	71.9	79.6	58.1	75.5
In regional town or capital	2.0	1.7	2.5	1.1	2.1	4.0

How does distance to local market town affect likelihood of selling: (Marginal effects computed from probit regression)	Oxen			Sheep		
	(1)	(2)	(3)	(1)	(2)	(3)
Distance to local market town	-0.003		-0.007	-0.010		-0.008
	(1.06)		(0.33)	(1.87)*		(1.90)*
Road quality: Some accessibility by trucks or buses		-0.089	-0.085		-0.086	-0.044
		(3.10)**	(2.92)**		(2.35)**	(1.03)
Road quality: Accessible only to carts, animals or people		-0.028	-0.027		0.140	0.162
		(1.15)	(1.14)		(2.40)**	(3.25)**

Note: Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 13—Sales of livestock products and access to local market towns

	Where do you sell livestock products (hides, butter, eggs, milk)? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	20.8	12.7	30.3	25.0	36.6	10.1
In other village	4.1	4.1	4.1	4.6	2.3	4.5
In local market town	71.7	82.7	58.8	68.5	47.7	84.8
In regional town or capital	3.4	0.5	6.8	1.9	13.4	0.6

	How does distance to local market town affect likelihood of selling: (Marginal effects computed from probit regression)								
	Hides			Butter			Milk		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Distance to local market town	-0.011		-0.014	-0.013		-0.022	-0.006		-0.007
	(1.60)		(3.13)**	(1.48)		(4.91)**	(1.36)		(2.52)**
Road quality: Some accessibility by trucks or buses		-0.032	0.044		0.367	0.602		0.056	0.131
		(0.53)	(0.59)		(2.22)**	(5.10)**		(0.62)	(1.21)
Road quality: Accessible only to carts, animals or people		0.145	0.211		0.202	0.195		0.088	0.086
		(1.88)*	(3.18)**		(1.82)*	(2.68)**		(1.22)	(1.50)

Note: Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 14—Source of private remittances and gifts by access to local market towns

	Where do senders of remittances and gifts live? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	24.8	17.7	29.9	32.9	16.5	26.5
In other village	10.0	6.5	12.5	11.4	7.4	13.2
In local market town	13.6	2.4	21.6	18.0	11.4	8.8
In regional town or capital	51.6	73.4	36.0	37.7	64.7	51.5

Table 15—Location of wage work, by access to local market towns

	Where do you undertake wage work? (Excludes food for work) (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	77.6	80.2	76.2	71.6	86.1	81.0
In other village	13.7	9.4	16.0	18.2	6.9	11.4
In local market town	6.4	9.4	4.7	7.4	4.2	6.3
In regional town or capital	2.3	1.0	3.1	2.7	2.8	1.3

Table 16—Own business activities and access to local market towns

	Where do you sell products produced from own business activities? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	33.9	20.0	42.4	31.1	36.1	35.4
In other village	10.0	7.6	11.5	11.7	3.9	16.8
In local market town	52.8	70.8	41.8	51.5	58.9	45.1
In regional town or capital	3.3	1.6	4.3	5.6	1.1	2.7

How does distance to local market town affect likelihood of selling products such as handicrafts (Marginal effects computed from probit regression)	(1)	(2)	(3)
Distance to local market town	0.003		0.002
	(1.71)*		(0.92)
Road quality: Some accessibility by trucks or buses		0.097	0.083
		(2.35)**	(1.82)*
Road quality: Accessible only to carts, animals or people		0.019	0.010
		(0.64)	(0.32)

Note: Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 17—Sales of processed foods, by women and access to local market towns

	Where do you sell processed foods? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	71.2	41.7	93.6	75.9	65.6	66.7
In other village	6.3	12.5	1.6	8.6	0	9.5
In local market town	21.6	43.8	4.8	15.5	34.4	19.1
In regional town or capital	0.9	2.0	0	0	0	4.7

How does distance to local market town affect likelihood of selling processed foods? (Marginal effects computed from probit regression)	(1)	(2)	(3)
Distance to local market town	-0.004		-0.005
	(0.89)		(1.59)
Road quality: Some accessibility by trucks or buses		0.019	0.066
		(0.29)	(0.83)
Road quality: Accessible only to carts, animals or people		-0.063	-0.052
		(2.59)	(1.43)

Note: Processed foods include tella, araqi, injera, and dabbo. Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 18—Sales of handicrafts and other nonagricultural products, by women and access to local market towns

	Where do you sell handicrafts and other nonagricultural products? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	19.5	14.1	22.8	10.1	34.8	12.1
In other village	6.6	2.2	9.4	7.6	2.3	15.2
In local market town	72.6	83.7	65.8	80.7	61.8	72.7
In regional town or capital	1.3	0	2.0	1.6	1.1	0

How does distance to local market town affect likelihood of selling these products? (Marginal effects computed from probit regression)	(1)	(2)	(3)
Distance to local market town	-0.010		-0.008
	(0.65)		(0.63)
Road quality: Some accessibility by trucks or buses		-0.120	-0.076
		(0.71)	(0.47)
Road quality: Accessible only to carts, animals or people		-0.404	-0.388
		(3.11)**	(3.20)**

Note: Handicrafts and other nonagricultural products include pottery, weaving, charcoal, firewood, and dungcakes. Probit regressions include mean rainfall at village level, amount of irrigated land available in Peasant Association (PA), household size, sex and literacy of household head, cattle owned, and total amount of land controlled by household (in hectares) as controls. Standard errors are corrected for PA-level clustering. Absolute values of z-statistics are in parentheses. * Significant at the 10 percent level; ** Significant at the 5 percent level.

Table 19—Purchases of consumables (batteries, matches, etc.), by access to local market towns

	Where do you buy consumables? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	35.4	28.7	37.8	43.5	40.1	22.1
In other village	9.0	17.3	6.0	14.2	3.4	5.2
In local market town	54.5	53.7	54.8	41.6	53.0	72.3
In regional town or capital	1.1	0.3	1.4	0.7	3.5	0.4

Table 20—Purchases of foodgrains, by access to local market towns

	Where do you buy foodgrains? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	24.4	21.8	25.4	26.5	30.3	18.1
In other village	10.5	21.4	6.5	14.5	1.8	10.2
In local market town	63.5	56.8	65.9	58.8	60.6	71.7
In regional town or capital	1.6	0	2.2	0.2	7.3	0

Table 21—Purchases of fruit and vegetables, by access to local market towns

	Where do you buy fruits and vegetables? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	26.6	18.7	29.4	25.8	30.9	24.9
In other village	11.0	22.5	6.8	16.4	2.8	8.6
In local market town	60.8	58.8	61.5	57.4	59.0	66.5
In regional town or capital	1.6	0	2.3	0.4	7.3	0

Table 22—Purchases of meat and dairy products, by access to local market towns

	Where do you buy meat and dairy products? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	38.8	21.8	45.1	36.1	30.1	47.6
In other village	10.3	20.3	6.6	15.9	0.9	8.4
In local market town	49.4	57.2	46.5	47.6	62.4	44.0
In regional town or capital	1.5	0.7	1.8	0.4	6.6	0

Table 23—Purchases of items such as sugar, salt, and cooking oil, by access to local market towns

	Where do you buy items such as sugar, salt, and cooking oil? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	28.6	25.0	29.9	32.9	35.3	18.7
In other village	10.2	19.4	6.9	15.1	2.8	8.0
In local market town	59.2	55.6	60.5	51.4	54.6	72.7
In regional town or capital	2.0	0	2.7	0.6	7.3	0.6

Table 24—Purchases of processed foods such as biscuits and sodas, by access to local market towns

	Where do you buy processed foods such as biscuits and sodas? (percentages)					
		By distance to local market town		By road quality		
		Less than 8 kilometers	8 kilometers or greater	Accessible by any vehicle	Some accessibility by trucks or buses	Accessible only to carts, animals or people
				(percentages)		
In village of residence	22.9	21.9	23.3	28.9	33.2	8.9
In other village	9.9	14.5	8.2	11.5	3.3	11.7
In local market town	64.1	62.9	64.6	58.7	55.6	76.3
In regional town or capital	3.1	0.7	3.9	0.9	7.9	3.1

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