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Development Economics: Theory, Empirical Research and Policy Analysis
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Chapter 8
Domestic Markets for Goods and Services

Life in the world's rich countries is dense with market opportunities. Grocery store aisles, department stores and web sites offer breakfast cereals, shoes, cars, fitness training sessions and college diplomas, in some cases from the other side of the planet. In many parts of the developing world, on the other hand, life brings contact with few markets. Occasionally selling beans or cotton, and buying fertilizer or cookware, some rural households seldom participate in markets, and when they do, face few choices and deal only in small local markets. What explains this dramatic difference? What causes markets to grow in geographic reach, variety and sophistication? And what is the relationship between market expansion and development?

Once markets develop, the prices people face in those markets have profound implications for their way of life and well-being, as we learned in Chapters 6 and 7. Rising corn prices may push poor corn consumers into hunger, while providing bright new opportunities for some corn farmers. What determines market prices? And what impacts will the investments and innovations that underlie economic growth and development bring to prices in diverse markets?

This chapter examines why markets emerge and expand, what might inhibit their spread, and what prices result when the purposeful decision-makers of Chapters 6 and 7 interact with each other in markets. The chapter then applies the concepts and analytical tools developed along the way in addressing the weighty and much-debated question: What relationships between government and markets are most conducive to development?

The focus in this chapter is on markets for goods and services such as rice, shoes and fertilizer. In Chapter 9 and 10 we turn our attention to labor markets and financial markets. In Chapter 11 we address interactions among all these markets at regional, national and international levels.   The tools developed here for examining market equilibrium are essential in policy analysis, and are employed in every policy analysis application in Part IV.

What are markets?

Markets are forums for exchange of goods and services, in which people participate primarily out of self-interest (Fafchamps, 2004). People sell some of the their grain, carpentry services or labor time in order to buy clothing, radios and other items they would prefer to consume. Their exchanges may take the form of barter, in which they directly trade grain for clothing. More often, however, they sell their grain or labor to one set of trading partners in exchange for money, which they then use to buy clothing

from other partners.   Much more complicated exchanges may be governed by formal contracts or informal agreements specifying in advance when and where each party will transfer specific goods, services or payments to the other.

<p style="text-align:center">Why Markets Emerge and Expand: The Gains from Exchange</p>

People begin trading with each other – and markets emerge – because they find it beneficial to do so. In this section we describe the benefits generated through market exchange, starting with market exchange at its simplest level: exchange between two neighbors.

Relative productivities and the gains from exchange. Consider two farm families, the Smith's and the Jones'. Each family owns an acre of land, and wishes to consume both rice and vegetables, but the families differ in their capabilities for producing rice and vegetables. If Family Smith devoted its entire acre to rice cultivation, it would obtain 10 bags of rice, while if it used the entire acre for vegetables, it would obtain 5 bags of vegetables. (It could also divide its land between cultivation of rice and vegetables. If it devoted half its acre to rice cultivation and half to vegetable cultivation, it would obtain 5 bags of rice and 2.5 bags of vegetables.) Having different soil type or elevation, Family Jones' productivity conditions are the reverse. It could obtain a maximum of 5 bags of rice or 10 bags of vegetables from its acre of land.

In Figure 8.1 the shaded triangle in each panel represents a family's production possibilities, or all the combinations of rice and vegetables that they could feasibly produce. The line defining the diagonal edge of the triangle is the family's **production possibilities frontier** (PPF), or the set of all combinations of rice and vegetables that it could produce while cultivating all of its land and cultivating each crop at the household's maximum productivity. For Family Smith, the PPF stretches from the point (0,10) to the point (5,0). For Family Jones, the PPF stretches from the point (0,5) to (10,0).

If exchange between the families were impossible, each family would find itself in **autarky,** or the state of engaging in no trade. Each family would have to consume some combination of rice and vegetables that it can produce on its own farm. Using its resources as effectively as possible, it would consume on its PPF. Using the language of Chapter 6, the PPF would constitute the family's "budget constraint", and it would choose to consume at the point along that budget constraint that maximizes its utility. Let's suppose that Family Smith chooses to consume at point A, while Family Jones chooses point B.[1]

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[1] We could introduce indifference curves into the diagram to illustrate each family's preferences, and could then figure out where each family would consume by looking for a tangency between an indifference curve and the PPF. For our purposes here, however, it is more convenient to leave the indifference curves invisible.

Figure 8.1a	Figure 8.1b

bags of rice (Figure 8.1a y-axis)

10

• C

• A

O   5   **bags of vegetables**
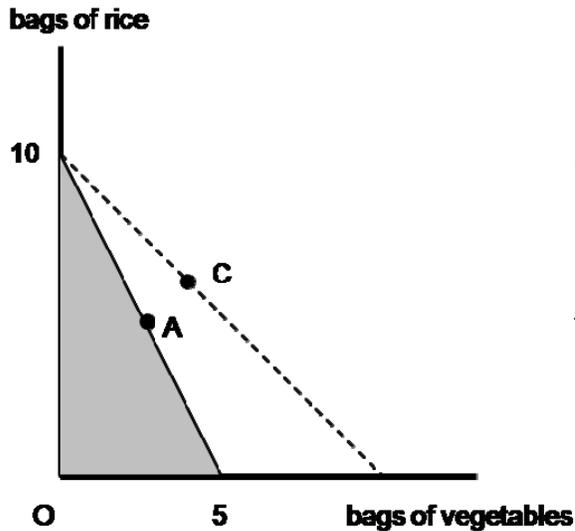
Family Smith's Production Possibilities Frontier has a steeper slope, indicating that the Smith's are relatively more productive in rice cultivation.

bags of rice (Figure 8.1b y-axis)

C

5

• D

• B

O   **bags of vegetables**   10
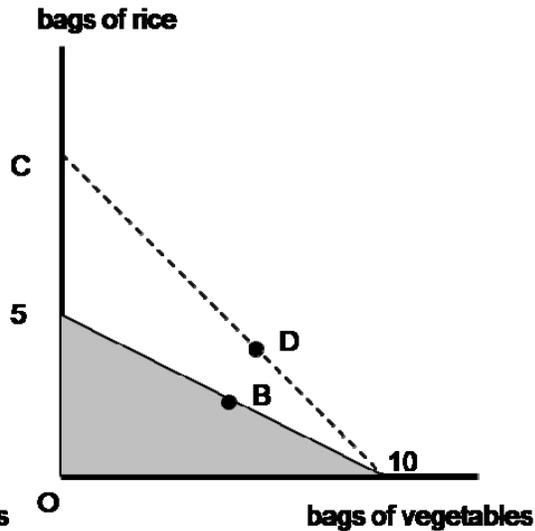
Family Jones' Production Possibilities Frontier has a flatter slope, indicating that the Jones' are relatively more productive in vegetable cultivation.

Our assumption about the families' differing production capabilities implies that their PPFs have different slopes, and we will see that this difference in slopes creates the potential for both families to benefit from trade. Family Smith's PPF has a slope of -2. This says that if Family Smith wishes to consume another bag of vegetables, while remaining in autarky, it must give up 2 bags worth of rice production. If offered the opportunity to trade for a bag of vegetables at a cost of less than 2 bags of rice, it would seize the opportunity. The family could produce one bag less of vegetables, use the freed up land to produce two more bags of rice, and then give up only some of that extra rice to obtain the bag of vegetables through trade. The Jones' PPF has a slope of -1/2. If it wishes to produce another bag of vegetables, it must give up the production of only ½ bag of rice. Turning this around, Family Jones would have to give up 2 bags of vegetables to obtain a bag of rice. They would be interested in obtaining rice through trade at any cost less than two bags of vegetables. At any rate of exchange of bags of rice for bags of vegetables between 2 (the absolute value of the slope of Family Smith's PPF) and ½ (the absolute value of Family Jones' PPF), both families would want to trade.

If opportunity for trade arises, it will bring specialization in production and expanded consumption. To see this, suppose the families agree to exchange rice for vegetables on a 1-for-1 basis.[2] For Family Smith, it is always cheaper (in terms of foregone rice consumption) to obtain vegetables through trade rather than through production on its own farm. Thus the Smith's choose to specialize in rice cultivation, producing at the point (0,10) at the upper left hand end of its PPF in Figure 8.1a. The dashed line represents its "consumption possibilities under exchange". The consumption possibilities

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[2] Later in the chapter we will begin describing the forces that determine exactly what market rates of exchange will emerge. For our current purposes it is sufficient to pick a convenient rate of exchange at which both families are willing to trade.

schedule starts at the point (0,10), because the family could choose to consume all 10 bags of rice that it produces (and consume no vegetables). It has a slope of -1, indicating that, while the family continues to produce at the point (0,10), each time it delivers up a bag of rice for exchange, it would obtain a bag of vegetables in return. We can tell trade is beneficial for the Smith's because the dashed line contains consumption combinations that lie to the northeast of point A. (Indeed, no matter where the family had chosen to consume along its autarky PPF, its consumption possibilities under exchange would include points to the northeast.) This means that through trades of appropriate sizes at the 1-for-1 rate of exchange, Family Smith could manage to consume more of both rice *and* vegetables than it would have consumed in the absence of exchange. We can think of exchange as offering Family Smith a "better technology" for converting rice into vegetables than re-allocating land from rice cultivation to vegetable cultivation on its own farm. A similar logic applies to Family Jones, which specializes in vegetable cultivation and achieves higher levels of consumption through trade than it could have obtained in autarky.

As long as the two families have PPFs with different slopes, and they trade at a rate of exchange in between the absolute values of their PPF slopes, we can find particular trades that leave *both* families better off. In Figure 8.1, an example of a trade that would leave both better off is a trade of 4 bags of Family Smiths's rice for 4 bags of Family Jones' vegetables. This would cause Family Smith to consume at point C and Family Jones to consume at point D. Both families are better off than if they had remained in autarky.

What's going on exactly? Family Jones has higher **relative productivity** in vegetable cultivation, while Family Smith has higher relative productivity in rice cultivation. This means that in autarky Family Jones can produce an additional bag of vegetables at a lower cost in terms of foregone rice production than is true for Family Smith, and Family Smith can produce an additional bag of rice at lower cost in terms of foregone vegetables. When the families move from autarky to specialization and exchange, the joint resources of the entire two-person "economy" are put to better use. Land that is better for rice cultivation is used for rice cultivation, while land that is better for vegetable production is used for vegetable production. As a result, the economy's overall capacity to produce rice and vegetables is increased, and both parties to the voluntary exchange are able to benefit from expanded consumption.

Money-mediated exchange. The exchange just examined involved only two households and took the form of barter. In reality, a household's integration into a local market is more likely to take the form of attending the village market day, where exchanges take place among many neighbors using money. Even so, the same intuition regarding the benefits of specialization and exchange applies. As long as the households have some differences in relative aptitudes for producing the various goods they all wish to consume, they have some potential to benefit from specialization and exchange.

Relative and absolute productivity differences. What if one family had inferior capabilities for producing both crops? Would both families still find trade beneficial? The answer is yes, as long as the families' *relative* productivities still differ. Consider

Figure 8.2. Family Jones' PPF is the same as in Figure 8.1, but Family Smith's production possibilities have now shrunk (because, for example, we are now considering a family with land of much lower quality). The most rice Family Smith could produce is 4 bags, and the most vegetables it could produce is 2 bags. We say that it is **absolutely less productive** in both rice and vegetable cultivation relative to Family Jones, which could produce 5 bags of rice or 10 bags of vegetables. Family Smiths's PPF is everywhere closer to the origin than is the PPF for Family Jones. But Family Smith's PPF remains steeper than Family Jones'.

Figure 8.2a

bags of rice

4

O   2   **bags of vegetables**
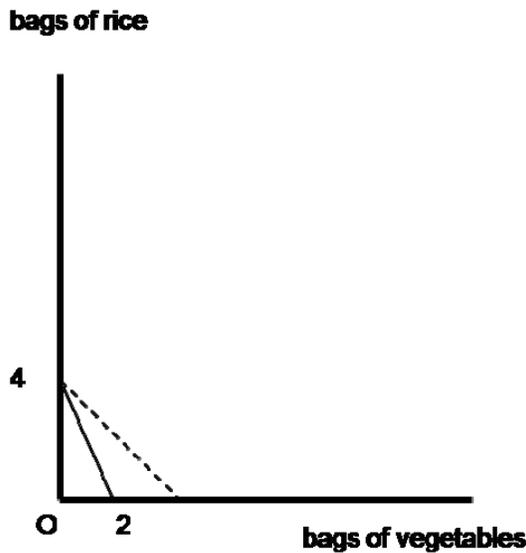
Family Smith is absolutely less productive in both goods but the steeper slope of its Production Possibilities Frontier still indicates that it is relatively more productive in rice cultivation compared to Family Jones. Trade improves its consumption possibilities.

Figure 8.2b

bags of rice

5

O   10   **bags of vegetables**
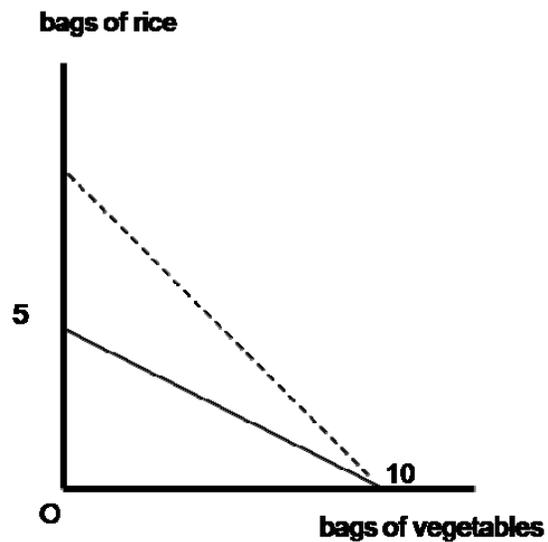
Family Jones is absolutely more productive in both crops, and relatively more productive in vegetable cultivation. The family can improve its consumption through trade, even if its trading partners are absolutely less productive in both crops.

When facing any market rate of exchange between -2 and -1/2, Family Smith would specialize in rice cultivation, and could consume anywhere along the dashed consumption possibilities schedule shown Figure 8.2a. Family Jones would specialize in vegetable cultivation and consume along its dashed consumption possibilities schedule. Both families would be made better off. What matters for trade to be beneficial is that families differ in their *relative* productivities, and not their absolute productivities. When two parties exchange two goods, by definition, each party is relatively more productive in one of the two goods. Family Smith, despite its absolute disadvantages, is *relatively* more productive in rice cultivation. We say that Family Smith has a **comparative advantage** in rice cultivation (and Family Jones has comparative advantage in vegetable production).

Gains from specialization and scale. The specialization and exchange illustrated in Figures 8.1 and 8.2 increase the productivities of rice and vegetable cultivation for the economy as a whole, by allowing the cultivation of each crop to shift onto farms better suited for it. In practice specialization may have even greater benefits, because it may allow each family's own productivity to increase, through at least two channels. First,

productivity may increase because of **intrinsic specialization advantages,** or the reduction of waste associated with dividing time and land between uses. For example, no longer having to distinguish rice fields from vegetable fields, the families would no longer need to suffer as many losses associated with under-productive edges and corners of individual fields.

More important, specialization leads to production on a larger scale. When exchange takes place among many households, and in many goods, with individual producers fulfilling the demands of a large number of people, the increases in scale may be substantial. If production is characterized by **economies of scale**, then the per-unit cost of production falls as the scale of production increases, perhaps because increased scale pushes producers past production volume thresholds at which more efficient technologies become feasible and economical. For example, when each household is self-sufficient, food processing and clothing production are undertaken in labor intensive fashion using low productivity equipment and handicraft methods. The scale of production is sufficiently small that it does not pay to invest in productivity-increasing factory technologies. Only when specialization brings production at sufficient scale will it make sense for higher productivity food processing and textile factories to emerge.

Gains from increased variety. As households specialize and the scale of production and exchange increases, people gain not only because increased productivity allows them to obtain the same goods more cheaply, but also because they are no longer limited to consuming the particular varieties of goods that they know how to produce. It becomes possible to choose among a wider **variety** of goods and services. People value variety itself, enjoying the ability to consume a larger number of distinct items.[3] Increased variety also means that people with diverse needs and tastes have greater ability to identify specific items that best suit their needs.

The gains from expanding and integrating markets. Further gains arise when small village markets begin exchanging with each other, forming a single larger market. Just as we can draw production possibility frontiers (PPFs) for families, we can draw them for entire communities. We could re-label the graphs in Figure 8.1 or Figure 8.2, letting the PPFs represent the combinations of rice and vegetables (or food and textiles) that each of two communities could produce when putting all of their assets to good use. Again we would be able to demonstrate that, as long as their PPFs have different slopes, the two communities would find that specialization and exchange allows each of them to achieve higher levels of consumption of both goods. In fact, trade over longer distances is likely to allow greater gains from exchange than trade within local communities, because over longer distances relative productivities are likely to differ more, and trading with multiple communities is likely to allow production at larger scale.

Gains from agglomeration. While agricultural production must be spread out over great geographic space, and thus is suited to rural areas of low population density, many non-agricultural activities are better suited to urban locations where they have easy access to

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[3] Chamberlin (1933) and Lancaster (1971) are credited with first exploring the role peoples' love for variety might play in shaping market outcomes.

many workers, better information about consumer wishes, and more frequent interchange with buyers, suppliers and competitors. In fact, as firms are joined by many other firms in the same location (which becomes a town or city), they may benefit from **agglomeration economies,** which cause the productivity of individual firms to increase as the number of firms in the immediate vicinity rises. Because people living in cities must eat but produce little food, urban areas cannot even emerge without a concomitant emergence of exchange between urban and rural food-producing areas. Once urban areas emerge, their PPFs are likely to differ profoundly from rural PPFs, creating tremendous potential for gains from rural-urban trade.

Despite aggregate gains, some households may lose. The analysis of Figures 8.1 and 8.2, if re-labeled to refer to communities rather than families, would demonstrate only that *aggregate* consumption within each community is increased through specialization and exchange. It does not establish that each and every household within each community is made better off. Indeed, we will find that there are bound to be losers as well as winners. Later in the chapter we begin developing tools for studying the likely identities of the winners and losers from market creation and expansion.

What prevents markets from emerging or expanding: Transfer costs

If market integration carries with it such potential to improve productivity and variety, then what holds it back? Unfortunately, potential market participants must weigh the benefits of exchange against the associated **transfer costs***, or the costs of transferring the goods from seller to buyer and of carrying out the transactions through which this happens. Transfer costs can be very high in developing countries for many reasons.

Transportation and communication costs. Often households that might benefit from exchange are separated from each other by geographic distance. This means that any goods exchanged between them must be transported from one place to another. Even where wide roads are in good repair, transporting goods costs time and money. For many communities in Africa, however, where less than half the population lives close to an all-weather road, transportation options are limited, and transportation is costly, time consuming, unpredictable and physically risky (WDR, 2008). Geographic separation also implies that sellers and buyers must engage in some sort of communication simply to find one another and strike a deal. For example, a farmer might have to spend time in a central marketplace waiting, and manufacturers might have to spend time on the phone and internet attempting to identify buyers.

Storage and financing costs. Because finding buyers takes time, and because some goods are produced seasonally but consumed continuously, a seller may need to store produce for a period between production and delivery. Storage brings direct costs, because goods must be stored in either owned or rented facilities. It also brings indirect costs related to rotting, damage and pilferage. Whether or not the seller must store her produce before selling, time is likely to elapse between production and payment by buyers, thus the seller may require financing to pay for inputs, transport and marketing prior to obtaining payment from sales.

Contracting and screening costs. Many beneficial exchanges can take place only when the parties have sufficient trust in each other. Even when paying cash to carry away a bag of vegetables from the market square, the buyer must trust that the seller has not hidden rotten vegetables in the middle of the bag. The need for trust is much greater when simple cash-and-carry transactions are unattractive. For example, a small factory wishing to can beans might prefer to arrange a more sophisticated transaction, in which it pays a farmer to deliver beans to the factory on a specified date. Both parties must trust that the other will follow through on promises. If the farmer fails to deliver on the contract date, the factory will remain idle; and if the farmer delivers on the contract date, but the factory refuses to accept the beans, or attempts to pay a lower price for the beans (taking advantage of the pressure the farmer faces now that the beans are harvested and starting to perish), the farmer may fare much worse than if he had taken the beans elsewhere.

Unfortunately, in many developing countries the social and legal institutions that might facilitate trust are lacking or very costly to access. (We return to this issue in Chapter 12.) Lacking such institutions, buyers and sellers perceive sophisticated transactions requiring trust very costly, associated with significant risk of large losses. As a result, few such transactions are undertaken and producers are limited to transacting within a small circle of friends, family and long-term business associates.

Licit and illicit taxes. Sometimes transactions are made more costly by government efforts to tax them. In developing countries, where many transactions are small, informal and in far-flung places, many kinds of transactions are nearly impossible to tax. Often the easiest transactions to tax are those involving international trade, because the transactions involve goods that must pass through a sea port, air port or customs station on a major highway or railway. For this reason, import tariffs and export taxes have often contributed a large fraction of government revenues in developing countries.

Even within countries, some transactions are easier to monitor and tax than others. Longer-distance trades – whether between rural and urban areas, or between large regions – are easier to detect and tax than trades among neighbors within villages, because it is easier to monitor the movement of goods along a few main highways than it is to monitor the movement of goods along diverse walking paths and among people in the market square. In some cases central governments provide local governments with the ability to raise revenue by giving them authority to tax agricultural goods passing through checkpoints along major roads within their jurisdiction.   In other cases central governments simply prohibit private transport of goods between communities, in order to enforce the monopoly of a government marketing board on the buying and selling of specified agricultural products (see Chapter A).[4] In yet other cases, the local police (or other groups) decide for themselves to set up checkpoints along major routes, at which they extract bribes from travelers.

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[4] We can think of such outright prohibitions as raising transfer costs, because they are effective only when potential buyers or sellers are convinced that ignoring the prohibition would bring sufficiently high risk of financial, time or psychic costs.

Market intermediaries and marketing rents. The activities of transportation, marketing, storage, contract-writing, and financing are very different from the activities of producing rice or vegetables. Just as there are gains to specialization among producers of different foods, so there may be gains to specialization in the production of these **marketing services** as distinct from the production of rice or vegetables. Many marketing tasks also require the use of capital items – refrigerated trucks, storage silos, networks of business acquaintances, financial capital -- which require large investments by specialized entrepreneurs who can engage in enough trade to justify the investment. Thus it is not surprising that many of these tasks are carried out by **market intermediaries** rather than by the producers or consumers themselves.

In markets for agricultural goods, the intermediaries who perform these functions are highly diverse. On one end of the spectrum are the "higglers" of Jamaica, women who carry rural produce to town in baskets on their heads. On another end of the spectrum, and of growing importance throughout the developing world, are supermarket chains, which set up large regional warehouses, collect produce from farmers under contracts specifying quality standards and delivery dates, and package and distribute the produce to urban consumers. For more on supermarkets see Box 8.1. In between are a wide range of business people who engage in one or more of the many activities involved in food marketing: middlemen who gather produce from multiple farmers, truck drivers, grain millers, wholesalers who collect produce from multiple small middlemen, and more. Intermediaries who transfer fertilizer, seed and other inputs from manufacturers to farmers may include the owners of general stores in small towns or more specialized input suppliers.

Box 8.1
Supermarketization of Food Markets in Developing Countries

Traditional domestic food markets involve direct sales from farmers to consumers in weekly open air markets, or the collection of produce from farmers by traditional middlemen, who sell to wholesalers or directly to consumers in the markets of more distant towns. The food distributed through traditional marketing systems is undifferentiated by quality and unprocesed.

Over the last two decades food markets throughout much of the developing world have undergone transformation through a process of "supermarketization. First in South America and East Asia outside China, then in Central America, Mexico, Southeast Asia and South Africa, and more recently in South Asia, China, Eastern Europe and a few parts of Africa, supermarkets have entered and quickly taken over large fractions of domestic food retail.

When supermarkets enter food markets, they bring with them demands for more sophisticated transactions, and technologies for reducing the costs of those transactions. They require more sophisticated transactions with food producers, because they are serving a growing urban, higher income clientele that values quality, diversity and consistent supply. To fulfill these demands supermarkets must enter into contractual relationships with suppliers specifying strict quality standards and specific future delivery dates. Supermarkets' new technologies involve the use of large, centralized warehouses serving many retail stores and sourcing from farmers over large areas, sometimes including more than one country. Working with farmers either directly or through specialized brokers, they often provide training, inputs and equipment.

Taking advantage of economies of scale, they are able to reduce the costs of marketing high quality foods, offering urban consumers higher quality produce at lower prices, quickly gaining market share over more

traditional retailers. While delivering benefits to food consumers, the rise of supermarkets has more mixed implications for food producers. Creating the conditions for profitable trade in high quality produce requires investment in warehouses, transport systems, and the creation of productive relationships with producers. Supermarkets find that these investments are more profitable when they connect them to larger farmers with more productive land, or to well-run associations of smaller farmers, than when they involve unorganized small farmers. They are also more profitable in regions with good infrastructure. Naturally, supermarkets only undertake investment where it is most profitable. For farmers who already enjoy large farms, and good land and infrastructure, the spread of supermarkets thus offers new opportunities. But smaller, poorer, more remote and less well organized farmers miss out on these opportunities, and may even face declining opportunities in traditional markets, as consumers take advantage of the new services supermarkets offer. Observing the disadvantages that smaller farmers face in connecting to supermarket supply networks, some NGOs have begun efforts to organize and equip groups of farmers and link them up with supermarket procurement systems.

Source: Reardon and Timmer, 2007.

Even within urban areas a variety of intermediaries are involved in marketing. Formal wholesalers and retailers purchase goods from producers and set out wares for sale in stores, and informal street vendors purchase goods in stores and carry the goods out to more dispersed and convenient locations around the city.

In some markets, the transportation, communication, financing and other services that make the link between local producers and distant buyers possible are provided by a single large buyer, such as a company that processes sugarcane into ethanol. Integrating the marketing activities with the processing and sales activities within a single firm may reduce total transfer costs by facilitating better coordination and better flow of information between producers and consumers. Some such buyers go even further, providing inputs and training to the producers who supply them.

Sometimes marketers charge for their services explicitly. For example, a trucker may charge a trucking fee per ton of freight and per kilometer of distance. Often, however, marketers derive pay for their services by buying produce from "upstream" in the marketing channel and selling it "downstream" at a higher price. The difference between selling and buying prices is called the **marketing margin**. It is sometimes thought that the mere existence of marketing margins implies exploitation of small farmers and businessmen, who are thought to be cheated out of receiving the full retail price for their produce by exploitative middlemen. It must be recalled, however, that middlemen perform services that are costly to produce. Middlemen cannot charge clients more for their services than it would cost the clients to undertake the marketing activities themselves. They gain a place in the market because economies of scale and specialization allow them to reduce the cost of marketing services.

The critical question to ask about middlemen is not whether they enjoy a marketing margin, or whether the marketing margin is large in some absolute sense, but whether or not the marketing margin exceeds the marketers' per-unit cost of providing the marketing services. If marketers are perfectly competitive, then the marketing margin should just cover their cost of providing those services (if the costs are measured to include the

opportunity cost of the marketers' time and capital).[5]   Under circumstances of poor infrastructure and poor institutions, such costs can be great, thus even competitive marketing margins can be high. If, however, middlemen lack competition then they may be able to command **"marketing rents,"** or an excess of pay for their services over what it costs them to produce the services. Such rents constitute another contribution to total transfer costs.[6] When competition drives marketing margins to equal the real costs of marketing services, driving all rents out of the system, markets are said to be **efficient.**

Under what conditions might middlemen extract rents? Rents arise when competition is limited. Sometimes competition is limited by policy. For example, when government regulations award legal right to import and retail a chemical fertilizer to only one company, the lucky importer lacks competition and thus retains an ability to raise price above cost without losing all customers.   At other times a more subtle set of circumstances may effectively limit competition and allow marketers to reap rents. For example, if residents of small rural communities are to participate in market exchange in larger markets, they may have to purchase transport for goods and services over a single market road. Few people may have the knowledge, skills and interests required to set up wholesaling and retailing services between this community and the larger market, and even fewer may have the financing required to purchase the necessary vehicles and invest in creation of the necessary business networks.   Even with financing, potential competitors may avoid entry into small markets already served by one (uncompetitive) middleman or vertically integrated buyer, because they fear the market is too small to sustain more than one such business. Thus it is possible that small remote markets are served by marketers who reap rents.

Careful empirical research on the extent of competition in these small rural markets is valuable, because lack of competition increases marketing margins, discouraging exchange by increasing transfer costs. It thereby prevents some of the potential gains from exchange from being realized, as well as shifting the distribution of the gains from exchange toward the middlemen or vertically integrated buyers with market power. The few studies that have emerged thus far do raise concerns about non-competitive behavior in some markets in remote areas with poor infrastructure. Aker (2007) finds evidence of positive marketing profits using monthly market-level data on price differentials and transport costs for pairs of markets in and around Niger. Osborne (2005), using a year of detailed daily data on 10 wholesale grain traders in Ethiopia, finds evidence that traders in more remote locations engage in non-competitive behavior, depressing prices paid to farmers by an average of 3 percent, with price reductions higher in harvest seasons when

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[5] For an explanation of why competition leads to a long-run equilibrium in which producers earn a normal return on their assets (but zero "economic profits"), see Pindyck and Rubinfeld, of standard economic theory that perfect competition should lead to a long-run equilibrium in which producers earn zero economic profits. See Pindyck and Rubinfeld (2009), Chapter 8.

[6] Even when extracting rents, middlemen cannot drive transfer costs above what it would sellers to undertake the transactions themselves. Unfortunately, for sellers with few assets, the only way to carry out the transactions themselves might be to carry small quantities of produce on their heads. Taking into account the cost of their time and the losses associated with being unable to transport all produce in a time fashion (e.g. before it rots), the per-unit cost of carrying out these transactions may be extremely high.

supply is great. Such price reductions are especially deleterious for small farmers who do not have the means to store their produce at harvest.

How transfer costs inhibit trade. To see how transfer costs can inhibit trade, consider what happens to the analysis of Figure 8.2 when exchange becomes costly. Figure 8.3 copies the second panel of Figure 8.2 for Family Jones. When trade was costless, Family Jones could bring AB vegetables to market and receive the BC units of rice in exchange, allowing it to consume at point C.

Figure 7.3

bags of rice
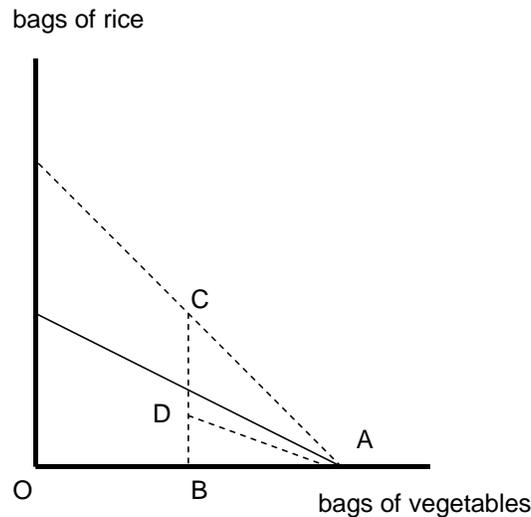
bags of vegetables

The gains from specialization and exchange
may be outweighed by transfer costs.

Suppose now that trade is costly. When Family Jones gives up AB bags of vegetables, it must use some of that produce (or money it receives in exchange for the vegetables) to cover the costs of getting the produce to market and finding a buyer. If the transactions costs are the equivalent of CD bags of rice, then when the family brings AB bags of vegetables to market, it brings home only BD bags of rice, and ends up consuming at point D, which lies inside its PPF. Under such circumstances trade would leave the family worse off than if it remained in autarky and consumed on its PPF. A family in such circumstances will choose not to trade.

Empirical significance of transfer costs. Box 8.2 provides anecdotal evidence on significance of transfer costs in Cameroon.

Box 8.2
Transfer Costs in Cameroon

In late 2002 a reporter for the *Economist* magazine accompanied an 18-wheeler loaded with 30,000 bottles of beer and other beverages from the port city of Douala to the small town of Bertoua in Cameroon. The 500 km (313 mile) trip, which might have taken 5 or 6 hours in the United States, took four days. Given grid lock traffic, exacerbated by crumbling roads and car

wrecks that could not be cleared until examined by the police (who were in no rush), it took two hours simply to leave the city. Outside the city progress was slowed by unpaved roads of rutted red dirt bordered with steep ditches, temporarily rendered impassable by rain three times during the trip. Once the delay lasted several hours longer than it might have, because it was difficult to locate the person in charge of unlocking a gate used to prevent large vehicles from using the road when wet. Only after the gate was unlocked did the travelers discover that a bridge further on had been washed out and they would have to find an alternate route. More dismaying than the condition of the road was the need to stop, often for hours at a time, at 47 (!) road blocks operated by police, most of whom were seeking bribes in beer or cash. Rough roads and dysfunctional law enforcement systems took their toll not only in time and in bribes, but also high vehicle maintenance costs, and high risks of injury and death from road traffic accidents.

The net result of transport difficulties for consumers in Cameroon is that a bottle of Coca-cola that costs 300CFA (the local currency) in the capital city, where it is bottled, costs 315CFA in a small town 125km down the road, and 350CFA 100km further. Consumers living off the main road fair even worse: a beer that costs 350CFA in the port city of Douala on the western coast costs 450 in villages that must be reached by foot in the country's eastern region.

In addition to increasing the average time and money costs of transport, and thus the prices paid by outlying consumers, transport difficulties like these make it nearly impossible to plan business operations with any accuracy. Uncertainties generated by poor infrastructure require Guinness Cameroon, the local subsidiary of the multinational beer producer, to retain 40 days worth of inputs in inventory, increasing production costs by perhaps 15 percent.

Source: *The Economist*, December 19, 2002.

What determines prices and the extent of the market: Partial Equilibrium Analysis

We have examined the benefits that may arise out of exchange, and the transfer costs that may inhibit exchange, but we have yet to develop tools for understanding the determination of which exchanges take place and the prices at which they take place. This section exposits a basic building block for the analysis of these issues: a graphical model of equilibrium in a single market. The graphs are useful for **partial equilibrium analysis**, in which we seek to understand the determination of prices and quantities in a single market or small set of markets, while taking prices in all other markets as given. In Chapter 11 we develop tools for shedding light on "general equilibrium", in which we take into account the mutual effects of changes in any one market on all others.[7]

Geographical grounding. If we wish to take transfer costs seriously, we must take geography seriously. Thus when defining the market of interest, we must identify not only the commodity of interest, but also the geographic region of interest and the location of the central market within this region. The region of interest might be a village (and the

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[7] The analysis of the benefits of exchange presented early in the chapter was a simple form of general equilibrium analysis, in which we recognized interactions between markets for rice and vegetables. In this section we assume that rice and vegetables are both exchanged for money in the market center. We hold constant the real value of a unit of currency (in the sense that a unit of currency can always be redeemed for the same amount of a fundamental good like an hour of unskilled labor time) and the real price of one of the goods, and examine how forces of supply and demand determine the price of the other (and the quantities of it that are purchased and sold over various distances).

surrounding agricultural land), a larger region of a country, an entire country, or even the world.[8] For a village, the central market location may be a weekly gathering of sellers and buyers in a market square. For a region it may be the commercial district of the primary city. For a country, it may be the urban district near the country's main port or in the capital city. Having identified the region and market location of interest, we will use the adjective "local" to refer to producers and consumers within this region, and to prices and quantities exchanged in this market location.

In Figure 8.4 we examine the market for carrots in Small Village, and the geographic region within which its farmers live and work, and focus on the exchange of carrots between producers and consumers in the village's market square. The horizontal axis measures the quantity of carrots (in bags) that are sold in the village market, while the vertical axis measures the price (in pesos per bag) at which carrots are sold there.

Figure 8.4
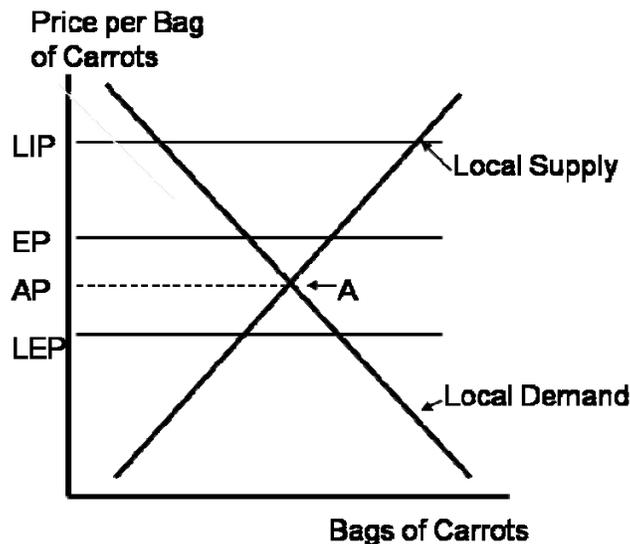
Local consumers and producers may consider importing and exporting as well as buying and selling locally. To determine equilibrium prices and quantities in the local market, we must describe local supply, local demand and opportunities for external trade.

Local supply and local demand. The **local supply curve** indicates the quantities of carrots that the producers in and around Small Village would be willing to sell in the market square at various prices that might obtain there. It is upward sloping, indicating that as the local carrot price rises (while holding constant all other factors that influence farmers' supply decisions), local producers are willing to supply more carrots to the

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[8] When analyzing policies, the region of interest will often be defined for us by the geographic scope of the policy in question. For a small NGO project implemented in a single village, the region of interest is the village and surrounding agricultural land. For policies toward international trade, the region to which we first direct our attention is the entire country, though we will also probably wish to consider differences in impacts across smaller sub-regions.

market. The **local demand curve** indicates the quantities of carrots that consumers in and around Small Village would be willing to buy in the market square. It is downward sloping, indicating that as local price rises (while holding constant all other factors that influence consumer demands), local consumers are interested in purchasing fewer and fewer carrots.

The geography of local supply and demand. Local supplies and demands come from households living in and around Small Village, which are geographically dispersed and differentiated in productive capabilities. At any given price for carrots in the market, some households find it attractive to sell carrots and others find it attractive to buy carrots, but some will find that the benefits of buying or selling carrots in the market are outweighed by the transfer costs. (See Chapter 7's discussion of joint production and consumption decisions of farm households.) Villagers who live further from the market square, or whose routes to the market square are more treacherous, difficult and undeveloped, will be more likely to remain outside the market.

When the market price rises, the quantity of carrots supplied to the market may increase not only because farmers already participating in the market increase their supplies, but also because more remote farmers who previously remained outside the market start finding it attractive to enter the market. As the market price rises, more remote consumers may also begin to find it less attractive to obtain carrots in the market and begin producing carrots for themselves (or ceasing to consume carrots altogether). Thus movements along local supply and demand curves can be understood to have implications for the geographic extent and nature of the local market.

Autarky equilibrium. The local supply and demand curves contain sufficient information to answer the question: what price would obtain in this market if trade with other regions were impossible, and what quantity would be exchanged at that price? Under such circumstances the village would be found in autarky, at least with respect to carrot trade. In autarky the quantity of carrots purchased by local consumers must equal the quantity of carrots sold by local producers. For the market to be in equilibrium, everyone in the market must be able to purchase or sell the quantity of carrots he or she desires at the going price. As should be familiar to students with introductory economics training, such conditions obtain only at the intersection of the supply and demand curves (the point A in the Figure 8.4).[9] We will call the price associated with the intersection of the supply and demand curves the **autarky price**. (Notice that we call this the autarky price, because it indicates the price that would obtain *if* the market were in autarky equilibrium. It remains a well-defined price level even when the market is not in autarky equilibrium.)

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[9] At this price, the quantity that local producers wish to sell just equals the quantity that local consumers which to buy. If the price were higher, producers would wish to supply more, consumers would wish to purchase less, and some carrots on offer would go un-purchased. The suppliers who fail to find customers would be willing to offer consumers a lower price in order to attract business. Other producers would have to follow suit, and the price will be bid down until it reaches the equilibrium level. Similarly, if the price were lower than the price at point A, consumers who cannot obtain as many carrots as they wish would bid the price up until it reaches the equilibrium level, at which they all obtain as many carrots as they wish.

Opportunities for external trade, and transfer costs. Often we will wish to study geographic regions that are not in autarky, but rather engage in trade with external markets. We acknowledge the potential for external trade by introducing into our diagram additional devices that describe the attractiveness of importing to or exporting from the most attractive external market. For Small Village, this might be the market in a larger town (which we'll call Big City) within the same region of the country.[10] We depict opportunities for trade with the external market by introducing three horizontal lines into the diagram (as in Figure 8.4), at the heights of three important price levels. The **external market price** (EP) is the price that people pay for carrots in the larger external market (in Big City), which we will assume to be unaffected by what happens in the local market. The **Local Import Price** (LIP) is equal to EP *plus* the transfer costs associated with purchasing the good in the external market and bringing it back to the local market. (For our purposes here, it does not matter whether consumers of goods produced in the external market undertake the costly importing activities themselves, employ middlemen, or implicitly pay the transfer costs to producers or retailers based in the external market who retail their goods in Small Village. All that matters is the ultimate cost of carrying out the transactions.) Local consumers would never be willing to pay more than the LIP for locally produced carrots, knowing that they could import them at a total cost of LIP. The **Local Export Price** (LEP) is equal to the EP minus the transfer costs associated with transporting the good from the local market to the external market and selling it there. Local producers would never be willing to sell locally for less than the LEP, knowing that they could net the LEP on any unit they exported. The LIP always lies above the EP, while the LEP lies below; and the greater are the transfer costs involved, the wider the gap between the LIP and LEP.

Types of Equilibrium. The local market for carrots is in equilibrium when no consumer wishes to buy more locally produced carrots than are available, and no local producer wishes to sell more locally than is demanded locally at the current price. Three quite different types of equilibrium are possible, depending on the heights of the LIP and LEP lines relative to the autarky price (AP). Roughly speaking, if external prices are "high" relative to the AP, the Small Village market will be found in an **exporting equilibrium**. If external prices are "low" relative to the AP, the Small Village market will be found in an **importing equilibrium**. If external prices are "in between", the Small Village market will be found in an **autarky equilibrium**, in which it neither imports nor exports. The following paragraphs make this more precise.

An easy way to decide whether importing or exporting (or neither) will take place in equilibrium is to ask: if the local price of carrots were equal to the autarky price, would producers be willing to fulfill local demands and would consumers be willing to purchase local supplies. For example, suppose the LEP lies above the autarky price. Local suppliers would rather export carrots than to sell them locally the AP. If local consumers are to have their demands fulfilled, they must drive the local price up to the level of the LEP. At that price, local producers are content to fill local demands, and then export any

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[10] For a larger geographical region (with a central market in a large town), the most attractive external market might be the even bigger capital city. For a country, the external market is the international market.
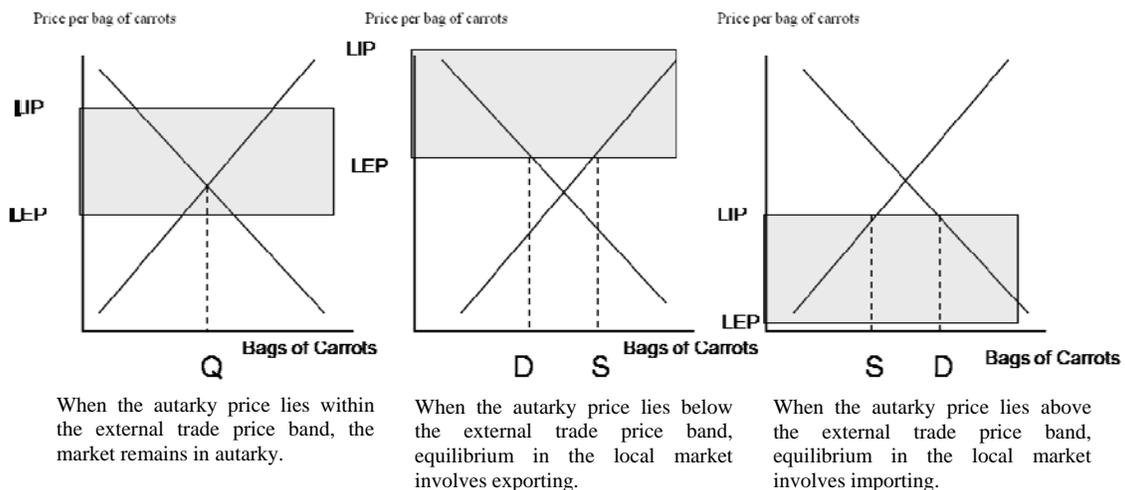
additional carrots they wish to supply at that price. Thus when the LEP lies above the autarky price, equilibrium in the local market will involve exporting.

Similarly, if the LIP lies below the autarky price, equilibrium will involve importing. Local consumers would rather import over purchasing locally at the AP. If local producers are to sell their produce they must drive the local price down to the level of the LIP. At that price local consumers are content to buy what is supplied locally at the LIP and then import any more they wish.

Finally, if the autarky price lies between the LEP and LIP (so that neither of the above two conditions hold), then there is no local interest in either importing or exporting, and an autarky equilibrium emerges (and will be described by the intersection of the local supply and demand curves, as discussed above). This is the case in Figure 8.4. Notice that the LIP always lies above the LEP, so it is impossible for both importing *and* exporting of the same good to be attractive.

A useful way to re-draw Figure 8.4 is shown in the first panel of Figure 8.5. We have erased the EP line and some labels, and have shaded in the rectangle between the LIP and LEP lines, which we will call the "**external trade price band**." Knowing the height and width of this band is key to understanding the relationship of local producers and consumers to external markets. If (as in Figure 8.5a) the band contains the autarky price (that is, if the intersection of local supply and local demand falls within the band), then the village does not engage in external trade. If the entire band lies above the autarky price, as in Figure 8.5b, then exporting is attractive. If the entire band lies below the autarky price, as in Figure 8.5c, then importing is attractive.

Figure 8.5

| When the autarky price lies within the external trade price band, the market remains in autarky. | When the autarky price lies below the external trade price band, equilibrium in the local market involves exporting. | When the autarky price lies above the external trade price band, equilibrium in the local market involves importing. |

Autarky equilibrium re-visited. In the first panel of Figure 8.5, the intersection of local supply and demand curves lies within the trade price band. No importing or exporting is attractive, and the equilibrium price is the autarky price. The quantities of carrots sold by local producers and purchased by local consumers are both equal to Q. Here we learn

that the standard introductory economics description of market equilibrium at the intersection of the supply and demand curves (with no mention of external trading opportunities) applies only when substantial transaction costs (larger than the difference between local and external prices) render both importing and exporting unattractive.

Exporting equilibrium. The price band in Figure 8.5b lies above the intersection of the local supply and demand curves. In equilibrium the local price must equal the LEP. Producers would not sell locally at a lower price, and competition among them would prevent the local price from rising higher. Producers bring home the same net price of LEP whether they sell locally or export. Equilibrium is described by the LEP line and its intersections with the local supply and demand curves. We can identify the quantity of carrots supplied (to any market) by local producers, and the quantity of carrots purchased by local consumers, by observing the points at which the LEP line crosses the local supply (S) and demand curves (D). The difference between S and D is the quantity of carrot exports from Small Village to Big City.

Importing Equilibrium. The price band in Figure 8.5c lies below the intersection of the local supply and demand curves. Most important, the LIP lies below the autarky price. In equilibrium the local price must equal the LIP. Consumers would not buy locally at a higher price, and competition among them would prevent the local price from falling lower. Consumers must pay the same gross price (equal to the LIP) whether they buy locally or import. We can identify the quantity of carrots purchased by local consumers from any market, and the quantity sold by local producers, by observing the points at which the LIP line crosses the local demand (D) and supply (S) curves. The difference between demand (D) and supply (S) is the quantity of imports.

Supply shifts. The impact of local supply and demand changes can differ profoundly depending upon the type of equilibrium. If local carrot farmers invest in new equipment, adopt new and improved production technologies, enjoy reduced input prices or experience unusually good weather, they become willing to sell more carrots at any local price, and the local supply curve shifts to the right. The three panels of Figure 8.6 help us analyze the possible impacts of such a shift.

Figure 8.6
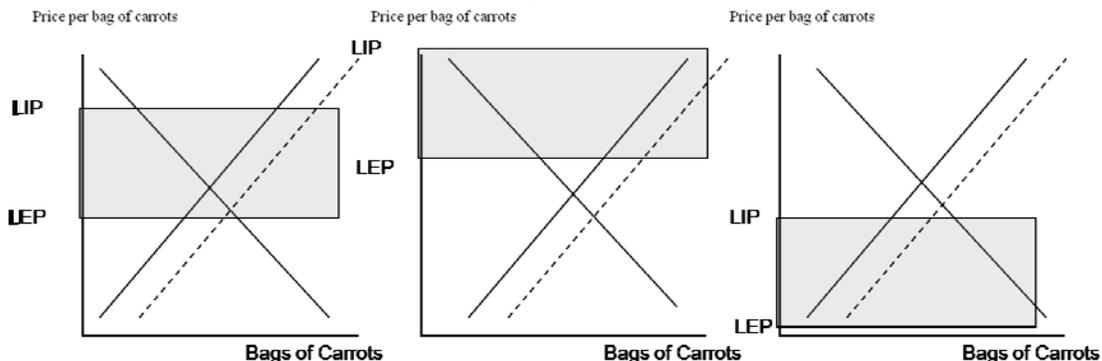
In autarky equilibrium, an outward shift in local supply reduces the local price and increases local production and consumption.

In exporting equilibrium, an outward shift in local supply increases local production and exports, while leaving local consumption and price unchanged.

In importing equilibrium, an outward shift in local supply increasing local production and reduces imports, while leaving local consumption and price unchanged.

All three panels of Figure 8.6 share the same initial (solid) local supply and demand curves, as well as the same post-change (dashed) local supply curve. The three diagrams differ in the height of the external trade price band, so that the initial equilibrium is autarky in the first panel, an exporting equilibrium in the second panel, and importing equilibrium in the third panel. The first panel, which describes a village in autarky, produces predictions that are familiar from introductory microeconomics courses. Equilibrium before the supply shift is associated with the intersection of local demand with the solid local supply. Equilibrium after the supply shift is associated with the intersection of the local demand curve with the dashed local supply. The increase in local supply pushes the local price down and increases the quantity purchased by local consumers.

The impacts of the local supply increase are quite different in the second and third panels, because trade with large external markets essentially pins down the local price at a constant level, as long as the price in the larger external market is unaffected by changes in local supply and demand conditions in Small Village. In the second panel, the local price is equal to the LEP in equilibrium. The local supply shift leaves the LEP, and thus the local price, unchanged. With the local price unchanged, and the local demand curve in the same place, the local quantity purchased by consumers also remains unchanged. What changes is the volume of production by local producers and the quantity they export to the external market, both of which increase. Similarly, in the third panel, the local price remains unchanged at the level of the LIP. Local consumers continue to purchase the same quantities at the same price, while local production increases and the quantity of imports from the external market falls. (This holds true as long as the local supply curve shift is small enough that the intersection of local supply and demand remains above the LIP.)

These graphical tools for studying the market implications of supply shifts will be of great use in the analysis of many policies. They will help us determine whether agricultural research and extension policies (which shift agricultural supply curves to the right) can be expected to generate benefits for food consumers (by reducing prices). They will also remind us to question whether microfinance programs stimulating investment in small businesses are appropriate in remote rural communities, where exporting the relevant goods to other markets may be too costly, yet adding a single new supplier may shift local supply out enough to drive the local price below levels at which production is profitable.

Shifts in local demand curves. As local incomes rise, the local quantities demanded of many goods and services increase, some more than others. Local demand curves may also shift as a result of changes in local tastes, or in response to changes in prices in markets for other goods and services. When local demand shifts to the right, the equilibrium price and quantity increase if the market is in autarky. If the local market imports or exports, the increase in local demand will reduce exports or increase imports without inducing a change in local price.

Developing the instinct to employ the graphical tools described here for studying demand as well as supply shifts is an important step in the study of development and policy. Problem 1 at the end of the chapter demonstrates how they may be used, for example, in examining the relative impacts on local markets of cash and food-based transfers.

Changes in local import and export prices. For a local market in exporting equilibrium, an increase in the external price (EP) that raises the LEP raises the local price, reduces the local quantity demanded, increases the local quantity supplied and expands exports. For a local market in importing equilibrium, an increase in EP that raises the LIP raises the local price, increases the local quantity supplied, reduces the local quantity demanded and reduces imports. For a local market in autarky equilibrium, a small change in the external price has no impact on the local price (though a large change could induce a switch to an importing or exporting equilibrium).

Relationships among markets at different geographic levels. Figure 8.7 presents graphs depicting the national market for rice in a rice exporting country, as well as local markets in two villages within the same country. Notice that the units on the horizontal axis are 10,000s of bags of rice for the larger national market, and just individual bags of rice for the smaller local markets. The local supply and demand curves in the national market diagram represent the supplies of rice that producers within the country would be willing to ship into the capital city market at any price, and the purchases of rice that consumers within the country would be willing to purchase in the capital city market at any price there. The shaded external trade price band describes opportunities for international trade. It is centered around the world market price (WP). The lower edge of the band is the Local Export Price as viewed from the national market in the capital city (LEPN). Because this lies above the autarky price, we know that the national market is in exporting equilibrium, and the price in that market is equal to LEPN.

Figure 8.7
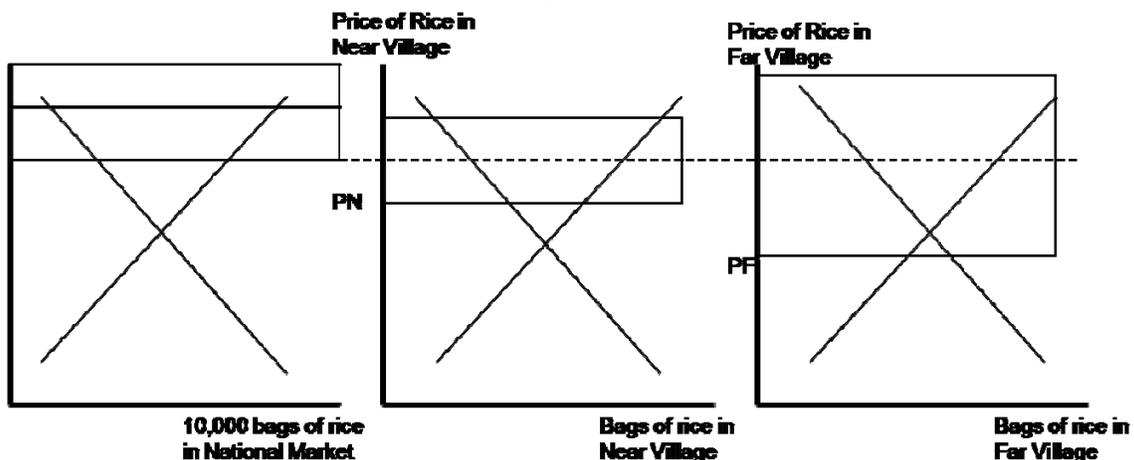
| Supply in the national market include for rice include rice exported to national market from outlying villages. Demand in the local market includes quantities imported from national market into outlying villages. | At the current price in the national market, producers in Near Village find it profitable to export to the national market. | At the current price in the national market, producers in Far Village do not find it profitable to export to the national market. |

The second and third panels of Figure 8.7 depict the local markets in two villages within the country where local supply and demand conditions are identical (i.e. their local supply and demand curves are in the same positions, in graphs employing the same units). The transfer costs associated with trade between Near Village and the capital city are smaller than the transfer costs associated with trade between Far Village and the capital city, because Near Village lies closer to the capital city than Far Village or the roads connecting Near Village to the capital city are of higher quality and cover easier terrain.

We assume that the capital city market is the external market most attractive to households in both Near Village and Far Village. Thus the external market price relevant in both villages is LEPN. To describe opportunities for trade between a village and the national market, we must draw an external trade price band of relevant width around the LEPN. The width of the external trade price band is much wider in Far Village than in Near Village, as a result of the higher transfer costs. In the equilibrium depicted here, the LEP relevant in Near Village (the bottom of the external trade price band in the Near Village diagram) becomes the Near Village Price (PN). This price lies above the autarky price in Near Village, so Near Village exports to the capital city. These exports constitute part of the total "local supply" forthcoming into the capital city market at the price LEPN. The external trade price band in Far Village is wide and contains the autarky price. Thus at this configuration of prices in the world and national markets, Far Village remains in autarky. Near Village is said to be **integrated** into the larger national market, because it engages in trade with it (whether importing or exporting), while Far Village remains outside the national market.

What would happen if prospects for international exporting improve, either because the world price of rice rises or the transfer costs of exporting from the capital city to international markets fall? (Try drawing a set of three graphs to work out the implications of this change for the markets in the capital city, Near Village and Far Village.) The Local Export Price relevant in the national market (LEPN) would rise. The equilibrium price in the capital city market, which must equal the LEPN as a result of competitive pressure, must rise with it. As the price increases, the movement up and to the right along the local supply curve indicates that national producers send more rice into the capital city. The movement up and to the left along the local demand curve indicates that local consumers reduce their consumption in the face of higher prices. The total quantity of exports to international markets rises.

The increase in LEPN also means that the external trade price band relevant for Near Village shifts up. Though the price of rice in Near Village is lower than the price in the capital city, the two prices nonetheless rise by the same amount. Indeed, a key implication of the integration of markets in this framework is that when markets for a particular good in different locations are linked with each other through flows of the good between them, the prices of the good in those markets should rise and fall together (assuming transfer costs do not change).[11] The international price increase "passes

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[11] Empirical tests of market integration, such as those in Aker (2005), take advantage of this observation and involve examination of correlations of prices across market locations.

through" into the Near Village market. Local demand in that village falls, local supply rises, and its exports to the capital city market increase, helping to explain the source of the movement up and along the curve describing supply to the capital city market.

The external trade price band relevant to Far Village rises as well, but as long as Far Village remains in autarky equilibrium, prices there are unaffected by changes in world prices. High transfer costs prevent the rising export prices from being transmitted to Far Village. Only if the price increases in the national market are great enough will the lower edge of the external trade price band rise above the autarky price, causing Far Village to start exporting to the capital city. Far Village would then become integrated into the national market.

Transfer cost reductions, market integration, winners and losers. By reducing the width of the external trade price band for Far Village in Figure 8.7c, sufficiently great reductions in transfer costs could cause the Far Village market for rice to become integrated into trade over a larger area. By opening up trade, such a change must bring increases in Far Village's aggregate consumption, as argued in the first part of this chapter. But we can also see that some groups within the community might nonetheless lose. The increased price of rice might hurt net rice consumers, for example. Fortunately, this need not be the end of the story. Expanded demand for labor in rice cultivation might raise incomes for net rice consumers who work for wages, and declining prices of imported consumer goods might also improve the overall impact on those households. Chapters 9 and 11 will provide additional tools for examining the distributional impacts of improved trading opportunities.

Market power considerations. In the preceding paragraphs we have implicitly assumed that either market intermediaries earn no rents, or the absolute size of the rents remains constant even in the face of supply and demand shifts. Marketers with market power may, however, find that their profit-maximizing response to an increase in external market prices is to raise the price they pay to local producers by less than the world market price increase, implicitly raising the rent they enjoy. In such a case, the external price increase "passes through" to local producers only partially, as the width of the external trade price band increases. For empirical evidence on the extent of pass through from world markets to local producers, see Goldberg and Knetter (1997).

Relationships between traditional and "higher value" markets. As world incomes rise and the world population becomes increasingly urban, demands for traditional products are being replaced by demands for **higher value goods**. For example, demand for "traditional" carrots sold in bundles of mixed shape and size, available only in season and according to a market-day schedule is giving way to demand for "fancy" carrots sold reliably every day in packages of uniform shape and size. Fancy carrots must be grown using a new seed variety, and using more exact standards of seed placement, fertilization, watering and weeding. They must be carefully sorted before being assembled into bunches or packaged. Schedules and storage facilities are necessary for guaranteeing the constancy of supply throughout the year. Mechanisms may be required to certify that the carrots meet certain quality standards.

We may use Figure 8.8 to organize our thinking about the process by which local farmers upgrade from traditional to fancy carrot cultivation. The two panels depict the markets for traditional and fancy carrots in a rural community. The solid demand and supply schedules in both diagrams, together with the lightly shaded external trade price bands, depict an initial situation in which farmers cultivate only traditional carrots. Because farmers have not made investments necessary to acquire capacity for fancy carrot cultivation, we draw the supply curve for fancy carrots very high and steep. Because sorting facilities, certification mechanisms, delivery coordination and storage are lacking, the effective costs of transferring fancy carrots properly are prohibitively high. Local consumers have little interest in fancy carrots.

Figure 8.8
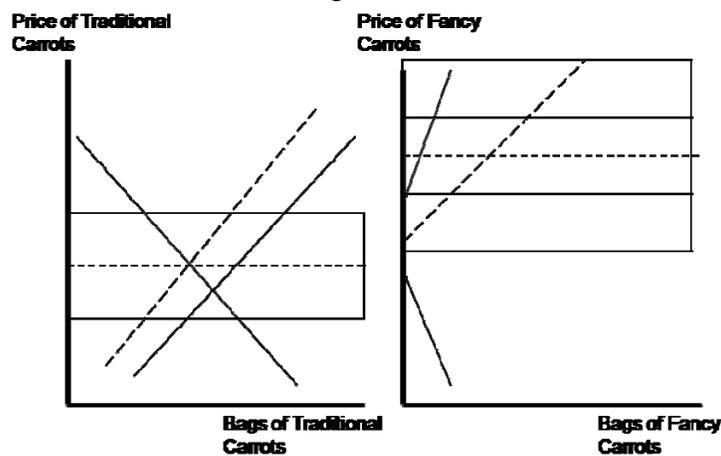
The local market for traditional carrots remains in autarky both before and after joint investments in farm-level technology for fancy carrot cultivation and infrastructure and institutions to reduce fancy carrot transfer costs.	Fancy carrot production and export become profitable only after farm-level investments that shift local supply out and investments in infrastructure and institutions that reduce transfer costs and shrink the external trade price band.

The dashed supply curve in Figure 8.8b depicts local supply of fancy carrots after local farmers invest in inputs, equipment and technical capacity for producing fancy carrots. If fancy carrot transfer costs remain at their initial level, it would remain uneconomical to export fancy carrots to the external market (and also uneconomical to try to sell fancy carrots to locals). This tells us that farmers are unlikely to make the investments necessary for fancy carrot cultivation while fancy carrot transfer costs remain high. If, however, the creation of storage and coordinated delivery arrangements greatly reduced the fancy carrot transfer costs, raising the local export price (as illustrated by the darker external trade price band in Figure 8.8b), then the exporting of fancy carrots, and the farm-level investments required to make that possible, would be profitable. The rightward shift of fancy carrot supply would lead to exporting of fancy carrots at the new price. If fancy carrots are cultivated on land previously devoted to traditional carrots, the supply of traditional carrots shifts to the left, as illustrated by the dashed supply curve in Figure 8.8a. This leftward shift would impose costs on local consumers, who must pay

more for traditional carrots, while perhaps boosting incomes even for local carrot producers who continue to produce traditional carrots.

Markets, Policy and Development

Changing perceptions of how markets do or do not work in developing countries have been used to justify dramatic changes in development policies over the decades. In the 1940s and 1950s widespread belief that developing country markets function poorly (when left to the private sector) led to thorough-going government involvement in markets, even to the point of instituting government marketing boards to replace the private sector in activities like buying and selling agricultural produce. By the 1980s the "markets versus government" pendulum had swung to the other extreme. Belief that markets function best when free of government interference motivated dramatic policies of "liberalization" (i.e. removing government regulations and taxes on market transactions) and "privatization" (i.e. removing government institutions from buying, producing and selling goods and services, and allowing the entry of private suppliers of marketing services). By the 1990s the disappointing performance of countries that liberalized and privatized initiated yet another re-thinking of the appropriate relationship between government and markets. In the view that has emerged, more nuanced beliefs justify certain targeted kinds of involvement by governments in market development and motivate experimentation with creative partnerships between government, private firms, non-governmental organizations and other actors.

Here we use concepts and tools developed in this chapter to make sense of these swings in opinion and policy, and to offer guidance to contemporary market development efforts. Central to the discussion is careful thought about the causes and effects of transfer cost reductions.

Markets expand in geographic scope and sophistication when transfer costs fall. After road construction reduces transport costs, a remote community that had previously engaged in little external trade might start exporting agricultural produce and importing consumer goods. Development of better legal and law enforcement systems might render contracts for future delivery and payments more trustworthy, allowing creation of higher value markets for goods that are delivered to consumers more steadily and in more consistent quality.

Market expansion driven by transfer cost reductions has the potential to raise the level and growth rate of a country's aggregate labor productivity and average income, as well as to reduce poverty. Market expansion may increase the *level* of average income by facilitating specialization and gains from exchange. It allows producers to specialize and take advantage of economies of scale, as we saw early in the chapter. In principle, transfer cost reductions also have the potential to raise a country's *rate of growth* of labor productivity by raising rates of private investment and innovation. Where high transfer costs keep a small market in autarky, local producers perceive little return to investment for increasing supply, because increases in supply would just drive down local prices. When reductions in transfer costs open up wider markets and make exporting profitable,

private investment may become profitable. (Try using graphs to make the argument of the last two sentences.) Transfer cost reductions may further encourage investment and innovation by reducing the effective costs of purchasing new inputs. Finally, transfer cost reductions may also play an important role in poverty reduction. Investment and innovation in other parts of the economy will do little good for the remote rural poor unless transfer cost reductions allow them to integrate into the larger economy.

Transfer costs cannot be reduced without investment. Transport cost reductions require investments in road construction and the purchase of vehicles. Reductions in market costs may require investments in telecommunications systems and in the formation of producer groups capable of coordinating deliveries. Education and the development of legal institutions may be required to bring down the costs of devising more sophisticated exchanges.

Private actors have incentive to undertake some of the transfer-cost reducing investments. For example, private traders may have incentive to invest in buying a truck and setting up a business for collecting and delivering farmers' produce to an urban buyer. If the investments allow the trader to offer transport services to farmers at a price below what it would cost farmers to do the transporting themselves (which may be very high), they can offer services at prices that farmers find attractive while still covering costs and earning a return on their investment.

Unfortunately, many of the investments required to reduce transfer costs may be difficult for private investors to undertake, for reasons introduced in Chapter 3 (and to which we will return in greater detail in Chapter 11). Many required assets – especially related to transport and communication infrastructure, or to the creation of effective legal institutions – are public goods, which produce benefits for many people but are incapable of producing profits for private investors, because it is impossible to charge for their use. Uncongested rural roads on which it is not practical to charge tolls, information regarding the standards producers must comply with to enter successfully into foreign markets, and facilities and institutions for grading, labeling and certifying process and quality standards may all be considered assets with public goods qualities. Whether public goods or not, many of the investments are also large, and may be difficult to finance in imperfect financial markets (see Chapter 10).

On top of this, investment in transaction cost reduction may be inhibited by coordination problems. Just as investments in transfer cost reductions may be unprofitable unless local producers invest in expanding production capacity, so investments in the expansion of production capacity may be unprofitable unless transfer costs are reduced to the point that exporting becomes profitable. Coordination between producers and intermediaries may be required to induce simultaneous investments. Governments may be able to facilitate and encourage this coordination.

All the roles for government involvement with markets that we have discussed thus far are positive roles that reduce transfer costs and encourage market development. Governments often play a very different role in markets, however. They sometimes tax

sales in a market in order to generate revenue for carrying out government programs. They also use taxes and subsidies to manipulate important prices to achieve distributional objectives, as when they reduce the price at which food is sold to urban consumers, in the interest of reducing the poverty of urban workers. Such taxation and regulation of transactions *increases* transfer costs. Thus any distributional or budgetary benefits must be weighed against possible losses in the level and growth rate of labor productivity.

Underlying the market liberalizing policy reforms of the 1980s were the implicit assumptions that (1) governments' primary effect on markets was to *increase* transfer costs them through taxes, regulations, and replacement of more efficient private sector marketers by less efficient government marketers, and (2) the costs of these measures in terms of reduced productivity and economic growth probably outweighed any distributional or budgetary benefits. When the liberalizing reforms of the 1990s reduced taxation and allowed the private sector to take over agricultural marketing activities, however, private markets did not spring into existence. Facing poor infrastructure and difficulties in obtaining finance, potential market intermediaries were unwilling or unable to set up transport services between all remote producers and their external markets. With prices more unstable in liberalized markets than they had been when established by the government, potential investors in marketing enterprises were also put off by the riskiness of the investments. Thus, even with the removal of taxation, effective transfer costs in some markets seems to have increased as the supply of marketing services dwindled. Even where private markets did arise, the effects of reduced transfer costs on growth were not as large as had been assumed. This experience led analysts to pay much more attention to the ways in which government involvement might be required to encourage some of the investments necessary for the emergence and operation of markets.

Increasingly public and private actors are studying the **value chains** that must be in place for a market connection to develop between a set of producers and a set of consumers. The value chain is the sequence of activities that must be undertaken to facilitate production of a certain good and ultimately deliver it to consumers according to whatever process and product standards they require. For example, the value chain linking a set of small farmers in Africa to European vegetable markets may involve marking of inputs to farmers, provision of finance and extension services, quality control certification, sorting, packaging, transporting to the capital city, wholesaling to an exporter, international transport, clearing customs, and retailing to consumers.

Many of the activities along a value chain require investments that could be profitable for private actors, but only if they are sure that all the other links in the chain will also be put into place through appropriate investments. If the investments necessary to create one link in the chain, such as road investments, are unlikely to be undertaken by private actors, the entire chain may fail to emerge. NGOs and governments are increasingly attempting to focus their efforts on subsidizing or undertaking the specific links in value chains where public intervention is likely to be required, and on bringing together and coordinating private actors for whom it would be profitable to invest in creating the remaining links. The resulting multi-party partnerships are highly diverse and tailor-

made for specific markets. In Uganda an NGO partnered with a farmer organization to link farmers with an urban fast-food restaurant to whom they could supply potatoes. The NGO helped the farmers gather the information necessary to create a successful collaboration. Through their organization, the farmers learned how to cultivate a new variety of potato, developed a system of staggered planting dates on plots of land at different altitudes making year-round delivery possible, and made arrangements for storage and emergency purchase of potatoes from other farmers in order to fulfill their promised delivery schedule (Kaganzi, et al., 2008). On a larger scale, the British non-profit organization Infraco employs modest subsidies in helping to create collaborations between large outside private enterprises and farmer groups in remote areas of Africa with high quality soils and climate, through which the private enterprises are given incentive to undertake large mutually beneficial investments in transport and irrigation infrastructure (see www.infraco.com).

Sometimes large private sector buyers of higher value products see sufficient potential profit in developing a value chain that they engage in most of the coordinated investments themselves, especially in regions in which basic infrastructure investments have already been made by governments.   The experience of the exporting firm Lecofruit in contracting with small farmers in Madagascar for supplying high quality vegetables to the European markets demonstrates both the potential for private investment to overcome some potential barriers to market development, and the potential for intervention by government or NGOs to spur private development further (Box 8.3).

Box 8.3
Contract farming of high quality vegetables for the European market in Madagascar

High quality vegetables command a substantial premium in European markets. For example, hand-picked green beans can earn two or three times the price of beans perceived to be of lower quality. Given the intensive labor requirements of hand-picked beans and other high quality vegetables, countries with low wages and long growing seasons are potentially attractive locations for their production. Preferential trade agreements, such as the Everything But Arms initiative, through which Madagascar and 47 other low income countries gained duty-free and quota-free access to European markets, also encourage production in Madagascar.

Lecofruit, a large multinational agricultural trading company, sought to take advantage of these conditions by contracting with local small-holder farmers.   After initial experiments with gherkins, and later diversification into snow peas, asparagus and mini-vegetables, the company now concentrates its Madagascar operations primarily on hand-picked and hand-handled fine French beans, which it sells to seven European supermarket chains and other customers.

If production in Madagascar for export to Europe was to be profitable, the company would require production to meet exacting process and product standards, while holding production, processing, transport and other costs below the level of prices that the products could command in the European market. Quality improvements and cost reductions required several kinds of investments that might be rendered difficult by market failures. First, farmers would have to make long-term investments in learning how to cultivate new crops and using new methods (such as learning how to make compost from manure and vegetable matter, a practice they had not

previously employed), as well as shorter-term investments in new seeds, fertilizer and pesticides. Financial market failures rendering it very difficult for small farmers to obtain credit from commercial lenders might stand in the way of these investments. Second, larger-scale investments would be required in transport infrastructure and in institutions guaranteeing compliance with process and product standards.

The company developed an elaborate system of interaction with contracted small-holder farmers, through which it sought to solve as many of these problems as it could simultaneously. The company employs 300 extension agents, each of whom works with 30 contracted farmers, with the help of 5 or 6 extension agent assistants. Each contracted farmer devotes a specified small plot of land (usually involving only one third of his total small holding or less) to production for the company during a specified period, primarily in the off season of rice, which is the farmers' main staple crop. Through the extension agents the company trains the farmers in the methods required for production of high quality beans. It provides seeds, fertilizer and pesticides on credit, which the farmers pay back with the beans they produce in the first weeks of harvest. Extension agents visit them at least once a week, making sure they are following prescribed practices, sometimes applying the pesticides themselves, and also keeping a watchful eye to prevent farmers from selling to other buyers. The beans are transported to the capital city, where they are canned and sent to Europe. Exacting Europeans buyers conduct chemical residue tests and send independent auditors to certify that standard regarding hygiene and work practices are maintained.

Use of this system with about 9000 small farmers appears to be profitable for the company. Minten, et al.'s (2005) estimates suggest that participation has also been quite beneficial for the farmers. They receive a higher price for their produce than they would receive in local markets for traditional crops Over the course of a year, a typical participating household earns about $45 from contract farming, about half the household's monetary income. Also important is the impact on timing of income. Contract income is received during what would otherwise be the "hungry season" between rice crops. The farmers also report using some of the new practices (such as composting) on other off season crops (on land not under contract), and econometric study suggests that their productivity in rice cultivation increases when the land used for rice cultivation is used for contract farming in the off season, because of the long-lasting effects of the composting and fertilizer application.

While Lecofruit has managed to introduce mutually beneficial contracting relationships with 9000 farmers in Madagascar, their experience also points to the potential importance of market failures in preventing investments that would allow such market developments to expand further. Their efforts are restricted to farmers quite near to the capital city, Antananarivo. In the wake of a government road building project, they rapidly expanded operations to 1000 new contract farmers, suggesting the crucial role of transportation infrastructure in shaping their incentives for expansion. They also tend to work with farmers who are more educated than the average rural resident, and express concern with the time and cost involved in training up extension agents, given the low educational base with which they must work. The up-front cost of identifying and organizing good prospective contract farmers, and helping them acquire skills of long-term use, may also require a substantial investment, raising the possibility that NGOs willing to perform these function in a subsidized fashion might increase the numbers of farmers with which the company is willing to establish long-term relationships.

Source: Minten, et al., 2005.

Moving Forward

The tools for analyzing goods market outcomes presented in this chapter are fundamental to economic analysis. But goods markets are only a subset of the larger set of markets that must work well together in successful development. In the next chapter we turn our attention to labor markets.

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Questions for Review

1. What are **markets**?
2. Define the **production possibility frontier** (PPF) for a household.
3. What is **autarky**?
4. Using simple PPF diagrams, explain how specialization and exchange allows both parties to gain, as long as the slopes of their PPFs differ.
5. What is the difference between being **absolutely less productive** in corn cultivation and **relatively less productive** in corn cultivation? What does it mean for one household to have a **comparative advantage** in the production of one good (relative to its potential trading partners)?
6. In addition to allowing gains from specialization associated with comparative advantage, through what other channels might exchange lead to benefits for the parties to the exchange?
7. Define the PPF for a community. Why might the potential gains from exchange between communities be even larger than the potential gains from exchange between neighbors?
8. What are **agglomeration economies**?
9. Do graphical arguments regarding the gains from exchange between communities indicate that every household within each community will gain from exchange?
10. What are **transfer costs**? Discuss the many possible sources of transfer costs. Why might typical transfer costs be higher in some developing countries than in developed countries?
11. What sorts of transactions are most likely to be taxed, whether officially by central or local governments, or unofficially by people seeking bribes or protection money?
12. Define **marketing services** and **market intermediaries**.
13. What is the **marketing margin**? Do high marketing margins always imply un-competitive behavior by middlemen? What are **marketing rents**?
14. What does it mean for markets to be **efficient**?
15. Under what conditions might the provision of marketing services by market intermediaries be un-competitive?
16. Use a simple PPF diagram to explain how transfer costs might inhibit trade.
17. Draw and discuss the origins and significance of every element (**local supply curve**, **local demand curve, external market price**, **local import price**, **local export price**) in the market equilibrium analysis tool developed in this chapter.
18. Define the **autarky price**.
19. State the conditions under which a market will be found in **importing equilibrium**, **exporting equilibrium** and **autarky equilibrium**.
20. Define the **external trade price band**.
21. What sorts of events might lead to a rightward shift of the local supply curve?
22. Discuss how the impacts on the local market of a local supply increase differ depending on whether the local market is in autarky, importing or exporting equilibrium.
23. What sorts of events might lead to shifts in the local demand curve, the external market price?
24. Discuss the relationship between the national market and the market in a small community that exports to the national market.

25. What does it mean for the market in some community to be **integrated** into a larger market? What does integration imply about the relationships between prices in the market centers for the community and the larger market?

26. What changes might induce a community that was previously in autarky (in a particular good) to become "integrated" into the national market for that good?

27. Why might some socio-economic groups within a community be hurt by the community's integration into larger markets through transfer cost reductions?

28. Using graphs like those in Figure 8.8, discuss why investments in farm-level improvements required to cultivate fancy carrots and regional investments in infrastructure and institutions to reduce fancy carrot transfer costs might both be profitable if undertaken simultaneously, even when neither investment would be profitable if undertaken alone.

29. How might investments that reduce transfer costs increase the level of average income, the growth rate of average income and the rate of poverty in developing countries?

30. What kinds of investments might be required to bring about sufficient reductions in transfer costs that a new market emerges? Why might the private sector fail to undertake some of these investments, even when the social benefits of all the investments outweigh the costs?

31. What kinds of government intervention increase transfer costs and what kinds tend to reduce transfer costs? How is this distinction useful for understanding swings in the debate regarding "markets and development"?

32. What are **value chains**? How is the study of value chains shaping market development policies of governments and NGOs?

Questions for Discussion

1. Consider the work of a development organization that seeks to stimulate development in a rural community by catalyzing the community's entry into the production and export of a new commodity.
   a. What does the analysis of the gains from specialization in the first part of the chapter have to say about how the organization should choose which commodity to promote?
   b. What does the discussion of transfer costs have to say about the types of difficulties the organization should consider when gauging the potential benefits of production and export, and when brainstorming about the types of intervention that might prove useful to increasing production and trade?

2. Consider a rural community in which many households produce rice, and consider an agricultural extension program that causes some but not all local farmers to adopt new, more productive technologies. In a diagram like 8.4 (rendered for rice rather than carrots), what schedules or lines would shift, and in which directions, as a result of the agricultural extension program? If the rice market in this community is in autarky equilibrium (both before and after the introduction of the program), what happens to the price of rice? Employing common sense, as well as the tools of the first half of Chapter 7, identify the diverse socio-economic groups within the community who are likely to be affected by the extension program and subsequent price changes in diverse ways? Which groups are likely to gain? Which groups are likely to lose?

3. Read Williamson (2000), which discusses different notions of what is meant by the "Washington Consensus" within differing schools of thought. Create a list of the various policy agenda items that are included as components of the "Washington Consensus" within any school of thought. For each item, consider whether it has more to do with (a) letting currently existing markets (shaped by current transfer costs) operate without direct government intervention (in the form of taxes on or regulations of transactions), (b) reducing government involvement in production and marketing in the hopes that private providers of goods and services will respond to market incentives, replacing the government provision of goods and services by private provision, or (c) undertaking investment to reduce transfer costs and increase the geographic scope of markets.

Problems

1. Governments and NGOs often implement emergency distributions of food or cash in poor rural areas. One set of differences between cash and food distributions that figures into debates regarding their relative merits pertains to differences in their impacts on local food markets and local food production.

In a diagram describing the market for "food" in a small rural area in which an emergency distribution is implemented, a cash distribution can be modeled as shifting the local demand curve to the right. The size of the horizontal shift may be determined by asking: "if the local price were to remain constant, by how much would households receiving new cash increase their demand for food?" (As we saw in Chapter 6, recipient households would probably wish to spend only part of their new cash on food, thus the rightward shift will be smaller than the quantity of food that could be bought with the total cash transfer at the initial local price.) A food distribution, in which food is trucked in from outside the community and distributed to local households, can be modeled by introducing a new "total local food supply" curve, which lies to the right of the local supply curve as well as a new "total local demand for food" curve, which lies to the right of the local demand curve. The total local food supply curve indicates the total quantity of food that would come into the market at any price, whether from local suppliers or the distribution program, and lies to the right of the local supply curve by the amount of food distributed. The total local demand for food curve indicates the total quantity of food acquired from either the local market or the program at any given price. It lies to the right of the local demand curve by *less* than the quantity of food distributed; as we saw in Chapter 6, food recipients are likely to use the new resources to consume more of both food and other goods. Their consumption of other goods is made possible by reductions in their purchases of food out of their non-program income.

    a. Using appropriate market diagrams, compare and contrast the effects of cash versus food-based emergency distributions in local food markets characterized by autarky equilibrium, and discuss what happens to the relative merits of cash and food transfers as the local supply curve becomes more inelastic. (When studying the effects of changes in the elasticity of local supply, be sure to hold the horizontal sizes of local supply and demand curve shifts constant, while changing only the slope of the local supply curve.)

    b. Using appropriate market diagrams, compare and contrast the effects of cash versus food-based emergency distributions in local food markets in importing equilibrium both before and after the distribution, and discuss what happens to the relative merits of cash and food transfers as the local supply curve becomes more inelastic.

    c. How would you expect the elasticity of local food supply to differ in the short run and long run? What implications does this have for debates about the relative merits of cash and food distributions?

2. The following two graphs are identical. They each describe the market for rice in a small rural region. The schedule marked D describes the local demand for rice within the region. The schedule marked S2 describes the local supply of rice in "good years" (during which weather and other conditions lead to high agricultural productivity), while the schedule marked S1 describes the local supply of rice in "bad years." The shocks that cause local supply to move back and forth between positions S1 and S2 affect only half the farmers in the region. That is, half the farmers have constant productivity over all years, while the other half of farmers experience fluctuating productivity (but their crops are never completely destroyed).

    • Diagram A   Diagram B
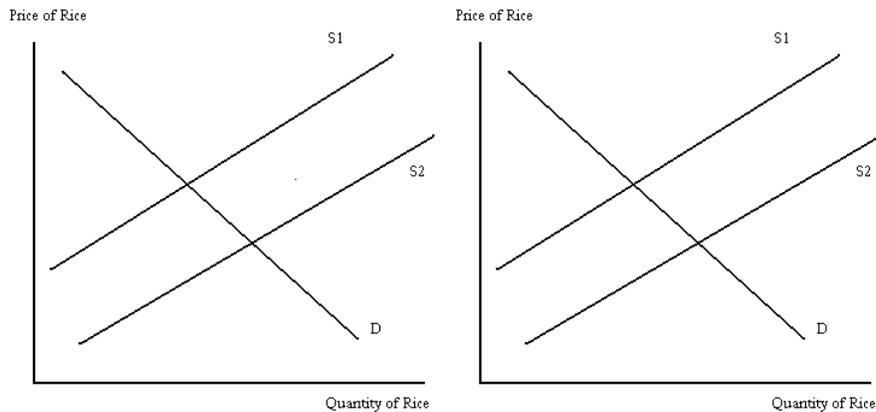
Please assume throughout this problem that the nearest external market for rice is a big city, where the price of rice stays constant (despite any changes in supply in the small rural region). [Prices may be more nearly

constant in the city because the big city market is the destination for exports from a large number of small communities. Different sets of small communities have bad weather each year, but the number of small communities having bad weather is roughly the same each year. Thus supply conditions vary dramatically in small communities, while total supply in the big city market is nearly constant.] Please also assume that the supply shocks associated with weather leave the local demand curve in the small rural region unaffected. [This is for simplicity. In reality, demand would probably fall when bad weather causes local incomes to fall. But the demand reduction would tend to be smaller than the supply reduction, so we will get the right idea of the direction of changes even if we ignore the demand shifts.]

    a.   Draw into Diagram A local import price (LIP) and local export price (LEP) lines that depict a situation in which this region exports to the big city in good years and imports from the big city in bad years. Be sure to label what you draw carefully. Now describe this situation in words, explaining why it implies that the region will export in good years and import in bad years. Define any terms you introduce.

    b.   Now draw into Diagram B local import price and local export price lines that depict a situation in which this region never engages in trade with the big city. That is, draw in lines that describe a situation in which this region trades with the big city neither in good years nor bad years. Be sure to label what you draw carefully. Now describe this situation in words, explaining why it implies no trade with the city in good years or bad years. Define any terms you introduce. Remember that the price in the big city is constant.

    c.   In which set of circumstances (those depicted in Diagram A or Diagram B) does the local price of rice fluctuate more from year to year? In which does the local quantity consumed fluctuate more? Discuss the sense in which improved access to external markets can serve as a "shock absorber" for fluctuations in local supply conditions.

    d.   In which set of circumstances (those depicted in Diagram A or Diagram B) would you expect the welfare of local rice consumers (who do not produce rice) to fluctuate more between good years and bad years? Explain.

    e.   In which set of circumstances would you expect greater fluctuations from year to year in the incomes of farmers with stable productivity (i.e. the farmers who do not experience the productivity shocks)? Explain.

    f.   Assuming that local price fluctuations are not so great as to prevent local farmers from enjoying higher profits in years of good supply conditions, in which set of circumstances would you expect greater fluctuations from year to year in the incomes of farmers with fluctuating productivity? Explain.

3. The country of Nermal exports wheat to world markets. Wheat is, of course, produced in rural areas. Some of the wheat produced is consumed by farmers themselves, some is sold to rural consumers in local rural markets, some is sold to consumers in the capital city, and some is exported from the capital city to other countries.

    a.   Define Nermal's "national wheat market" to involve all domestic wheat supplied to the capital city, whether for local consumption or export, and all wheat demanded by Nermal citizens in the capital city. Using a well-labeled diagram and clear text, *explain the logic behind the following statement:*

> "When Nermal's wheat farmers are hit by drought, pest invasions or other bad supply shocks, Nermal exports will shrink but the price paid for wheat by consumers in Nermal's national wheat market will not rise, as long as the world market price of wheat remains constant."

You may assume that local supply shocks leave local demand curves in this market unmoved, and that the country continues to export even after the supply shock. Be sure to explain the logic linking the local consumer price and the world market price.

    b.   Using a well-labeled diagram and clear text, explain why the price of wheat in a remote rural region of Nermal might rise when local supply is hit by a bad shock, even when the price of wheat in the capital city remains constant (for reasons discussed in part a). Be sure to state clearly any assumptions you must make about the region for your explanation to be relevant, and include in your graph some reference to the local export price. [*Note:* Your answer here provides an explanation for the following "puzzle". If a country is a small wheat exporter, and the world market price remains steady, then standard economic theory says that the local price of wheat should be unaffected by shocks to local supply and demand. But in practice local supply shocks

do tend to increase the *average* (across geographic areas) domestic price of wheat even when some wheat is exported.]

4. Draw a market diagram for a local market for rice facing an external market price for rice that is higher than the local price, but in which high costs of importing and exporting cause the local market to remain in autarky. Suppose a road already exists between the local community and the external market, but costs of importing or exporting remain high, because no external traders have set up routine business activities in the local market, and no locals have set up routine business dealings in the external market.

   a. Draw what would happen to this diagram in the short run (during which costs of importing and exporting remain unchanged) if the external market price for rice rises, but the local market for rice remains in autarky.

   b. Explain why this change might stimulate private investment in the development of transport/marketing businesses that could reduce costs of exporting from the local community to the external market.

   c. Draw into the diagram and discuss what would happen if investments do indeed take place that reduce transfer costs enough so that the community begins exporting.