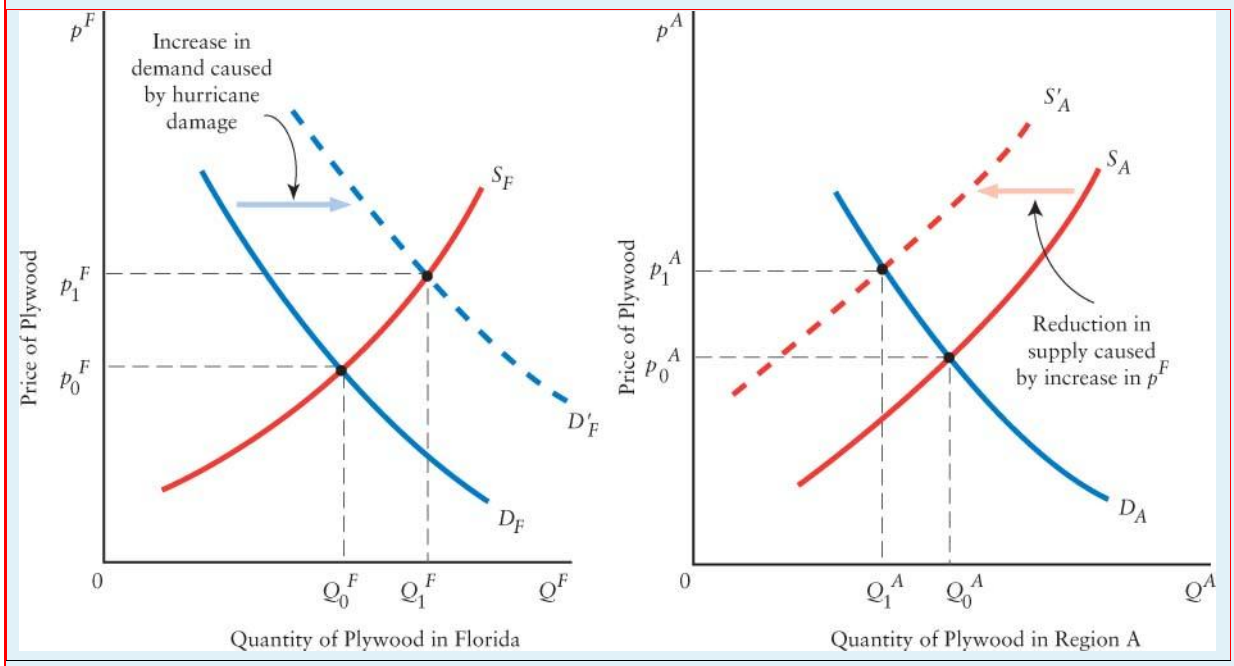
Linkages Between Markets

In Chapter 5 we explain the difference between partial-equilibrium and general-equilibrium analysis. Here we provide some detailed examples of how markets are linked together. There are three broad reasons that markets may be connected—*regional* linkages, *input–output* linkages, and linkages through *resource constraints.*

Regional Linkages

How are geographically separate markets connected? We examine two different linkages. In the first, *mobile supply* is what links the markets; in the second, the linkage is provided by *mobile demand.*

FIGURE 1 Regional Linkages with Mobile Supply



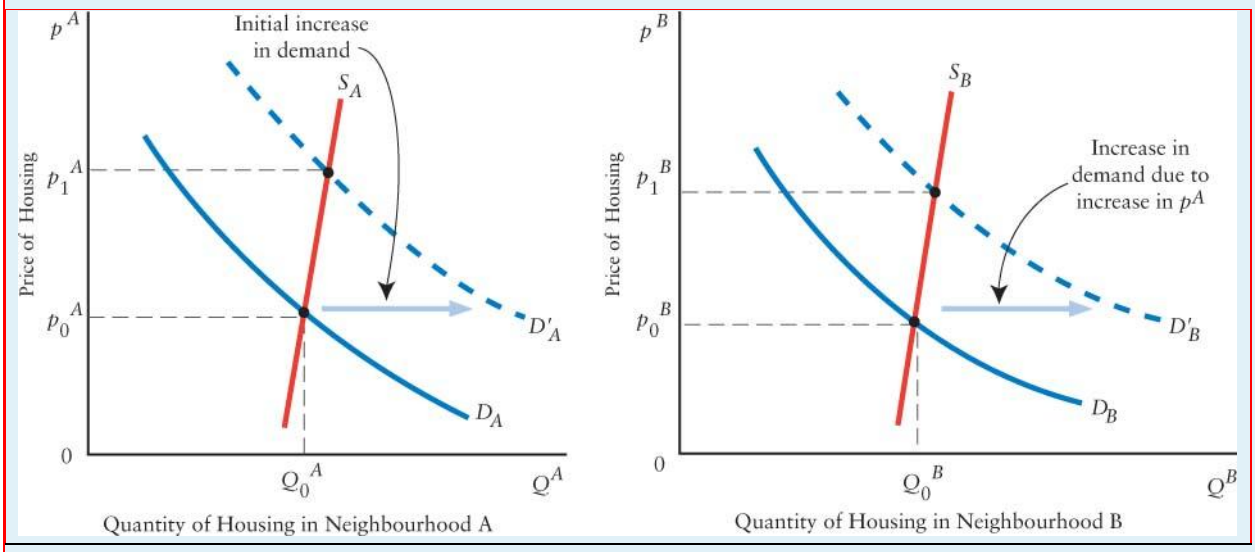
When the supply of a product is mobile between regions, prices in regional markets tend to move together. The initial equilibrium in Florida is p_0^F and Q_0^F; in some other region, denoted Region A, it is p_0^A and Q_0^A. The hurricane leads to an increase in demand for plywood in Florida and thus drives prices in Florida up to p_1^F. The supply curve in Region A, however, is drawn *for a given price of plywood in Florida* since supplying to Florida is a substitute to supplying Region A. The increase in p^F therefore reduces the supply in Region A. This reduction in supply (the shift from S_A to S'_A) shows up as part of the increase in quantity supplied in Florida (the movement along S_F). The supply reduction in Region A increases price to p_1^A. The two markets are linked through the mobility of supply, and the prices in the two markets move together.

Mobile Supply By *mobility of supply* we mean the ease with which suppliers can move their products from one market to another. This mobility depends on the product in question and the distance between the two markets. If the product is very costly to transport (like gravel or cement) and the markets are far apart (like British Columbia and Nova Scotia) then the two markets will be separate. But if the product is inexpensive to transport (like computer chips or leather gloves) and the markets are close together (like Ottawa and Toronto) then the two markets will be closely linked. Consider the following example that illustrates how mobile supply can link regional markets.

In August 1992, Hurricane Andrew struck the Florida coast and caused a great deal of damage to buildings and houses. As soon as the hurricane was over, the process of rebuilding began. This caused a sharp increase in the demand for plywood. The predicted price increase occurred in Florida almost immediately. But the economic effects of the hurricane were not confined to Florida. As the price of plywood soared in Florida, suppliers from other regions of the country directed their plywood shipments toward high-priced Florida. This reduction in supply in the other regions caused shortages and led to price increases. Builders across the country were forced to adjust to more expensive plywood—prices increased by 18 percent in just two weeks. This situation is illustrated in Figure 1.

Mobile Demand Now consider a situation in which it is prohibitively expensive to transport a product (immobile supply) but demand can move relatively easily. This would be the case, for example, in the housing market in two residential neighbour-

FIGURE 2 Regional Linkages with Mobile Demand



When demand for a product is mobile between regions, prices in regional markets tend to move together. The initial equilibrium in Neighbourhood A is Q_0^A and p_0^A; the equilibrium in Neighbourhood B is Q_0^B and p_0^B. Demand increases in Neighbourhood A to D'^A (coming from faraway neighbourhoods, not including B) and raises the price to p_1^A. As price increases in Neighbourhood A, some of the new demand gets crowded out and switches over to the houses in nearby Neighbourhood B. The reduction in quantity demanded along D'_A (due to the increase in price) becomes the increase in Neighbourhood B's demand to D'_B. The regional markets are linked and the prices in the two markets move together.

hoods that are close together. It is obviously very expensive to move a house from one neighbourhood to another, and it is not easy to build new houses in the short run. So we can think of these two neighbourhoods as each having very inelastic short-run supplies of housing. Demand, in contrast, may be relatively mobile between the two neighbourhoods since living in one neighbourhood may be viewed as a reasonable substitute to living in the other.

Suppose that Neighbourhood A experiences a substantial increase in demand for housing, perhaps because its schools are widely reported to be of very high quality. Further, suppose that the increase in demand for housing in Neighbourhood A comes from families currently living in faraway neighbourhoods. This increase in demand will naturally raise housing prices in Neighbourhood A. As prices rise there, however, some of the potential homeowners get crowded out by the price increases and they begin to look more favourably at houses in nearby Neighbourhood B, where prices are not (yet) rising. This shift in demand toward Neighbourhood B leads prices to rise there as well. Figure 2 illustrates this example.

The Role of Substitution In both of the previous examples, *substitution* plays a key role in linking the regional markets. Indeed, substitution is just another word for the *mobility* of demand and supply. In the plywood example, firms viewed selling plywood in Florida as a substitute for selling plywood in other regions. In the housing example, consumers viewed buying houses in Neighbourhood B as a substitute for buying houses in Neighbourhood A.

Linkages between regional markets are determined by substitutability, either in demand or supply. The degree of substitutability, in turn, is determined by distance, transport costs, and the nature of the products.

In the plywood example, the degree of substitutability of supply—and thus the extent of the linkage between markets—is determined by the cost of transporting the plywood relative to its price. The more costly it is to transport, the less willing firms will be to move the plywood between regions. At some high level of transport costs, it will no longer pay suppliers to move the plywood, and the regional markets will not be linked together.

In the housing example, the degree of substitutability of demand—and thus the extent of the linkage between markets—is determined by the attributes of the housing in each neighbourhood (and by the characteristics of the neighbourhoods themselves). If living in Neighbourhood A is viewed by consumers as being very similar to living in Neighbourhood B, then the markets will be linked. If the two neighbourhoods are viewed as offering completely different living experiences, the markets will not be linked together.

Input–Output Linkages

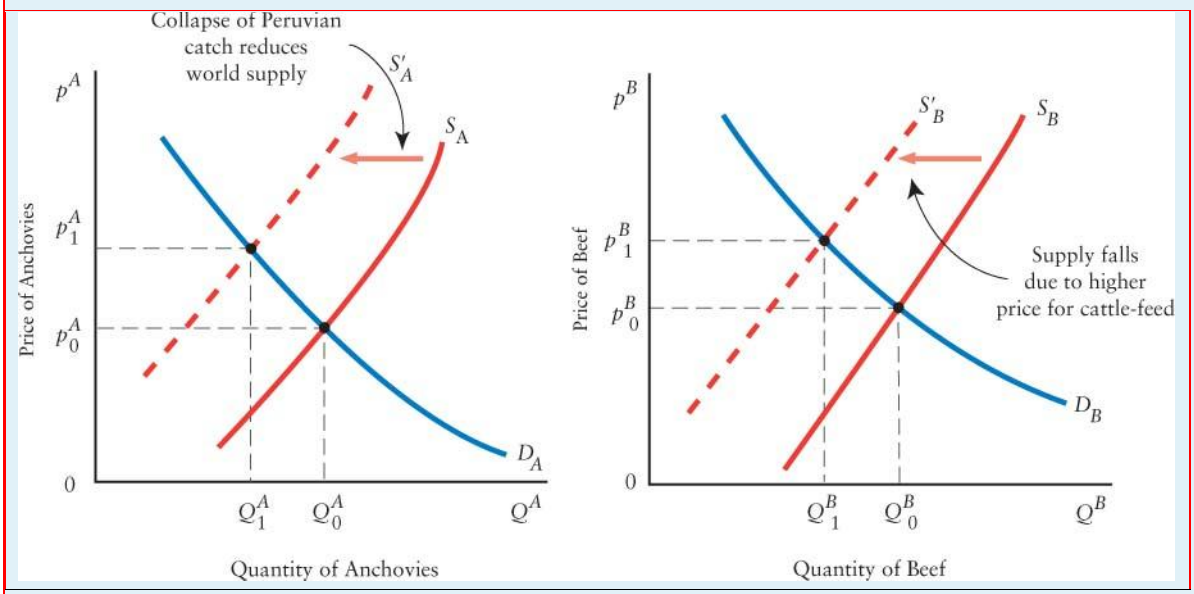
We have considered cases where regional markets of the same product are linked through the mobility of supply or demand. Now think about linkages between markets of very different products. For instance, is the market for anchovies linked in any way to the beef market? Is the market for glass linked to the market for cars? The answer in both cases is yes. The linkages arise because some products (like anchovies and steel) are used as *inputs* to the production of other products (like beef and cars, respectively).

Changes in the price of one product lead to similar changes in the prices of goods that use that product as an input.

Consider the following example dealing with anchovies and cattle that is illustrated in Figure 3. One important use of anchovies (besides being used in Caesar salads and as a topping for pizza) is as a protein supplement for livestock, especially beef cattle. In 1973, partly as a result of the unusual weather associated with the cyclical recurrence of El Niño, there was a sharp reduction in the Peruvian anchovy catch. Since Peru was a large producer of anchovies, the decline in Peru's catch led to a significant decline in the world's supply of anchovies, which then pushed up world anchovy prices. The higher price of anchovies, in turn, sharply increased the price of cattle-feed. The increased cost of the cattle-feed then led to a reduction in the supply of beef cattle. Prices for beef increased. The anchovy market and beef markets were linked, with the prices of the two products moving together.

This example may seem like an unusual one but the principle involved is very general. An increase in the price of one product generally leads to price increases for all goods using that product as an input. Through such input–output linkages, we can better understand co-movements in the prices of many products, including electricity and aluminum, wheat and poultry, rubber and running shoes, fertilizer and agricultural crops, and steel and automobiles.

FIGURE 3 Input–Output Market Linkages



Changes in the price of inputs lead to similar changes in the price of outputs. The initial equilibrium is Q_0^A and p_0^A in the anchovy market, and Q_0^B and p_0^B in the beef market. When El Niño leads to a reduction in the Peruvian anchovy catch, the world supply of anchovies shifts from S_A to S'_A and anchovy prices rise to p_1^A. The supply curve for beef is drawn for a given price of cattle-feed. As the price of cattle-feed rises (because it includes anchovies), the supply of beef shifts from S_B to S'_B. This reduction in the supply of beef causes the price of beef to increase to p_1^B. The markets for inputs and outputs are linked, and the prices often move together.

Linkages Through Resource Constraints

Are the markets for restaurant meals and clothing linked in any way? How about the markets for corporate jets and automobiles? In both cases, the products are clearly different and there are no obvious input–output linkages. Even though there may be none of the obvious regional or input–output linkages that we have been discussing, these seemingly unrelated markets are indeed linked, though the nature of the linkage is subtle.

Even seemingly unrelated markets are linked through resource constraints.

There are two ways to think of the resource constraints linking markets. The first is a demand-side constraint; the second is a supply-side constraint.

Demand-Side Resource Constraints Consumers have only so much income they can spend. Even if they decide to borrow (so that they can spend in excess of their income) they must divide their total expenditure between housing, food, clothing, education, travel, entertainment, and so on. Thus, an extra $100 spent on restaurant meals must imply a reduction in spending on something else. As we saw in Chapter 1, this need for the consumer to make choices exists because of scarcity.

The scarcity faced by consumers implies that many apparently unrelated markets are actually linked together. If consumers with a constant amount of income increase their demand for chicken, they are probably decreasing their demand for beef or pork. If they increase their demand for movie tickets, they are probably reducing their demand for concerts or other forms of entertainment. If they increase their demand for airplane tickets, they are likely reducing their demand for railway or bus tickets. These linked demand changes will have effects on prices and resource allocation that you should by now be able to analyze.

Supply-Side Resource Constraints Restaurants and theatres compete against each other for the consumer's entertainment dollar. But how about products that are arguably not in competition with each other? Surely consumers do not view corporate jets as a substitute for automobiles, or hospitals as a substitute for bridges. Though it may be true that consumers view the degree of substitutability between such products as negligible, the markets for these goods are still linked through supply-side resource constraints.

In an economy with fully employed resources, devoting more resources to producing one product must imply devoting fewer resources to producing other products.

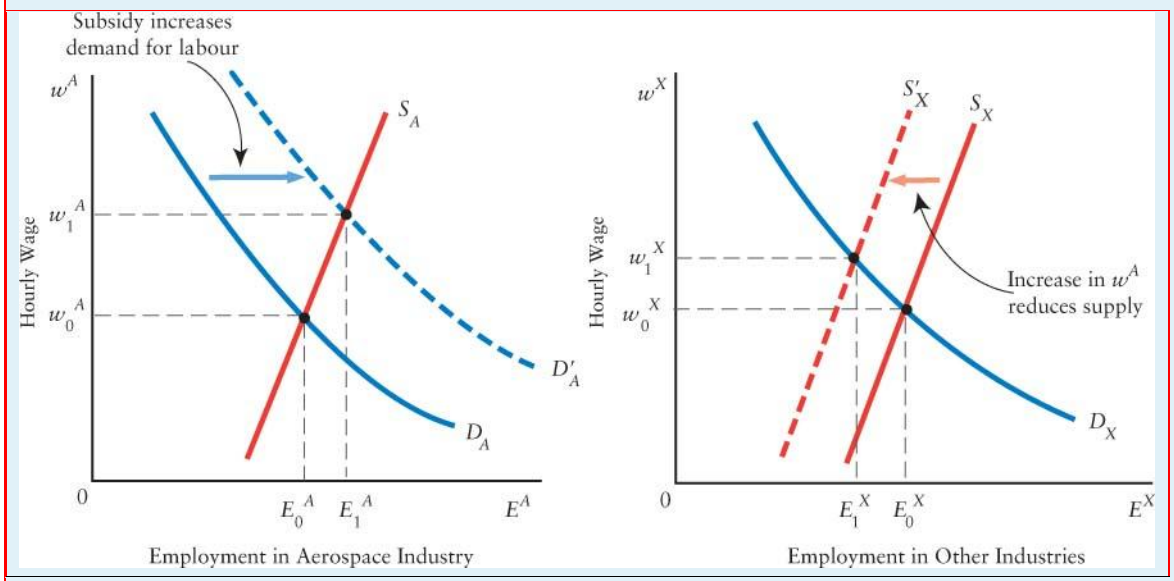
In other words, for a given level of technology and a given amount of resources, an increase in the supply of one product must imply a reduction in the supply of some other product. This is nothing more than a restatement of what we first encountered in Chapter 1 when we described a country's production possibilities boundary. But it is surprising how often this fundamental point is either ignored or forgotten in public debate.

One of the best examples of how this supply-side constraint is ignored in public debate is the often-heard claim by a public official that a specific program in one industry—such as a subsidy or a tax incentive—has "created jobs." The alleged proof of the claim is that the level of employment in the assisted industry is higher after the subsidy than before. But where did these new jobs come from?

Figure 4 shows how this situation can be analyzed. The basic story is as follows. Suppose the government chooses to subsidize firms in the aerospace industry (as it has in Canada for many years). A government subsidy to aerospace firms leads those firms to expand production and increase their demand for workers. Employment in the aerospace industry will therefore increase. But those workers must come from somewhere. In particular, those workers must be drawn away from other industries, and the way this happens is through an increase in wages. The increase in demand for labour in the subsidized aerospace industry drives up the wage in that industry. As the wage rises, workers in other industries are attracted to the aerospace industry (this is a movement along the labour supply curve in the aerospace industry). But as these workers move out of other industries and toward the aerospace industry, there is a reduction in the supply of labour to all other industries. Thus the "created jobs" in the subsidized aerospace industry are only possible because of the "destroyed jobs" in other industries. Jobs do get created in the aerospace industry, but no new jobs get created *in the economy as a whole.*

We have just suggested that government efforts to stimulate total employment by assisting particular industries are ineffective, since the economy's resource constraint implies that any job gains in one part of the economy must be matched by job losses elsewhere. Keep in mind, however, that we have been considering an economy in which resources are fully employed, so that the economy is on the production possibili-

FIGURE 4 Supply-Side Resource Constraints



With given total supply of labour, an increase in employment in one industry must be matched by a decrease in other industries. The figure shows the two labour markets, one for the aerospace industry and the other for all other industries combined (called them *X*). The initial equilibrium is E_0^A and w_0^A in the aerospace industry and E_0^X and w_0^X in the other industries. When the government subsidizes firms in the aerospace industry, the demand for labour increases from D_A to D'_A. This pushes up wages in the aerospace industry and attracts workers from other industries. But, as workers move to the aerospace industry, the supply of labour to other industries falls from S_X to S'_X. This raises wages and leads to a reduction in employment in other industries. The jobs that are "created" in the aerospace industry are matched by "destroyed" jobs in other industries.

ties boundary. But this is not always the case. When you go on to study macroeconomics, you will learn that the economy is sometimes *inside* the production possibilities boundary because it has idle resources, the most important of which is probably unemployed labour. In such cases, government efforts to "create jobs" might have the intended effect since some of the newly employed workers in the assisted industry could come from the pool of unemployed workers. But even in such cases, this supply-side resource constraint is important. Except in extreme situations, the increase in employment in the assisted industries will overstate the increase in total employment because *some* of the new workers will come from other industries.

Summary

We have now seen three general ways that apparently unrelated markets can be linked together—regional linkages, input–output linkages, and resource–constraint linkages. As you proceed through the microeconomics half of the textbook, you will notice that all of the analysis is of a partial-equilibrium nature, meaning that we analyze one market in isolation of other markets, and do not discuss these various linkages. We do this, first, because it is far simpler than thinking about many markets simultaneously and therefore it is easier to build an intuition for the economic relationships being examined. But there is a second reason we emphasize partial-equilibrium analysis—because the markets we are analyzing are typically very small relative to the overall economy, and therefore it is appropriate to analyze the single specific market under consideration while more or less ignoring all other markets.

It is useful to keep in mind, however, the general point that markets do not exist in isolation. Though it is simpler to analyze individual markets while ignoring all others, you should keep in mind the various ways that markets can link, and often are linked, together. The examples we have discussed here illustrate situations where the phenomena being examined require that some attention be paid to the various linkages between markets. As you become more comfortable with microeconomic analysis, you will come to learn that situations in which interesting market linkages exist are probably more common than those in which they are absent.