

four coconuts—this is the height of the curve where it intersects the vertical axis. If he spends all of his time catching fish, then he can catch eight fish—this is the distance from the origin to the point where the PPF intersects the horizontal axis.

Robinson can select any point along the PPF, which we have drawn here as a straight line. The slope of this line reflects the opportunity cost of coconuts in terms of fish. Since the PPF has a slope of -3 , it indicates that Robinson must give up three coconuts to get one additional fish. All of the points on the PPF are efficient from the perspective of production since along this line there is no way that Robinson can increase the quantity of one good produced without reducing the quantity of the other.

The point that Robinson chooses along the PPF depends on his relative preferences for fish and coconut. He will select the combination of fish and coconuts that maximizes his satisfaction. Suppose that he selects a point like A, where he is consuming fifteen coconuts and three fish. From our discussion of the demand curve, we know that at this point if Robinson is a rational consumer, he will get just as much pleasure from one more fish as from three coconuts. If this were not so, then he could improve his well-being by moving along the PPF. For example, if one fish gave him as much pleasure as two coconuts, he could reduce his consumption of fish by one and increase his consumption of coconuts by three. Since it only takes two coconuts to compensate for the fish he has given up, he would be better off.

ADDING THE OPPORTUNITY TO TRADE

Crusoe lives on a nearby island, where she too gathers coconuts and catches fish. In FIGURE 20b we show her PPF. Looking at her production, we can see that Crusoe is better at catching fish than Robinson, and she is better at gathering coconuts. In an eight-hour day, she can catch thirty-six fish or gather thirty-six coconuts. Because Crusoe's PPF is above and to the right of Robinson's at every point, we say that she has an *absolute advantage*.

The slope of her PPF is -1 , indicating that the opportunity cost of one fish is one coconut. Crusoe can select any point along her PPF. But by the same logic we used before, we know that at that point she will value one fish the same as one coconut. Let's suppose that Crusoe is initially consuming eighteen fish and eighteen coconuts at point B.

One day, Robinson finds a boat and sails to Crusoe's island. They begin to talk about their respective consumption patterns, and Robinson proposes that if they agree to trade, they can both be better off. Crusoe is skeptical at first since she produces more fish and more coconuts than Robinson, and so she cannot see how they could find an opportunity to trade. But Robinson persists. He points out to her that at the moment they are producing a total of thirty-three coconuts (Robinson's 15 plus Crusoe's 18) and twenty-one fish ($3 + 18$). But, if Robinson were to devote eight hours to gathering coconuts, he could produce twenty-four. Meanwhile, if Crusoe were to spend

two more hours fishing, then she could produce nine coconuts and twenty-seven fish. Together their combined production would be thirty-three coconuts (the same as before) and twenty-seven fish (six more than before). If they split this extra production, they could each increase their consumption by three fish.

COMPARATIVE ADVANTAGE AND THE GAINS FROM TRADE

How can it be that Crusoe, who is better at everything, can be made better off by trading with Robinson? The answer to this question lies in the insight that what matters is not the absolute productivity of either Robinson or Crusoe, but rather their respective **comparative advantage**. Even though Robinson produces fewer coconuts per hour than Crusoe, he has a comparative advantage in producing coconuts.

By changing their allocation of time between fishing and gathering coconuts, Robinson and Crusoe in effect "transform" fish into coconuts. Robinson faces a cost of just $1/3$ fish per coconut, while it takes Crusoe one fish to produce a coconut. When Robinson specializes in producing coconuts and Crusoe specializes in producing fish, their collective economy can increase its total production.

The principle of comparative advantage offers a profound insight about the opportunities for gains from trade that applies equally to individuals and to nations. So long as trading partners differ in their comparative advantage, they can improve their overall well-being by specializing. The more extensive the markets in which they trade are, the greater the opportunities for specialization and the larger the gains from trade.

THE POLITICAL ECONOMY OF TRADE

If trade increases a nation's well-being, then why is there so much public opposition to international agreements designed to promote freer trade? While free trade expands the overall size of the economy, it also implies shifts in the size of different industries. In the previous example, Robinson and Crusoe simply reallocated their time. But when countries become increasingly specialized, the costs and benefits of trade fall on different groups of people. As a result, even though the gains from free trade exceed the losses, those citizens who will experience losses are likely to oppose freer trade.

To see this, let's consider the impact of free trade in more detail. We will begin by considering a small economy that is isolated from international markets because trade is prohibited. As a result, the domestic equilibrium is determined by the intersection of the country's supply and demand curves as depicted in FIGURE 21a. Suppose that the world price is PW , illustrated by the horizontal line above the domestic equilibrium price. Consumer surplus is equal to the sum of the areas marked A and B; producer surplus is equal to the area C.

If the law prohibiting trade is removed, this country