

Taking Advantage of Trade: The Role of Distortions

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Abstract

This paper explains the differential impacts of trade on countries in terms of distortions broadly speaking. It argues that it is vital to identify such distortions and fix them before urging countries to liberalize their trade.

1 Introduction

One of the central themes of trade theory is that, overall, trade is a force for good. Trade people will readily agree that while there may not be Pareto improvements from trade, “potential Pareto improvements” are possible. This mantra, that the benefits of integration into the world economy outweigh the costs, is often invoked and is quite widely accepted. Yet, not all countries seem to have gained equally from their own liberalization or that of their trading partners. It might even be that some have lost. Even when developed countries have offered preferential access to the most poor of the developing countries, there has been a differential ability on the part of these poorest countries to take advantage of these preferences. In fact, the very poorest seem to be the least able to take advantage of such preferences with the result that, among the less well off, gains tend to accrue to those to need them the least, rather than the most!

Here I argue that the existence of “distortions” broadly speaking, and their interactions with trade liberalization might well be one reason for the above to occur.¹ I should make it clear that the term distortions will be used very broadly: maybe too broadly! It will include product market distortions related to the exercise of monopoly power, as well as factor market distortions that involve paying workers other than their marginal product (whatever be the reason). It will also cover situations that might not be thought of as “distortions” like the existence of holdup problems (both due to corruption and technology), to legal constraints that prevent incentives from operating and/or efficient organization

¹This is a standard result in the theory of the second best.

forms from being used, to the lack of infrastructure that causes power cuts and long delays and high costs in transportation. If existing distortions broadly speaking are (at least part of) the reason why some countries may have failed to gain from greater integration with the world market, then it is important to identify these distortions and alleviate them *before*, or at least *along with*, urging such countries to liberalize. Research directed towards identifying and empirically documenting the existence of such distortions is then a precursor to good policy advice.

The idea I want to push is simple and is perhaps best made through an analogy. Think of an island where *all* the natives are effectively one legged because they are required by law to strap up one leg. Despite this handicap relative to the two legged, they manage to subsist on the flora and fauna of the island. Although they have some trouble climbing trees to pick fruit, and maybe getting around while hunting is slow, they manage. Now think of what happens when humans not subject to this stricture arrive. Being faster, they get to the fruit and the prey before the one legged so that there is nothing left for the one legged who then starve.

Surely there is some wage at which the one legged can be employed? Maybe not. If the two legged can always beat the one legged to the spoils, the one legged will be quite useless (unless there is an excess supply of fruit trees or prey relative to labor so that this is not the case). What does this have to do with trade? Well, think of the one legged as the individuals/firms operating in the domestic distorted economy and the two legged as foreign individuals/firms. Think of trade as opening up your economy to the two legged. Before trade, even if your productivity was low, your people survived. After trade, they are helpless against the foreigners. This does not mean that trade should be abjured. Rather, it should be taken as a call to get the law revoked that required one leg to be strapped up! In other words, domestic distortions should be fixed before opening up to trade as trade can often make them much more pernicious.

I will proceed as follows. First, I will lay out the received wisdom on trade effects in second best situations. I will begin with some simple ideas from the theory of the second best. Then I will outline some insights that are obtained from work in two directions, namely the presence of labor market distortions with indivisibilities in consumption and the presence of credit constraints. Finally, I will speculate on some as of yet under-researched ideas about why countries may be able to differentially exploit access to world markets. These include ideas on the role of infrastructure and the importance of sunk costs in product choice which suggest some promising directions for future research.

2 Lessons From The Theory Of The Second Best

The main result from the theory of the second best is that in the presence of existing distortions, relaxing a single distortion (or group) of distortions need not raise welfare. What does this result have to do with trade? The inability to trade can be thought of as a distortion resulting in domestic prices not being

aligned with world prices. In the presence of other market distortions, removing or reducing this distortion (i.e. opening up to trade or liberalizing trade) could easily reduce welfare. This insight, in and of itself, is not particularly useful. What one wants to know for this insight to have any remote policy relevance is which distortions are likely to have this effect. In general, the following presumption is not too far from being true: Product market distortions are less likely to be made worse by trade than are factor market ones.

2.1 Product Market Distortions

Since trade integrates product markets, distortions due to market power in the product market are likely to be *diminished* by trade. This is the thrust of much of the (now) older work in trade with imperfect competition and increasing returns with free entry. Opening up a country to trade raises the total number of (domestic and foreign) firms in the market thereby reducing their market power as reflected in price cost margins, as well as raising the output of each firm thereby allowing them to better exploit economies of scale and reduce average costs.²

However, even here there is an important caveat: since welfare is the sum of producer surplus, consumer surplus and net government revenue, when profits are present, trade could well have adverse welfare effects due to profit shifting to foreign firms. Although there might be gains from lower prices for consumers, the losses due to profit shifting of trade liberalization could outweigh these gains. This was the thrust of the strategic trade policy literature of the 1980's. However, the empirical relevance of this literature was soon seen as limited. Two exceptions to this latter statement are particularly worth noting. First, the presence of other distortions can amplify the extent of the welfare effects of strategic trade policy. For example, in his work on automobiles Dixit (1988) shows that in a simple model calibrated to the US automobile industry in the 80's, the potential gains from strategic trade policy would be at most in the millions of dollars. However, once labor rents accruing to workers (due to the presence of trade unions who jack up wages) are accounted for, this number can morph into the realm of billions of dollars. Second, in situations with a small number of players, policies that seemed to be marginal, like setting non-tariff barriers (NTBs) at supposedly non binding levels, could end up being far from such. Thus, even quotas set at the free trade level of imports could end up restricting trade. The reason is that in strategic environments, it could be worthwhile for one party to *make* the NTB bind on the other and this could result in seemingly innocuous policies being far from such. This is the thrust of the work on NTBs in strategic environments.³

²This is very well laid out in Dixit and Norman (1980).

³See Krishna (1990) for an overview of this area.

2.2 Factor Market Distortions

In trade, work on factor market distortions (FMDs) has been targeted for the most part to the effects of minimum wages. See for example, the classic work of Brecher (1974a,b) which looks at the effect of a minimum wage distortion on an open economy⁴. The more recent work of Davis (1998), builds on this work and looks at the effects of trade between an economy with a minimum wage distortion (Europe) and one without it (the U.S.). Davis argues that trade may simultaneously prop up U.S. wages and cause greater unemployment in Europe). Thus, opening up to trade could well make Europe much worse off! It is an excellent example of the Second Best Principle at work. In contrast to Davis's work, the endogenous distortion in the work reported below results in resource misallocations, not unemployment.⁵

2.2.1 A Simple Ricardian Setting

Rather than use a minimum wage distortion, think of the FMD as an inability or unwillingness of firms, in at least part of the economy, to distinguish between the ability of workers, even though workers are heterogeneous and all markets are otherwise perfectly competitive. In the former socialist economies, the state owned sectors (the distorted sector) usually paid a flat wage per worker which was only loosely related to ability.⁶ If other sectors are un-distorted and pay a productivity based wage, the best workers will be attracted to the un-distorted sector while the lower ability ones flock to the distorted sector.

Similarly, in developing economies, agriculture is run along family farm lines so that workers in agriculture (the distorted sector) can be thought of as obtaining a fixed wage rather than the value of their marginal product. When workers differ in their abilities, this leads to higher ability workers leaving agriculture. Of course, the higher the wage, the higher the average quality of worker attracted to sector offering a uniform wage per worker.

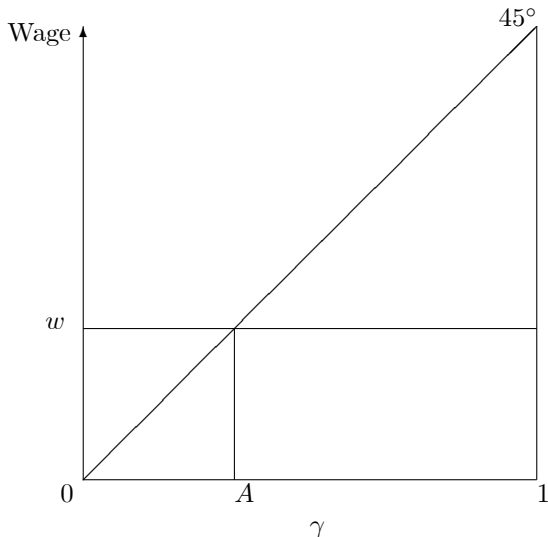
Thus, suppose that in one sector there is this distortion while in other sectors of the economy, this distortion does not operate and workers are paid according to their marginal product. This is depicted in Figure 1. Think of γ as the effective units of labor in a worker of type γ . In the un-distorted sector, the unit requirement of effective labor is unity and this sector's output (Y) is taken as the numeraire. A worker can therefore always make γ by working in the un-distorted sector so that if the wage per worker is w , all workers of type less than w will work in the distorted sector making good X , while the remaining will choose to make Y . It is easy to see from Figure 1 that the distortion results

⁴The minimum wage distortion in this paper is exogenously specified. Brecher (1992) develops an efficiency wage model with an endogenous factor market distortion which results in unemployment.

⁵The discussion below is based on Krishna and Yavas (2005) and Krishna, Mukhopadhyay and Yavas (2005).

⁶Jefferson (1999) argues that "the inability of state enterprises to monitor and reward high quality labor is likely to create an adverse selection problem in which the most skilled and motivated workers exit from the state sector...".

Figure 1: The Allocation of Labor Between Sectors in the Distorted Economy



in a firm's paying all but the marginal worker willing to work for the firm's offered wage more than his opportunity cost. This overpayment, in turn, raises the firm's costs above the level that would prevail if the firm could distinguish between differentially able workers.

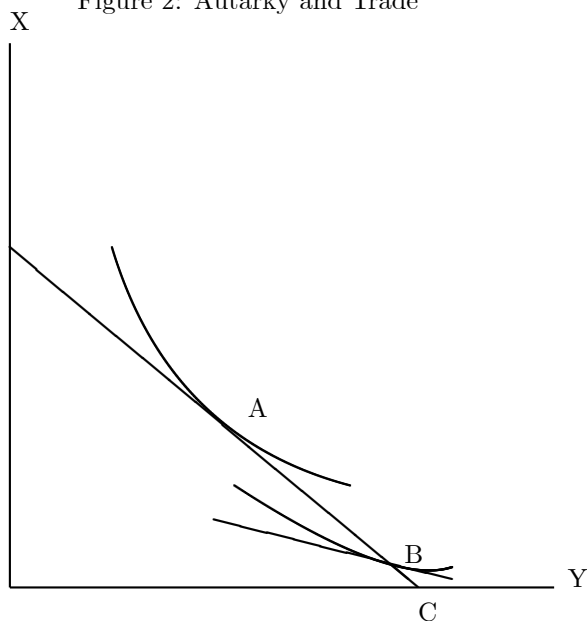
The effect of the distortion on *production* (and hence *consumption*) in autarky is straightforward: as the cost is high, so is the price (as this equals cost) and consequently, demand is low. Thus, relative to the first best, too little of the distorted good is made and consumed. In our Ricardian setting, since there is no unemployment and a single factor, effective labor, the economy remains on the Production Possibility Frontier (PPF), but at the wrong point on it: at *B* in Figure 2, not *A*, which is the first best.⁷

In autarky, the effect of the distortion on *welfare* depends on the extent of substitutability in consumption. The more the substitutability, the greater the deleterious effects of the distortion in autarky; since the price of the distorted good is higher than in an un-distorted economy, consumers substitute away from it a lot when substitutability is high, causing far too little of the distorted good to be produced (as compared to the efficient level). In the extreme, when the goods are perfect complements, the consumption levels are the same as in an un-distorted economy.

Under trade, consumption and production are de-linked. The distorted economy has a comparative disadvantage in the distorted sector: thus, it is imported. Hence, opening up to trade involves *making even less* of the distorted good: in Figure 2, the economy specializes in *Y* at *C*. This effect reduces welfare as the

⁷Factor market distortions (FMDs) could place the economy on the wrong point on the production possibility frontier, or even put the economy inside the frontier if there are many factors even if there is full employment.

Figure 2: Autarky and Trade



production point moving from B to C at given prices can only reduce welfare. However, having access to cheaper X makes the price line steeper and this effect raises *welfare* as the economy is specialized in Y . The more substitutable the goods are in consumption, the greater the welfare gain via this price effect.

The important thing to note is that FMDs tend to be made *worse* by opening up to trade. The FMD raises the cost, and hence the price of the good made by the distorted sector. As a result, in the absence of trade, too little of this good is produced and consumed relative to the first best. But when this country opens up to trade, it will have a comparative disadvantage in the good made by the sector with the FMD. Thus, it will import it and reduce its own production of the good. But since too little of the good was being produced to begin with, this will make the production point deviate even more from the first best resulting in possible losses from trade.

Note that if all sectors are so distorted, then even if workers are heterogeneous, there is no place for high ability workers to be paid according to their ability, so that workers will not sort across sectors: each sector will get workers of average ability, just as it would if it paid workers according to their ability! Thus, in general equilibrium, there is no misallocation of workers across sectors. However, if some sectors become market driven, then the distortion hurts. This suggests that it is the economies in transition with both state run and free enterprise sectors, that would be most likely to suffer losses from trade. This may

help explain why transition countries are slow in reaping the full extent of gains from trade. They may even be hurt by trade.

The kinds of issues that arise with such FMDs are amplified by the existence of indivisibilities. Think again of a two good world. One of the goods, which can be thought of as a “lumpy consumer good” like a refrigerator or car, is indivisible in consumption: either zero or one unit of it can be consumed.⁸ Moreover, this indivisible good is highly valued, meaning that consumers are much better off if they can afford the good, than if they cannot. As the good is indivisible, only consumers with incomes high enough (above the price) can afford the good.⁹

Think of this indivisible good (X) as being made in the state run sector where all workers are paid the same independent of their productivity. Of course, the higher the wage offered in this sector, the more workers choose to work there. As explained above, paying workers a wage independent of their ability raises production costs above what they would be otherwise.¹⁰ But now, this is not the end of the story. If workers are well paid, they can afford the indivisible good, and because of this, the demand for the indivisible good is high, (in fact, everyone buys the indivisible in this good equilibrium), which makes the demand for the workers in that sector high and keeps their wage high! On the other hand, if workers are poorly paid, this chain of causation works in reverse. If wages are low, demand for indivisibles is low (in fact only the most able working in the un-distorted sector can afford the indivisible), which keeps demand for workers in the state run sector and wages there too low for workers there to afford the indivisible! In this way, a FMD together with indivisibilities can give rise to two equilibria: a good one where all agents can afford the indivisible and a bad one, where only a select few can do so.

When are such multiple equilibria likely and when is there a unique equilibrium? Multiple equilibria tend to occur when the economy is productive, but not too productive. If the economy is too unproductive, then it just has not got the resources to produce enough to meet high demand levels so that the good equilibrium cannot exist. If the economy is too productive, then costs are so low that everyone can always afford the indivisible¹¹ so that only the “good” equilibrium exists in autarky. In between lies the realm of multiple equilibria. Thus, it may be that in developing countries, like China in the past, the “good” equilibrium might not have been viable at all. However, the “good” equilibrium

⁸The good itself can differ according to the level of development and particular needs. In poorer settings, this might be as small an item as a water purifier, or a wood or gas cookstove, or a radio or TV.

⁹Although goods can be made divisible by renting or sharing, an essential indivisibility remains since it is usually much more costly to rent than buy. Why not share the good then? This seems hard as there are moral hazard problems involved in sharing.

¹⁰To fix ideas, think of a mixed economy like India before reforms or the former Soviet Union: much of the economy is state run, though there is a private sector.

¹¹If the economy is too unproductive, then this good equilibrium where everyone can afford the indivisible cannot be supported: it takes more workers than are available in the economy to make enough of the indivisible for everyone! This could be the case in a less productive environment, like India or China in the past, while the “good equilibrium” might have been a possibility in the former Soviet Union, where despite all the inefficiencies of the system, the standard of living was reasonably high before its collapse.

might have been a possibility in the former Soviet Union, where despite all the inefficiencies of the system, the standard of living was reasonably high before its collapse.

In such a setting, there is reason to expect trade to have large adverse welfare effects for the distorted economy. Why? Well, think of this distorted closed economy in the “good” equilibrium. Even though costs are high in the distorted sector, the high wages in the state run sector (where wages per worker have to be lower than those in the non distorted sector as all workers could choose to work there) ensure that everyone has the ability to buy a stove, or refrigerator or scooter,...¹² Now think of opening the economy up to trade. As the distorted economy has higher costs, and hence a comparative disadvantage in indivisibles, this “good” equilibrium cannot survive opening up to trade. Indivisibles will be imported, at lower prices, but this will not help the less able who have lost their well paying jobs! Of course, the more able will be better off but society as a whole will be worse off when the loss of welfare of the less able is taken into account. If the world price under trade is close to the autarky cost of indivisibles in the distorted economy (as it would be if the distorted economy was “large” so that its autarky prices prevailed) then there could even be a weak Pareto loss in welfare from opening up to trade.

While these models are special, the ideas that emerge from them make sense at a basic level. Maybe the citizens of the former Soviet Union did not have access to the luxuries and the quality of products in the West, but before its fall, they had a pretty decent standard of living! Once the economy opened up, no one wanted Soviet style goods, so these sectors closed down, with consequent devastating effects on incomes and welfare of those working there. Of course, those who succeeded in the new Russia were much better off, but it is hard to argue that on average this was the case, especially in the early years of the transition.

These ideas also have some relevance for Development Economics. Family farming results in workers earning the average rather than the marginal product in agriculture. When workers are identical in ability and marginal product is diminishing, as has been assumed in this literature, average product exceeds marginal product so that too many workers remain in agriculture. In the development literature this distortion has been linked with the concept of “Disguised Unemployment”, see Sen (1960). However, when labor varies in ability, as in the above model, only lower ability labor remains in agriculture. The marginal worker in agriculture in effect subsidizes all other workers in the sector as he obtains a wage below his marginal value product in the sector. As a result too little effective labor remains in agriculture rather than too much which is the opposite of what is predicted in the classic work on disguised unemployment!¹³ The effect of the distortion on output is the same. In autarky, too little of the

¹²Although the economy is distorted, the less able gain a lot by this distortion, though the more able lose as they pay higher prices for the indivisible.

¹³This is in line with the observation that the young and able are disproportionately represented in those migrating from rural areas, with children, women and the elderly staying behind.

distorted good is made and its price is too high. As a result, the distorted economy has a comparative disadvantage in the distorted good which is imported when the economy is opened up. This reduces the output of the distorted good and worsens the distortion. On the other hand, trade results in the usual price effects that raise welfare. Thus, welfare may rise or fall as a result of trade liberalization. However, a large distorted economy always loses from trade as, by definition, it does not reap any beneficial price effects.¹⁴

2.3 Credit Constraints

Credit constraints operate in both static and dynamic contexts. In the static context, credit constraints will tend to limit the size of the sector that is dependent on credit. In a now familiar manner, one could argue that to the extent that credit constraints raise the costs of the credit intensive sector relative to the rest of the economy, the economy will make too little of the credit intensive sector's output. Moreover, that trade will likely make this output distortion worse as the economy has a comparative disadvantage in the credit intensive sector.

More interesting and unique are the dynamic effects. Here I will draw upon Krishna and Chesnokova (2009) and Chesnokova (2007). The former paper looks at steady state equilibria only. It shows that in a general equilibrium setting, where the acquisition of skills by heterogeneous workers is explicitly modeled, one can think of steady state supply much as we do in a static model. In steady state, if credit constraints are not binding, steady state relative supply is shown to be increasing in price as in static settings. If credit constraints are binding however, steady state relative supply need not be increasing in price, and consequently, multiple steady state equilibria may exist. Non-monotonicity of relative supply may even result in trade equilibria where the country ends up importing the industrial good (which is intensive in its use of credit) at prices higher than its autarky price. As a result, there are potential losses from opening up to trade.

The latter paper is particularly fascinating. At the modeling level, it takes the classic paper of Banerjee and Newman (1993) (which deals with occupational choice in an overlapping generations type model, in the presence of credit constraints, in a closed economy setting) and extends it to an open economy. It is the first paper that provides a clean explanation of how *immiserizing deindustrialization* can occur. It has been argued (see, for example the deindustrialization debate in India under British rule) that particular trade/domestic policies in India under the British resulted in the irreversible loss of certain industries, and that this was bad for welfare.

In her work, Chesnokova shows how trade can not only cause deindustrialization, but how this deindustrialization can reduce welfare! Think of an economy making two goods: the industrial good which needs up front investment, and

¹⁴This perfectly in line with the literature on the theory of the second best, (see Lipsey and Lancaster (1956)) where a recurring theme is that in the presence of existing distortions, reduction or removal of a distortion can lower welfare. See, for example (Ethier 1982).

the agricultural good, which does not. Trade can cause deindustrialization by bringing the price of the industrial good down below the level at which bequests are large enough to permit the next generation to invest in what is needed to be in the sector where large investments need to be made up front. In the presence of credit constraints, the inability to make such bequests causes the industrial sector to shrink over time, which explains how deindustrialization can occur. But why should this deindustrialization be immiserizing? Deindustrialization cannot be welfare reducing if the price of the industrial good remains low. However, as the industrial sector shrinks, the price of the output of this sector will rise. Yet, the sector will be unable to expand the way it shrank as the absence of credit will prevent agents from moving into the sector freely. In this way, she argues, not only can trade destroy the industrial sector, but it can also raise its price above that prevalent under autarky. This is what makes its demise immiserizing. She shows that this immiserizing deindustrialization cannot happen if the agricultural sector is productive enough, but can occur if it is not very productive as this is when agricultural agents cannot leave bequests to their offspring that are large enough for them to become industrialists.

While this work is quite stylized, there is enough truth in it for this to be a cautionary tale for developing countries where the operation of credit markets tends to be relatively poor. Interest rates in such countries can often be well over 100% per annum and this could well make the loss of sectors, especially ones where up front investments are needed, very hard to reverse.

3 The Second Best in Disguise

A concern that is often expressed these days is that the countries that seem to have gained the most from trade are the ones that have needed it the least. The poorest and most mismanaged ones have been the slowest to reap the benefits of globalization. An interesting take on this can be found in the work of Demidova (2008). Her paper looks at two features of globalization, productivity improvements and falling trade costs, and considers their effect on welfare in a monopolistic competition model with heterogeneous firms (a la Melitz (2003)) and technological asymmetries. Productivity improvements are interpreted as having a “better” productivity distribution to draw from.¹⁵ She shows that improvements in a partner’s productivity always hurt a country. Her reason is not the usual one that relies on adverse terms of trade effects resulting from an improvement in productivity.¹⁶ Rather, it is really the second best theorem in disguise. In her work there are two sectors: the first which makes a homogeneous goods and is competitive which we can call agriculture. The other sector (call it manufacturing) makes differentiated goods and is monopolistically competitive. In this sector firms are heterogeneous ex post but homogeneous ex ante in their productivities as they only discover their productivity after they make a fixed

¹⁵Better means hazard rate stochastic dominance.

¹⁶Productivity improvements, in essence, shift the relative supply of the exportable outwards, thereby reducing its price.

and sunk investment. Firms choose where to set up shop and there is free entry.

Now the logic of her result is that as there is market power in manufacturing, firms hold back supply to raise price and hence, too little is produced relative to the first best. Trade further reduces output in the country with the worse productivity distribution as firms are attracted to locations where they can get a better productivity draw. Thus, trade reduces the entry and hence the output of industry in the technologically backward country, which results in losses from trade. She also shows that falling trade costs result in disproportionate gains to more technologically advanced countries as a fall in trade costs puts the country with lower costs in a better position to exploit its advantage.

Her results seen in this light are no mystery: Yet the implications for policy are quite profound once one asks where these differences in productivity distributions might be coming from. It is likely that they arise from differences in infrastructure and institutions broadly speaking.¹⁷ Onerous labor regulations that prevent the firing of workers, or poor roads and ports will in effect reduce the productivity of a firm in the poorly managed country making it a bad place to locate. It is telling that many Indian multinationals choose to headquarter, not in Mumbai or Delhi, but in Singapore! Similarly, the vast difference in Infrastructure investment in India and China could to be a large part of the reason for their differences in their current per capita incomes.

At the micro micro level, these differences in infrastructure could be the reason for the difficulty poor countries seem to have in accessing world markets. This difficulty is both via the obvious direct effect of limited port facilities which creates long delays in ships berthing, and corruption or inefficient labor practices which raise the costs of transportation directly, or more subtly via holdup problems. It is clear that farmers in developing countries are unlikely to get rich growing staples like wheat or rice. Rather, the money seems to be in making high value specialty products like fresh flowers or exotic fruit for which the developed world is willing to pay what seems like a fortune to the poor.

So why does this not happen? One might argue that the reason is that the farmers have no idea that this demand is out there and need to engage in “discovery”. But this can be, at best, the smaller part of the story. Even if the farmers knew what to make, they would probably not make it. Why? All the products mentioned above are perishable. This makes sellers open to the classic hold up problem. Once the flowers are ready, or the fruit is ripe, the farmer cannot consume it himself. Nor can he credibly hold on to it if the buyer tries to take advantage of its perishability to offer a low price ex-post. This makes the farmer wary of getting into this business ex ante! After all, if the price of wheat is low, he can store it and eat it. At least he will not starve. But this is not the case if he is growing flowers! The situation would made worse by bad roads that limited the number of buyers coming to the village leading to markets that are very thin. This will clearly exacerbate the hold up problem as it will be harder for a farmer to find an alternative buyer if he is held up by his original one.

Why not contract on the price of the product ex ante? This will do little

¹⁷See Krishna (2007) for more on this and the constraints on Indian development prospects.

to alleviate the holdup problem if the courts are overloaded or corrupt so that it is hard to sue for breach of contract. In this manner, poor judicial systems and corruption also make this holdup problem worse. As a way around such problems, innovative contracts arise. For example, in India, it used to be the norm that mangoes were sold to the buyer after they were ripe. This left farmers open to hold up as discussed above. In recent times, a new contractual form has sprung up where farmers “rent” out the mango trees to the buyer once the flowers have formed and a reliable estimate of yield is possible. The renter then takes care of the tree and all else for the season with full rights to the fruit. As the farmer gets the payment up front, there is no holdup problem on his side which makes him willing to make the long-term investments in trees needed to increase production. There may be inefficiencies here as the farmer may be better placed to monitor and protect the trees, but at least it helps solve the holdup problem.

All of the above suggests that a broad interpretation of the theory of the second best calls for government to actively look for ways to deal with such issues. Whether these ways involve creating cooperatives that offer fair prices and distribution networks for perishable products, or building roads to distant places, or investing in port facilities and removing onerous regulations, removing these impediments to accessing world markets is vital to reaping the gains from globalization.

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