

Trade with Labor Market Distortions and Heterogeneous Labor: Why Trade Can Hurt

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Abstract

This paper explains the differential impacts of trade on countries in terms of institutional differences which result in factor market distortions. We modify the Ricardian, Specific Factor and Heckscher Ohlin models of trade to capture these.

Trade has both terms of trade effects and output effects. Both work to raise welfare in an undistorted economy. In a distorted economy, price effects work to improve welfare, while output effects work to reduce it. Large distorted countries are more likely to lose from trade as beneficial price effects are lower. In addition the greater the substitutability between goods, the more likely it is that welfare rises through trade.

1 Introduction

The latter part of the 20th century saw a surge in trade volumes. Some developing countries liberalized trade hoping to emulate the success of the East Asian miracle economies; others just out of the socialist bloc looked to the world for consumer goods. Most did not perform very well. During the early stages of liberalization, incomes even fell in many transition economies. It would seem appropriate to ask what might lead to such different experiences with trade liberalization.

We argue that labor market distortions and their interactions with trade liberalization might be important in answering this question. This paper is related to the literature in trade on factor market distortions, work in Labor Economics on heterogenous labor as well as to work in Development Economics on organizational differences between developing and developed economies.

While factor market distortions and their effect in open economies have been a focus of much work in trade, attention has been targeted for the most part on the effects of minimum wages. See for example, the work of Brecher (1974) (which looks at the effect of a minimum wage distortion on an open economy) as well as the recent work of Davis (1998) (which looks at the effects of trade between an economy with a minimum wage distortion (Europe) and one without it (the U.S.) and argues that trade may simultaneously prop up U.S. wages and cause greater unemployment in Europe).

If firms are unable to identify the ability of workers and workers are unable to fully signal their ability then wages are positively related to the average ability of the labor pool firms draw from. Such models have features in common with ours. Weiss (1980) develops such a model in a partial equilibrium closed economy setting and argues that job queues or unemployment could occur.

There is also a large literature in Development Economics on the effects of family farms. However, most of this work deals with homogeneous labor in a closed economy setting. 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 our model, only lower ability labor remains in agriculture. The marginal worker obtains a wage below his marginal value product. As a result too few workers remain in agriculture rather than too many!

Differences in the way labor markets work crucially affect how production is organized in various economies. In market economies, workers are paid the value of their marginal product so that labor allocation between sectors is efficient. Such economies can only gain from trade. On the other hand, institutional constraints may prevent an efficient allocation of labor. In this paper we look at a particular kind of factor market distortion that can be interpreted in both the context of an economy making the transition from a socialist to a market economy, or in terms of institutions existing in parts of the developing world.

In the former socialist economies (transition economies), the state owned sectors (called the distorted sector) usually pay a flat wage per worker which is only loosely related to ability. If other sectors are undistorted and pay a productivity based wage, the best workers are attracted to the undistorted sector while the lower ability ones flock to the distorted sector.

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.

With either interpretation, the effect of the distortion is the same. In autarky, too little of the 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, there are the usual price effects through trade which raise welfare. Thus, welfare may rise or fall as a result of trade liberalization. However, a large distorted economy always loses from trade as it does not reap any beneficial price effects. This is 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).

In autarky, the effect of the distortion on welfare depends on the extent of substitutability in consumption. If the goods are perfect complements, in autarky the consumption levels are the same as in an undistorted economy. However if there is any substitutability, there is too little output in the distorted sector. The more the substitutability, the greater the deleterious effects of the distortion; since the price of the distorted good is higher than in an undistorted 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).

Trade involves importing the distorted good and with a Constant Elasticity of Substitution formulation, greater substitutability results in gains from trade. The more substitutable the goods are in consumption, the greater the price effect through trade. As the price effect is beneficial, trade tends to raise welfare.

This paper builds on Krishna and Yavas (2002), who use a Ricardian setup to show how such labor market distortions in transition and developing countries affect the level and distribution of income and hence the demand for indivisible consumer goods. In their model, effects in transition and developing economies differ, though the basic story is similar. They argue that in the absence of trade, wages are high due to the distortion, and as a result demand for indivisibles is high, which sustains these high wages. However, as the cost of the distorted good is higher in the distorted economy, it tends to be imported, with adverse consequences on the level and distribution of income.

Such factor market distortions have similar effects even when goods are divisible. By modifying the standard trade models, namely the Ricardian, Specific Factors, and Heckscher Ohlin models, we are able to look at a wider set of issues.

Section 2 develops the Ricardian model and shows how this distortion affects labor allocation and output and why trade always makes existing distortions worse. We also look at the effects of substitutability between goods on the gains from trade for a distorted economy. Section 3 develops the Specific Factors model and argues that similar effects obtain when the marginal productivity of labor is diminishing. Section 4 deals with the Heckscher Ohlin model of trade and shows that it does not alter the flavor of the results either. Section 5 contains some final remarks.

2 The Ricardian Model

There are two economies, Home and Foreign, which have access to the same technology, but differ in their institutional arrangements¹. There are a continuum of individuals, indexed by γ , who are uniformly distributed on the unit interval with density related to the labor size. Type γ is endowed with γ units

¹Since we are looking at the effects of different labor market institutions we abstract from differences in technology. These can be easily added to the model.

of effective labor. There are two goods, X and Y , and both goods are produced under competitive conditions. It takes one unit of effective labor, E , to make a unit of either good.

Let Y be the numeraire good with a price of unity. Let I be the total income of the economy, and let P and P^* denote the autarky price of X in Home and Foreign. Let L and L^* be the size of the labor force, i.e., the density of the distribution of γ , in Home and Foreign, respectively. Labor in the Y sector is paid the value of its marginal product in both economies. Labor in the X sector is paid its marginal product in Foreign, but is paid a constant wage per worker, independent of ability, in Home.

2.1 Autarky Equilibrium

In the undistorted economy, called Foreign, a worker with productivity γ earns γ if he works in Y and γP^* if he works in X . For both goods to be produced, P^* has to equal 1.²

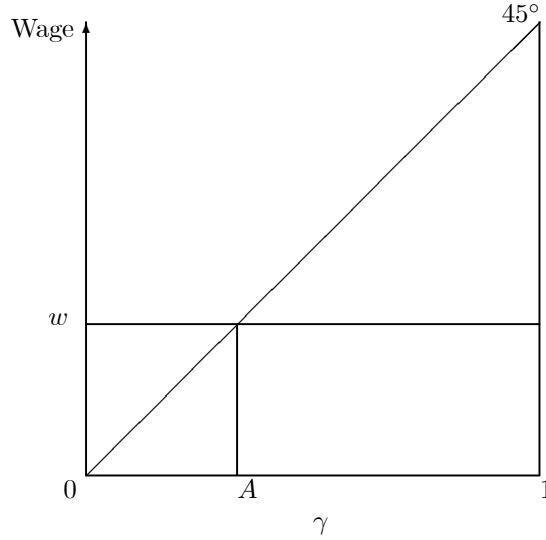
Let \bar{w} be the fixed wage per worker in sector X in the distorted economy. This fixed wage has two interpretations. It can be interpreted as the wage per worker paid by state owned manufacturing firms. Alternatively, it can be interpreted as the income of a worker who works in the family farm and obtains the average product there.³ The allocation of labor is depicted in Figure 1. At wage w , workers with $\gamma > w$, that is workers in OA , choose to work in X . The remaining workers choose to work in Y . An increase in the wage rate attracts workers with higher ability into X and raises the average quality of labor there.

At wage \bar{w} , and assuming γ is uniformly distributed, $\bar{w}L$ workers are employed in X . On average, each worker has $\frac{\bar{w}}{2}$ effective units of labor. Total

²For both goods to be produced, there must be some workers willing to work in each sector. However at any $P^* \neq 1$, all workers will prefer working in one or the other.

³We assume that all family farms have the same average ability.

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



output of X at this wage, denoted by $X(\bar{w})$, is their product,

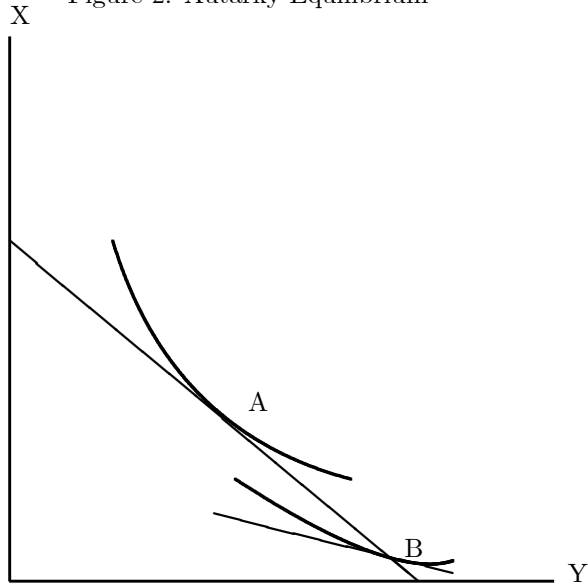
$$X(\bar{w}) = \frac{\bar{w}^2}{2}L.$$

Since each worker is paid \bar{w} , total labor cost is \bar{w}^2L . Hence, cost per unit of good X , and hence its price, P , is 2.

In Home, as a result of the fixed wage per worker in sector X , workers (other than the marginal one) earn more than they would in the undistorted sector.⁴ This raises the cost of producing good X , and hence its price. This, in turn, reduces the demand and output of the distorted sector in autarky equilibrium. Thus there are too few workers in the X sector. This is depicted in Figure 2. The Production Possibility Frontier (PPF) of the distorted economy is the same as that of the undistorted one and given the Ricardian setup, it is linear. The undistorted economy produces at point A where the indifference curve is tangent to the PPF. As there is no unemployment, the distorted economy remains on the PPF. It just produces at the wrong point, making too little X at B . At B

⁴Note that in the market economy, the productivity of the workers in X is equal to the value of marginal product in Y .

Figure 2: Autarky Equilibrium



the price line is flatter than the PPF but is tangent to the indifference curve since consumption decisions are not distorted.⁵

2.2 Trade Equilibrium

Trade equilibrium is best understood using the standard relative demand (RD) and relative supply (RS) framework. In Figure 3, RS^W depicts the world relative supply. At $P = 1$, the undistorted economy becomes willing to produce good X and it can produce up to $\frac{L^*}{2}$ units while the distorted economy produces only good Y , $\frac{L}{2}$ units of it. Thus, the relative supply of good X at $P = 1$ is, at most, $\frac{L^*}{L}$. For $P \in (1, 2)$, $RS^W = \frac{L^*}{L}$. At $P = 2$, the distorted economy also becomes willing to produce good X and RS^W becomes horizontal.

⁵In the extreme case where goods are perfect complements, the consumption and hence output levels in a distorted economy under autarky are the same as in an undistorted economy. However as long as there is any substitutability, there is too little output in the distorted sector.

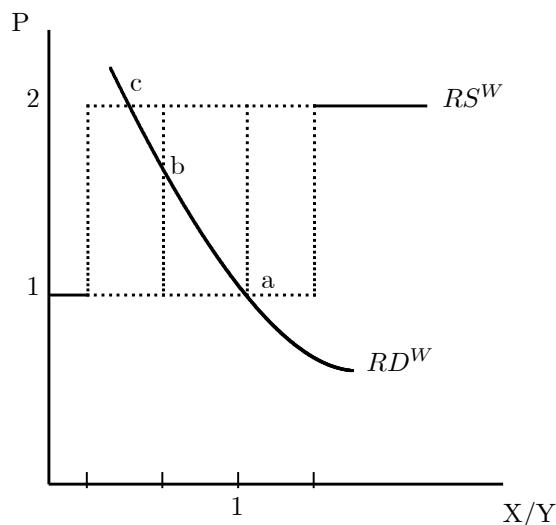
Given identical homothetic preferences across countries, the world relative demand (RD^W) depends on relative prices alone and is identical to that for either country. If, in addition, X and Y enter preferences symmetrically, then their demands must be equal at $P = 1$. Hence, the price under free trade, P^F , depends on the relative size of the two countries, L and L^* . Recall that relative supply at $P = 1$ is at most $\frac{L^*}{L}$. If $\frac{L^*}{L} < 1$, then the intersection of RS^W and RD^W must occur at a point like b or c in Figure 3. Hence P^F must be greater than unity, and the undistorted economy completely specializes in good X . If $\frac{L^*}{L} \geq 1$, then this intersection must occur at a point like a in Figure 3. So $P^F = 1$ and the distorted country completely specializes in good Y .

This pattern makes sense since if $\frac{L^*}{L} < 1$, then Foreign is small relative to Home, and it must specialize in the distorted good, X , in which it has a comparative advantage. On the other hand, if $\frac{L^*}{L} \geq 1$, then Foreign is large relative to Home, it can produce enough to meet world demand of good X , and therefore Home completely specializes in the undistorted good, Y , in which it has a comparative advantage.

2.2.1 Welfare Effects

The undistorted economy never loses from trade. The effects on the distorted economy are varied. There are two effects at play. Recall that the distorted economy produces too little of the distorted good in autarky, and it has a comparative disadvantage in its production. Trade makes this distortion worse as the country produces even less of the distorted good after trade. There may however be a welfare gain through lower prices of X . The net effect depends on which one dominates. If substitutability between goods is parameterized using a constant elasticity of substitution (CES) utility function, simulations show that welfare rises due to trade for $(\sigma, \frac{L^*}{L})$ that lie above a weakly downward sloping

Figure 3: Trade Equilibrium in the Ricardian Model



curve denoted by $\sigma(\frac{L^*}{L})$.

If $\frac{L^*}{L} \geq 1$ then Home makes only Y . Hence, the output effect is adverse. However, as $P^F = 1$, the value of output is constant along the PPF and Home obtains the same welfare as that of an undistorted economy. Hence, trade must always raise welfare in Home.

If $\frac{L^*}{L} < 1$ then P^F must exceed unity, occurring at a point like b or c in Figure 3. For a given $\frac{L^*}{L}$, the lower the substitutability the higher the price in free trade. This occurs because when goods enter preferences symmetrically, the relative demand curve must always go through the point $(1, 1)$, i.e. the point a in Figure 3. It is easy to see that when σ is high enough the free trade price is close to unity, so Home welfare under trade approaches that of an undistorted economy. As a result, Home gains from trade. As σ falls from this high value, relative demand becomes steeper, rotating about the point $(1, 1)$. Since $\frac{L^*}{L} < 1$,

the intersection with relative supply occurs at a higher price. At some level, say $\hat{\sigma}$, P reaches 2. At this level of σ , welfare must fall due to trade since Home makes only Y and prices are its autarky prices. By continuity, at some value of σ in between, denoted by $\sigma(\frac{L^*}{L})$, Home neither gains nor loses from trade.

Once σ reaches $\hat{\sigma}$, further decreases in σ do not affect the price in free trade. However, Home starts to produce both X and Y . In this region, Home must lose from trade as there is no positive price effect, and since Home imports X its production of X must be lower than under autarky.⁶

3 Specific Factors Model

Would the results derived above carry through if labor faced diminishing returns as it would in the presence of other factors? In the next two sections we show that their spirit does indeed carry through.

Consider the specific factors model. Each sector has a fixed amount of a specific factor which cannot move across sectors while labor is mobile. We assume that Home and Foreign are identical in every respect except that Home has a labor market distortion in X . Let E^i denote the effective units of labor employed in sector i , and K^i denote the fixed amount of specific factor employed in sector i , for $i = X, Y$. Let $X(E^X, K^X)$ and $Y(E^Y, K^Y)$ denote the constant returns to scale production functions for the two sectors, and let the price of Y be unity so that P denotes the relative price of X .

3.1 Autarky Equilibrium

As before, X pays a fixed wage per worker regardless of workers' ability while workers earn the value of their marginal product in Y . As a result of this, lower ability workers prefer to work for X while higher ability workers opt for Y . Let

⁶Suppose its output of X was the same as under autarky. Then as price is the same as Home's autarky price, it must neither import nor export which is a contradiction.

$\tilde{\gamma}$ be the worker who is indifferent between working for X and Y .

Let $w^e = Y_1(\cdot)$ be the wage per effective unit of labor in Y (where subscript i denotes the derivative with respect to the i th argument). The earnings of a worker with ability γ in Y are $w^e\gamma$ while the earnings of a worker in X are \bar{w} . In equilibrium, the highest ability worker in X , or $\tilde{\gamma}$, is indifferent between the two sectors so that

$$w^e\tilde{\gamma} = \bar{w}. \quad (1)$$

Note that a worker's decision whether to work for X or Y depends on $\frac{\bar{w}}{w^e}$. As this goes up, $\tilde{\gamma}$ rises, and the number of workers as well as the effective labor in X rises while that in Y falls.

What determines the allocation of effective labor in equilibrium? Once we determine this, we know all the endogenous variables in the system. Note that given our assumption that ability is distributed uniformly over the interval $[0, 1]$, the average ability of workers employed in X is $\frac{\tilde{\gamma}}{2}$. We assume competition so that firms in X take \bar{w} and the average ability of the work force ($\frac{\tilde{\gamma}}{2}$) as given, and choose only how many such workers to hire.

Thus, the problem faced by firm j in X facing P , $\tilde{\gamma}$ and \bar{w} is

$$\max_{n_j} PX(n_j \frac{\tilde{\gamma}}{2}, K_j^X) - \bar{w}n_j$$

where n_j is the proportion of labor force employed by firm j , and hence $n_j \frac{\tilde{\gamma}}{2}$ is the total units of effective labor employed by firm j , denoted by E_j . K_j^X is the amount of the factor specific to X that firm j has. The first order condition of the problem yields

$$PX_1(n_j \frac{\tilde{\gamma}}{2}, K_j^X) \frac{\tilde{\gamma}}{2} = \bar{w}$$

which in turn implies that

$$P = \frac{\bar{w}}{\frac{\tilde{\gamma}}{2} X_1(E_j^X, K_j^X)}. \quad (2)$$

Since all firms face the same prices and wages, their marginal products are equalized. Given constant returns to scale production functions, marginal products are homogeneous of degree zero and depend only $\frac{E_j^X}{K_j^X}$. Hence, it is equal for all firms and equal to that for the hypothetical aggregate firm. Thus,

$$X_1(E_j^X, K_j^X) = X_1(E^X, K^X). \quad (3)$$

Using equation (3) and substituting for \bar{w} using (1) into (2), and noting that $w^e = Y_1(\cdot)$ gives

$$P = 2 \frac{Y_1(\cdot)}{X_1(\cdot)} \quad (4)$$

as the relation defining the allocation of labor and relative supply in the distorted economy.

Also note that when factors are paid in this manner, the value of output exactly equals factor payments.

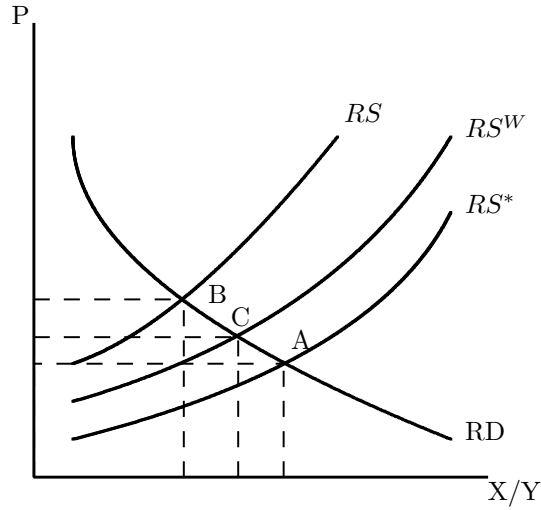
$$\begin{aligned} PX(E^X, K^X) &= P[E^X X_1(\cdot) + K^X X_2(\cdot)] \\ &= P\left[\frac{\tilde{\gamma}}{2} n X_1(\cdot) + K^X X_2(\cdot)\right] \\ &= \bar{w}n + rK^X. \end{aligned}$$

The first equality follows from constant returns to scale. The second equality follows from the fact that hiring n workers of average quality $\frac{\tilde{\gamma}}{2}$ gives the effective labor E^X . The last follows from (2). As a result, whether one thinks of a fixed wage per person being paid in X or whether one thinks of workers in X being equal residual claimants to output in X (once capital has been paid) gives the same result.

In an undistorted economy the marginal value products of the two sectors are equalized so that

$$PX_1(\cdot) = Y_1(\cdot),$$

Figure 4: Equilibrium in the Specific Factors Model



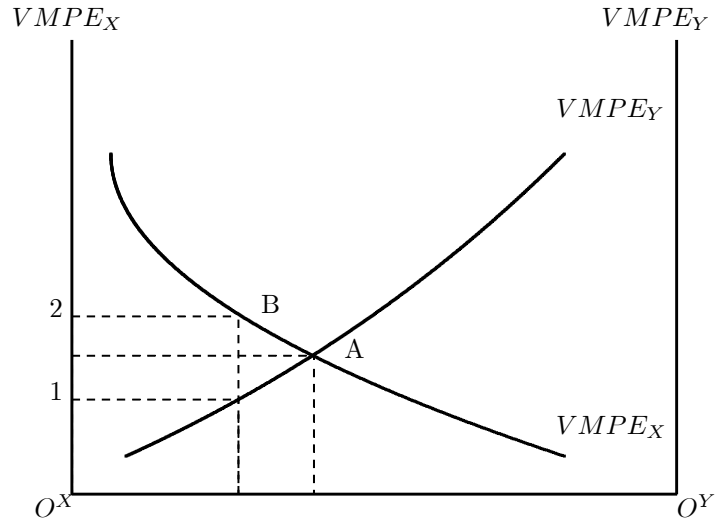
and relative supply is given by

$$P = \frac{Y_1(\cdot)}{X_1(\cdot)}.$$

Figure 4 illustrates these relative supply curves. For any given allocation of labor, and hence supplies, the price needed to elicit this relative supply in the distorted economy is twice that needed to elicit the same relative supply in the undistorted economy. Hence, at any given horizontal coordinate in Figure 4, the vertical coordinate of RS is twice that of RS^* . Given that preferences are identical and homothetic, relative demand is the same in all economies, so that differences in relative supplies translate to a higher autarky price of X in the distorted economy. In Figure 4, point A depicts the autarky equilibrium in Foreign, and point B depicts the autarky equilibrium in Home.

Given the higher autarky price, the distorted economy's relative demand for,

Figure 5: Allocation of Effective Units of Labor

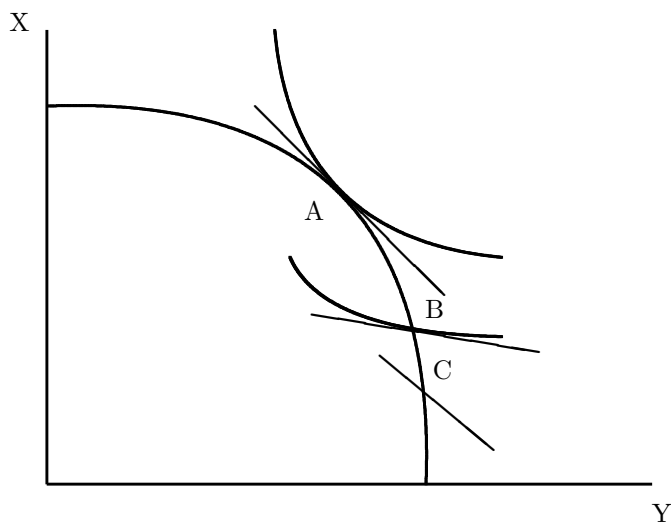


and hence supply of, good X is lower than that in an undistorted economy, and therefore sector X in a distorted economy employs too little effective units of labor relative to an undistorted one.

These results can be better understood using Figures 5 and 6. Figure 5 illustrates the allocation of effective units of labor using the standard specific factors diagram. The two ends of the box are the origins for the two sectors and the downward sloping curves (with respect to their origins) depict the value of marginal product of an effective unit of labor in each sector. In the absence of a factor market distortion, the marginal productivity of labor in each sector is equalized. This is represented by point A . On the other hand, with labor market distortions, from (4), it follows that

$$PX_1(\cdot) = 2Y_1(\cdot)$$

Figure 6: A Comparison of Equilibria



and the marginal value product of an effective unit of labor in X equals twice that in Y . In other words, the equilibrium allocation of effective units of labor is such that the vertical length of the $VMPE_X$ is twice that of the $VMPE_Y$ as illustrated by point B in Figure 5. Note that at any price, less of X is made and more of Y is made as a result.⁷

Figure 6 depicts the production possibilities frontier for the distorted and undistorted economies, as well as production (which equals consumption) in autarky. Both economies have the same production possibility frontier (PPF) as there is no unemployment in either. In the undistorted economy, the autarky relative price of good X (of $\frac{Y_1(\cdot)}{X_1(\cdot)}$) is tangent to both the PPF and to the indifference curve of the economy at point A . On the other hand, the dis-

⁷With many sectors the same arguments work. As in Figure 5, draw the horizontal sum of $VMPE$ in each distorted sector using O_X as the origin and the the horizontal sum of $VMPE$ in each undistorted sector using O_Y as the origin. In equilibrium, the $VMPE$ in each distorted sector equals the twice that in each undistorted sector.

torted economy has a higher autarky relative price of good X , (of $\frac{2Y_1(\cdot)}{X_1(\cdot)}$) and it consumes and produces less X as depicted by point B . Moreover, the slope of the PPF at B is steeper than the price ratio which equals the slope of the indifference curve through B . Note that as a result its welfare is below that of the undistorted economy.

3.2 Free Trade Equilibrium

What will be the effect of trade in this environment? Does the distortion always get worse as in the Ricardian model, or can it get better? The answer follows quite simply. Given the relative supplies of the two economies as depicted in Figure 4, the world relative supply is given by RS^W which must lie in between RS and RS^* . As relative demand for the world equals the common relative demand of the two countries, the free trade price must lie in between two autarky prices, as depicted by point C in Figure 6. Therefore, after opening up, Home observes a decline in the relative price of good X and hence its relative supply falls short of its relative demand and it imports good X and exports good Y .

Note that a reduction in relative supply of X moves Home along its PPF to point C in Figure 6, thereby worsening the distortion in output. At given prices, this reduces welfare. However, the price of X also falls through trade. As Home is an importer of X , this raises welfare. The net effect of trade depends on which of these two effects, the output effect or the price effect, dominates. Under free trade, Home consumption lies along the line through C with slope P^F . It lies to the left of C as X is imported. Similarly, Foreign consumption in Free trade lies along the line through D with slope P^F . It lies to the right of D as X is exported.

As an economy gets larger, the relative price in the free trade equilibrium approaches its autarky price, and therefore the extent of the beneficial price

effect falls. If Home country is very large, then the free trade price will be very close to its autarky price, and the price effect will be negligible. On the other hand, since the other country will export good X and import good Y at, for them, higher price of X , the output effect will remain. Therefore, it follows that a large economy must lose from trade.⁸

It is worth noting that trade between two distorted economies, one with a distortion in X and the other with a distortion in Y , causes the distortion in both countries to get worse as each country has a comparative disadvantage in the production of the good in which it has a distortion, and it will import this good in trade equilibrium producing even less of it.

4 Heckscher-Ohlin Model

What makes the H-O model different from the specific factors model is the assumption that K as well as E is mobile across sectors. This allows us to ask how the allocation of capital is affected by the distortion in the labor market, the effects of trade on this allocation decision, as well as the consequences for trade of the fact that capital is endogenously determined.

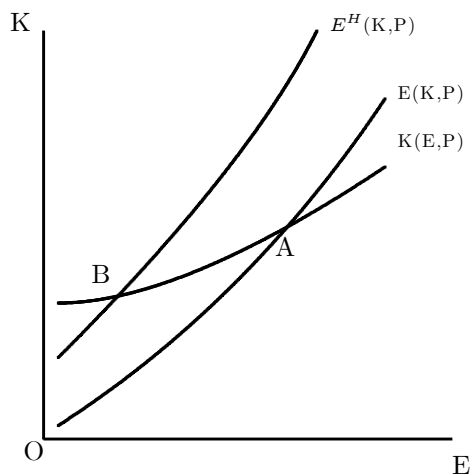
Let $K(E, P)$ denote the capital chosen for a given E employed in a sector when price of X is P . Similarly, let $E(K, P)$ denote the effective labor chosen for a given K and P . With two factors and constant returns to scale, an increase in the employment of one factor must increase the marginal product of the other factor. In other words, $K_1(E, P)$ and $E_1(K, P)$ are positive so that both $K(E, P)$ and $E(K, P)$ are upward sloping for a given P . Moreover to meet second order conditions, direct effects outweigh indirect effects so that $K(E, P)$ is flatter than $E(K, P)$ in Figure 7.

⁸Different groups are affected by trade as in the standard specific factors setup. The real return to the specific factor whose relative price goes up rises, while that of the other specific factor falls. The effect on the real return of labor depends on their preferences.

For the undistorted sector, the capital and effective labor allocations are given by the intersection of these two curves. When the price equals P , this intersection occurs at A in Figure 7. If the sector was distorted, then as discussed in the previous section, the effective labor employed at any given level of capital and for fixed P , is lower than that for the undistorted sector. Hence, in Figure 7, $E^H(K, P)$ lies to the left of $E(K, P)$. For a given price level, $K(E, P)$ does not shift due to the distortion alone. Hence, the choice of K and E for a distorted sector at any given price level, occurs at the intersection of $E^H(K, P)$ and $K(E, P)$ which occurs at a point like B with lower K , E , and output when price is equal to P . As a result, at any P , the capital and labor used in X , and hence the output of X , the distorted sector, is lower for Home than for Foreign, and so is its relative supply of X relative to Y . Note also that at any given P , the capital labor ratio in the distorted sector in the distorted economy is more than that in the same sector in the undistorted economy (the slope of OA is less than that of OB). As a result, an otherwise identical distorted economy under free trade would produce less X but do so using more capital intensive techniques!

Figure 4 above illustrates the relative supply for the distorted and undistorted economies (RS and RS^*). As relative demand is the same for both, the points E and F depict their autarky equilibria. Since RS lies to the left of RS^* , the autarky price at Home must exceed that in Foreign. Note that Home has a comparative disadvantage in good X . As a result, the pattern of trade is unaffected by the the ability of capital to move. What will be the effects of trade on welfare? As before, trade results in importing the good. This output effect worsens welfare. On the other hand, as price falls, welfare rises.

Figure 7: Capital Employment in the Distorted Sector



5 Conclusion

The last decade has seen a large number of countries embracing trade reforms. However, many of them have not been able to emulate the success of the fast growing East Asian countries. Our analysis suggests that labor market distortion prevalent in developing countries might lead to a fall in welfare, especially for a large country, when such economies open up to trade. While the East Asian economies were small, economies that have not done as well tend to be larger.

Our results are consistent with the experiences of some transition economies. Most sectors in the erstwhile socialist economies were state owned in the old regime. This corresponds to all sectors having the labor market distortion. It is easy to verify that in our model if all sectors are distorted, production decisions remain efficient. Reform consisting of privatizing some sectors would however result in inefficiencies in production decisions, which would be worsened through

trade. This is yet another example of the Theorem of the Second Best and the dangers of partial reform. Our analysis suggests that a dip in national income occurring in the initial stages of privatization is likely and consistent with the initial post reform experience of almost all transition economies, see Figure 1.2 in the recent monograph, World Bank (2002).

While our work here focuses on the implications of a labor market distortion, there are, of course, many other aspects of the experience of both developing and transition economies which are not addressed here. Many reasons have been put forward to explain the differential performance of developing economies. See, for example, Krueger (1984) and Ray (1998) for an overview of some of this literature. Similarly, there have been a number of interesting hypotheses put forward to explain the sharp decline in industrial output and GDP in Eastern Europe and the former Soviet Union countries. These include slow adjustment resulting in unemployment, see Gomulka (1992), investment delays caused by the unwillingness to invest till a good match is found since investment is relation specific, see Roland and Verdier (1999), and the disorganization hypothesis of Blanchard and Kremer (1997), where strong complementarities between inputs allows suppliers to exercise their bargaining power and disrupt production chains.

Our work has some natural extensions. In this paper, we assume that when there are other scarce factors of production, labor in the distorted sector shares the residual output after these factors are paid the value of their marginal product. This corresponds to the existence of a perfect market in land and capital. All those who own land or capital earn the return from it and this is separate from who works it. However, in many developing countries, leaving the family farm means giving up your rights on the land, and workers who remain in the family farm share the entire output of the farm. The implications of such a

labor market distortion are different than the one analyzed here. For one, the factor market distortion could result in too little or too much being produced.

Another natural extension concerns capital flows. There have been large capital flows between market economies and transition and developing economies (see Lucas (1990)). Here we do not allow capital to flow between countries. Augmented versions of this model can also help explain the simultaneous occurrence of factor movements and goods trade without resorting to explanations relying on trade barriers (as does the work on Multinationals) or adjustment costs (which results in capital flows being spread out over time). Extending the model in these directions is part of an on-going research agenda.

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