$$\bar{w}a_{LY} + r_Y a_{KY} = P_Y \qquad (3.8)$$

$$wa_{LZ} + r_Z a_{KZ} = P_Z \qquad (3.9)$$

$$a_{KY}Y = K_Y \qquad (3.10)$$

$$a_{KZ}Z = K_Z \qquad (3.11)$$

Now, there is no relationship between r_Y and r_Z and capital is sector-specific. Given P_Y we determine r_Y from (3.8) and (3.10) given K_Y we determine Y. Equations (3.1), (3.9), (3.4), (3.6) and (3.11) give us a typical specific factor model of Jones (1971) with variables w, r_Z, R, X and Z getting determined accordingly.

PROPOSITION 3.2. *A rise in P_X must raise w when capital is sector-specific*

Proof. We involve results in the magnification effect in Jones (1971).

$$\hat{R} > \hat{P}_X > \hat{w} > \hat{P}_Z = 0 > \hat{r}_Z$$

A rise in P_X must raise R and w and reduce r_Z. QED

As P_X rises, X rises demanding more labour from Z. Now, capital in Z is sector-specific and therefore cannot relocate. Thus, as labour moves out of Z, $\dfrac{K_Z}{L_Z}$ increases raising w and reducing r_Z. Note that real agricultural or informal wages go down in terms of the agricultural product, independently of the assumption of capital mobility.

VARIATIONS IN THE STRUCTURE

Mobility Costs of Labour

We have assumed that rural and urban informal wages are the same. However, one could assume the following.

$$(1+\mu)w_R = w_U \qquad (3.12)$$

where, μ is a premium that has to be attached to w_R, the rural wage, to cover the cost of mobility. Note that as long as w_R and w_U are positively correlated, our results will go through. Therefore, we do not need the assumption of perfect mobility.

Informal Sector and Non-traded Final Good

One may argue that a large chunk of the informal sector in the developing world is engaged in producing non-traded service goods. We now recast our structure to include such a possibility.

Suppose we take the case of perfect mobility of capital and add another informal sector, which produces a non-traded good (N), with capital and labour. Note that (w, r) continue to be determined from (3.2) and (3.3) and therefore P_N, the price of the non-traded good, gets determined in a similar manner. If P_X goes up, we have exactly the same outcome as before except for some added complications. P_N will not change as w and r do not change.

In the case of sector-specific capital, a rise in P_X will raise w and reduce r_Z. P_N can go either way. But again, the wage impact is the same as before.

Informal Sector and Non-traded Intermediate Good for Y

Suppose the non-traded product is an intermediate input used in Y. Since P_N depends on w, r, the direct plus indirect requirements make P_Y a function of $\bar{w}$, w and r. Then given P_Y and P_Z, w and r are determined. A rise in P_X continues to have no impact on w, given P_Y and P_Z.

With immobile capital the structure is a bit complex, as Y will use labour, formal and informal, and two types of capital. In fact, 'capital mobility' does not mean much in the current context, as there is indirect mobility through the use of the non-traded good.

★ ★ ★

Agriculture constitutes a major fragment of economic activity in a typical developing economy and maintains a dominant share in the workforce. Does rising agricultural prosperity necessarily improve rural wages? We built a simple model, in line with ongoing work on the informal labour market and argued that reverse migration into the rural sector can be achieved without any increase in the wages if capital can costlessly shift from informal to formal manufacturing. Implications of such inter-sectoral mobility are rarely highlighted in literature. In the very short run, wages may increase because capital is stuck. As time elapses the impact on wages will taper off.

It should be clear by now that perfect mobility and complete immobility yield very different results. One could formulate a model with restricted mobility of capital and then relate the wage outcome to the 'degree' of mobility. If such 'degree' falls below a threshold, one would guarantee wage improvements following a rise in P_X.

NOTES

1. See for example, Banerjee et al. (2002) on land reforms in India.

4   Outsourcing, Informality, and Informal Wages

One of the salient points of this volume is exploring a range of avenues through which exogenous policy changes affect organization, output, factor prices and other critical aspects associated with the functioning of the huge informal sector present in several developing and transition countries. This chapter introduces an issue with substantial contemporary relevance for the entire world, which is of particular significance for rapidly industrializing countries of the South, including India, China, Brazil and South Africa. At the very outset, however, it should be acknowledged that empirical support for most of these countries is hard to come by and the few empirical studies that we know of are discussed in Chapter 8. Presently, we intend to theoretically investigate the connection between production and outsourcing from the formal sector and its implications for economic development within its large informal counterpart. Therefore, we primarily discuss the nature of production organization between the formal and informal sectors operating through vertical linkages and subjected to external shocks.

Thus, we contemplate that deregulation, economic reforms, and increasing global exposure should affect informal activities, wages, and employment in a developing country. It appears that the more productive firms will not necessarily increase their total demand for formal labour if they have an opportunity to access informal labour markets and pay lower wages than those paid to the organized workforce. This is

a common characteristic among firms involved with outsourcing of production in different parts of the world. We keep the analysis simple by neglecting direct off-shoring from a formal unit in a developed country to an informal unit in a developing country, although similar instances are quite common among traders engaged in procuring certain commodities that are produced outside mass factory systems. Handcrafted artefacts, garments, utensils, and gems and jewellery are often purchased directly from informal sources in developing countries through intermediaries and traders. This is a feature that creates a strong vertical linkage between formal and informal organizations. We explore such interaction theoretically in this chapter and offer appropriate case studies in Chapter 10.

It should be made clear at the beginning that the route that outsourcing/off-shoring usually takes is somewhat different from the delegation of production from the formal to the informal unit. Despite certain broad similarities between the two phenomena, such as convincing appropriate authorities (labour unions, board of governors, shareholders, and others) that outsourcing is the only possible avenue to help a firm survive, the major distinction lies elsewhere. It is the extra-legal nature of informal activities that often raises a big question mark on whether the act of outsourcing is legitimate or not. In addition, there are glaring issues with regard to quality control, violation of labour laws and standards, and so forth that can jeopardize an otherwise prudent economic decision. In other words, there are both direct as well as countervailing issues in formal-to-informal outsourcing that need to be streamlined before the larger implications are understood. For example, a formal unit can decide to outsource to an extra-legal unit and expose itself to the risk of being apprehended by regulators of labour laws and standards. The important question at this juncture is whether or not to use informal sources at all. A model incorporating such intricacies of decision-making is presented in the next section and the issue circumvents the choice of formal or informal labour as the two categories available to a formal unit. In the section that follows we discuss the issue of employment and political strategy behind enforcement. The last section provides a conclusion.

VERTICAL LINK BETWEEN FORMAL AND INFORMAL UNITS

It is generally observed that units under the informal sector produce more non-traded goods and services than traded commodities. The

non-traded goods are sold either to the consumers directly or used as intermediate inputs by producers of final goods in the formal sector. Apparently, if the share of intermediate inputs is quite high, then significant changes in the formal sector should also affect informal producers. For example, if industrial deregulation or withdrawal of protection leads to contraction in the formal segment, informal producers of intermediate inputs cannot escape the burden. A pertinent question is: might this reduce informal wages? Common sense suggests that it would.

However, Marjit (2003) argues that it is far from a foregone conclusion. If, for example, the informal segment consists of two sub-segments, one supplying an input to the formal sector and the other producing a final good, informal wages and employment can still rise despite an adverse supply shock affecting the formal sector. Further, if the sub-segment linked vertically to the formal sector is capital intensive relative to the other sub-segment, there is a convincing case that informal wages and employment must increase. The informal service sector, to which we have briefly alluded earlier, might serve as an appropriate example in this regard. As capital moves out of the sub-sector producing the intermediate good and into the labour intensive service sector offering the final output, informal wages are likely to receive a positive thrust so long as the demand facing the sector is not very inelastic. The exact measure of this elasticity along with other empirical facts about the informal sector in India is discussed in Chapter 8.

Apart from Indian evidence, Goldberg and Pavcnik (2003) argue that trade liberalization has an ambiguous effect on the 'informal' sector, since the evidence from Brazil shows little or no connection between trade policy and informality, while for Colombia liberal trade policies have led to the expansion of the informal sector. Goldberg and Pavcnik (2003) use a 'shirking' model of the labour market to justify their empirical claim. In an earlier attempt, Funkhouser (1994) used household surveys to provide detailed evidence on informal activities in Central American countries. It seems that the inconclusiveness of this relationship warrants a reevaluation of the issue both theoretically and empirically. Presently, we construct a simple model with a formal–informal relationship, and use tariff and interest rates as two policy instruments. Interestingly, a lower tariff is likely to expand informal production, while a lower interest rate generates countervailing implications. In Chapter 8 we revisit these issues empirically and pursue the results offered here.

The Model

Consider a firm in the import-competing sector protected by an import tariff, t, and hiring workers at a wage rate w_1 in the formal sector and w_2 in the informal sector, such that, $w_1 > w_2$. Clearly, production in the informal sector implies non-compliance with labour laws, that is, avoiding the effectively higher cost of production. However, since this may lead to infringement of certain legal procedures, firms should internalize a punishment cost, if apprehended. We postulate that penalty increases in the size of informal production. However, there is another crucial point. By enjoying tariff protection the firm is better off compared to any other activity undertaken. Thus, t also denotes the margin of benefit for being in the protected sector. There is a chance that in case the firm is apprehended and punished, it may lose its license and therefore lose the benefit from protection as well. Note that this is equivalent to a situation when the firm is apprehended but it pays a bribe to escape punishment. It implies that the equilibrium bribe should be increasing in t, since the possible loss facing a firm moves positively with t. The firm maximizes the following:

$$\text{Max } \Pi \ (L_1, L_2) = (1 + t) f(L_1 + L_2) - (w_1 L_1 + w_2 L_2) (1 + r) - z(L_2, t)$$
$$(4.1)$$

L_1 is the employment in the formal sector, L_2 in the informal sector and $z(.)$ represents anticipated punishment costs, $z_1 > 0$, $z_{11} > 0$, $z_{12} > 0$, $f' > 0$, $f'' < 0$. We define r as the interest rate on working capital, assumed to be the same for the formal and informal sectors. However, this is not a strong assumption for our results.

Therefore, consider t and r as the two policy instruments. Economic reforms generally imply a decline in both t and r (developing countries have historically maintained a high interest rate and high protection in the manufacturing sector, for attracting foreign capital and protecting the domestic manufacturing sector).

First order conditions from (4.1) yield:

$$(1+t)f' = w_1(1+r) = w_2(1+r) + z_1 \qquad (4.2)$$

Second order conditions are satisfied. Figures 4.1 and 4.2 describe the equilibrium.

In Figure 4.1, initially L_o is total employment with L_{10} in the formal and L_{20} in the informal sectors respectively. If t falls, $(1+t)f'$ shifts down, and so does z_1 since $z_{12} > 0$. This shows that total employment declines, but L_{20} increases, and the informal sector expands.
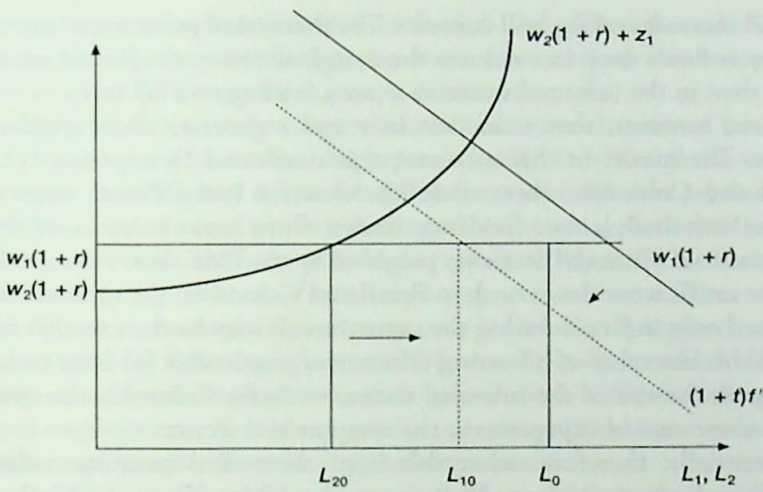
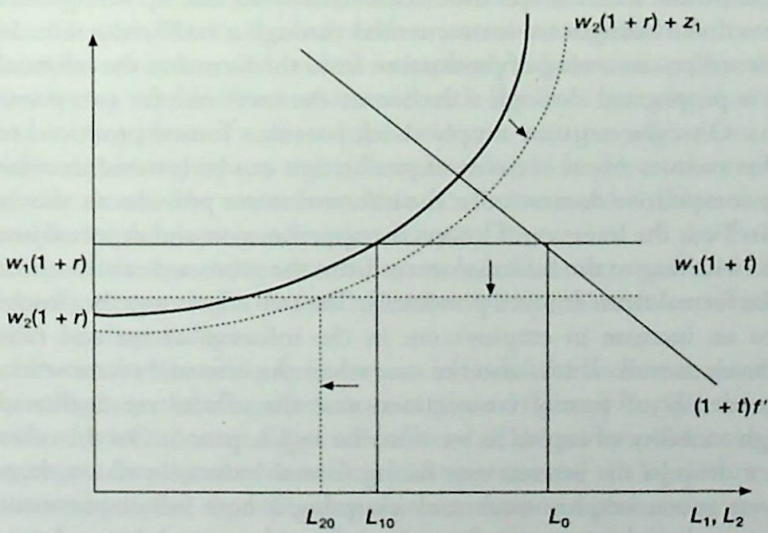Figure 4.1   Equilibrium in Linked Markets

Figure 4.2   Shifting Equilibrium

In other words, a drop in t will reduce aggregate output and employment. At the same time, the anticipated marginal cost of punishment also goes down increasing L_{20}.

On the other hand, a drop in r will shift both $w_1(1 + r)$ and $w_2(1 + r)$ down, although the former drops more than the latter as $w_1 > w_2$. Total employment will increase as we move down the $(1 + t)f'$ line. Therefore,