

## Capital Mobility and Informal Wage in a Small Economy

### – Two Examples

**Abstract:** We conduct two policy experiments in a general equilibrium framework with an informal sector. The first deals with a liberal trade policy and the second with a decline in the unionized wage rate. In both cases, informal workers *gain* if capital moves between the formal and the informal segments and *lose* if it does not. These results are independent of the *factor intensity rankings* of the sectors. Both of these results have important policy implications.

**JEL Classification Codes:** F11, F13, O17, J31, J42.

**Keywords:** Informal wage, Capital Mobility, Trade reform, Labour Union, Economic Welfare.

**Authors:** **Sugata Marjit** Centre for Studies in Social Sciences, Calcutta.  
R 1, B. P. Township, Kolkata 700 094, India.  
E-Mail: [smarjit@hotmail.com](mailto:smarjit@hotmail.com)

**Saibal Kar\*\*** Centre for Studies in Social Sciences, Calcutta.  
R 1, B. P. Township, Kolkata 700 094, India.  
Tel: 91-33-2462 5794 / 5795 / 7252.  
Fax: 91-33- 2462 6183.  
E-Mail: [saibal@cssscal.org](mailto:saibal@cssscal.org)

**Punyabrata Sarkar** Calcutta Metropolitan Development Authority,  
Calcutta, India.  
E-Mail: [punyabratasarkar@hotmail.com](mailto:punyabratasarkar@hotmail.com)

**\*\* Corresponding Author.**

**Acknowledgements:** Sugata Marjit acknowledges helpful comments from the seminar participants at the MENA division of the World Bank. Informal Discussion with Ronald Jones have been quite rewarding. The authors are grateful to Chaitali Sinha and Nilendu Chaudhury for research assistance. The usual disclaimer applies.

## 1. Introduction

Does liberal trade policy hurt workers? Does militant labour unionism help non-unionized workers? Throughout the entire developing world, such questions are raised in the public domain and are usually responded with heated debates. However, emotions can run high and political instincts may overpower scientific arguments. Naturally, this calls for exploring simple economics, which can shed some light on such profound issues. Our purpose here is to provide a framework for addressing these intriguing questions.

It is well known that a large part of the workforce in the developing world is absorbed in the informal sector.<sup>1</sup> While organized workforce can negotiate and use bargaining strength to affect the unionized wage, informal labour market usually responds to competitive conditions. Detailed discussion on the structure of such markets, their relevance in the developing world and a survey on other related issues is available in Agenor (1996). Fields (1990), Rauch (1991) and Agenor and Montiel (1996) are some of the theoretical works that explore the structure and composition of informal labour markets. Many recent empirical papers show increasing employment in the informal sector due to structural adjustments in the economy. Gafar (1997) shows that unemployment rate fell in post-reform Jamaica due to rapid decline in growth of labour force and subsequent expansion in job creation mainly in the low productivity informal sector. Alleyne (2001) later confirms that there has been considerable informalization of the economy, as the pool of self-employed individuals, contract workers, contractors, and lower-level workers have grown substantially. Amadeo & Pero (2000), however, show that there has been a shift of workers in Brazil from the informal manufacturing to the informal service sector and has caused an

---

<sup>1</sup> The level of entrenchment of the informal economy is easily seen from developing country statistics. For example, Kurukshetra and Singh (1999) calculate informal employment in post-reform India to be 365 million for the year 1993-94.

increase in both the share of self-employed workers and informal wage. Unni and Rani (1999) also indicate an increase in agricultural and informal employment in India in the post-reform period. More recently, Zaghera (1998) and Dev (2000) also show that post-reform India has a larger share of informal workers. However, *expansion* of employment *does not* necessarily reflect growing *impoverishment* in the informal sector, since real wages can experience favourable movements even with higher employment, as in the post-reform period. Such issues are usually unexplored. Some statistical evidence supporting the claim of rising real wage in the informal sector is available from various issues of the National Sample Survey of India (1984-85 to 1999-2000).

Here we follow up with a simple two sector model developed along the lines of Carruth and Oswald (1981), Agenor and Montiel (1996), Kar and Marjit (2001), and Marjit and Beladi (2002) to demonstrate the interesting role played by mobility of capital in dictating the policy outcomes for the informal sector. If capital is mobile between the formal and informal segments, liberal trade policy must improve the informal wage.<sup>2</sup> By the same argument a more aggressive wage bargaining in the formal sector must hurt an average informal worker. Both these results are reversed if capital is sector-specific in the sense of Jones (1971). An interesting aspect of these results with capital mobility is that they do not require any assumption on factor intensity rankings.

Section 2 develops the model and discusses the results. Last section concludes.

---

<sup>2</sup> Marjit (2003) considers a model where the informal sector produces an intermediate input. Still a liberal trade policy can improve the real wage in the informal sector. However, this result does depend on factor intensity rankings within the informal sector. In a different context Marjit and Beladi (2002) show that Stolper-Samuelson rankings due to price change will hold irrespective of intensity rankings, when capital is fully mobile between formal and informal sectors and the unionized wage is indexed to price changes.

## 2. Models and Results

### Perfect Capital Mobility

Two sectors in the economy, formal and informal, produce  $X$  and  $Y$  respectively. In the formal sector, wage is determined by unionized bargaining and it is higher than the market-clearing wage prevailing in the informal sector. Workers initially try to find a job in the formal sector. In case they do not, they choose to join the informal sector. As already hinted, wage rate adjusts in the informal sector to absorb all workers who are not employed in the formal sector. There is no unemployment in the model, which is characterized by wage differential and also by full-employment. Our small economy assumption means that prices of  $X$  and  $Y$  are given in the rest of the world.  $X$  represents the sector, which enjoys either protection or a subsidy, which in turn pops up its effective price relative to  $Y$ . One can interpret  $X$  as an import-competing good, which enjoys a tariff  $t$ , and  $Y$  as an exportable. Technology is CRS with diminishing marginal products and the market for the commodities is competitive. We first consider the case with capital mobility and then discuss the case with sector-specific capital. The following symbols will be used in our framework:

$\bar{w}$	Formal unionized wage
$w$ :	Informal flexible wage
$r$ :	Return to capital
$X$ :	Output of formal sector
$Y$ :	Output of informal sector
$P_X, P_Y$ :	Exogenous commodity prices
$L$ :	Supply of Labour
$K$ :	Supply of capital
$a_{ij}$ :	Use of $i^{th}$ input in $j^{th}$ sector; $i = K, L; j = X, Y$ .

$t$ : Initial tariff rate on  $X$

Competitive conditions imply,

$$a_{LX}\bar{w} + a_{KX}r = P_X + t \quad (1)$$

$$a_{LY}w + a_{KY}r = P_Y \quad (2)$$

$$a_{LX}X + a_{LY}Y = L \quad (3)$$

$$a_{KX}X + a_{KY}Y = K \quad (4)$$

Given,  $\bar{w}$ ,  $P_X + t$  and  $P_Y$ , one can determine  $r$  and  $w$  from (1) and (2), while (3) and (4) determines  $X$  and  $Y$ .

**Proposition I:** *A decline (rise) in  $t$  ( $\bar{w}$ ) must increase (reduce)  $w$ .*

Proof: A decline in  $t$ , given  $\bar{w}$  will reduce  $r$  and from (2)  $w$  must go up. A rise in  $w$  must reduce  $r$  as well, and raise  $w$ . **QED.**

A decline in  $t$  and/or a rise in  $\bar{w}$  drives away both labour and capital into  $Y$ . But as  $r$  drops, marginal product of labour must go up raising  $w$ . This suggests that capital-labour ratio in  $Y$  must increase following such changes, i.e., capital is displaced at a greater rate relative to labour. We do not need factor intensity rankings for such a result.<sup>3</sup>

### Sector-Specific Capital

Next, we introduce the specific-factor case. The specific factor model alters the previous specifications. Two added symbols will be used here.

$K_X$ : Capital specific to sector  $X$ ; return  $r_X$

$K_Y$ : Capital specific to sector  $Y$ ; return  $r_Y$

---

<sup>3</sup> Output changes do require factor intensity conditions. See Marjit and Beladi (2002) for a discussion on this issue.

General equilibrium structure of the system is given by:

$$a_{LX}\bar{w} + a_{KX}r_X = P_X + t \quad (5)$$

$$a_{LY}w + a_{KY}r_Y = P_Y \quad (6)$$

$$a_{LX}X + a_{LY}Y = L \quad (7)$$

$$a_{KX}X = K_X \quad (8)$$

$$a_{KY}Y = K_Y \quad (9)$$

Now  $r_X \neq r_Y$  and  $(K_X, K_Y)$  have to be fully utilized as specific factors, as they cannot be relocated in other sectors. Equations (5)–(9) determine  $w, r_X, r_Y, X$  and  $Y$ , given  $\bar{w}, P_X + t, P_Y, L, K_X$  and  $K_Y$ . This specification generates the following proposition.

**Proposition II:** *A decline (rise) in  $t$  ( $\bar{w}$ ) must reduce (increase)  $w$ .*

Proof: First note that factor prices need to be solved simultaneously with the outputs, unlike in the earlier system where commodity prices and  $\bar{w}$  could uniquely solve for the factor prices. A drop in  $t$  then reduces  $r_X$  from (5). From (8) as  $\frac{\bar{w}}{r_X}$  increases,  $a_{KX}$  increases (by CRS) and  $X$  must go down. By the same reasoning,  $a_{LX}$  drops and  $a_{LX}X$  declines. Then it must be the case that  $a_{LY}Y$  increases in equilibrium. But  $K_Y$  is sector-specific and therefore,  $\frac{K_Y}{L - a_{LX}X}$  must go down raising  $r_Y$  and  $w$  in the process. One can repeat the same argument for a rise in  $\bar{w}$ . **QED**

One might argue that typically a larger fragment of the informal sector produces non-traded goods, prices of which are determined through local demand and supply conditions. Therefore, the assumption of a ‘small open economy’ does not do justice to a proper

characterization of an informal segment. If one carefully looks at our framework, it is fairly easy to imagine the implications of an extension of the following sort.

Suppose one includes another non-traded good produced in the informal sector along with the existing traded good. The price of the non-traded good would be determined endogenously. However, both of our propositions will remain intact in this case. The driving force behind the result is the fact that,  $(w, r)$  continues to be determined by the competitive conditions in  $X$  and  $Y$ . Since the exact modelling and related algebraic calculations do not add much to our basic intuition, we do not include this in our current presentation.<sup>4</sup> The bottom line is that our propositions may not be sensitive to the nature of the goods produced in the informal segment.

### 3. Conclusions

We get back to the pair of questions addressed in this paper. Does liberal trade policy hurt informal workers? Does militant labour unionism help the non-unionized workers? Our answer to both these questions is ‘no’, if capital is allowed to move freely between sectors in response to sector specific policies. It is the rigidity in capital movements, possibly induced by institutional problems, which become quite crucial in determining the policy outcomes. Informal workers could possibly vote for reformatory policies and flexible labour laws provided there is some mechanism to ensure movement of capital between formal and informal sectors.

---

<sup>4</sup> The  $3 \times 3$  structure has some relationship with flexible wage, full-employment models utilized in Marjit and Beladi (1996, 1999).

## References

- Agenor, P. (1996), 'The Labor Market and Economic Adjustment', *IMF Staff Papers* 32: 261-335.
- Agenor, P & P. Montiel. (1996), *Development Macroeconomics*. Princeton, NJ: Princeton University Press.
- Alleyne, Dillon. (2001), 'The dynamics of growth, employment and economics reforms in Jamaica', *Social and Economic Studies*, 50 (1): 55-125.
- Amadeo, E and V. Pero. (2000), 'Adjustment, Stabilization and the Structure of Employment in Brazil', *Journal of Development Studies*, 36 (4): 120-48.
- Carruth, A & A. Oswald. (1981), 'The Determination of Union and Non-union Wage Rates', *European Economic Review*, 16 (2/3): 285-302.
- Dev, Mahendra S. (2000), 'Economic Liberalization and Employment in South Asia - I', *Economic and Political Weekly*, August 1, Special Article.
- Fields, G. (1990), 'Labour Market Modelling and the Urban Informal Sector: Theory and Evidence', in D. Turnham (ed.), *The Informal Sector and Evidence Revisited*. Paris: OECD.
- Gafar, John. (1997), 'Structural Adjustment and the Labor Market in Jamaica', *Canadian Journal of Development Studies*, 18 (2): 239-61.
- Jones, Ronald. (1971), 'A Three Factor Model in Theory, Trade, and History', in Bhagwati, J *et al.* (eds.), *Trade, Balance of Payments and Growth, Ch. 1*. Amsterdam: North-Holland.
- Kar, Saibal & S Marjit. (2001), 'Informal Sector in General Equilibrium: Welfare Effects of Trade Policy Reforms', *International Review of Economics and Finance*, 10: 289-300.
- Kurukshetra, A & Gulab Singh. (1999), 'Gross Domestic Product and Employment in the Informal Sector of the Indian Economy', *Indian Journal of Labour Economics*, 42 (2): 217-30.
- Marjit, Sugata. (2003), 'Economic Reform and Informal Wage- A General Equilibrium Analysis', *Journal of Development Economics*, 72: 371-378.
- Marjit, S & H. Beladi. (2002), 'The Stolper-Samuelson Theorem in a Wage Differential Framework', *The Japanese Economic Review*, 53 (2): 177-181.
- Marjit, S & H. Beladi. (1999), 'Complementarity Between Import Competition and Export Promotion', *Journal of Economic Theory*, 86, 280-85.
- Marjit, S & H. Beladi. (1996), 'Protection and Gainful Effects of Foreign Capital', *Economics Letters*, 53: 311-316.

NSSO, 1989 (40<sup>th</sup> Round), 1993 (45<sup>th</sup> Round), 1996 (51<sup>st</sup> Round), 1999 (55<sup>th</sup> Round), Survey of Unorganized Manufacture, *Department of Statistics, Government of India*.

Rauch, James. (1991), 'Modelling the Informal Sector Formally', *Journal of Development Economics* 35 (1): 33-47.

Unni, Jeemol. (2001), 'Gender and Informality in Labour Market in South Asia', *Economic and Political Weekly*, June 30, Special Article.

Unni, Jeemol and Uma Rani (1999): 'Informal Sector: Women in the Emerging Labour Market', *The Indian Journal of Labour Economics*, 42(4), October-December.

Zagha, Robert. (1998), 'Labor and India's Economic Reforms', *Journal of Policy Reform*, 2 (4): 403-26.