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Liberalisation, Wages and Sector Growth – General Equilibrium Analysis for India



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Export-Import Bank of India instituted the International Economic Research Annual (IERA) Award in 1989. The objective of the award is to promote research in international economics, trade, development and related financing, by Indian nationals at universities and academic institutions in India and abroad. The study titled 'Liberalisation, Wages and Sector Growth – General Equilibrium Analysis for India' is based on the IERA Award 2018 winning thesis by Dr. Soumyatanu Mukherjee, Assistant Professor of Economics, Humanities and Social Sciences Department, IIT, Kharagpur.

This study enlightens different channels through which liberalised trade policies can have differential impact on the organisation of production in different sectors that subsequently seep into the relatively larger share of the workforce,

employed in the agricultural or non-agricultural informal sectors with wage earnings below or just above the poverty line. In the four core chapters, this study brings together salient features of a developing dual economy like India,

such as the dualism observed in domestic factor markets and co-existence of internationally non-traded goods, within the realm of general equilibrium framework that captures structural features of trade and production patterns

Table 1: How This Study Fills the 'Gaps' in Existing Research?

Sector Definitions		Factor Market Characteristics				Vertical Production Linkage with Formal Sector	Use of Imported Intermediate Input (Middle Products) in Formal Sectors
		Substitutability between Land & Labour	Capital Market	Unskilled Labour Market	Skill Differences		
Informal Sector	Agricultural (in Rural Area) – Models with Urban Unemployment	Not Considered in Existing Literature Such as Hazari & Sgro (1991), Chaudhuri (2007)	Perfect (Hazari & Sgro, 1991; Chaudhuri, 2007), although imperfection could have been addressed	Perfect	All the informal sector workers are equally unskilled and perfectly mobile within the informal sectors (b/n different sub-sectors)	No (Hazari & Sgro 1991; Chaudhuri 2007)	N/A
	Non-agricultural (in Urban or Semi-urban Area) – Models with Full Employment of Unskilled Labour	N/A	Often imperfection in informal credit market is addressed by restricted capital-mobility between informal & formal sectors (Marjit 2003; Marjit et al. 2007).			Yes (Marjit 2003)	
						No (Jones 1974; Marjit et al. 2007; Marjit & Maiti 2005)	
Formal (Non-agricultural) Sector		N/A	Perfect	Unionised (Marjit & Maiti 2005; Marjit et al. 2007; 2008)	Yes (Marjit & Acharyya 2003)	N/A	Not considered in the literature discussed (except Jones 2012) and in most of the existing literature

for a typical developing country (DC hereafter) like India.

The contributions of this study (represented in Table 1) starts with providing an explanation of why a DC like India may experience a jobless growth in the organised sectors during liberalised regime within the framework of a three-sector mobile capital version of Harris-Todaro (HT hereafter) type general equilibrium model describing rural-urban migration with agricultural dualism and a non-traded intermediate input.

The comparative static results show

a) impact of trade liberalisation policy in presence of labour market imperfection on the competitive rural (informal) wage when there exists agricultural dualism in the rural economy; and

b) labour market reforms, contrary to the conventional wisdom, may raise the competitive wage.

These results suggest that government

needs to be very careful in the implementation of these different liberalisation policies to achieve welfare gains, while the latter result is extremely crucial as it suggests why labour market reform is an important liberalisation policy in the context of an agro-dominated developing economy. The predictions from the analytical framework imply that as a consequence of different trade reform policies, organised sectors have experienced increased competition from foreign markets which has forced them to relax labour laws (with the freedom to switch towards relatively capital-intensive techniques of production), resulting in retrenchment of relatively less productive workers and ending up with the jobless pattern of growth in these organised urban sectors during the liberalised regime.

This study also explores a controversial policy debate in DCs including India, concerning acquisition of agricultural land to set up Special Economic Zones (SEZs) in order to promote

industrialisation. This research critically analyses the implications of this policy, using a three-sector Harris-Todaro type general equilibrium model (Harris and Todaro, 1970) with the SEZ sector characterised with increasing returns to scale (IRS) sector, having an imperfectly competitive market (see Table 2).

It is found that following an inflow of foreign capital due to the government policy of easing the entry criteria for FDI, the industry expands through spillover effects and in turn, the agricultural sector may expand for a sufficiently higher degree of scale economies in the SEZ sector through the general equilibrium implication on resource reallocation. The magnitude of urban unemployment may fall, albeit the workers in general will be worse-off due to reduction in the wage income. National income of the economy may increase and export by the SEZ sector may rise simultaneously, given a negligible income-elasticity of demand for the SEZ-good. Thus, this research demonstrates that starting from the same

Table 2: Model Environment

No of Sectors	Sector Definitions		Input Usage		Relative Factor-intensity Ranking
	Traded	Non-traded	Agricultural Sectors (Sectors 1 & 2)	Registered Agro-based Manufacturing Sector (Sector 3)	
3	Sector 1 → 'Advanced' agricultural sector within the rural area. Producing primary exportable.	Sector 2 → 'Backward' agricultural sector, providing local agricultural intermediate inputs for sector 3.	Labour Market → Competitive labour market – labourers are perfectly mobile between sectors 1 & 2, since both of them are situated in close vicinity within the rural area.	Labour Market → Unionised (imperfect) labour market, with workers receiving contractual wage.	Heckscher-Ohlin (HO) 'nugget' → Formed by the sectors 1 & 2, using two common factors – land and labour. In this HO-nugget, it is assumed sector 1 is relatively more land-intensive than sector 2.
	Sector 3 → Organised 'agro-based' industrial sector within the urban area. Producing import-competing goods (for e.g., sugar)		Land Usage → Sectors 1 & 2 use land in production of agricultural products. Capital Usage → Sector 2 uses capital, on the top of using land in its production.	Capital Usage → Sector 3 uses capital, on the top of using labour and intermediate input (provided by Sector 2) in its production.	

initial conditions, a small, open economy with SEZs is more likely to attain 'efficient equilibrium' in terms of substantial growth effect compared to an economy without SEZs, albeit the rural workers (non-migrants) will suffer from the reduction in real wage-income. Therefore, this policy essentially indicates a mixed outcome and calls for government support for displaced people and rural workers.

The economic reforms of 1991 in India has contributed to the technological improvement in the urban organised sectors which has been quite substantial over the recent years. Albeit the existence of strong production inter-linkage between formal and informal sectors; the concurrency of productivity take-offs in the organised sectors and sharp increase in urban informal wages in recent years, still remains a puzzle since both capital and labour flow to the informal sectors. Hence, in order to propose a plausible answer to this puzzle,

this study also investigates the general equilibrium implications of trade-induced technological progress in the formal non-agricultural sectors of the economy on the urban informal wages with segmentation in factor markets.

Using a four-sector general equilibrium model, the urban formal sectors wages are pegged at a higher level than competitive wages by prior negotiations with labour unions; while dualism in the capital market is characterised by the fragmented interest rate structure, featuring lower allocation of loanable capital to the informal sector at a higher relative rental rate. Informal sector producers, however, use capital and labour in fixed proportions. The inter-linkage between the formal and informal credit markets (that has been evidenced and demonstrated in different theoretical and empirical literature), has been ignored in earlier related works (Kar & Marjit, 2009; Marjit & Kar, 2008a, 2009) in course of

examining the impact of trade reform measures in the formal sectors on the informal wages in such four-sector general equilibrium model in presence of finished non-tradable and non-traded intermediate inputs (refer Table 3).

Thus, the importance of credit-product inter-linkage between the urban formal and informal non-agricultural industries is also highlighted in order to trace out the implications of trade-induced productivity surge in the formal sectors on the wages and employment conditions of the economically marginalised urban workers working under informal arrangements.

Growth acceleration in skill-intensive sectors has been one of the most prominent features of the liberalisation experience in India. On the other hand, liberalisation has facilitated import of capital goods and thus, the foreign technology embedded within those

Table 3: Model Characteristics

No. of Sectors	Rural Sectors		Urban Sector	Factors of Production		Assumptions
	Agricultural Sector	SEZ Sector		Labour Market	Other Inputs	
4	Sector 1 → produces X_1 with inputs (L, T) using CRS	Sector 2 → produces X_2 by costless assembling of an array of locally produced imperfectly substitute intermediate inputs x_i – increasing returns to the no. of varieties → IRS external to the firm, internal to the industry	Sector 3 → produces a manufacturing commodity, X_3 with (L, K) using CRS	Unorganised 'informal' rural labour market in sectors 1 & 2; with competitive wage (W) – both sectors are in close vicinity – so perfect labour mobility b/n the 2 sectors	Land (T) used in sectors 1 & 2	Model-specific Assumptions: (a) Domestic and foreign varieties of capital are perfect substitutes (b) Sector m (that is within the SEZ), is more land-intensive than sector 1.
		Each variety of x_i s gets produced by monopolistically competitive producers using a composite factor bundle, m ; which, in turn, gets produced using factors (L, T, K) with CRS		Unionised (imperfect) labour market in sector 3; with workers receiving contractual wage (W^*), determined by prior negotiations b/n representative firm and representative trade union	Capital (K) is used in sectors 2 & 3	Simplifying Assumption: Land-output ratio in sector m (a_{Tm}) is constant.

Table 4: Model Environment

No of Sectors	Sector Definitions		Factor Markets		Relative Factor-intensity Ranking
	Non-traded	Traded	Labour Market	Capital Market	
4	Sector 1 → Finished non-tradable producing sector; absorbs surplus labour among the migrants coming to city; represents very low-skilled activities such as domestic help or small vendors with little or no use of capital. Leontief Production technology.	Sector 3 → Export sector, vertically integrated with sector 2, use (relatively) skilled labour and capital, along with the 'middle product' imported from the ROW and the local inputs supplied by Sector 2. CRS production function.	'Informal' Labour Market in Sectors 1 & 2 → Competitive (unskilled) labour market with flexible wages (unskilled).	Imperfect capital (credit) market in informal sectors (Sectors 1 & 2) → Interest rate is steeply higher from the one prevails in the formal competitive credit market. Capital (credit) allocated to the informal sector is positively related to the return differential between the two (informal & formal) credit markets.	Only applicable for the traded formal sectors, Sectors 3 & 4 – that is, the sectors using two common factors – Skilled Labour & Capital – therefore, forming the required Heckscher-Ohlin 'Nugget'.
	Sector 2 → Non-agricultural intermediate input producing sector, using relatively unskilled labour and capital, providing intermediate inputs ranging from leather and rubber products to electronic equipment to the export sector (Sector 3). Leontief Production technology.	Sector 4 → Import-competing sector; uses skilled labour and capital. CRS production function.	'Formal' (Skilled) Labour Market in Sectors 3 & 4 → Rigid (skilled) Labour Market in formal sectors (Sectors 3 & 4) with institutionally given higher (skilled) wage fixed by prior negotiations (however, the wage-bargaining is not explicitly modelled given the focus of the model).	Perfect credit market in formal sectors (Sectors 3 & 4) → Competitive credit market with market-determined interest rate.	Sector 3 (export sector) is <u>relatively skilled-intensive</u> than Sector 4 (import-competing sector) (with respect to capital). No factor-intensity reversal.

imported inputs. To utilise those inputs, or equivalently, to use the foreign technology embedded within those inputs in the most effective way, demand for additional skills has been generated. This leads to increased demand for skilled workforce driving their wages up. In this context, this study also explores the general equilibrium impact of such trade-induced growth in the skill-intensive sector on informal sector wages and employment and most importantly, how this impact is mediated through the existence of finished non-tradable and the corresponding domestic demand-supply forces.

In the context of frictional unemployment of skilled labour using the efficiency wage hypothesis: a higher wage rate motivates the skilled worker to

work hard; and a higher unemployment rate accentuates the disutility in the presence of a threat of firing and subsequently makes the skilled worker more disciplined.

In this extended model (refer Table 4) as well, likewise in the full-employment scenario, there is an additional supply-effect that depresses informal unskilled wage and thereby price of the non-tradable good and thus adds to the ambiguity in non-traded production. Therefore, as before, the effect on real income of the urban population and the demand for the non-tradable will be ambiguous. Consequently, the direction of change in competitive informal wage and thereby the direction of change in income-inequality measure (Gini coefficient) will also be ambiguous in this extended model.

The contents of the publication are based on information available with Export-Import Bank of India and on primary and desk research through published information of various agencies. Due care has been taken to ensure that the information provided in the publication is correct. However, Export-Import Bank of India accepts no responsibility for the authenticity, accuracy or completeness of such information.

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