# Informal sector and the developing world: relating theory and evidence to India.

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# Informal Sector and the Developing World: Relating Theory and Evidence

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**Abstract:** The informal economy has emerged as one of the most dynamic and active segments of the entire developing world. Contemporary studies show that markets and competition both play dominant roles in determining wages in the informal sector. One major theme that we shall discuss deals with how the wage and employment in the informal sector responds to shocks to which formal or organized/unionized segment of individual industry types are subject to. We use simple general equilibrium expositions to answer this critical question and substantiate that with evidence from India. The generalized theory is also supported by other empirical evidences from Africa and Latin America. We mainly argue that without capital accumulation in this sector – an outcome of capital mobility between the formal and informal sectors, the observed upward wage movement or productivity growth in the informal sector would not have been possible. Empirically, growth in informal fixed assets imparts positive and significant impact on the urban informal wage in India. The emergence of informal sectors and the close connection with corruption are also discussed in detail.

**JEL Classification**: F11, F16, O17
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## 1. Introduction and Empirical Facts

The primary motivation for analysing the informal sector as an important economic activity comes from the fact that on an average 70 per cent of the labour force in the developing countries work under arrangements outside the purview of what is typically known as the formal/organised sector. Data published by the ILO reports varying rates of labour force participation in Southeast Asian, East European, African, and Latin American countries. Ranging from 15 per cent to 20 per cent in Turkey and Slovakia to 80 per cent in Zambia, or about 83 per cent in Myanmar imply large share of the active labour force as engaged in informal activities. Moreover, considering the state of agricultural and rural activities in these countries, it is quite apparent that the total shares of the informal sector in these countries are even higher. This is corroborated by some of the other studies, which provide evidence that in low-income countries like Nigeria, Bangladesh, Ivory Coast, India, and elsewhere, the share of the urban informal sector is at least as high as 51 per cent. Alternatively, seen from the point of view of the 'minimum wage' earners, only 11 per cent of Tunisia's labour force, for example, is subject to minimum wage; in Mexico and Morocco, a substantive number earns less than the minimum wage; in Taiwan, the minimum wage received by many is less than half of the average wage, and etc. (Agenor, 1996).

Understandably, these are approximations based on sample studies because the typical gamut of informality in developing countries precludes exact estimates of turnovers and employment in such occupations. The importance of informal sector in the livelihood of a large number of workers in poor countries is further emphasised in view of only 1 to 5 per cent activity in less populous developed countries. For India, fortunately, a considerably reliable survey of informal units is available from the

National Sample Survey Organisation (NSSO). It consists of samples of informal units drawn from almost all the provinces and union territories and usually published every five years. The survey covers the average yearly wage, employment, major occupational categories by broad industry types, gender, fixed assets and value added of the informal units classified as Non-Directory Manufacturing Enterprises (NDMEs) and Own Account Enterprises (OAEs), both rural and urban in either case. The sample size varies from less than 100 units in relatively remote locations to more than 10,000 for major states.

The research issues one could cover and estimate empirically requires manoeuvring within the available data and might turn out to be restrictive for very general questions. Nevertheless, there are some issues which this data set still supports in favour of improving our understanding of the connection between theoretical and empirical idiosyncrasies of this sector. To this end, Kar and Marjit (2009) and Marjit and Kar (2007) takes up the urban NDMEs given their strong inter-linkage with the urban formal sector for five consecutive rounds of the NSSO data: 1984-85, 1989-90, 1994-95, 1999-2000 and 2000-01, for 17 states in the first period and that extended to all the states and union territories for the remaining time period. These papers show that the period of gradual trade liberalisation in India, i.e. the post-1991 decade which led to closures of many formal and traditional industries releasing unskilled labour in large numbers coincides significantly with annual (real) growths in (i) urban informal wage (*IW*), (ii) urban informal fixed assets (as a proxy for capital formation, *FA*) and (iii) urban informal value added (*VA*). The latter two variables are used to explain the movement of the first.

The reason behind choosing these variables is strongly embedded in the theoretical structures these papers construct. We believe that the co-existence and

close interaction between formal and informal sector in India and in similar countries is an appropriate representation of both production organisation and the labour market. While a number of studies take up this mode and discuss many related questions, the basic idea spawns from a relative movement of capital and labour between these sectors and how that affects the factor prices in general equilibrium (Marjit, 2003). This, we have explored in other occasions (Marjit and Kar, 2010; Marjit and Kar, 2007, for example) to reemphasise the fact that the general equilibrium implications of inter-sector mobility of factors of production quite suitably explain the dynamics of the informal sector as corroborated by empirical findings. These studies have used external shocks as dictating the initial readjustments in the economy with a relatively advanced formal sector and a technologically primitive informal sector. The more precise issue originates from the empirical observation that trade liberalisation drives capital and labour into the informal sector and yet the wage rises across states, steeply for some and moderately for the rest, leading to an average annual real wage growth of 10% somewhat contrary to conventional wisdom. Similar studies for Brazil and Colombia (see Goldberg and Pavcnik, 2003) provide no conclusive evidence. Evidence drown from various issues of the International Financial Statistics (IMF) shows that though tariffs have come down both in Brazil and Colombia, the decline in the interest rate is distinctly visible for Brazil. It may be the case that for Brazil the interplay of offsetting effects is responsible for little or no change in the size of the informal sector, while for Colombia the tariff effect has been predominant in ushering an expansion of informality within its firm structures.[1]

Concerning the broader question on what drives informalisation among firms, few recent papers like McKenzie and Sakho (2010), Dabla-Norris *et al*. (2008),

[1] Also see Kelley (1994) for Peru, Gindling (1991) for Cost Rica, Berry (1998) for Latin America in general,

Fugazza and Jacques (2003), etc. discuss possible channels. Of these, Dabla-Norris *et al*. (2008) finds that the quality of the legal framework is crucial for determining the size of the informal sector for eighty developing and developed countries. If the legal system is functional on the other hand, then the significance of taxes, regulations and constraints are of limited importance. Not surprisingly, they also find that the firm size and the degree of informality are negatively correlated, although stringent legal norms and not credit constraint so much, may still push larger firms to function in the informal segment. McKenzie and Sakho (2009) on the other hand, argue that tax registration for firms in Bolivia, where the incidence of informality is the largest in South America, tax registration leads to lower profits among smaller and larger firms, while it increase profits for mid-sized firms. They show that very small firms deemed as own account enterprises have little to gain from formalisation. Conversely, the firms which can grow up to the extent of hiring six workers, too have little to gain from formalization as they end up paying more taxes without the added benefit of tapping the extra clientele that they already are catering to. The ones in the middle, stands as the only group which thrive on aspirations of growing bigger and often realises such profits that come from the ability to show tax receipts as an instrument engendering reputation and consequently consumer confidence. We discuss more on the political economy of the emergence of informal sector in section 2.

Furthermore, Straub (2005) argues that compliance with formal registration procedures at a cost allows firms to benefit from key public goods, enforcement of property rights and contracts. This would ultimately enable the firms to participate in the formal credit market as well. The access to formal credit market, according to this paper is evaluated against the relative costs of existence in either of these regimes and should be considered as a critical determinant of the choice between formality and

informality. The relationship between economic reforms and informalisation also vary widely for African countries (see, for example, Savard and Adjovi, 1997 for Benin; Sethuraman, 1997; Bautista, Lofgren and Thomas, 1998 for Zimbabwe; Xaba et al 2002, for a number of counties showing steady growth in informal output and employment; Verick, 2006 for an overall account, etc.). Finally, note that the health of the informal sector is deeply related to the extent of poverty in these countries and many of these studies also discuss the connection (see, Kar and Marjit, 2009 for a general discussion and estimates for India).

Are relationships then country-specific and nothing could be offered at a more universal level to account for similar patterns for a large number of developing and transition countries? The theory and supporting evidence we present is an effort to find a more uniform relationship in general equilibrium structures. Section 2 discusses the political economy views on the emergence of informal sectors in developing countries. Section 3 offers empirical findings on India and section 4 develops the theory. Section 5 discusses the implications of change in informal wages on aggregate poverty situation and section 6 discusses the close linkage between informality and corruption. Section 7 concludes. Algebraic derivations and related tables are available in the appendix.

## 2. Emergence of the Informal Sector

Before we land into the analytical domain of models dealing with informal labour, we must offer a discussion on why and how the informal sector has emerged and whether it is a deterrent to the process of development. Is it partly a conscious choice of the state or is it something that is imposed on the state? The borderline between legal and extra legal can be an endogenous political choice in a democracy, a

thesis which has again been somewhat neglected in discussions on politics and economics of development.

A couple of texts that set the stage for such discussions are by Hernando De Soto (2000) and Avinash Dixit (2004), albeit they are written from two different perspectives. De Soto's book "The Mystery of Capital" brings to the forefront the lack of property rights and legal contracts in the informal segment that locks in huge amount of capital, blocking development all around. The policy of guaranteeing property rights, enforcement of legal contracts etc., is expected to release capital for investment and growth. Dixit on the other hand talks about lawlessness of economics that necessitates appropriately designed contracts needed for conducting business. Dixit's book is oriented mainly to a varied treatment of the intricacies of contractual arrangements reflecting on the boundaries between legality and extra-legality that are often rather thin. De Soto's contribution, on the other hand, draws on some casual empirical work and offers a range of persuasive anecdotes. Nevertheless, both in a sense admit the problems and complications arising from inclusion of the concept of informality in economic activities, and consequently in economic analyses. De Soto's position seems, however, in favour of legalising the extra-legal, while Dixit provides a workable structure *within* the domain of the extra-legal. Both of these approaches indirectly hold the state and the regulatory structures responsible for the emergence of informal arrangements and formalising the informal seems to be the first best choice that is somehow not implemented by the state.

Contrary to these, two recent studies by Marjit, Mukherjee and Kolmar (2006) and Dasgupta and Marjit (2006) provide political rational on the part of the state to perpetuate informal arrangements. We use the first of these to develop a model in section 2.2, while the essential arguments in Marjit, Ghosh and Biswas (2007) shall

complement the analysis from the corruption and reform issues that also significantly affect the existence and functioning of the informal sector. Furthermore, the paper by Marjit, Mukherjee and Kolmar (2006) argues that given high incidence of poverty and absence of a social welfare system, a democratic state uses the informal sector as a buffer for the poor people. The extra legal occupations work as substitutes for social security and emerge as an innovative and effective re-distributive strategy.

The degree of enforcement of property rights by itself becomes a strategic political variable at this juncture. Typically, in median voter models, tax is the only instrument for redistributing income from the rich to the poor. However, there can be alternative instruments as well, somewhat underexplored in the related domain. In the developing world, the majority of the workforce is employed in the informal sector, in activities that are illegal or extralegal. Studies by Marcouiller and Young (1995), Choi and Thum (2004) and Marjit (2003) deal with the cases where government policies determine and interact with the size of the informal or shadow activities. Allowing extra legal activities to flourish, which amounts to a thriving informal sector may be a conscious strategy on the part of the government in a poor country, since it helps tackling the problem of unemployment and poverty. Sarcastically, one might coin it as the policy of 'development through backdoor' which often delivers the desired goals set by the government in power, essentially *being in power* for a long patch of time, particularly when frontal development initiatives turns out to be difficult owing to levels of vested interest within the government. Doubtless, such strategic negligence on the part of the government may be harmful for the environment fostering legitimate income generating processes. For example, allowing street vendors to congest the streets, ignoring illegal electric connections, allowing people to sleep on the pavements or on the railway platforms, allowing slums to

develop in public spaces, all of these may reflect tolerance by the government and the civil society alike, not necessarily on humanitarian pretexts.

For developing countries, it seems, that the jury is still out on whether the state as an authority can set limits to use of public space for private consumption, albeit there are well defined rules one way or the other. In fact, this debate lies at the core of the larger choice between formality and informality, which requires further understanding in similar contexts. In recent times a few papers, such as that by McKenzie and Sakho (2010), Dabla-Norris *et al*. (2008), Fugazza and Jacques (2003), and etc., however, discuss the channels leading to informality among firms. Of these, the first study finds that the quality of the legal framework is crucial for determining the size of the informal sector. If the legal system is functional on the other hand, then the significance of taxes, regulations and constraints are of limited importance. Not surprisingly, they also find that the firm size and the degree of informality are negatively correlated, although stringent legal norms and not credit constraint so much, may still push larger firms to function in the informal segment. McKenzie and Sakho (2009) on the other hand, argue that tax registration for firms in Bolivia, where the incidence of informality is the largest in South America, tax registration leads to lower profits among smaller and larger firms, while it increase profits for mid-sized firms. They show that very small firms deemed as own account enterprises have little to gain from formalisation. Conversely, the firms which can grow up to the extent of hiring six workers, too have little to gain from formalization as they end up paying more taxes without the added benefit of tapping the extra clientele that they already are catering to. The ones in the middle, stands as the only group which thrive on aspirations of growing bigger and often realises such profits that come from the ability to show tax receipts as an instrument engendering reputation and consequently

consumer confidence. Furthermore, Straub (2005) argues that compliance with formal registration procedures at a cost allows firms to benefit from key public goods, enforcement of property rights and contracts. This would ultimately enable the firms to participate in the formal credit market as well. The access to formal credit market, according to this paper is evaluated against the relative costs of existence in either of these regimes and should be considered as a critical determinant of the choice between formality and informality.

From a public economics point of view, it is possible that the imposition of a suitable tax burden by the social planner on the formal sector towards formalising the informal may turn out to be self-defeating in purpose. The tax burden meant for re-distribution and rehabilitation may be so high that those in the formal sector gets dissuaded from working within the formal sector and choose to become net recipients by switching sides drying up the tax base in the process. Thus, the problem is not one which lends itself to unmixed solutions. At the same time, it can hardly be denied that some of these extra-legal activities may actually hurt the legal income earners by creating negative externalities both in the production process as well as in public life. In this context, once again a few recent attempts deal with the determinants of informality, such as, that by Chong and Gradstein (2007) which proposes a simple theoretical model where the extent of informality is positively related to income inequality present in the country and is positively sensitive to presence of weak institutions. The surprise element is however, that the size of the informal sector is negatively related to the economy's wealth. To this end, the study shows that the choice of producing in the formal sector vis-à-vis the informal sector is based on the equality of expected utilities from the two decisions and the equality generates a cut-off income level below which all are poor and produce in the informal sector. As the

country becomes richer, this cut-off point is pushed up leading to larger informal units in equilibrium. This result must appear counterintuitive and could lend itself to analytical reasons and empirical evidence for a large number of countries – developed and developing – only under the argument that the positive growth effect is countered by the negative effect on size of informal sectors due to tightened institutional quality that follows economic development. Nevertheless, the study further establishes that both the proxies for the tax burden and the labour rigidity turn out to be not robust at all and mostly not significant except for a limited number of specifications.

On the basis of the above arguments, we discuss two instruments in the hands of the government for redistribution – tax and governance. A relatively weak governance structure allows for extensive informality, which helps the poor, but hurts people with tax paying capacity, whereas strong governance protects the legal taxpayer, but increases the possibility of social unrest as the incidence of poverty and inequality increases. The cost of sustaining governance is financed by income tax. All the societies considered in various models, with different poverty levels and different extents of income inequality, face identical political support functions, and we do not consider totalitarian regimes. In most cases, as in this model we shall briefly discuss, the political regime consists of a two party democracy. It is well known in the political economy context that, policies targeted at satisfying the preference of the median voter help win the election. With the aid of a simplistic model we show that there is a reasonable case for strong governance and high tax for those societies that experience lower incidence of poverty and a lower income inequality. Conversely, in societies where the incidences of poverty and income inequality are high, the level of governance is chosen to be weak, as well as the income tax rate, lower. If the government perceives that the effect of the tightness

and rigidity in the level of governance on the informal income is not very strong, then also it might choose relatively higher level of tax rate and regulatory controls. In this regard, we follow the standard 'political support' approach developed by Stigler (1971) and Peltzman (1976). Interested readers may also refer to Persson and Tabellini (2000), Hillman (2003) etc. for a textual treatment of issues related to the median voter approach.

The existence of an unorganised sector helps the organised firms to take advantage of liberal economic policies and in a way use a disadvantage to gain competitive advantages, locally and globally. This is adequately demonstrated in Marjit and Maiti (2007) and Maiti and Marjit (2008). Dasgupta and Marjit (2006) use a framework with unionised labour and informal workers and show that the state will have reasons to undermine the strength of trade unions and stealthily promote the culture of informal sector, again to push forward liberal policies.

Essentially, therefore, these papers look at the possible reasons as to why the state may be reluctant in clearly defining the boundaries of legal institutions and consequently chose an optimal degree of enforcement. In a related paper Sarkar (2006) writes on the economic policies of the left-ruled state government in the state of West Bengal in India and argues that the ruling coalition has encouraged proliferation of the informal sector as if on a clientele mode, such that they are always in a position to control the economic lives of the poor. This is also in line with the general tenet of the argument that the informal sector becomes a necessary element of state sponsored political strategy, especially when the institutions themselves are endogenously designed and their limits are manipulated to obtain highest political returns. It may perhaps be best viewed as the well-known dilemma of rules versus discretion as exemplified in the macroeconomic theory in a different context (Barro

and Gordon, 1983). Institutional commitment specifies certain rules of the game relatively sticky and unmanipulable. On the other hand the state sometimes needs flexibility to foster adopted policies and at times to steer political self-interest. Informal sector provides a great opportunity to practice discretion. Great many concerns behind formalising the informal often miss out this simple motivation prevalent in a democracy. Marcoullier and Young (1995) is an elegant piece related to the political issues discussed above. It talks about the predatory state that uses informal arrangements to extract revenues.

We devote our attention to this issue in tune with one of the purposes of the book, i.e., dwelling on a number of serious contemporary concerns regarding the organisation of production in the informal sector for the developing countries in general and for India in particular. One could extend the line of argument developed by Sarkar (2006) and Marjit, Mukherjee and Kolmar (2006) and analyze how state actually renders a fairly organised form of political supervision and control of the unorganised sector in India. In fact, there seems to be a tremendous "organised" intervention if one takes the case of left ruled West Bengal. The parallel informal economy employs people, leads to politically recognised and guarded activities, and generates revenues that are redistributed to strengthen political patronage. If markets and policies promote relatively unfettered growth of small private investments, poor people's dependence on politics and politicians will be far less and that undoubtedly poses a threat to the political power structure. Unlike in the developed countries politicians in India hardly have alternative occupations. Fully functional market capitalism, if it delivers, shall go against such entrenched vested interest. Yet, politicians need markets, to the extent it absorbs the poor, and helps them to have an economically meaningful existence. The fear of social unrest and worse, civil war, or

revolution powerful enough to shatter the very foundation of political power in a democracy seems to have driven important considerations behind visibly large patronage of the informal sector acting as a pure substitute for the front-door development efforts on the part of the governments. It is this kind of trade-off that makes the informal sector a strategic conduit of development. This issue, to our understanding remains a wide and open research question.

Another important departure from the existing literature is the issue of governance. This relates our paper to the economics of corruption and its impact on the informal sector. Interested readers may look at Gupta and Chaudhuri (1997), Kolmar and Marjit (2000), Dessey and Pallage (2003) and Choi and Thum (2004) among others. Use of informal workers is illegal in our set-up since this involves violation of labour laws. We argue that if the producer is monitored and apprehended for operating an 'informal' segment, he faces a penalty such as losing the license to produce the import competing product, thereby losing the tariff protection. However, he can escape by paying a bribe to the apprehending agent. It is reasonable to argue that the opportunity costs of such actions are increasing in benefits from protection. We develop an explicit Nash-bargaining structure to determine the equilibrium bribe. This outcome is internalised by the firm while deciding on the allocation of production and employment choice between the formal and the informal sectors. Our focus is on reforms related to the external sector involving a decline in the tariff rate and deregulation of capital account, thereby causing cost of capital (or the borrowing cost) to fall. This has been a worldwide phenomenon for sometime now and real interest rates have drastically come down, especially in the developing world. For example, in India, one of the redeeming consequences of reforms has been a phenomenal increase in foreign exchange reserve and a sharp decline in the interest

rates.

## 3. Reform and Informal Wage in India

Therefore, what could possibly explain the post reform average rise in the informal wage across India, between 1991 and 2001? Notably, this is also the period when trade liberalisation started affecting the formal industrial sectors through withdrawal of protection and decrease in import barriers. The retrenchment of workers and thwarted job creations under the circumstances are both expected to put pressure on non-formal job markets. The basis tenet goes that if unskilled labour formerly part of the organized sector flows into the informal counterpart due to retrenchment, or most fresh job-seeker looks up to the informal sector then the informal wage must fall to accommodate them. The informal sector is characterised by the fact that wages are determined in a competitive setting and not administered by prior negotiations with labour unions. Therefore, in the aftermath of trade liberalisation one expects the informal wage to fall in equilibrium and worsen the conditions of the working poor. On the contrary, the informal wage actually grew in real terms. We figured from the available data that the annual growth in real wages (deflated by 1989-90 consumer price index of India) in the NDMEs have a key relationship with the annual growth in real Fixed Assets (FA, and stands for capital accumulation) and the real Value Added (VA) within the informal units. A rise in FA, an equivalent to capital formation, is expected to affect the informal wage positively as would a rise in the value added. Simple regression analyses over yearly cross sections for each round of data and subsequently over pooled data for all the available years run as a pseudo-panel confirm positive relationships that are statistically significant. This implies that higher capitalisation and higher value addition in the

informal sector have outweighed the downward pressure on real wage due to large labour influx. The increased capitalisation is possible when capital from the formal sector relocates to the informal sector and when fresh investments take place in the latter. It has been previously shown (Marjit and Kar, 2007) that the rise in capital deployment in the informal sector coincides with dwindling capital accumulation in the formal industries suggesting a relocation. However, the exact route such mobile capital follows is difficult to unearth and can serve as a proxy on the aggregate.

Furthermore, data from NSSO also reveals that the own account enterprises or the self-employed units (OAEs) within the informal sector experienced positive growth in prices, output and participation. These empirical features characterizing the informal sector are reflected in the short theoretical model. In fact, the theory predicts that the wage of informal workers should increase and the informal industrial commodity expand in production if the formal import competing sector contracts due to withdrawal of trade protection. The growth in value added and fixed assets in the NDMEs serve as approximations for these changes.

Although generally, the informal sector activity pertains to non-traded items in the economy, from street vendors to domestic helps, in many countries they produce intermediate goods, processed exportable and import substitutes with subcontracts from the formal sector. In such cases, the formal sector often adds the capital content (like, the brand name) only. In many other cases, informal industries that produce garments, leather goods, small tools and machinery are known to export directly – often bypassing the formal regulations and procedures mainly through adjacent border trade.[2] Apart from that, in all the developing countries, agriculture, poultry and fisheries are pre-dominantly outside the formal sphere and consumer non-durables

[2] Earlier, De Soto (1989) pointed out that a heavy burden of taxes, bribes and inflexible bureaucratic regulations in the formal sector drives many producers into the informal sector.

such as vegetables, fish and meat are procured from informal producers, processed and traded. Analysing the impact of *industrial* and *trade reform* on these activities and on the workers employed therein should offer a wider view in favour of appropriate policy formulations. It is to be noted that given the considerably large share of employment in these sectors even small positive gains in the real wage, can increase the economic attainments of millions in most developing and transition countries.

As briefly referred to earlier, let us re-emphasize the fact that mobility and more specifically the degree of mobility of capital is one of the most instrumental factors behind tracing the connection between either prosperity or ruin in the formal sector to the implications it might have for the informal counterpart. In this connection, it is imperative to discuss the precise mechanism that captures the issue of capital mobility, typically since there is neither a measure nor statistical evidence on how capital takes flight from dwindling industries and relocates into the prospering ones. Marjit (2003) shows that even if a part of the informal sector is vertically linked with the formal sector and the formal sector contracts due to trade liberalization, informal wage can still increase. In Marjit and Kar (2007) and Marjit, Kar and Beladi (2007) capital mobility also plays a major role in two sector formal-informal frameworks. Capital immobility reduces informal wage when informal employment expands, whereas allowing for freer capital mobility leads to exactly opposite outcomes.

While there are other mechanisms that can generate such positive economic impact for the existing group, here the argument builds strongly on the observation that several developing countries have been experimenting with policies on trade reform for quite some time. These include critical features like contraction of the

formal protected industries, either via import liberalization or through state initiatives in withdrawing support from loss-making public enterprises. This implies that a large amount of capital and labour that were earlier part of these industries would now have to relocate to a more profitable venture. In most of these countries, the vacuum left by the vanishing large scale public industries have been filled not by similar manufacturing units, but by predominantly service oriented smaller firms which face less stringent labour laws and industrial regulations. And moreover, the new opportunities that have emerged in the so-called sunshine industries are incapable of accommodating the retrenched capital and labour, a larger share of which has hence been devoted to less formal employment. There may be several explanations for this transition. Normally, workers retrenched from typical import-competing public or private enterprises would not find it easy to get reemployment in formal service industries recruiting high-skilled professionals with advanced technical expertise that the older industries rarely employed. We present a formal model below, which captures the exact mechanism whereby capital mobility affects the informal wage when the formal industrial sector crumbles under increased competition. In particular, we argue that the mobility of capital between formal and informal sectors can provide a completely new and unconventional set of results that theoretical and empirical studies using purely partial equilibrium models fail to recognise.

## 4. Modelling Informal Sector

Assume a two-sector small open economy. $X$ is produced in the formal manufacturing sector and $Y$ is the informal manufacturing sector. Both $X$ and $Y$ use labour and capital. Wage in the formal segment is fixed through bargaining. Initially, $X$ is protected either through a tariff or by a state-subsidy, which artificially increases

the price of *X*. Trade reform or withdrawal of subsidy implies a decline in the tariff/subsidy rate, denoted by *t*. Workers, who do not find jobs in the formal sector flock in sector *Y* where they receive the market determined wage rate. We call this the informal wage. There is no open unemployment in this model. People must find jobs to survive, and wage in the informal sector adjusts fully to accommodate workers moving into the sector. Markets are competitive and technology exhibits CRS and diminishing marginal productivity.

The model is similar in spirit to Agenor and Montiel (1996), Carruth and Oswald (1981), Marjit and Beladi (2002) and Marjit (2003). Capital and land are fully employed. The symbols we use are given as follows:

$\overline{w}$: Formal unionized wage; $w$: Informal (flexible) wage

$r_i$: Return to capital in sector i, $i$=*X, Y*; $X$: Output of formal sector;

$Y$: Output of informal sector $(P_X, P_Y)$: Exogenous commodity prices

$\overline{L}$: Supply of Labour; $\overline{K}$: Total supply of capital

$K_i$: Supply of capital in sector *i*,; $(a_{LX}, a_{LY})$: Per unit labour use in *X* and *Y*.

$(a_{KX}, a_{KY})$: Per unit capital use in *X* and *Y;* $t$: Import tariff

'^' represents percentage changes for particular variables and symbols used bear the same implications as in Jones (1965).

Competitive price equations that describe the system are given by,

$$\overline{w}a_{LX} + r_X a_{KX} = P_X(1+t) \qquad (1)$$

$$wa_{LY} + r_Y a_{KY} = P_Y \qquad (2)$$

Commodity prices are given from the rest of the world. Let us suppose $Y$ is exported and $X$ is imported.

Full employment conditions imply:

$$a_{LX}X + a_{LY}Y = \overline{L} \tag{3}$$

$$K_X + K_Y = \overline{K} \tag{4}$$

$$a_{KX}X = K_X \tag{5}$$

$$a_{KY}Y = K_Y \tag{6}$$

Let $\hat{\overline{w}}$ be so determined that,

$$\hat{\overline{w}} = \alpha\hat{P}_X + \beta\hat{P}_Y, \quad 0 < \alpha, \beta < 1 \tag{7}$$

Finally, the capital mobility condition:

$$\frac{K_X}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right), \phi' > 0 \tag{8}$$

Equation (8) suggests the following. At any point of time $\overline{K}$ is allocated between $X$ and $Y$. But such allocation depends on return differential. Hence there is imperfect mobility of capital. If $\left(\frac{r_X}{r_Y}\right)$, increases, $\frac{K_X}{K_Y}$ will also increases. $\frac{K_X}{K_Y}$ describes the relative supply of capital in sector $X$. The usual way to model this is to assume sector-specific capital for $X$ and $Y$ without any mobility with $\phi' = 0$. Perfect mobility will always imply $r_Y = r_X$ and there is no relevance for a separate sectoral supply function of capital. Relative supply adjusts to demand in each sector and this is the standard Heckscher-Ohlin structure. We shall demonstrate that our comparative static depends on the curvature of $\phi' = 0$.

Given $(P_X + t, P_Y)$, $\overline{w}$, $L$, and $K$, we have $w$, $r_X, r_Y$, $X$, $Y$, $K_X, K_Y$ to solve from (1)-(6) and (8). The determination of general equilibrium proceeds as follows. From

(1) we can determine $r_X$ . Now using (4) and (8) we get (8) ′.

$$\frac{\overline{K} - K_Y}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right) \qquad (8)'$$

As $r_Y$ increases, given $r_X$ and $\phi' > 0$, $K_Y$ must rise. This defines the relationship *MM* in figure (1). Now using (5), (6) and (3),

$$\frac{a_{LX}}{a_{KX}}(\overline{K} - K_Y) + \frac{a_{LY}}{a_{KY}}K_Y = \overline{L} \qquad (9)$$

Since $r_X$ is given by CRS, $\frac{a_{LX}}{a_{KX}}$ is given. Now as $r_Y$ increases, from (2), $\frac{r_Y}{w}$ must rise and $\frac{a_{LY}}{a_{KY}}$ must rise as well. Hence in equation (9) the LHS unambiguously increases.

To bring back the balance $K_Y$ must fall substantially. As long as $\frac{a_{LY}}{a_{KY}} > \frac{a_{LX}}{a_{KX}}$, LHS must decrease with a decline in $K_Y$. Such an assumption implies that the informal sector is labour-intensive; an assumption by virtue of being realistic is kept all through the paper. Therefore as $r_Y$ rises, $K_Y$ must fall. This defines *FF* in Figure (1). Once $(r_Y, K_Y)$ are determined from Figure (1), the rest of the variables can be determined easily.

The key comparative static exercise we are interested in is a decline in '*t*'. Figure (1) helps us to trace out the consequences of both. A decline in *t* reduces $r_X$, given $\overline{w}$ and $P_X$. Given $r_Y$ a drop in $r_X$ increases $K_Y$, as $\phi' > 0$. This will mean a rightward shift of *MM* to $M'M'$.

At the same time given $r_Y$ and $K_Y$, a drop in $r_X$ reduces $\frac{a_{LX}}{a_{KX}}$ and therefore LHS in (9) declines. The balance is restored through an increase in $K_Y$ at a given $r_Y$. *FF* shifts to the right as well. The way Figure (2) is drawn suggests that *Y* must expand.

But $r_Y$ may remain unchanged and can in fact go either way. Note that if *MM* shifts quite a bit relative to *FF*, $r_Y$ will decline and w will increase. The mobility effect has to be significant for a positive effect on the informal wage. A drop in $\frac{a_{LX}}{a_{LY}}$ releases labour to *Y* sector, which implies that *FF* shifts up requiring more $K_Y$ to accommodate displaced labour. Additional capital that comes to *Y* because $r_X$ is lower must outweigh the required amount needed to absorb displaced labour at a given $r_Y$, hence at a given w to induce an increase in *w*. With zero mobility *MM* is vertical and remain unchanged. Hence, $r_Y$ must increase and *w* must decrease through a shift in *FF*. With perfect mobility *MM* is horizontal at $r_Y = r_X$ and as $r_X$ drops, *MM* shifts down. Notwithstanding the shift in *FF*, $r_Y$ must adjust to the new level of $r_X$ and *w* must increase. Figure (3) describes the effects of such adjustments.

The above two cases explicitly demonstrate the *partial and general equilibrium* results that can be derived from this model. In figure 5.2, the vertical line MM represents perfect immobility of capital between the formal and the informal segments. Under the circumstances, formal job losses and crowding in of workers into the informal sector leads to wage cuts in the latter. The situation undergoes a complete reversal if capital is perfectly mobile and is represented by a horizontal line MM (figures 2 and 3). Retrenchments from the formal sector and additional job creation in the informal could even lead to a wage gain for the informal workers, thus establishing the general equilibrium implications of our model. Finally, the precise condition for $\frac{dw}{dt} > 0$ is given by: $\hat{w} > 0, iff, \varepsilon > \sigma_X K_X f\left(\frac{\lambda_{LX}}{\lambda_{KX}}\right)$. (10)[3],[4]

[3] See Appendix A for detailed algebraic proof.

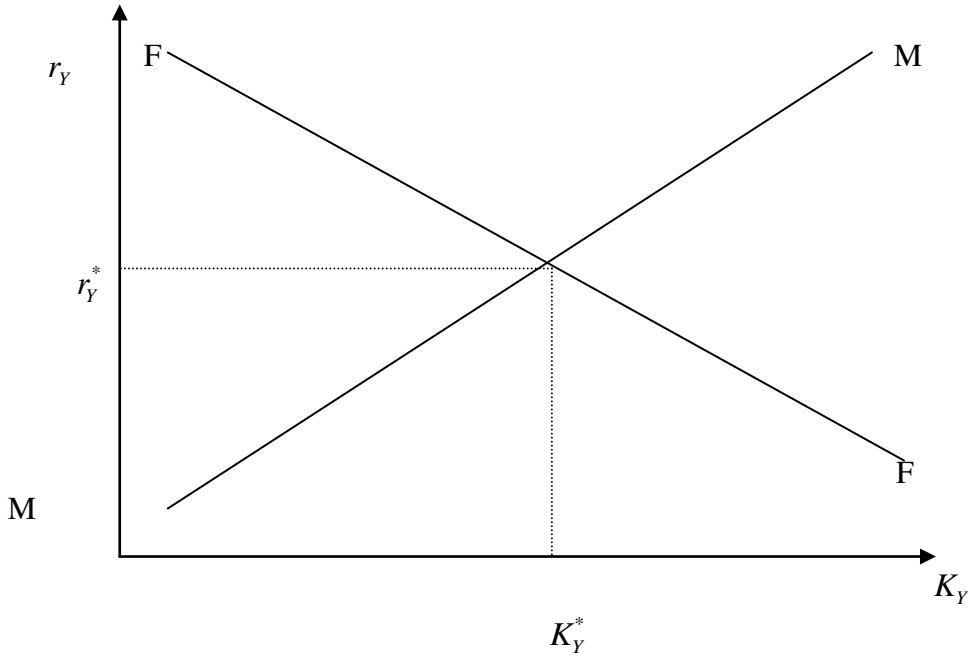


Figure 1. Determination of first equilibrium

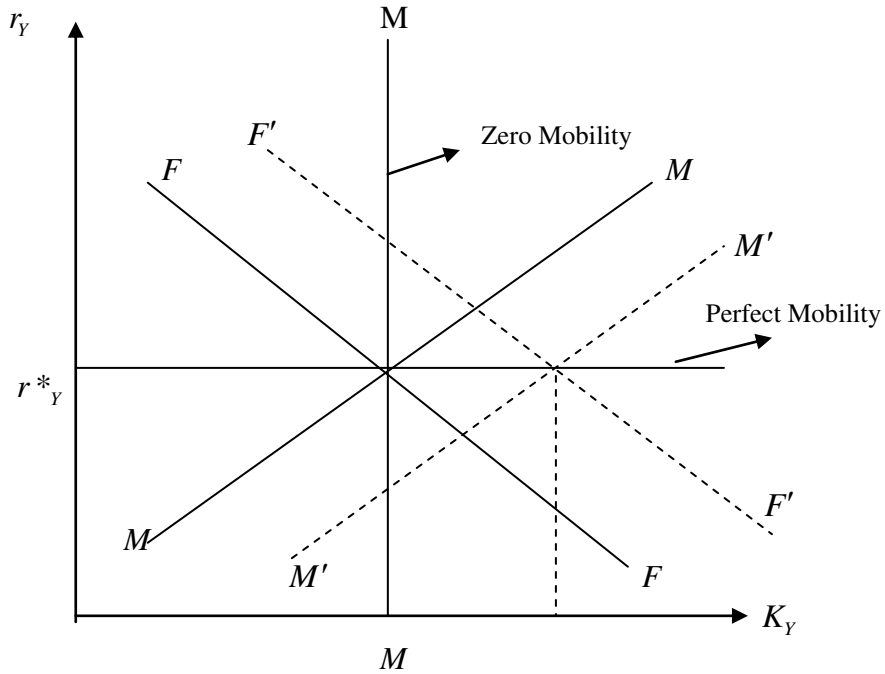


Figure 2. Equilibrium interest rate under different patterns of capital mobility

[4] Condition (10) offers a directly testable hypothesis. However, it requires matching data on product specific capital stock in both formal and informal sectors, and the return capital earns in each sector. Thus, we set aside this direct exercise for future work effort and use a proxy measure instead

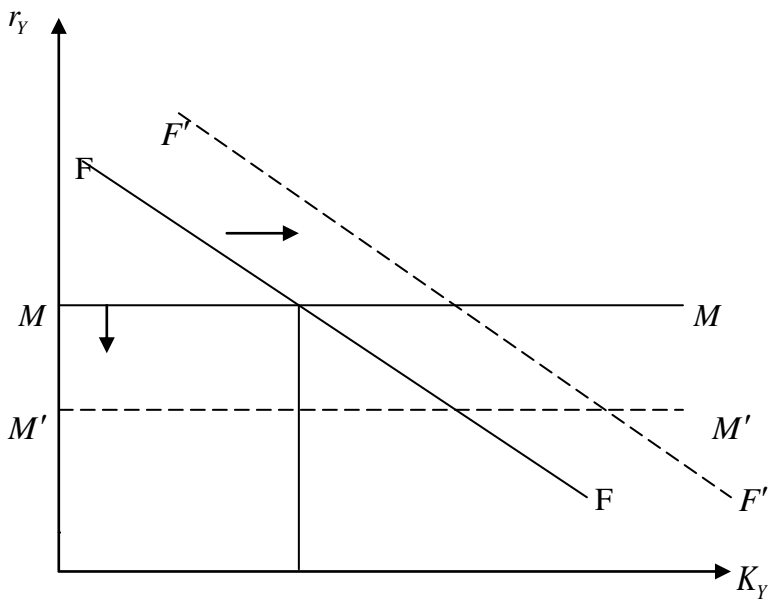


Figure 3 Considering perfect capital mobility

## 5. Informal Wage and Poverty in India

It is best to admit that relating informal wage and poverty to trade liberalization is a more difficult job empirically, than theoretically. The empirical structure is highly dependent on the availability and reliability of data on informal sector. This section draws on the wage implications of economic reform on the informal sector. We argue that any measure of urban poverty is strongly dependent on the performance of the informal sector in the cities and our main hypothesis is the following. If exogenous shocks, such as, a tariff reduction for the formal industrial units leads to a change in the wage of the informal workers, then one should expect a decline in the proportion of workers living in poverty using any standard measure of poverty. It is well-known that large part of the urban poor in India works and lives under the so-called informal sector arrangements and that any improvement in the wages of the informal workers may significantly lower the incidence of poverty. This would not be the case in the rural areas, because in comparison to the rural informal

sector a larger share of the poor is engaged in agriculture. Thus, we test for the relationship between Urban Head Count Ratio (UHCR) and the urban informal wage (NDMEs). We conduct an OLS and an unbalanced panel regression for all the rounds of survey we have already discussed. It should be noted that there are many other important variables that are potential candidates in the exercise, such as gender-based wages, specific occupational types and so on, which are excluded here mainly to provide an aggregative explanation of the main relations. We relate the growth of informal wage in a period dominated by industrial trade liberalization and its effect on the percentage of people in the Below Poverty Line (BPL) category. It is also to be noted that the informal sector data and the BPL data are not from the same samples and no common database that enumerates and reports both, exists.

The exercise is carried out in two stages: first, we regress the current period's BPL percentage on previous periods Annual Informal Wage growth, where the results of the OLS suggests a negative relationship significant at 5% level (Table 1, Appendix B). Second, we conduct the analysis as a panel of the states and union territories over four rounds of survey, and it reveals presence of random effects. It nevertheless matches the OLS results closely. However, as it can be seen from Table 2 (Appendix B) the coefficient of IWPREV (real informal wage in the previous period) is still negative but now significant at 1% level. To summarize, therefore, one may state that the effect of an improvement in the annual wage in the informal sector has negative and significant impact on the incidence of urban poverty across states and union territories in India.

## 6. Informality and Corruption

To construct the relation ship between informality and corruption consider a simple Ricardian type of production structure. Labour is the only input of production

that is shared by the formal and the informal sector. The formal–informal distinction is captured through the assumption that the wage level in the former is greater than that in the latter. Such wage determination is beyond the control of the particular firm. Initially, we assume there is no difference in productivity of labour between segments. Therefore, it is quite likely that the entire production should shift to the informal sector. However this cannot be done since 'informal' production is 'illegal' due to it's violation of labour laws and hence calls for punitive measures from the state.

For the producer, the probability of being apprehended while producing in the informal sector will depend upon the size of the informal sector. In our model, the probability of getting caught increases with the visibility of such sector, i.e., due to an increase in the employment level. Clearly, when the product serves as an import competing good and is protected, the level of employment in each sector depends on the level of protection. If the producer gets caught while producing in the in formal sector, he has to pay either a bribe or the punitive cost. He will have to pay the bribe to the monitoring officer, who receives a salary otherwise independent of his monitoring capabilities.

We now analyze the collusive game between the potentially bribing producer and the potentially corrupt monitoring officer. As the firm's profit level is a function of the tariff rate prevailing, and that all monitoring officers are corruptible, the punitive cost is assumed severe in that the producer is pushed to his reservation pay-off. Then the interesting part is to obtain the optimal level of bribing through a 'Nash-bargaining' approach. The net profit of the dishonest producer with tariff protection would be the profit at the given tariff rate less the bribe. But if he does not pay a bribe, he is punished and the net profit falls to the reservation payoff level. On the other hand if the monitoring officer takes a bribe his total income increases by the amount

of the bribe; otherwise remains at the level of his salary.

The producer will try to rationally allocate the total production into two different sectors in order to maximize his total profit, under the condition that he might get caught with some probability if operating in the informal sector. Using the Nash Bargaining solution regarding the optimal bribe paid, which is increasing in the level of the tariff protection, one can show that if the tariff protection falls, the total production and hence, the total labour requirements will fall. This is a conventional result. But what is more striking is that labour requirement in the informal sector will rise while the labour requirement in the formal sector will fall.

Intuitively, as the tariff rate goes down, the equilibrium amount of bribe also goes down. Therefore, the effective marginal cost facing the informal segment also goes down which leads to a change in the composition of production in favour of the informal sector. Declining tariff and the resultant fall in bribes indicates the beneficial effect of reformatory policy. However, this also increases the extent of extra-legal activity, i.e. the size of the informal output. Needless to say, this is the natural outcome when the labour market reform is kept on hold while trade reforms are prioritized.

Apart from reforms in the external sector, it is also possible that internal economic readjustments also engender similar shifts in production organisation, with interesting twists as one encounters in the presence of large informal arrangements. For example, consider plausible consequences of introducing reforms in the capital market, i.e., lowering of interest rates. We introduce a notion of 'working capital' in the basic model. The notion of working capital has become quite significant in recent discussions of firm level investment with imperfect credit market. Interested readers may have a look at Fazzari and Peterson (1993). The firm under consideration needs

to pay workers at the beginning of the period and then repays the principal and interest at the end of the production period. This is the standard idea of working capital or credit which affects the profitability of firms in a big way. To prove our point we need not distinguish between formal and informal interest rates. So we keep them the same at r. Once again, maximizing the objective function of the producer where the choice is between labour allocation between formal and informal segments with probability of getting apprehended for such activities and the consequent punitive cost/bribe leads to the following outcome. As the rate of interest goes down, total labour employment should increase. However, the sectoral reallocations take an interesting turn. We observe that a fall in the rate causes formal employment to expand and informal employment to shrink.

In brief, therefore, if market interest rate falls given unchanged tariff protection, total labour requirement will rise along with an increase in the formal employment and a fall in informal employment. As the per-worker investment is more in the formal sector as they have to be paid a higher wage, a fall in the interest rate lowers the relative cost of hiring formal workers and therefore the formal sector expands. Our earlier assumption suggests that the amount of bribe depends on the tariff rate because in case the entrepreneur has to close down his business, he will lose the protection induced incentive.

In this case, however, as the interest rate goes down, the overall profit of the firm goes up and now the enforcement officials in this sector may ask for more bribes if the informal activities are to continue. This discourages the use of informal workers further. Nevertheless there is a possibility that albeit the size of the informal sector contracts, total bribe may actually go up. Our main intention here is to focus on the size of the informal sector. What we have shown so far is that a drop in tariff rate will

increase informal employment while a drop in interest rate reduces the same. Therefore, if one is looking at reforms driven by two different instruments, one should expect offsetting effects on the size of the informal segment.

## 7. Discussion and Conclusion

This paper offers a different approach compared to prior attempts at quantifying and theorizing the activities of the informal sector in dual economy labour markets. By linking the unorganised sector to the organized sector through capital mobility, we are able to estimate and theorize in more formal ways the effects of reform on the wage and employment status of workers in the informal sector. The results, as we have discussed are quite revealing. With the help of a rigorous general equilibrium model we establish that trade liberalization in the formal sector raises both employment and wages in the informal sector. If capital is easily mobile between the two sectors, the implications are quite contrary to conventional wisdom. Even if capital is sticky, as we explored in other studies referred to earlier, downsizing of the capital intensive import competing sector may lead to increased output in the labour-intensive informal segment and raise informal wage. The issue of capital mobility thus takes an important role in shaping the magnitude and directionality of informal wage subject to exogenous policy changes in the organized sectors of an economy.

Furthermore, the role of labour productivity in both formal and informal sectors can also impart strong influences on the employment and wages in the informal sector. Labour productivity improvement in the unskilled labour-intensive segments of the formal sector can improve informal wage even in the short run under

free mobility of capital, and with formalization of informal labour. These issues along with relevant policy debates on concerns over governance, corruption and informality are expected to cover wider grounds through future research.

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**Appendix A**

*Proof of condition (10)*

$$\overline{w}a_{LX} + r_X a_{KX} = P_X(1+t) \tag{A.1}$$

$$wa_{LY} + r_Y a_{KY} = P_Y \tag{A.2}$$

$$\frac{K_X}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right), \phi' > 0$$

$$\frac{\overline{K} - K_Y}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right) \tag{A.3}$$

From (A.1), $\hat{r}_X\theta_{KX} = \hat{P}_X - \theta_{LX}\hat{\overline{w}}$

$$= \hat{P}_X(1-\theta_{LX}\alpha) \tag{A.4}$$

Where, $\hat{\overline{w}} = \alpha\hat{P}_X + \beta\hat{P}_Y = \alpha\hat{P}_X$, since $\hat{P}_Y = 0$.

From (A.2), $\hat{w}\theta_{LY} + \hat{r}_Y\theta_{KY} = 0$. This implies, $\hat{w} = -\frac{\theta_{KY}}{\theta_{LY}}\hat{r}_Y$. (A.5)

Now using equations (3) to (6),

$$a_{LX}X + a_{LY}Y = \overline{L}.$$

Reformulating, $\frac{a_{LX}}{a_{KX}}(\overline{K} - K_Y) + \frac{a_{LY}}{a_{KY}}K_Y = \overline{L}$

Again, $\lambda_{LX}\hat{X} + \lambda_{LY}\hat{Y} + \lambda_{LX}\hat{a}_{LX} + \lambda_{LY}\hat{a}_{LY} = 0$

And $\lambda_{LX}\hat{K}_X + \lambda_{LY}\hat{K}_Y + \lambda_{LX}(\hat{a}_{LX} - \hat{a}_{KX}) + \lambda_{LY}(\hat{a}_{LY} - \hat{a}_{KY}) = 0$ (A.6)

But, as $K_X = \overline{K} - K_Y$

$\hat{K}_X = -\hat{K}_Y/\phi$, where $\phi = (K_X/K_Y)$.

Substituting these information in (A.6),

$$-\frac{1}{\phi}\lambda_{LX}\hat{K}_Y + \lambda_{LY}\hat{K}_Y + \lambda_{LX}\sigma_X\hat{r}_X - \lambda_{LY}\sigma_Y(\hat{w} - \hat{r}_Y) = 0 \tag{A.7}$$

Rearranging, and using (A.4), and $\theta_{LY}(\hat{w}-\hat{r}) = -\hat{r}_Y$

$$(\lambda_{LY} - \frac{1}{\phi}\lambda_{LX})\hat{K}_Y + \lambda_{LX}\sigma_X\hat{P}_X\left(\frac{1-\theta_{LX}\alpha}{\theta_{KX}}\right) + \lambda_{LY}\sigma_Y\frac{\hat{r}_Y}{\theta_{LY}} = 0.$$

Thus, $$(\lambda_{LY} - \frac{1}{\phi}\lambda_{LX})\hat{K}_Y + \sigma_Y\frac{\lambda_{LY}}{\theta_{LY}}\hat{r}_Y = -\lambda_{LX}\sigma_X\hat{P}_X\left(\frac{1-\theta_{LX}\alpha}{\theta_{KX}}\right) \qquad \text{(A.8)}$$

Now, taking '*ln*' on (A.3),

$\ln(\overline{K} - K_Y) - \ln K_Y = \ln\phi\left(\frac{r_X}{r_Y}\right)$. Taking percentage changes,

$\hat{K}_X - \hat{K}_Y = \frac{1}{\phi}d\phi = \frac{1}{\phi}\frac{\delta\phi}{\delta\left(\frac{r_X}{r_Y}\right)}\frac{r_Y dr_X - r_X dr_Y}{r_Y^2} = \frac{\phi'}{\phi}\frac{r_X}{r_Y}(\hat{r}_X - \hat{r}_Y)$. Using (A.4),

or, $$\hat{K}_X - \hat{K}_Y + \frac{\phi'}{\phi}\frac{r_X}{r_Y}\hat{r}_Y = \frac{\phi'}{\phi}\frac{r_X}{r_Y}[\hat{P}_X(1-\theta_{LX}\alpha)/\theta_{KX}]$$

We define, $\varepsilon = \frac{\delta\phi}{\delta(r_X/r_Y)}\frac{r_X/r_Y}{\phi}$, as the elasticity of capital mobility between sectors *X* and *Y*.

Thus, $$-\hat{K}_Y[1+\frac{1}{\phi}] + \varepsilon.\hat{r}_Y = \varepsilon\hat{P}_X(1-\theta_{LX}\alpha)$$

Therefore, $$\hat{r}_Y = \hat{K}_Y\frac{1}{\varepsilon}[1+\frac{1}{\phi}] + \hat{P}_X(1-\theta_{LX}\alpha) \qquad \text{(A.9)}$$

Rearranging equations (A.6) and (A.7),

Define, $\mu = (\lambda_{LY} - \frac{1}{\phi}\lambda_{LX}) = \left(\frac{\lambda_{LY}}{\lambda_{KY}} - \frac{\lambda_{LX}}{\lambda_{KX}}\right)K_X = \frac{\lambda_{LX}}{\lambda_{KX}}\frac{K_X}{\left(\frac{\lambda_{LY}}{\lambda_{KY}} - \frac{\lambda_{LX}}{\lambda_{KX}}\right)}$ (A.10)

$$\sigma_Y\frac{\lambda_{LY}}{\theta_{LY}}\hat{r}_Y + \mu\hat{K}_Y = -\lambda_{LX}\sigma_X\hat{P}_X\left(\frac{1-\theta_{LX}\alpha}{\theta_{KX}}\right) \qquad \text{(A.11)}$$

and

$$\hat{r}_Y - \frac{(\phi+1)}{\phi\varepsilon}\hat{K}_Y = \hat{P}_X(1-\theta_{LX}\alpha) \tag{A.12}$$

Using Cramer's rule to solve for $\hat{r}_Y$.

$$D = \begin{bmatrix} (\sigma_Y \frac{\lambda_{LY}}{\theta_{LY}} + \frac{\lambda_{LZ}}{\theta_{TZ}}\frac{\theta_{KY}}{\theta_{LY}}\sigma_Z) & \mu \\ 1 & -\frac{(\phi+1)}{\phi\varepsilon} \end{bmatrix} = \begin{bmatrix} -\frac{\sigma_Y \frac{\lambda_{LY}}{\theta_{LY}}(\phi+1)}{\phi\varepsilon} - \mu \end{bmatrix} < 0$$

$$\text{Therefore, } \hat{r}_Y = \frac{1}{D}[\frac{\lambda_{LX}\sigma_X\alpha(\phi+1)}{\phi\varepsilon} - \mu].\hat{P}_X(1-\theta_{LX}\alpha) \tag{A.13}$$

Now, suppose $\hat{P}_X < 0$, then $\hat{r}_Y > 0$ iff, $\frac{\lambda_{LX}\sigma_X(\phi+1)}{\phi\varepsilon} > \mu$

Finally, using (A.5)

$$\hat{w} > 0, \text{ iff, } \frac{\lambda_{LX}\sigma_X(\phi+1)}{\phi} < \mu\varepsilon \tag{A.14}$$

or, $\varepsilon > \frac{\lambda_{LX}\sigma_X(\phi+1)}{\phi\mu}$

or, $\varepsilon > \frac{\lambda_{LX}\sigma_X}{\mu}\frac{\phi+1}{\phi} = \frac{\lambda_{LX}\sigma_X}{\mu}\frac{1+\frac{K_X}{K_Y}}{\frac{K_X}{K_Y}} = \frac{\lambda_{LX}\sigma_X}{\mu}\frac{\overline{K}}{K_Y}\frac{K_Y}{K_X} = \frac{\lambda_{LX}}{\lambda_{KX}}\frac{\sigma_X}{\mu}$

Using (A.5.8), $\hat{w} > 0$, iff, $\varepsilon > \sigma_X K_X f\left(\frac{\lambda_{LX}}{\lambda_{KX}}\right)$

The above derivation provides the proof of condition (10). !

**Appendix B**

**Table 1.** Regressing current period's **BPL percentage** on previous year's Annual Growth of Informal wage

| Dependent variable: BPLPER<br>Methodology: OLS | | | | | |
|---|---|---|---|---|---|
| **Exp. Variables** | **Coeff.** | **t-ratio** | **$R^2$** | **AIC** | **Log - Likelihood** |
| IWPREV | (-) 0.236 | (-) 2.57* | 0.13 | 7.883 | (-) 183.24 |
| CONSTANT | 27.85 | 14.53* | | | |
| Note: BPLPER = **BPL percentage**<br>IWPREV = Previous year's growth rate of informal wage | | | | | |

**Table 2**. Unbalanced panel regression of current period's **BPL percentage** on previous year's **Annual Growth of Informal wage**

| Dependent variable: BPLPER<br>Model: Random Effects Model | | |
|---|---|---|
| **Exp. Variables** | **Coeff.** | **t-ratio** |
| IWPREV | (-) 0.229 | (-) 5.17* |
| CONSTANT | 27.12 | 11.98* |
| Diagnostics tests for the model:<br><br>Random Effects Model: v(i,t) = e(i,t) + u(i)<br>Fixed vs. Random Effects (Hausman) = .01<br>(1 df, prob value = .940154)<br>(High (low) values of H favour FEM (REM).)<br>Sum of Squares .6723<br>R-squared .1248 | | |
| Note: BPLPER = **BPL percentage**<br>IWPREV = Previous year's growth rate of informal wage | | |