


The formal–informal dichotomy: Revisiting the debate on the agriculture–industry linkage

The Economic and
Labour Relations Review
2014, Vol. 25(1) 154–178
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sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/1035304613517988
elrr.sagepub.com


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Abstract

Incorporation of the informal sector in the general Kaleckian framework of agriculture–industry linkage is the primary target of this article. We show that the agriculture–informal sector interaction is distinctly different from the agriculture–formal sector relationship. Although agriculture supports the formal sector only from the supply-side, it helps the informal sector by providing both demand- and supply-side inducements. Next, contrary to the general perception of formal–informal complementarities, we rather propose a fundamental conflict. This conflict arises in the presence of the food supply-constraint or the generic resource-constraint. Subsequently, with these theoretical perspectives, we show that policies that are beneficial for the formal sector, in fact, constrict the informal economy.

JEL Codes: J21, O11, O17, O20, Q18

Keywords

Accumulation by dispossession, agriculture–formal sector linkage, agriculture–informal sector symbiosis, formal–informal conflict, Kalecki, resource-constraint

Introduction

In the first two decades of left rule [rule of the Parliamentary-Left in West Bengal, India]... *hawking* was seen as a flexible strategy to manage urban poverty... Each of the petitions and policy reports thus relates to hawking as an inevitable fallout of urban poverty aggravated by the refugee influx. In the mid-1990s, however, ‘the tide turned’. Eager to regain the support of the *urban middle classes*, the... government of West Bengal made an all-out effort to make

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Bengal a *safe investment* destination. As a part of urban restructuring, in 1996, over a period of 2 weeks, in a well-planned and coordinated action called 'Operation Sunshine', municipal authorities and the police demolished all street-side stalls in Kolkata. In 1997, the state legislature brought about an amendment to the Kolkata Municipal Act that declared any form of *unauthorised occupation of streets and pavements* by hawkers a cognisable and non-bailable offence... But, within a few months, the hawkers began to reclaim their previous positions, mobilised by their unions, opposition party and even by the smaller constituents of the ruling Left Front... The government had to think again of 'regulation' of hawking as opposed to eviction and rehabilitation. (Bandyopadhyay, 2009: 18, emphasis added)

Thus,

... [t]he legitimate claim of capital to valorize and reproduce itself – and it can do so only by '*accumulation by dispossession*' ... – comes into *conflict* with the legitimate claim of petty producers to reproduce their *subsistence*. Here, *two different economic systems are pitted against each other*, each taking to the broader society its own moral claims – the capitalist economy representing itself as the vehicle of progress and development and the petty producers championing a human being's inalienable right to survival. (Sanyal and Bhattacharyya, 2009: 42; emphasis added)

This article explores these 'two different economic systems' (the formal and the informal) explicating how they 'are pitted against each other'. Its contribution is to construct a macroeconomic framework along Kaleckian lines, discussing these critical problems of contemporary development.

According to traditional development theory, economic development hinges on growth of a modern industrial sector. This modern industry-centric approach has been the dominant development discourse for years. However, since the early 1970s, it has been increasingly argued that such a 'Lewisian' path (Lewis, 1958 [1954]) is ineffective insofar as broad-based employment generation is concerned. On the other hand, studies have shown that the vast majority of the population in less developed countries (LDCs) has been engaged in non-agricultural activities outside the sphere of the modern/formal sector. Consequently, the focus has shifted towards the informal sector as capable of creating widespread employment and as the site of rehabilitation of surplus labour. It is argued that instead of being withered away through structural transformation (as indicated in Hymer and Resnick, 1969), the informal sector is rather acting as an inclusive-development engine (Bangasser, 2000; Lanjouw and Lanjouw, 2001; Mellor, 1976; Ranis and Stewart, 1993, 1994; Saith, 1991). The nature and dynamics of the informal sector and the pattern of its relationship with other sectors have become important issues of research.

To understand the magnitude of the issue, we briefly present some facts regarding the informal sector in general and that of India in particular. First, the

... informal sector may be broadly characterized as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at low level of organization, with little or no division between labour and capital as factors of production and on a small scale. Labour relations, where they exist, are based mostly on casual employment, kinship, or personal or social relations rather than contractual arrangements with formal guarantees. (National Sample Survey Organisation (NSSO), 2001: 1)

Table 1. The informal economy as a percentage of GDP (un-weighted average).

	1989–1991	1994–1995	1999–2000
24 African countries	33.9	37.4	41.2
25 Asian countries	20.9	23.4	26.3
17 countries of Central and South America	34.2	37.7	41.5
23 Transitional countries	31.5	34.6	37.9
21 OECD countries	13.2	15.7	16.7

GDP: gross domestic product; OECD: Organisation for Economic Co-operation and Development.
Source: Batini et al. (2011).

Second, we present a global scenario which clearly shows the importance of the informal sector and most importantly, its rising share! This is seen in Table 1.

Now coming to India, we find the features summarised in Table 2.

Another very important trait of the Indian informal sector is that a very large part of it is linked with agriculture. Even the urban segment of the informal sector is heavily dependent on agriculture. In fact, this should not be a matter of surprise, as the overwhelming majority of informal sector enterprises belong to industry categories that are deeply integrated with agriculture and allied activities. Table 3, on industry groups, is self-explanatory.

If we identify some specific industries within the Indian informal manufacturing sector which account for more than 77% of the total number of informal manufacturing enterprises, we find the industry groups as in Table 3 according to the number of enterprises in descending order.

Thus, the significant size of the informal sector and its rising share even in times of growth make it an important issue for research. Not only the intra-sectoral characteristics, but also its relations with other sectors of the economy, become vital.

Consequently, the primary aim of the article is to analyse the relationship between the informal sector and other sectors, specifically the formal sector and agriculture. To do this, we place the informal sector in the general framework of agriculture–industry inter-linkage. This inclusion not only extends the traditional agriculture–industry linkage literature by bringing in the issues of agriculture–informal and formal–informal relations, but also helps to identify certain fundamental confusions that persist in the long-standing agriculture–industry literature. Next, contrary to the general perception that the formal and informal sectors are complementary to one another,¹ we posit that there is a fundamental conflict between them. Furthermore, this conflict points to an even more fundamental contradiction within the contemporary doctrine of ‘development management’.

A model of the formal–informal dichotomy²

Agriculture–formal sector interaction

Review of the literature

- (a) Demand-side linkages: There is a vast literature that argues that agriculture provides a ‘home market’ for the formal industrial sector and thereby mitigates its ‘effective demand problem’ through the following channels:

Table 2. Share of the organised (formal) and the unorganised (informal) sector employment across industries in India (%).

Industry	1983		1987-88		1993-94		1999-2000	
	Organised	Unorganised	Organised	Unorganised	Organised	Unorganised	Organised	Unorganised
Agriculture and allied	0.6	99.4	0.7	99.3	0.6	99.4	0.6	99.4
Mining and allied	55.5	44.5	44.2	55.8	40.7	59.3	43.2	56.8
Manufacturing	19.7	80.3	17.3	82.7	16.1	83.9	14.9	85.1
Electricity, Gas and Water	90.7	9.3	71.3	28.7	69.7	30.3	79.0	21.0
Construction	17.7	82.3	10.1	89.9	10.0	90.0	6.5	93.5
Trade and allied	2.1	97.9	1.8	98.2	1.6	98.4	1.2	98.8
Transport and allied	38.8	61.2	34.8	65.2	29.7	70.3	21.5	78.5
Services	40.3	59.7	36.8	63.2	31.7	68.3	34.8	65.2

Source: Sakthivel and Joddar (2006).

Table 3. Major industry groups within the unorganised (informal) manufacturing sector of India.

15	Manufacture of Food Products and Beverages
20	Manufacture of Wood and Products of Wood and Cork, Except Furniture, Manufacture of Articles of Straw and Plating Materials
18	Manufacture of Wearing Apparel Dressing and Dyeing of Fur
17	Manufacture of Textiles
16	Manufacture of Tobacco Products

Source: National Sample Survey Organisation (NSSO) (2002).

- (1) Redistribution of income away from the net savers in the presence of differential propensities to consume formal sector output across different economic classes. This redistribution is initiated by a shift in the terms of trade between the agriculture and the formal sector (Bose, 1989; Rakshit, 1982; Taylor, 1983).
 - (2) Mutual exchange of surpluses between the formal sector and the agriculture. As agricultural production rises, more of its output is sold to the formal sector, raising agricultural income. Consequently, demand for the formal sector output rises (Bhaduri and Skarstein, 2003; Kaldor, 1996 [1984]; Raj, 1976).
- (b) Supply-side linkages: agriculture provides supply-side support for the formal industrial sector:
- (1) The agricultural sector supplies wage-goods and raw materials for the formal sector. These essential products are provided to the formal sector through simple inter-sectoral exchange (Chakravarty, 1977; Kalecki, 1993 [1954]).
 - (2) Food-constraint pushes up food prices in the face of growing demand from the formal sector, which leads to either an upward wage-price spiral (Kalecki, 1993 [1954]) or deterioration of terms of trade for the formal sector resulting in a 'profit squeeze' (as in Ricardo, 1815). Conversely, a cheap and abundant food supply ensures transfer of surplus from the agriculture to the formal sector (Preobrazhensky, 1965 [1926]; Ranis and Fei, 1961).

Our departures

(a) We depart from the assumption of the presence of a redistributive channel which is supposed to boost demand for formal sector output. Consider a situation where all the contending classes (capitalists and workers in the formal sector and farmers) form separate but equally strong lobbies. In such a situation, these classes can collude, the political expression of which is a 'coalition government'. In a regime of 'coalition politics', each of the contending groups tries to maintain its relative socio-economic position. Therefore, we assume rigidity of the formal sector real-wage and product-wage and, hence, rigidity of the agriculture–formal sector terms of trade. However, we will relax this assumption of rigidity of distributive parameters in our third section.

Empirical evidence, as captured through Tables 4 and 5, using Indian data, supports our assumption of distributive inflexibilities. We have calculated mean and coefficient

Table 4. Index of TOT between agriculture and non-agriculture from 1982–1983 to 2005–2006 (base: triennium ending 1990–1991 = 100).

	Year	Index of TOT	
	1982–1983	91.4	
	1983–1984	91.6	
It is evident that though the 10-year mean value rises for more recent truncated series compared to the earlier one/s, the index of TOT fluctuation, i.e. the coefficient of variation, markedly falls, indicating increasing stability of the series in recent times	1984–1985	93.9	
	1985–1986	93.6	
	1986–1987	95.7	
	1987–1988	97.4	
	1988–1989	98.3	
	1989–1990	99.4	
	1990–1991	101.9	
	1991–1992	105.6	
	1992–1993	103.9	
	1993–1994	103.6	
	1994–1995	106.6	
	1995–1996	105.3	
	1996–1997	103.1	
	1997–1998	105.6	
	1998–1999	105.2	
	1999–2000	102.7	
	2000–2001	100.9	
2001–2002	102.8		
2002–2003	103.6		
2003–2004	101		
2004–2005	100.3		
2005–2006	101.9		

Sources:
Agricultural Statistics at a Glance, The Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, 2006–2007.

Summary statistics for 1982–3 to 1993–4:
mean = 98.025 and coefficient of variation = 0.05030914

Summary statistics for 1994–95 to 2005–6:
mean = 103.25 and coefficient of variation = 0.01991529

TOT: terms of trade.

of variation from the series of data on agriculture–non-agriculture terms of trade and on non-agricultural real wages adjusted by using consumer price index. We find out that the decadal fluctuations of all these data sets have been reduced considerably after the 1970s.

(b) Next, we assume the absence of capital flows between the agriculture and the formal sector. Essentially, this means balanced trade between these two sectors. Balanced trade is assumed to remove the possibility of extracting a trade surplus by any sector from any other.

(c) Now we come to our third contention. Our claim is that simple exchange with balanced trade between the agriculture and the formal sector cannot create any extra demand for the latter. In fact, a popular perception is that a bumper crop facilitates industrial revival because it leads to an increase in income or purchasing power in the agrarian sector, raising demand for the formal sector goods.³ This argument is based on the implicit assumption of constant terms of trade. The assumption is necessary because a bumper crop, *ceteris paribus*, will change the terms of trade against agriculture. This, in turn, will

Table 5. Index of annual real non-agricultural wage rates in terms of consumer price index of industrial workers (1973–1974 to 2003–2004).

	Year	Index of real non-agricultural wage rates	
	1973–1974	173.92	
	1974–1975	157.36	
	1975–1976	178.98	
	1976–1977	188.26	
Though the mean value rises for more recent truncated series, the index of fluctuation markedly falls compared to the first decade, indicating increasing stability of the series in recent times compared to the first decade	1977–1978	182.56	Sources: Wage data are calculated from Annual Survey of Industries, Central Statistical Organization, Government of India. Consumer Price Index data are obtained from Reserve Bank of India, Government of India. Summary stats for 1973–4 to 1983–4: mean = 196.8354545 and coefficient of variation = 0.11011514 Summary stats for 1984–5 to 1993–4: mean = 265.397 and coefficient of variation = 0.047082643 Summary stats for 1994–5 to 2003–4: mean = 273.965 and coefficient of variation = 0.078964
	1978–1979	209.82	
	1979–1980	212.25	
	1980–1981	211.17	
	1981–1982	206.83	
	1982–1983	217.65	
	1983–1984	226.39	
	1984–1985	245.61	
	1985–1986	253.38	
	1986–1987	258.46	
	1987–1988	258.37	
	1988–1989	273.48	
	1989–1990	281.97	
	1990–1991	283.16	
	1991–1992	258.15	
	1992–1993	272.65	
	1993–1994	268.74	
1994–1995	290.26		
1995–1996	305.89		
1996–1997	299.7		
1997–1998	296.29		
1998–1999	245.74		
1999–2000	255.98		
2000–2001	265.18		
2001–2002	259.32		
2002–2003	260.63		
2003–2004	260.66		

reduce the purchasing power of the agricultural sector, given inelastic demand for food from the formal sector.

However, even if we allow for the assumption of constant terms of trade, increased agricultural output is translated into actual additional purchasing power only after it is sold to the formal sector. Moreover, the purchase of additional agricultural output by the formal sector means a leakage from the expenditure on the formal sector incurred by that sector itself. This reduces the demand for formal sector output. On the other hand, when

additional income that accrues to the agricultural sector through sale of additional food to the formal sector is, in turn, spent on formal sector products, demand for formal sector commodities rises. However, ultimately there is no impact on demand for formal sector output, as the two effects counter-balance each other.

Together, all these departures and contentions imply a complete absence of all the agriculture–formal sector demand-side interactions discussed in the literature.

When agriculture experiences a bumper harvest, even though it is capable of supplying more food to the formal sector, the additional food fails to be absorbed by the latter because of the lack of any consequent rise in demand for formal sector output, that could push up its production. Lack of rise in complementary demand for formal sector product from any of the inside or outside sources will restrict increase in demand for food as well. Thus, the formal sector and agriculture simultaneously suffer from the ‘realisation crisis’ (Bhaduri and Skarstein, 2003; Chakrabarti, 2001, 2011). On the other hand, expansion of the formal sector crucially depends on an exogenous supply of food, absence of which triggers off either profit squeeze in the formal sector or a price-wage spiral across the economy. Thus, even if agriculture cannot be the ‘home market’ for the formal sector, it provides crucial supply-side support.

Kalecki: concept of ‘domestic exports’. We assume, for the time being, that the primary problem for the formal sector is lack of effective demand while the agricultural sector’s supply of food to industry is sufficient.⁴ In such a situation, the only option left for the expansion of the demand-constrained formal sector in a closed economy is the path of government intervention, given agriculture’s inability to provide a ‘home market’ for it.

The ‘home market’ for industry is defined as any non-industrial sector within the national economy vis-a-vis which domestic industry can enjoy an ‘export surplus’. The agrarian sector cannot be this ‘home market’ since it cannot finance its trade deficit vis-a-vis industry, given that the agrarian sector of the developing countries in general lacks the power to issue any financial asset like shares and bonds. Hence, the government sector is the proper candidate to play the role of ‘home market’. It can purchase goods from the industrial sector, given its monopoly power over printing money. In its trade with government, domestic industry ‘exports’ goods against ‘import’ of money. This ‘export’ which is, by definition, an ‘export surplus’ is what Kalecki terms ‘domestic exports’ (Kalecki, 1971 [1934]).

Kalecki: agricultural supply-constraint. Kaleckian analysis rules out agriculture as a possible ‘home market’ for industrial product. However, there is clear recognition of agriculture as the source of supply of wage good or ‘food’ to the industrial sector. In other words, Kalecki (1993 [1954]) recognises that agriculture may act as a supply-constraint on industry.

Now, given this whole context, we posit a capitalistic formal sector and try to capture its relationship with agriculture. We find that, given our departures/assumptions, a rise in agricultural production creates the potential for formal sector expansion only from the supply-side. However, on the demand-side, realisation of this potential

without involving a change in distribution of income requires adequate adjustment of real government expenditure on formal sector output. Thus, this domestic export not only mitigates the problem of effective demand for formal sector output but also removes the realisation problem of agriculture. Our initial objective is to unite the two in a single framework and to develop the framework analytically through the incorporation of the informal sector as mentioned above. This incorporation of the informal sector will be found to generate crucial insights for the discourse on agriculture–industry linkage. On the other hand, this comprehensive framework also brings in the issues of informal–agriculture and formal–informal relations and thereby helps in understanding the nature and locus of the informal sector itself – the main target of this article.

Basic features of our economy with both the formal and informal sectors

(a) We identify four sectors: a capitalistic formal industrial sector (formal sector), a non-capitalistic agriculture producing ‘food’, a non-capitalistic non-agricultural informal sector and the government.

(b) The formal sector is characterised by excess capacity, unemployment and mark-up pricing. Price is cost-determined and output is demand-determined.

(c) All profits in the formal sector are saved whereas all wages are consumed. A part of wage-income is spent on food so that there is the possibility of the formal sector facing agricultural supply-constraint.

(d) A fixed marketable surplus of food represents the agricultural supply-constraint for the formal as well as the informal sectors. Consequently, the price of food is demand-determined. The total capacity is given in the *short run* due to natural, technological and also institutional rigidities.⁵

(e) Contrary to the basis of the formal sector being a capital–labour dichotomy and the accumulation motive being the driving force for production, the non-agricultural informal sector is characterised by the consumption motive – the motive of satisfaction of basic needs (Chatterjee, 2008; Sanyal, 2007: 211–213),⁶ self-employment and absence of ‘capital’.⁷ Moreover, there is surplus labour. It essentially comprises ‘petty commodity producers’ who produce for the sole purpose of consumption and use only indigenous resources. We can also refer to the International Labour Organisation (ILO) definition of the informal sector (Bangasser, 2000) for most of these characteristics (see also NSSO, 2001: 1–2).

(f) The informal sector is self-sufficient in terms of both implements and non-food consumption. However, like the formal sector, it has to depend on agriculture for food which is obtained with the proceeds received through the sale of net output (net of requirements for self-consumption and reproduction) to agriculture itself.

(g) Aggregate agricultural income is earned by selling marketable surplus in the combined food-market, which is purchased by the agents of both formal and informal sectors. These two sectors purchase food at a single price. This income, in turn, is spent on the products of both formal and informal sectors. The division of income depends on the relevant terms of trade.

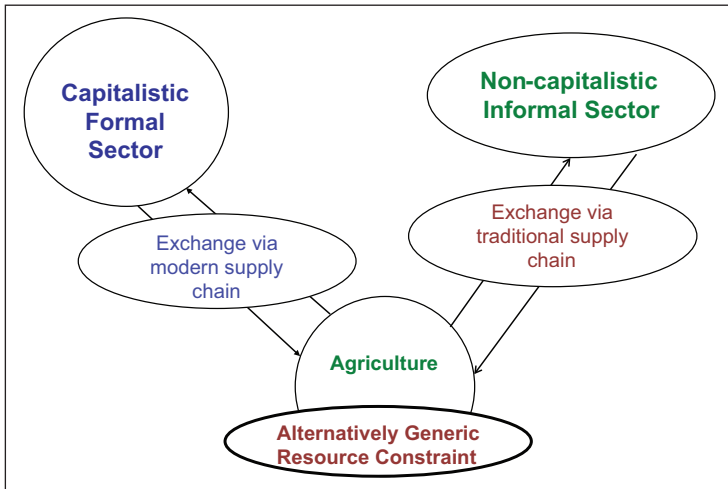


Figure 1. Structure of the model economy.

(h) There is balanced trade between agriculture and informal sector, on one hand and between agriculture and the formal sector, on the other.

(i) The government purchases the formal sector products by money creation. It constitutes the ‘domestic exports’ for the formal sector and relaxes the ‘effective-demand-constraint’ by providing the ‘home market’.

(j) The distribution of income among different classes is determined exogenously and there is social resistance to any drastic change in this pattern.

(k) We assume away any interaction between the formal and informal sectors. As a very small part of the informal sector is able to interact with the sophisticated formal sector, this seems to be a plausible assumption.⁸

(l) Ours is a short-run analysis, and we assume a closed economy set-up.

Thus, the basic structure of the model economy can be represented through the flow-chart in Figure 1.

Working of our model

*Interaction among formal sector, agriculture and government.*⁹ Excess capacity in the formal sector implies a given labour-output ratio l , and we take $l = 1$ through an appropriate choice of unit. Hence

$$L = Y \tag{1}$$

Here L and Y are the formal sector’s total employment and output, respectively.

Using equation (1), the marked-up price (p) over unit wage-cost (w) in the formal sector can be represented as

$$p = (1 + \tau) w \quad (2)$$

Here τ is a constant mark-up.

Workers' demand for a targeted real-wage in the formal sector is given by

$$w/p_f = \beta \quad (3)$$

Here p_f is the food-price and β is a positive constant.

Using equations (2) and (3), real-wage in terms of the formal sector output and terms of trade between agriculture and the formal sector can be written, respectively, as

$$(w/p) = 1/(1 + \tau) = \alpha \quad (3.1)$$

$$(p_f/p) = 1/[\beta(1 + \tau)] = \theta \quad (3.2)$$

α and θ are exogenously determined.

The basic income–expenditure accounting equation for the formal sector using the features listed in the section '*Basic features of our economy with both the formal and informal sectors*' can be written as

$$\begin{aligned} \text{Total formal sector output} = & \left(\begin{array}{l} \text{Total formal sector wage –} \\ \text{bill in terms of formal sector output} \end{array} \right)^{10} + \\ & \left(\begin{array}{l} \text{Total formal sector investment in terms of} \\ \text{formal sector output} \end{array} \right) + \\ & \left(\begin{array}{l} \text{Total government expenditure on} \\ \text{formal sector output} \end{array} \right) \quad (4) \end{aligned}$$

We assume that *real* investment (I) in the formal sector and *nominal* government expenditure (G) on the formal sector output are exogenously given at I^0 and G^0 . These assumptions along with equations (1), (3.1) and (3.2) transform equation (4) as follows

$$Y = L = (w/p).L + I^0 + (p_f/p).(G^0/p_f) = \alpha.Y + I^0 + \theta.(G^0/p_f) \quad (5)$$

Solution of equation (5) gives

$$L^* = [I^0 + \theta.(G^0/p_f)]/(1 - \alpha) \quad (6)$$

Now, food-demand per worker employed in the formal sector, given equations (3.1) and (3.2), can be expressed as

$$a_f = a_f(w/p, p_f/p) = a_f^0 \text{ (a positive constant)} \quad (7)$$

Hence, aggregate food-demand from the formal sector is

$$D_f = a_f^0 . L^* = a_f^0 . [I^0 + \theta.(G^0/p_f)]/(1 - \alpha) \quad (8)$$

There is an inverse relation between food-price and aggregate food-demand from the formal sector. As food-price falls, the money-wage is reduced, reducing formal sector price as well. Consequently, given the volume of *nominal* domestic exports, the *real* domestic exports rise, raising the level of formal sector employment following equation (8) and, hence, increasing the demand for food.

Now, we assume that for the time being a fixed amount of marketable surplus of food is supplied to the formal sector,¹¹ which can be written as

$$F = F^0 \quad (9)$$

Using equations (8) and (9), the food-market equilibrium condition is

$$F_0 = D_f = a_f^0 . [I^0 + \theta.(G^0/p_f)]/(1 - \alpha) \quad (10)$$

Equation (10) determines the equilibrium food-price p_f^* . It can be represented in a simple food-market demand–supply diagram with linear approximation (Figure 2).

The equilibrium food-price, p_f^* , determines equilibrium money-wage, w^* , in the formal sector, given equation (3). w^* , in turn, determines equilibrium price, p^* , the formal sector output-price, given equation (2). Consequently, the equilibrium size of real government expenditure, g^* , is endogenously determined as $g^* = G^0/p^*$. This equilibrium level of real domestic exports, in turn, can determine the equilibrium levels of employment and output in the formal sector using equation (5).

Corollary I: We can analyse the effect of an expansionary fiscal policy without any change in agricultural production. We assume an increase in nominal

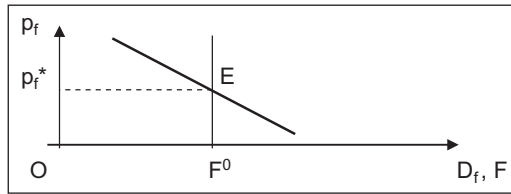


Figure 2. Food-market equilibrium representing the agriculture–formal sector interaction.

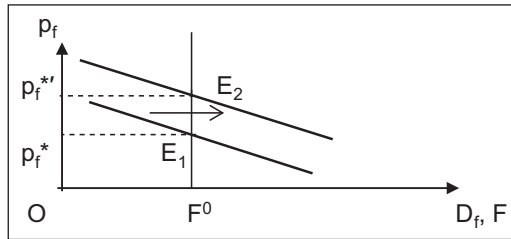


Figure 3. Effect of expansionary policy on the formal sector represented through food-market equilibria.

government expenditure on formal sector output. The effect of this policy is illustrated in Figure 3.

We start with the food-market equilibrium position E_1 with equilibrium food-price p_f^* . Now, G rises, with $F = F^0$. This leads to a rise in p_f . The process continues until one arrives at $p_f^{*'}$ such that the size of real domestic exports and, hence, the equilibrium levels of employment and output in the formal sector shrink back to their original values.

Corollary II: It follows that given the amount of per capita food consumption in the formal sector, a bumper harvest creates a *potential* for formal sector expansion. However, realisation of this potential requires an adequate increase in the value of real domestic exports. Such a case can be presented in terms of Figure 4.

Consider a case of downward flexibility of the formal sector money-wage. Let us assume a bumper harvest, raising the value of F to F^1 . As a result, the equilibrium food-price falls from p_f^* to $p_f^{*'}$. Given the distributive factors, this reduces w and, subsequently, p also falls. This, in turn, expands the size of real domestic exports and, hence, the levels of formal sector output and employment rise. Correspondingly, we get the movement of food-market equilibrium from E_1 to E_2 .

However, with downward rigidity of w , a fall in p_f due to a bumper harvest does not automatically increase real domestic exports. In that case, adequate expansion of the home market can only be achieved by a proper expansion of nominal government expenditure. The required expansion is such that the food-market clears at p_f^* and the equilibrium position moves to E_3 .

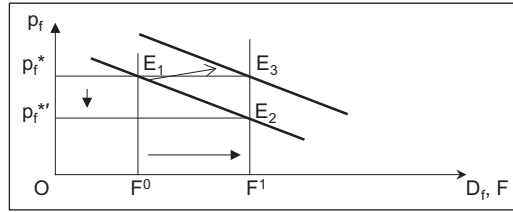


Figure 4. Effects of a bumper harvest on the formal sector shown through food-market equilibria.

Interaction between agriculture and the informal sector. Let us now turn to the agriculture–informal sector interactions separately from the agriculture–formal sector linkage as discussed above. This separation is a hypothetical one, which will be relaxed subsequently.

First, from the condition of labour-surplus in the informal sector, we can specify constancy of food requirement rate at the minimum subsistence level. Hence, $a_{fi} = a$. This is the constant per capita food consumption rate in the informal sector.

The absence of fixed (limiting) capital in the informal sector implies fixity of the labour-output ratio (l_i). Thus, $l_i = b$, a constant.

We also assume without loss of generality that the fraction of intra-sectoral utilisation of output in the informal sector for self-consumption and reproduction (β_i) is constant. Hence, $\beta_i = c$, a constant.

All these combined together indicate that the real average cost of production in the informal sector due to food and non-food consumption and use of implements and raw materials is structurally determined and is constant. Furthermore, as there is no surplus, the food and non-food consumption-cost and implements and raw materials costs solely determine the informal sector product-price. This price can be expressed as $p_i = [p_f \cdot a \cdot b + p_i \cdot c]$. Here p_i is the informal sector output-price and p_f is the food-price as before. Assuming, $b = 1$ (for simplicity), we have

$$p_i / p_f = a / (1 - c) = 1 / t \text{ (say)} \tag{11}$$

Thus, absence of fixed capital and the assumption of surplus labour along with the fixity of the fraction of intra-sectoral utilisation of output jointly imply a given terms of trade between the informal sector and agriculture.¹² Moreover, at these given terms of trade, the supply of net output, s , for the informal sector will be perfectly elastic and hence its value is demand-determined. Consequently, the s curve will be horizontal on the ‘ s – p_i/p_f ’ plane (Figure 5). Furthermore, a particular amount of food supply to the informal sector always induces a definite volume of trade between agriculture and the informal sector. As the perfectly elastic s and, hence, the informal sector output, y , and the corresponding employment, m , are demand-determined, the equilibrium values of these variables are solely set by the portion of marketable surplus of food or, more precisely, that of agricultural income transacted with the informal sector.

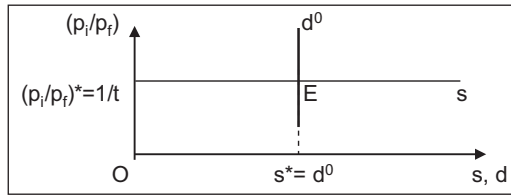


Figure 5. Informal sector–market equilibrium representing the agriculture–informal sector interaction.

As the supply of informal sector output is perfectly elastic and as it is determined only by the food supply, we get a crucial result that demand for food from the informal sector is also perfectly elastic. Agriculture does not face any demand problem so far as the informal sector is concerned. Thus, we have a sharp dichotomy between the agriculture–formal sector and the agriculture–informal sector inter-linkages.

Agriculture–informal sector and agriculture–formal sector interactions: a fundamental contrast. In our framework, agriculture acts as a source of food and raw materials and of demand for the informal sector. However, as we bring in the issue of agricultural supply, we implicitly incorporate in our analysis the question of the realisation of income by farmers. Only if the potential income is realised, is there the possibility of generating demand for the informal sector products. In our analysis, the crucial characteristic of the consumption motive for both the informal sector petty-producers and the (non-capitalistic) farmers closes this gap. There is no realisation problem for agriculture so far as the informal sector is concerned.

However, the absorption of agricultural surplus in the formal sector is not at all guaranteed. Agriculture may suffer from a ‘realisation crisis’ so far as its interaction with the formal sector is concerned. Mere supply of agricultural commodities does not automatically imply their sale in the capitalistic formal economy, as production in this sector is organised with accumulation motive and not for consumption as such.

A capitalistic economy would not invest and grow unless there is any (ex ante) guarantee of absorption of its ‘surplus’; mere (equivalent) exchange of its output with inputs like food and agro-raw materials cannot serve that purpose. If the capitalistic formal sector suffers from any inherent problem of insufficient demand and if no external support (such as net exports or government expenditure) is forthcoming, the simple supply of agricultural surplus can ensure demand for only an equivalent amount of formal sector output without assuring the absorption of the ‘surplus’ per se. Because of this non-realisation of ‘surplus value’, simple supply of agricultural surplus cannot induce capitalistic expansion.

Back to our model. From our preceding analyses, we know that the value of aggregate demand for informal sector output is equal to the part of aggregate agricultural income that is spent on it.

Hence

$$p_i \cdot d = e \cdot (p_f \cdot F) \tag{12}$$

Here d signifies the aggregate demand for the informal sector output and e is the fraction of the aggregate agricultural income spent on the informal sector output or that of the aggregate marketable surplus of food transacted with this informal sector.¹³

From the basic feature (g) of the section '*Basic features of our economy with both the formal and informal sectors*', we know that aggregate agricultural income is earned by selling a marketable surplus which is purchased by the agents of both formal and informal sectors. This income, in turn, is spent on the products of formal and informal sectors. As we have formulated earlier, the division of this income depends on the relevant terms of trade. Hence, we can write

$$e = e(p_f / p, p_f / p_i); \text{ with } e_1 < 0 \text{ and } e_2 > 0 \quad (13)$$

But, putting equations (3.2) and (11) into equation (13), we get

$$e = e^0 \quad (14)$$

Now, rearranging equation (12), substituting equations (14) and (11) into it and assuming a fixed marketable surplus of food, F^0 , we have

$$d = (p_f / p_i) \cdot e^0 \cdot F^0 = t \cdot e^0 \cdot F^0 = d^0 \quad (15)$$

This gives a vertical d^0 curve on the ' d - p_f/p_f ' plane (Figure 5).

From our characterisation of s (the net output in informal sector) as demand-determined and using equation (15), we get equilibrium s as

$$s^* = d^0 = t \cdot e^0 \cdot F^0 \quad (16)$$

This equilibrium is shown graphically in Figure 5.

As s is the net output in the informal sector, gross output (y) and employment (m) can be derived, given c (the constant fraction of the informal sector output utilised intra-sectorally).

Now, in the presence of an informal sector, only the fraction $(1 - e)$ of the aggregate food supply is directed to the formal sector instead of the full F^0 . Thus, the formal sector faces a shrinkage of food supply to $[(1 - e^0) \cdot F^0]$ from F^0 (which would have been the supply of food to the formal sector in the absence of informal sector). This supply-side squeeze reduces the formal sector's potential employment and output. Contrarily, if we assume that given an informal sector-agriculture complex, the formal sector-agriculture composite is incorporated into the economy, the former circuit gets constricted. The introduction of the formal sector siphons off crucial food supply from the informal sector

and destroys it. On the other hand, the formal sector simultaneously fills the shortage of non-food owing to the contraction of informal sector through a supply of formal sector goods and services to agriculture (exactly as in Hymer and Resnick, 1969).

Thus, we have a basic conflict between the formal and informal sectors in terms of employment and output in the presence of (the generic) agricultural supply-constraint.

In our above analysis, the two complexes, the agriculture–formal sector linkage and the agriculture–informal sector interactions, are treated as separate entities. This was essential to clarify certain crucial characteristics of these two sets of interactions in the context of the centuries old debate on agriculture–industry linkage. It was also necessary to explicate the fundamental conflict between the formal and informal sectors. But we need to relax this hypothetical segregation in order to analyse certain policy issues.

Formal–informal conflict: ‘Accumulation by dispossession’

First, we modify some of the crucial assumptions of our basic framework pertaining to the formal sector by considering certain contemporary changes in the developing economies.

As the population engaged in the formal sector, both workers and capitalists, spend a very small fraction of their income on food, it is quite likely that the wage is set independently of the price of food. Hence, from a short-run macro perspective, treating the money-wage as fixed is not a strong assumption (Bose, 1989; Taylor, 1983). Even if the price of food varies, the money-wage remains the same. The price of formal sector output, as before, is set by imposing a mark-up over wage. Hence, this price is also fixed (Bose, 1989; Taylor, 1983).

A change in food-price has the following consequences. On one side, given the assumption of fixed per capita food consumption by the workers, if the food-price rises, the expenditure on formal sector output will fall. However, under the assumption of formal sector–agriculture balanced trade, this leakage of demand from the workers is just counterbalanced by the increased income and hence expenditure on formal sector output by the farmers. Thus, a food-wage adjustment has no demand-side impact on the formal sector.

As the money-wage is assumed to be fixed, say at w^0 , the formal sector price p is fixed, say at p^0 . Hence, the product-wage in terms of formal sector output is *fixed* at $(w^0/p^0) = 1/(1 + \tau) = \alpha$; but the food-wage-rate, (w^0/p_f) , is now a *variable*. Moreover, terms of trade between agriculture and the formal sector, (p_f/p^0) , is also a *variable*.

Now, given the earlier notations and the assumptions $w = w^0$ and $p = p^0$ and given that p_f/p^0 is a variable now, equation (6) is modified (through modifications of equation (5)) in the following way

$$L^* = (I^0 + g^0) / (1 - \alpha) \quad (17)$$

Food-demand per worker employed in the formal sector has been assumed as a_f^0 , a positive constant; the relatively well-off formal sector population consumes a *fixed* amount of food per capita, irrespective of real income. Hence, food-demand from the formal sector can be written as

$$D_f = a_f^0 \cdot [(I^0 + g^0) / (1 - \alpha)] = D_f^0 \quad (18)$$

This gives us the vertical food-demand curve for the formal sector, that is, D_f on the ' D_f - p_f ' plane as in Figure 6.

Next, we turn to food supply. Until now we have considered 'e' to be exogenous. We need to relax this assumption to explicate the probable impacts of a change in the terms of trade. Putting equation (11) and the condition, $p = p^0$ into equation (13), we have

$$e = e(p_f / p^0, t), \text{ with } e_1 < 0 \quad (19)$$

Consequently, with equation (19), the equilibrium condition (16) changes to

$$s^* = d = t \cdot e(p_f / p^0) \cdot F^0 = d(p_f / p^0, F), \text{ with } d_1 < 0, d_2 > 0. \quad (20)$$

This implies a *leftward shift* of the vertical informal sector demand curve d , drawn on the ' d - p_f ' plane, owing to a rise in p_f (Figure 6). Furthermore, equilibrium condition (20) is also shown in Figure 6.

Given (e.F) as the fraction of food supply that is transacted with the informal sector and given equation (19) and the condition $F = F^0$, we can write food supply to the informal sector as

$$f = e(p_f / p^0) \cdot F^0 = f(p_f / p^0, F), \text{ with } f_1 < 0, f_2 > 0. \quad (21)$$

Given equation (21), food supply to the formal sector can be rewritten as

$$F_f = F^0 - f = [1 - e(p_f / p^0)] \cdot F^0 = F_f(p_f / p^0, F), \text{ with } F_{f1} > 0, F_{f2} > 0 \quad (22)$$

It implies a *positively sloped* F_f curve on the ' F_f - p_f ' plane (Figure 6).

Consequently, equations (18) and (22) modify the equilibrium condition (10) as

$$F_f(p_f / p^0, F) = D_f^0 = a_f^0 \cdot [(I^0 + g^0) / (1 - \alpha)] \quad (23)$$

This equilibrium condition (23) modifies Figures 1 to 3, by making the F_f (earlier F) curve positively sloped instead of being vertical. The fundamental difference is that, now

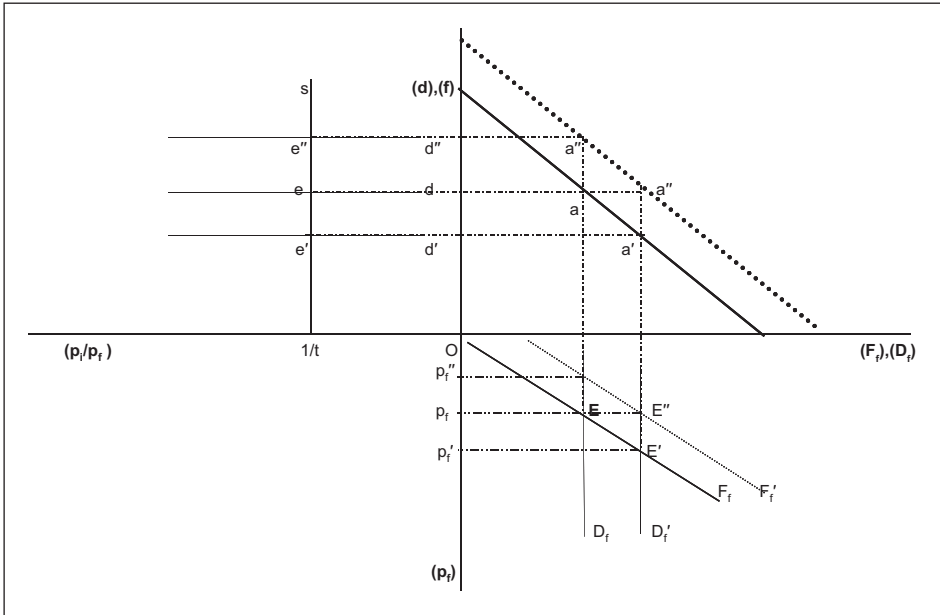


Figure 6. Simultaneous effects of expansionary policies on the formal and informal sectors represented through food-market equilibria for the formal sector and through the informal sector-market equilibria.

expansionary thrust is effective in expanding the formal sector. However, we will see that it happens only at the cost of expropriation of the informal sector.

The substitutability of food supply to the formal and informal sectors (given the overall potential) can be captured through a production-possibility-frontier (PPF). Assuming perfect substitutability, the PPF becomes a straight line (Figure 6). Hence

$$F^0 = (F_f + f) \tag{24}$$

Using equations (20)–(24), we can formulate Figure 6.

Next, we take up some policy issues, given these formal sector–agriculture–informal sector interactions as represented by Figure 6.

(a) Let us start from the initial equilibrium points E and e generated through the interactions between the sets of demand and supply curves (D_f, F_f) and (d, s), respectively, and mediated by the PPF. Now, we assume an increase in g^0 (or I^0) pushing up D_f to, say, D'_f . Consequently, the food-market equilibrium for formal sector–agriculture interactions shifts to E' moving along the F_f curve raising the equilibrium food-price from p_f to p'_f and, hence, drawing resources towards the formal sector. This squeezes resources for the informal sector. On the other hand, a rise in p_f shifts d to the left (d') following equation (20). Hence, we get the new informal sector equilibrium point e' through the interaction

between s and d' . Thus, expansionary boosts to the formal sector are effective (unlike in Figure 3), but that happens at the cost of contraction of the informal sector.

As the formal sector expands, it drives up the food-price, which, in turn, raises informal sector prices, given the agriculture–informal sector terms of trade. However, the formal sector price remains the same, given the money-wage and the mark-up. Hence, the formal–informal relative-price falls, reorienting (induced) demand and, thus, food supply away from the informal sector. Modernisation of the economy through expansion of the formal sector is not at all a cost less phenomenon. And it is quite possible that the social costs are higher than the corresponding benefits, not only in the short run but also in the long run.

(b) Contractionary effects on the informal sector due to formal sector expansion, as above, could be checked, only if a simultaneous and an appropriate increase in aggregate food supply F is ensured (that can be captured by an appropriate outward shift of PPF as shown in Figure 6) counterbalancing the impacts of food-drain to the formal sector. This could be materialised when formal sector expansion takes place only in conjunction with a bumper harvest so that food supply rises appropriately and the new formal sector–agriculture equilibrium is at E'' . Food-price does not change and, hence, the informal sector demand (d) does not shift from the initial position. The formal sector expands without changes in the informal sector output and employment.

(c) However, the impact of an increase in food supply, say through a bumper harvest, without any simultaneous expansionary demand-boost for the formal sector is revealing. As food supply rises, PPF shifts out and food supply to the formal sector, that is, F_f shifts to F_f' . Consequently, the food-price p_f falls to p_f'' shifting out the informal sector demand d to d'' . Thus, the informal sector expands, without any effect on the formal sector. Though food supply rises, reducing food-price, the formal sector price cannot fall due to money-wage rigidity. Thus, the formal sector–informal sector relative-price rises, raising the (induced) demand for and, hence, supply of food to the informal sector. As food prices fall and there is redistribution of real income to the formal sector workers away from the farmers, workers' demand for the formal sector output rises. But farmers' demand for this formal sector output falls by an equivalent amount under balanced trade. Hence, we do not have any effect on the formal sector.

(d) Hitherto, to integrate the formal sector–agriculture–informal sector interactions and, hence, to capture the variability of the fraction of aggregate agricultural income spent on the informal sector (i.e. variability of e), we assumed fixity of w and p . But we could make w and p flexible and fix p_f and hence, p_i , given the informal sector–agriculture terms of trade. The rigidity of p_f is also reasonable, given the practice of price-support to the farmers and price-regulation in the open-market or 'fair-pricing' through a public distribution system in the developing countries. But under such an altered assumption, the above-mentioned policy effects are reversed. When there is an excess demand for formal sector output under expansionary policy, formal sector prices rises. This raises the formal sector–informal sector relative-price inducing demand-leakage, and food supply increase towards the informal sector. Thus, the formal sector ultimately contracts. Hence, the policy of fixing p_f should be objected to by the formal sector. This is corroborated by the contemporary reaction against agricultural price-fixing under the pretext of ensuring efficiency through the 'free-market'.

Conclusion

The first objective of this article has been to show that the formal sector–agriculture relation is distinctly different from the informal sector–agriculture linkage. Second, contrary to the claims in a vast literature that agriculture constitutes the home market for the formal sector, it has been shown that agriculture provides only supply-side support for the latter and cannot be the home market.

The most important objective of this article was to show an inherent conflict between the formal and informal sectors originating from the crucial condition of economic resource-sharing. Furthermore, as the formal sector expands, we have shown that it squeezes the informal sector by dragging out resources. On the other hand, this destruction of the informal sector itself creates the ‘home market’ for the formal sector.¹⁴ Thus, the processes of modernisation boosting capital accumulation in the formal sector create the mass of dispossessed, and we have intensification of the formal–informal conflict owing to ‘accumulation by dispossession’ (Harvey, 2003).

Acknowledgements

The article is dedicated to the Late Kalyan Sanyal, the author’s PhD supervisor. The author is also grateful to Arup Mallik, Sarmila Banerjee, Aparajita Mukherjee, Anirban Kundu and Gary Mongiovi for valuable inputs. He also thanks the anonymous referees for important suggestions. However, the usual disclaimer that the author accepts full responsibility for errors and omissions applies.

Earlier versions of this article were presented at the Burdwan and Jadavpur Universities, India; University of Newcastle, Australia; and at The Max Planck Institute for Economics, Germany. Comments from conference participants are gratefully acknowledged.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Notes

1. ‘The goal must be to make these informal activities part of a growing formal sector that provides decent jobs, incomes and protection, and can trade in the international system’ (World Commission on the Social Dimension of Globalization, 2004: 61).
2. In this context, we refer to Chakrabarti (2001, 2009, 2011) and Chakrabarti and Kundu (2009). These frameworks have been modified, extended and developed substantially. We need to introduce and reorient these frameworks for the sake of continuity of analysis and, most importantly, for a comparative study of agriculture–formal sector and agriculture–informal sector linkages.
3. ‘The second piece of good news is the monsoon has been very good ... with a bountiful harvest, and with the associated activities like animal husbandry, poultry, also picking up, you can see a lot more value in the rural areas, which will help sentiment and growth’. (Reserve Bank of India’s Governor R. Rajan at Harvard Business School on 16 October 2013. *The Indian Express*, 2013)
4. According to many researchers, unemployment and underemployment in underdeveloped countries result from supply shortages rather than from deficiency of effective demand. But,

at the same time, low demand can be an additional cause of complication, and this article aims to concentrate on this latter issue along with the former problem. In fact, we intend to address both the issues of demand and supply shortages in this article. And here lies the novelty of our approach.

5. In fact, this agricultural supply-constraint represents the generic resource-limitation. To capture the whole lot of resources required for both the formal and informal sectors, we are using 'food' as a proxy. Essentially, the formal and informal sectors share different types of economic resources like food, agro-raw materials, minerals, water resources, forest products and, most importantly, physical space that is very crucial for densely populated countries of Asia and even Latin America. Across many countries of the Third World, the bone of contention between the formal/centre and its outside/informal has been the 'water-forest-land' resources (*jaal-jangal-jameen*).

Although in the context of a specific country, some of these resources could be non-binding, given the option of international trade, these are essentially binding at the global level (e.g. global food-shortage – a possibility in near future with full entry of Chinese and Indian consumers into the global market, non-renewable resource constraint across the globe, etc.). Moreover, most of the resources (*jaal-jangal-jameen*) are not even tradable. Incorporation of such resource-use by both the formal and informal sectors could be an extension of our following analysis, but it will only technically enrich our *models* without contributing much in terms of the fundamental message of this article: the global supply-side conflict between the capital/centre/formal-sector and its outside/non-capital, that is, the traditional and informal sectors.

6. 'The fundamental logic that underlies the operations of corporate capital is further accumulation of capital, usually signified by the maximisation of profit. For (the informal sector), while profit is not irrelevant, it is dominated by another logic – that of providing the livelihood needs of those working in the units'. (Chatterjee, 2008: 58)
7. Simple tools produced in the informal sector itself are used. However, these means of production cannot be 'capital' because of the absence of the profit motive (Bhaduri, 1986). More importantly, as these rudimentary tools are produced indigenously, they do not limit the production capacity unlike the case of fixed (limiting) capital of the modern sector.
8. '... while some informal workers provide low-cost inputs to global production systems, the majority are excluded from the opportunities of globalisation and confined to restricted markets' (World Commission on the Social Dimension of Globalisation, 2004: 60).
9. More comprehensive analyses of this particular issue can be found in our own earlier works: Chakrabarti (2001, 2009, 2011) and Chakrabarti and Kundu (2009). We need to introduce and reorient these frameworks for the sake of continuity of analysis.
10. A part of the wage-bill though spent on food, it fully comes back to the formal sector as agriculture-formal sector trade is balanced.
11. However, only a fraction of food supply should go to the formal sector in presence of the informal sector as we see below. But, for the time being, we assume away such a presence of informal sector. As we introduce the informal sector, the relevant conditions will be modified.
12. While agriculture-formal sector terms of trade is fixed through class-bargaining, agriculture-informal sector terms of trade become rigid following the logic of survival. As the requirement of survival binds the agriculture-informal sector terms of trade, it cannot change. But, the other terms of trade may change depending on the structure of the economy.
13. As we have a single food-market and agriculture-informal sector and agriculture-formal sector balanced trades, e represents fraction of both agricultural income and marketable surplus of food transacted with the informal sector. This is a demand-driven outcome and the division of agricultural supply is just a result of that.

14. This reminds us of ‘primitive accumulation’ (Marx, 1958) in spite of crucial differences in the historical processes. It is quoted by Lenin (1972 [1899]: 42) from Marx (Capital, vol. 1) that ‘(t)he expropriation and eviction of a part of the agricultural population not only set free for industrial capital the laborers, their means of subsistence, and material for labor; it also created the home market’. As ‘primitive accumulation’ proceeds and *agricultural and non-agricultural population gets expropriated*, a void is created which is filled up with the products of the upcoming capitalistic industry. ‘Thus, from the standpoint of abstract theory, the ruin of the small producers in a society of developing commodity economy and capitalism means ... the creation ... of the home market’.

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