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FDI and Business Internationalization of the Unorganized Sector:

Evidence from Indian Manufacturing

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Abstract: Available evidence, though limited to the organized sector only, suggests that FDI generally flowing in with MNE activities or FIIs generate technological and market access spillovers for firms outside the core group in destination countries. We investigate the organizational link between formal and informal sectors in India and argue that the spread of internationalization is more when production outsourcing prevails between such units. Higher wage in the organized sector is a factor that breaks standard institutional barriers leading to outsourcing of production to informal units. The evidence is puzzling to the extent that foreign capital and better know-how as drivers of international business to developing countries usually relax the credit constraint facing formal sector units at the destination. Using a measure of technology and a panel data for a large number of industrial units in India, we show that FDI transmitted through technology spill over leads to significant increase in the gross value added for the firms located in the informal sector. The paper points out that production re-organization associated with international business should provide additional insights for standard measures of internationalization of production and services.

1.   Introduction

Studies on international business indicate that internationalization of firms is a process by which the localized firms gradually increase their international involvement. The degree to which internationalization of firms become of critical importance for a country may depend substantially on the institutional and organizational structures adopted and prevalent in such places. At the same time, the nature of the business activities, knowledge of the market, resource and market commitments (see Johanson and Vahlne, 1977) at the level of the firm could turn out to be important factors discerning the more international firms from the ones[1] that operate within a limited domain and remain 'local'. Such internationalization may work through various linkages, including cross-border engagements in joint ventures, Greenfield investments and acquisitions. A number of influential country studies delineate the scope and extent of each of these avenues leading to internationalization of firms (viz. Kogut and Singh, 1988; Steuber *et. al.*1973), whereby 'local' firms produce and sell back to the 'global' parent firm. The extant literature, however, does not discuss the spillover of internationalization through outsourcing of production from formal to informal firms within a country. Since both the direction of international trade and capital mobility have turned predominantly into north-south phenomena over the last two decades, investigating the degree to which formal and informal firms interact in the south countries cannot be neglected altogether in view of a better understanding of the depth of internationalization. The present paper tests the hypothesis that foreign direct investment flowing from the industrialized to less industrialized countries may lead to production spill over from the formal or organized firms to the informal or narrowly defined, unorganized firms[2]. Once the involvement of firms typically outside the domain of organized business activities is taken into consideration, the overall degree of internationalization for firms in a specific country may turn out to be much more than originally estimated (Tokman, 1978). Our empirical results

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[1] Sullivan (1994) offers a robust measure of the 'degree of internationalization' of firms compared to the usual measure of 'foreign sales as percentage of total sales'

[2] In an earlier work, Monroy, et. al. (2014) showed that formal sector subcontracting is positively related to employment growth only in the most modern segments of the informal sector.

show that although the informal firms in India are not part of international business activities directly (earlier evidence suggests that some informal firms export directly, albeit the extent is fairly miniscule; see Marjit and Kar, 2011), but sub-contracting from formal firms that are increasingly exposed to international business through mobility of capital or through pure off-shoring of production and services, actually include them in the process of internationalization. In addition, the formal firms regularly engage contractual labor without the standard benefits associated with such employment, in order to fulfill input and output commitments made to foreign collaborators that either enter into joint ventures or supply capital via FDI and institutional investments (FII). The outsourcing of jobs to informal producers in the south countries, therefore, offers a new dimension in the literature concerned with internationalization of firms. This process of subcontracting activities of formal enterprises, representing all Indian manufacturing industries, has been studied by Ramaswamy (1999) showing an increase in subcontracting intensity of formal sector production between 1970 and the early 1990s.

Economic reforms in the developing and emerging economies of the world along with deeply entrenched global sourcing of production have undoubtedly resulted in increased fragmentation of production (Hanson, 2001). Simultaneously, the inflow of foreign direct investment (FDI) to the developing countries over the last few decades has been one of the most vibrant instruments of such production fragmentation, especially through spillover of production across sectors, but often limited by institutional restrictiveness. Generally speaking, production fragmentation allows firms to utilize cheaper resources, such as low-cost labor inputs along the value-added chain leading to gains from specialization (Deardorff, 2005). That outsourcing is a dominant characteristic of modern production organization is consequently well reflected in the theoretical and empirical literature (see Helpman, 2006 for a review). Note however, that production outsourcing in developing and transition countries that attract much research attention actually covers the domain of formal firms only and leaves out the large informal counterpart, despite the fact that informal units produce a considerable share of industrial and

semi-industrial output in such countries. In support of the objective laid out in the previous paragraph, we explore the pattern of production outsourcing between organized and unorganized units in India in the presence of foreign capital inflow. The international business implications of this FDI-linked production outsourcing from formal to informal units seems quite pervasive for India, where the share of workforce involved in informal activity is close to 93% (NCEUS, 2009). The spread of technology, of know-how, the rise in capital intensity and the possible expansion of global business links all seem to be positive implications associated with such international business activities between north and south countries.[3] In fact, Tokman (1978) had suggested that existence of subordination within the informal sector would result in a declining trend in the share of income for the informal sector as a whole, but this will not imply that the sector will disappear.

Various industrial and service sector firms in India receive contracts and foreign investments to aid production and a large number of such firms regularly outsource parts of the output (often intermediate goods) to firms in the informal sector. Whether FDI comes in to support production of semi-conductors, or export quality leather shoes or to the domestic transport sector, a portion of the output is produced by such firms that do not have the same legal and institutional standings as displayed by formal firms. The informal firms are essentially those, which are often not registered, do not pay taxes, do not abide by labor and industrial rules and regulations and violate property rights. Generally, a typical unorganized firm evades taxes and bypasses payment of minimum wage and labor union participation. Some of the

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[3] It is almost intrinsic to the description of formal and informal sectors in developing countries, that, 'formal' sector workers use collective bargaining as a wage-setting mechanism and include employees mainly from the government and registered private manufacturing and service firms. Historically speaking, in any country, the collective bargaining starts with participation of industrial workers – a tradition that has spread to the evolving service sector and has typically ignored the agricultural sector. In many developing and transition countries, however, this participation rate is not more than 30% of the total workforce, (see, Kar and Marjit, 2001 for further details). The remaining large section of workers do not get the benefit of union membership, neither in terms of pay nor job protection and are not even covered by national minimum wage acts (which exists but rarely adhered to in the poor countries, due to weak governance, strategic non-intervention, etc.) and are generally referred to as the informal workers. Thus, another description of a formal sector will be where minimum wage regulation is strictly enforced, whereas in the informal sector such law is not properly enforced and wage can have a free fall. We use the broader connotation of informal sector interchangeably with the unorganized sector (referring mainly to the industrial units).

unorganized units, as part of the informal institution, are nevertheless listed in the industrial directories and are commonly referred to as the Directory Manufacturing Enterprises (DMEs) as against Non-Directory Manufacturing Enterprises (NDMEs), coexisting with one-man self-employed units known as Own Account Enterprises (OAEs). These definitions have also been adopted by the International Labor Office following recent discussions in the ILO and Delhi Group (2007). The coinage of informality however, belongs to early writings available as part of reports prepared by the ILO (1972). In fact, there is a different stream of literature as Altenburg and Stammer, (1999); Mehrotra and Biggeri, (2005) on clusters which identifies the existence of micro and small enterprises mostly to unfavorable macroeconomic conditions which are caught in the low skills/low investment vicious circle[4].

Related literature suggests that, a different variety of firms (not necessarily in the informal sector) in China receive large positive spillovers from foreign investors of non-Chinese origin. In this connection, it may also be pointed out that organizational development (OD) in case of domestic transfers of production are usually less complicated compared to approaches made directly by MNCs of foreign origin, although many western firms are open to OD compared to local firms in East Asia (see Lau and Ngo, 2001).

India is no exception, and with an overwhelming share of informal firms located across different regions of the country, it should be natural to inquire if outsourcing is common between formal and informal firms (see Marjit and Kar, 2011 for models that engage with production outsourcing and buyback of intermediate goods produced in the informal sector by the parent formal firms and Mehrotra and Biggeri, 2007 for a detailed case studies on the wide spread of informal sector in the low and middle income countries). This literature (viz. Harriss 1990, Guha-Khasnobis and Kanbur 2006, Marjit 2003 and in particular, Siggel 2010) did not inquire if such tendencies rise with foreign capital flowing into the formal sector and how pervasive this effect might be. Using recent survey data on unorganized manufacturing units in

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[4] Also see Malony (2004) for an excellent view of the informal sector in developing countries primarily as an unregulated microentrepreneurial sector and not as a disadvantaged residual of segmented labor markets

India, we establish that foreign investments flowing into the organized sector may in fact lead to outsourcing to the unorganized sector. This is often influenced by the benefits of lower production costs creating an opportunity to remain viable and attractive to foreign investors. In the process, the entire informal sector may undergo a significant rise in the level of value added.

From the year 2000 inflow of FDI has been promoted hugely in India, including permission for 100% share with automatic approval in many sectors like, textiles, paper, chemicals, drugs and pharmaceuticals, rubber and plastic, non-metallic mineral products, metal products, machinery and equipment and automobiles. Notably, all these products have parallel production in the unorganized sector creating scope for outsourcing. We measure the effects of (i) prevailing wages in the organized sector, (ii) of technology, (iii) FDI inflow to the formal sector and (iv) the informal wage as primary variables of interest, on the gross value added (GVA) of the unorganized firms. We find that FDI flowing to the organized sector results in a higher GVA of the unorganized sector. This particular implication of doing business in developing countries have been discussed in popular forums, in the media, and even in Hollywood films where for example, a local electrician working in the informal sector fixes the power lines for running computers in a MNC-controlled BPO (Business Process Outsourcing) unit operating from the open terrace of a rented apartment whose ground floor gets waterlogged due to poor drainage. The empirical evidence on the depth and spread of business internationalization is what we offer here.

Since, this may apparently be puzzling, we discuss a possible transmission mechanism through which FDI aids production in the informal sector. Section 2 develops an analytical model, discusses the data and variables while, section 3 presents the econometric specification and results. Section 4 concludes.

2.   Analytical Structure and Empirical Model

We assume that an organized sector and an unorganized sector both exist in a small open economy. Each sector has a formal/organized unit and an informal/unorganized unit. In this economy, X is an import-competing good and Y is an export good produced with neo-classical technology. The formal segment in each sector contracts workers on a fixed wage, higher than that available in the informal segment.[5] We assume, not unrealistically that the formal wage is always higher than the informal wage because labor laws allow various benefits to the formal workers. The micro-theoretic foundation of dual wage system (viz. Goldberg and Pavcnik, 2003) applies here as well.

Let us clearly point out to the benefit of the wider audience that working in the informal sector is usually an outcome of formal industrial jobs being inadequate in number in the urban areas of atypical developing countries. As wage is allowed to adjust freely, there is usually no open unemployment in the informal sector. The model provides suitable representation of these features in addition to the fact that capital does not move freely between the formal and the informal segments. Within the formal segment also, let us assume capital is sector-specific. It turns out that the first assumption is far more crucial than the second. We shall take up the second when we discuss the detailed working of the model. Violation of the second assumption should not jeopardize our results.

In fact, the assumption behind the relatively inelastic interest differential between the formal and the informal sectors is empirically sound, mainly owing to the lack of transparency and legal status of the informal business units. Therefore, despite sufficient incentives for formal capital to relocate to the low-wage capital-starved informal segment (the return should be quite high), bank loans and other formal sources of credit cannot automatically flow out due to want of compliance with legal status and collaterals. Most informal units obviously do not satisfy

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[5] In this example, one can allow for re-negotiation of the fixed formal wage. We have checked that there will not be any qualitative change in the results even if we allow union bargaining. In fact, a re-negotiation of the fixed formal wage will redistribute the effects between labour and capital depending on the intensity assumptions used in this framework.

these requirements. Furthermore, possibilities of punitive actions/closures/evictions on these units via state policies render formal direct investments extremely risky. Thus, whatever little capital flow materializes, it takes the form of outsourcing of formal production/services to the informal segment (vertical linkage, see Marjit, 2003) and that which can be closely monitored by the formal counterpart through buy-back arrangements easily subjected to quality control.

While issues with quality monitoring, moral hazard on the part of the outsourcing firm etc. certainly require further research trying to relate formal and informal sectors, it is not what we focus on presently. In Marjit (2003), it has been shown that the mobility of capital between the formal and informal segments works towards an improvement in informal wage when more workers are pushed into the informal segment as trade reform leads to the downsizing of the formal sector. Moser (1978) presents a model of the informal sector based on petty commodity production and its subordinate relationship to the capitalist sector. It also identifies a continuum of productive activities, with complex linkages and dependent relationships, and identifies the dynamics of production and constraints on expansion. In this model we deliberately close the avenue for such mechanism to operate and still obtain the main result on production outsourcing.

We set up the following equations (unit cost equals unit product price in formal and informal sectors, 1-4; and total factor requirement equals total supply, 5-8) commensurate with above assumptions.

The competitive price conditions are:

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

$$\tilde{a}_{LX}w + \tilde{a}_{KX}R = P_X \qquad (2)$$

$$a_{LY}\overline{w} + a_{KY}r_Y = P_Y \qquad (3)$$

$$\tilde{a}_{LY}w + \tilde{a}_{KY}R = P_Y \qquad (4)$$

Full-employment conditions:

$$a_{LX} X + a_{LY} Y + \tilde{a}_{LX} \tilde{X} + \tilde{a}_{LY} \tilde{Y} = L \qquad (5)$$

$$a_{KX} X = K_X \qquad (6)$$

$$a_{KY} Y = K_Y \qquad (7)$$

$$\tilde{a}_{KX} \tilde{X} + \tilde{a}_{KY} \tilde{Y} = \tilde{K} \qquad (8)$$

where, P_i is the price of ith good, $i = X, Y$; $\bar{w}$ is the formal wage and w the informal wage; r_i ($i = X, Y$) is return to capital specific to the formal segment, while R is return to capital specific to the informal segment; a_{ij} ($< \tilde{a}_{ij}$) denotes the input-output coefficients in the formal (informal) segment; L is the inelastic supply of labor; and $\tilde{K}$ is the stock of informal capital, whereas K_i ($i = X, Y$) is the stock of formal capital. Goods X and Y are produced in the formal sector, while $(\tilde{X}, \tilde{Y})$ are produced in the informal segment of the economy. If $r_X = r_Y$, i.e. we assume mobility of capital within the formal segment, it is likely that either (1) or (3) will not bind. To avoid the case of complete specialization we assume, $r_X \neq r_Y$. But there are more subtle and profound institutional reasons behind this assumption, which we have discussed above.

Let us briefly discuss the effects of capital inflow ($K_X^f > 0$, FDI in the empirical model) in the formal sector that produces X. Note that, there is no price effect of such inflow, as the price is set at the level where formal commodities sell in the global market. This only changes equation (6) to:

$$a_{KX} X = K_X + K_X^f \qquad (6')$$

The inflow raises the stock of capital available to the production of X only, while no other sector undergoes such changes. The larger stock lowers return to capital in sector X, which due to specificity, however, cannot relocate to other sectors. Importantly, sector X is also covered by unionized wage negotiations which may not allow free entry of workers (see, van der Ploeg, 1987, wherein unions maximize wages and not employment). If the wages are renegotiable, as one would expect with a rise in the labor productivity owing to increase in the capital-labor ratio

in this sector, then the zero-profit conditions are maintained. However, without a significant rise in wages, the unit cost (LHS in equation 1) may still fall below the unit price (RHS in equation 1) due to cheaper capital (i.e., lower r_X) and influence other firms to enter this sector. The output shall certainly rise in sector X and it is quite likely that informal firms producing X with a different combination of capital and labor fill in this void by drawing labor from other informal sectors and adjusting wages and return on capital as per market conditions. Sectors producing Y, on the other hand may not find it convenient to relocate production to X as easily, even if such firms exist in the formal sector. The spread of informal firms may function as outsourcing of excess capacity from formal to informal organizations alongside access to advanced capital as we shall see in the empirical section, where FDI interacts with technology (capital/labor ratio) to promote production in the informal sector. The level of outsourcing may actually go up by much more when the labor unions renegotiate wages. If the wage rate rises and compensates the fall in return to capital more than proportionately, the firms find it difficult to stay in business, in which case they outsource to informal units. This should be accompanied by retrenchment of labor to the informal units producing similar commodities. This is clearly borne out in the empirical results below.

2.1   Data Sources

Data (for the years 2000-01 and 2005-06) for twenty three industries in the organized sector is obtained from the Annual Survey of Industries (ASI) and that of the twenty three unorganized sector industries (for the same years as ASI) from National Sample Survey Organization (NSSO)[6] aggregated up to 2 digit level. Data for Foreign Direct Investment is taken from the Department of Industrial Policy and Promotion, Government of India (for years 1998, 1999, 2003 and 2004). Our main objectives are to find whether formal sector firms in India outsource to the unorganized sector and to subsequently test if technology level in the

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[6] The choice of years for industry data is restricted by availability of recent data for unorganized sector industries. NSSO uses the term Fixed Assets to imply Fixed Capital stock as in ASI.

unorganized sector interacts with FDI in the organized sector to raise GVA of the unorganized sector.

2.2   The Choice of Variables

We consider gross value added, the fixed assets, wages and the technology used in the organized sector and unorganized sector. We also consider the volume of FDI coming into the organized manufacturing industries as an explanatory variable. Corresponding to the year 2000-01, we consider the volume of FDI inflow in the preceding years 1998, 1999, while corresponding to the year 2005-06, we consider the volume of FDI inflow in the years 2003 and 2004. We consider the previous years because it is less likely that FDI inflow will have contemporaneous effects on the industry parameters. We have converted all the nominal variables for 2000-01 to real variables by deflating them with the wholesale price index of 2000-01 and the variables of 2005-06 by deflating them with the wholesale price index of 2005-06.[7]

Gross Value Added (GVA)

NSSO calculates the gross value added of the unorganized sector enterprises by deducting their total operating expenses from the value of total receipts during the reference period. The ASI describes GVA of the organized sector as the increment to the total value of goods and services that is contributed by the factories for each product category.

Fixed assets (FA)

Increase in fixed assets of the unorganized sector is expected to increase its GVA, whereas, an increase in the fixed assets of the organized sector should reduce unorganized sector's GVA.

Wages (Wage)

Wages paid also includes other benefits or perquisites received by the workers. In line with the literature, it is expected that a high wage in the organized sector would increase the amount of outsourcing to the unorganized sector and hence raise the GVA. On the other hand, a high wage in the unorganized sector is likely to reduce the amount of outsourcing to this sector.

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[7] The base year of wholesale price index of both the years is the same.

Foreign direct investment (FDI)

FDI is the amount of money that has flowed in as investments. It has three components, viz., equity capital, reinvested earnings, and intra company loans.[8] FDI flowing into the industries one year ago *(FDI -1)* and two years ago *(FDI -2)* are taken into account. The lagged values imply that the FDI inflow in the contemporaneous time (during which the industries are surveyed) is not likely to have immediate impact.

Technology (Tech)

A measure of technology is important to understand whether the competitive edge in an industry is incumbent on the access to technology and associated innovations. Following Tybout (1997) and Bhaumik *et al.* (2006), we used the capital-labor ratio as a proxy for technology.

3. Econometric Specification

We have done an OLS estimation and a feasible generalized least square (FGLS) estimation to account for heteroscadasticity and autocorrelation in the data for FDI. The White's heterogeneity test suggests that we reject the null hypothesis of homogenous disturbances at 1% level of significance. Subsequently, we have controlled for industry specific AR(1) in the data.[9] The full econometric model that we estimate is:

$$GVA_{UN} = \alpha + \beta_1 GVA_{OR} + \beta_2 Wage_{UN} + \beta_3 Wage_{OR} + \beta_4 FA_{UN} + \beta_5 FA_{OR} + \beta_6 Tech_{UN} + \beta_7 Tech_{OR} + \gamma_1 FDI_{-1} + \gamma_2 FDI_{-2} + \delta_1 Tech_{UN} * FDI_{-1} + \delta_2 Tech_{UN} * FDI_{-2} + \varepsilon_{it} \qquad (9)$$

where, the subscript *UN* represents variables for the unorganized sector and the subscript *OR* represents variables for the organized sector. The other variables are defined as follows:

GVA = Gross value added

Wage = Wages paid to the workers

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[8] Earlier data on FDI in India included only cash acquisition of equity and preference capital; later on it follows standard IMF definition (GoI, 2002).

[9] Autoregressive (stochastic) process is used in statistical calculations in which future values are estimated based on a weighted sum of past values. An autoregressive process operates under the premise that past values have an effect on current values. A process considered AR(1) is the first order process, meaning that the current value is based on the immediately preceding value.

FA = Fixed Assets

Tech = Technology

FDI $_{-1}$ = Volume of FDI flowing into organized sector industries one year ago.

FDI $_{-2}$ = Volume of FDI flowing into organized sector industries two years ago.

Tech * *FDI* $_{-1}$ = Technology * FDI (1 yr ago)

Tech * *FDI* $_{-2}$ = Technology * FDI (2 yr ago)

We expect that the FDI, which necessarily flows into the organized sector, will affect the unorganized sector's GVA via two possible channels. Apart from having a direct effect, FDI affects the unorganized sector by influencing its level of technology adoption (a rise in the capital-labor ratio). The following interaction term explains such possibilities, where a change in GVA of the unorganized sector is affected at the margin by a rise in the FDI and via its interaction with the capital-labor ratio. The value of γ_i captures the direct effect, while that of δ_i provides the indirect effect given a level of technology in the unorganized sector. If both these coefficients are positive (negative), as our results show, the impact of FDI on the value added of the unorganized sector is unambiguously positive (negative). If these coefficients are of the opposite signs, then the relative strength (and statistical significance) of the two drive the final outcome at the margin.

$$\frac{\delta Y_{it}}{\delta FDI_{it}} = \gamma_i + \delta_i * Tech_{UN} \tag{10}$$

3.1   Results and Discussion

The results of regression analysis are presented in table 1. The generalized least square estimates shows that a one-unit increase in the GVA_{OR} significantly raises the GVA_{UN} at 1% level of significance.[10] This shows that as the formal firm's valued added increases, the value added of the informal firm increases also. The co-movements of the two value added is possible

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[10] The regression is also conducted by including the variable fixed asset of organized sector (FA_{OR}). We find that its effect on GVA_{UN} is negative and significant at 1 percent. However, since GVA_{OR} and FA_{OR} are highly correlated, we have not reported it in table 1.

only when both sectors raise output, of which the informal firm may raise it via outsourcing. Second, a rise in FA_{OR} reduces GVA_{UN} significantly, i.e., higher the FA_{OR} lower is the volume of jobs that the organized sector outsource. Within the unorganized sector, a one-unit rise in FA increases GVA_{UN} significantly. But, an increase in real wages in the unorganized sector by one-unit reduces the GVA_{UN} at the 5% level of significance. On the other hand, a rise in real $Wage_{OR}$ increases GVA_{UN}, as we have hypothesized above. This also conforms to the common perception that rising labor costs leads to production outsourcing to low cost units. Note that, an improvement in the technology used in the organized sector reduces GVA_{UN} significantly, whereas an improvement in the technology of unorganized sector raises its GVA. However, these do not independently carry any signal regarding the nature of outsourcing. As part of the main focus of this paper, we show that FDI_1 and FDI_2 both increases GVA_{UN}, although the positive impact of such transmission falls with time (i.e., the effect of FDI weakens over time).

The interaction terms (equation 10) play critical roles and determine the relative strength of the transmission mechanism by which FDI in the organized sector affects GVA_{UN} through outsourcing. The interaction terms show that a one-unit increase in FDI raises GVA_{UN} significantly by raising the level of technology in the unorganized sector. In other words, as FDI flows into the organized sector, they outsource a portion of their production to the unorganized sector along with technology inputs. This can take the form of more advanced and efficient equipments and production designs transferred to the unorganized sector as previously anticipated by NCEUS (2009). The rise in GVA_{UN} in this case is a direct outcome of such production outsourcing. The FDI-technology link offers a possible explanation of how the production may actually move from the organized to the unorganized sector in a developing country. Moreover, the coefficient of the interaction terms, unlike that of FDI, increases over time. This might be because it takes time to adapt technology, but once adapted its effect are usually long term in nature. Overall, the interaction term shows that the direct and indirect

impact together renders a more than proportionate (>1) increase in the GVA of the unorganized sector for one unit rise in the FDI inflow to the organized sector.

From equation (10), $\dfrac{\delta Y_{it}}{\delta FDI_{it}} = \gamma_i + \delta_i * Tech_{UN}$, it turns out that the relationship

provides a direct positive relation with stronger current impact based on the FDI lag. The longer the FDI stays in the economy the spillover of production to the unorganized sector (i.e., the rise in the GVA in the unorganized sector) becomes stronger. This is opposite in effect to the direct implications of FDI on production outsourcing, where the strength of FDI wanes down over time. Since adoption of technology needs time, in particular for the less formal production units, it is not surprising that spillover via technology interaction turns out to be more potent with longer backward lags.

$$\frac{\delta Y_{it}}{\delta FDI_{it}} = 51.73 + 1.30 * Tech_{UN} \quad for \ FDI_{-1}$$
$$and$$
$$\frac{\delta Y_{it}}{\delta FDI_{it}} = 51.73 + 1.52 * Tech_{UN} \quad for \ FDI_{-2}$$

Table 1   *Regression Results*

Dependent Variable: Unorganized sector gross value added (GVA$_{UN}$)		
Independent variables	OLS	GLS
GVA$_{OR}$	0.23	0.02*
FA$_{UN}$	0.31	0.60*
Wage$_{UN}$	0.44**	-0.47*
Wage$_{OR}$	0.12**	0.42*
Tech$_{UN}$	0.78	5.48*
Tech$_{OR}$	0.64	-5.26*
FDI$_{-1}$	0.02	0.14*
FDI$_{-2}$	0.13	0.12*
(Tech$_{UN}$)*FDI$_{-1}$	0.68**	1.30*
(Tech$_{UN}$)*FDI$_{-2}$	0.77	1.52*
Constant	23.21**	51.73**

Note: *** significant at 1 percent; ** significant at 5 percent level; *UN* = Unorganized Sector, *OR*= Organized Sector.
Source: Own calculations.

The results also hint at the possibility that the organized sector firms are competitive in nature, such that, even if new investments flow in, they might find the associated cost of production, in particular, the labor cost to rise with it. This should explain why more foreign investments in the organized sector might lead to greater outsourcing to the unorganized sector.

Related literature suggests that the rise in professional wages for software engineers, for example, led to exit of firms in the offshore units in India with the facilities moving back to the US. It is possible that for activities which do not have low-cost counterparts of the formal units, the rise in wage costs can lead to discontinuous jumps in production or bring forth 'finite changes' (Findlay and Jones, 2000). In view of what we provide as evidence, it might be important to recognize that expansion of international business via capital and technological movements from the north to the south may not be an automatic outcome unless the units receiving these have substantial ability to maneuver production organization at the firm level. This is further supported by the fact that per-worker growth rate of emoluments in 11 out of 14 unorganized sector industries (except, *coke-coal, petroleum products and nuclear fuels, fabricated metal products and office, accounting and computing machinery*) is either negative or less than that in organized sector (Table 2). The rise in labor cost seems a major reason behind outsourcing of production from the organized to the unorganized sectors for these industries.

Table 2. *Growth Rates of Emoluments per Worker in Organized and Unorganized Manufacturing between 2000-01 and 2005-06 (%)*

Industry Groups	Organized Sector	Unorganized Sector
Chemicals and chemical products	40	-52
Coke-coal, petroleum products and nuclear fuel	-8	20
Food products and beverages	21	-48
Motor vehicles, trailers and semi-trailers	19	15
Machinery and equipments, n.e.c	26	20
Textiles products	17	-54
Electrical machinery and apparatus, n.e.c	5	-25
Fabricated metal products	18	32
Rubber and plastic products	27	5

Paper and paper products	29	-65
Medical, precision and optical instruments	21	5
Leather and related products	22	-26
Office, accounting and computing machinery	25	39
Wood and wood products	56	-83

Note: n.e.c = not elsewhere classified
Source: Own calculations.

4.   Conclusion

Evidence of outsourcing between organized and unorganized sectors in India is often difficult to establish empirically mainly owing to the extra-legal characteristics of the unorganized sector. Although, a large number of studies deal with local and sector-specific interactions between organized and unorganized firms, industry level studies on the extent and routes of outsourcing is not common. This paper shows that there has been an increase in the scale of production of the unorganized sector in India which is possibly triggered by increase in outsourcing by the organized sectors and indirectly expand the scope of business internationalization. The level of outsourcing may even increase if the formal sector units receive capital from foreign sources. In general, internationalization of firms is limited to the idea that a local firm is international if foreign sale as percentage of total sale in that firm is positive. The degree of internationalization depends on this share. We argued that outsourcing of production from the organized to the unorganized sector actually leads to greater spread of internationalization, broadly defined, although the overall degree might remain same. The driver of this apparently unusual result is the phenomenon of outsourcing to the unorganized sector, which is a necessary criterion for the viability of formal firms. If the cost of production in the formal sector were low and flexibility high, then firms within the formal sector would have expanded in the face of foreign capital inflow. However, the access to informal production units allow formal firms to bypass such costs and yet continue to expand production when foreign capital relaxes its credit constraint. So, why would a formal unit outsource production when its credit or capital constraints are relaxed due to capital inflow? We explored two possible answers.

One, the influx of sector specific capital or knowledge expands production and requires a larger workforce to cater to the order. This additional cost at a pre-negotiated wage (and possibly facing renegotiation in favor of higher wages) might actually turn out to be higher than the fall in the rental rate of capital (sector specificity implies that the capital must be used in full, and therefore the rental rate may not even fall) and drive formal firms out of business. This may be a direct outcome of greater penetration of international business in developing countries. In fact, a number of (formal) software firms in India operating as outsourced units from USA shut down their operations in India because the wage component became higher than that borne even in the source country (Kuruvilla and Ranganathan, 2008). Two, the entry of formal firms shall further exacerbate the situation by raising prices of capital and drawing on the same pool of organized labor. Under the circumstances, the outsourcing to an informal unit seems to be the most likely outcome. Table 2 in the previous section showed that the informal sector in India produces an incredible range of substitute goods (for the formal sector) and that during the same period the informal sector registered a fall in (at least, low) wage growth in many product categories while the same categories registered positive and high wage growth per-worker in the formal sector. The evidence of wage growth suggests a possible validation of the above hypotheses. Overall, it implies that, as FDI flows into the organized sector, which is the primary beneficiary, it may spill over to the unorganized sector (mainly to avoid rising wage bills in the formal units) raising GVA there also. The spread of internationalization (because the informal units indirectly cater to the international product or service base) is a dominant outcome of the FDI transmitted through better technology adoption in the informal sector and complements a large number of earlier studies in this field that measures the degree of internationalization. In particular, the interaction term shows that the impact of FDI flowing into the organized sector raises the GVA of the unorganized sector when the level of technology adopted by the unorganized sector rises simultaneously. Finally, we have also shown that the organized wages, fixed capital, technology and productivities of both organized as well as unorganized sectors

increase unorganized GVA significantly. We hope to refine and use these results in future in order to understand the mechanism of technology transfer between formal and informal units in the presence or absence of foreign producers of similar commodities.

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