Economics of Skill Formation: A Note on the Need for Proper Manufacturing Base

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The skill gap constraints in India are the symptoms of the lack of initiation of division of labor-led sophisticated industrial differentiation. The focus on education and institutional initiatives for skill creation have to be integrated with sophisticated industrial differentiation; the subsidies have to target firm-specific skill formation that amounts to subsidies being directed at firms that employ higher labor force and targets larger volume of output. The higher labor productivity should be in terms of intermediate costs reductions that in turn permit higher wages and profits. Such growth process propagates itself in a cumulative way – supporting the coming up of new tasks, new skills without facing skill gap constraints.

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Economic Issues

At present, in India, there is the urgent need for the skill formation. The acquisitions of new and advanced technologies by Indian firms, and the move from a sellers' market to a consumer friendly market, has created a demand for skill sets (and specialists) that are not available or not created by the educational system. (In a way, this development is contrary to the human capital theory postulate where the educational system creates such changes). The related demand for the educational system to adapt to the new environment/challenges however requires enormous developmental funds; experience suggests that mere institutional arrangements in terms of setting up of ITIs, or vocational studies, etc. are not enough; one has to equip them properly. The ability of the economy to make the necessary adjustment would have to take into account the fiscal constraint that the government faces when it also has to facilitate the generation of private finance for such technological acquisitions. Second, in today's scenario, the creation of skilled laborers pertains to skill sets that define global competitiveness; even if the gov-

ernment imparts the requisite skills, it only makes the labor force globally mobile. The domestic firms have to pay higher wages to retain them. In this sense, the adjustments have to depend on the growth of firms, which generate the funds for imparting skills and ensure higher returns to the firms. Third, if imported technologies create the skill gap because they are aspects of continuous firm-specific industrial differentiation in the developed countries that continuously define new tasks, new specializations; skill sets relevant today can be irrelevant tomorrow; therefore, outside creation of particular types of skill sets (say, supported by government's borrowing) may not remove the skill constraints facing higher growth prospects, which in turn can create fiscal insolvency.

These observations suggest that the onus of skill formation lies with the firms. This raises three issues. One, the firm that creates skill and pays higher wages, also has to realize higher profits. That is, skill formation requires a growth of firm that can ensure both higher wages and profits.

Second, if skill formation is at the level of the firm, the retention issue becomes important. As Baran (1952:84) noted, " starting a new industrial enterprise is predicated among other things upon the availability of appropriately skilled manpower. Engaging men and training them on the job is time consuming and expensive. They are liable to be unproductive, wasteful, and careless in the treatment of valuable tools and equipment. Accepting the losses involved may be justifiable from the standpoint of individual firm if such a firm can count with reasonable certainty on retaining the services of those men after they go through training and acquire the requisite skills. However, should they leave the firm that provided the training and proceed to work for another enterprise, that new employer would reap the fruits of the first firm's outlays." He goes on to point out that even if this problem is non-existent in the developed country, it assumes importance in an underdeveloped region, highlighting the differences between private and social benefits, i.e. even if society would benefit, individual businesspersons cannot afford to provide the training, unless they can retain the created skilled workers. (In fact, the above difference sometimes calls for government intervention; but the present paper tries to show that skilled workers turnover is less of a problem if it is created by the firm level – see below).

Third, individual initiatives for skill formation have to be part of an overall growth process that has to define the evolution of both new technologies and new skill sets, without facing skill gap constraints.

These three conditions are the ones under which an economy does not face the skill gap constraints. To start with, a particular focus can be on the developed countries that do not face the skill gap constrains in their development process. As an astute observer of scientific developments, Marx (1977) noted that the development of science (say, advent of stream power based on an accurate in-

vestigation of the law of friction), facilitating larger scale production in the advanced countries, never faced skill labor gaps constraints because of the prior existence of division of labor in these economies. There is no doubt the close association between the incidence of higher skilled and educated labor force – the specialists - and higher development status in terms of division of labor-led industrial differentiation (i.e., narrow specialization in economic activities). As Stigler (1951) had noted, what distinguishes the developed countries is the existence of specialists that can be attributed to domestic division of labor. In fact, commenting on the status of underdeveloped regions, (Stigler, 1951: 192-3) noted, "By a now overly familiar argument, we (American production methods) shall often be a seriously inappropriate model for industrialization on a small scale. Our processes would be too specialized to be economical on this basis. The vast network of auxiliary industries which we can take for granted here will not be available in small economies. Their educational institutions will be unable to supply narrowly specialized personnel; they will lack the specialists who can improve raw materials and products." In fact, he also attributed the continuous domestic advancements to such existence of specialists. As he (1951:193) noted, "At best, the small economies that imitate us can follow our methods of doing things in this year, not our methods of changing things next year" (Stigler, 1951: 193). He was emphasizing that the existence of sophisticated educational system and 'specialists' is the precondition for the 'growth' prospects.

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Division of Labor

It should be noted that though the above observations highlight the importance of division of labor, Marx and Stigler do not furnish us with the theory as to why division of labor leads to the satisfaction of the three conditions that the present paper holds to be important for the absence of skill gap constraints. In fact, the new endogenous growth theories also provide the theoretical conditions under which 'human capital' can ensure the continuance of high growth phases; but these theories remain silent on the explanation of the existence of human capital as an aspect of highly developed status. For example, Indian studies show that the *independent* development of education system to generate more skilled labor force has had limited impact on development processes. Even if there would the (public?) provision of 'education' (including imparting of skill) that creates more skilled manpower, it is the employment opportunities that gives them value in the capital theory: for example, the underemployment possibility would assign a lower weight to such human capital index (Mathur, 1984). The incidence of such underemployment possibilities is higher in the underdeveloped countries (Stiglitz, 1988; Rodriguze-Clare, 1994). In fact, there are the instances

where higher investment in human capital has not led to creation of good employment opportunities (or transformation of production conditions) in the same (underdeveloped?) region (Frank, 2005).

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In this context, the present paper shows the importance of the initiation of division of labor that highlights a firm targeting larger volume of output that permits the sub-division of the business into many specialized sub-tasks. First, as Padhi (2014) noted, division of labor permits intermediate costs reduction that can permit both higher wages and profits. This needs elaboration. If the inter-linkages within the firm (or between specialized firms) achieve intermediate costs reduction and also permits sticky prices, the differential increase in the price of the product and the price of the intermediate costs implies that the nominal value added per unit of output can be higher than the expansion of real output, measured by the double deflation method. Here, the expansion of real output reflects division of labor led creation of sub-tasks (specializations) that take place in an informal way (i.e., with an emphasis on redeployment of labor force) and enjoin higher wages. Then, if expansion of real output, led by specialization, would take into account higher wages to specialized labor force, the trading profits (i.e., increase in nominal value added more than real value added) permits higher profits to the firm. However, these trading profits are aspects of economic progress when they are due to the intermediate costs reduction in the face of sticky prices; not due to higher price (market power) in the face of constant (or, rising) intermediate costs.

In addition, the sub-tasks are not limited to manufacturing; the firm also undertakes many related tasks when it targets larger output; it may involve informal sources of finance, trading, transport. Then if division of labor reaches an advanced stage (Young, 1928), manifested in industrial differentiation when specialized firms come up for the specialized tasks, both manufacturing and service related, as an interrelated whole, better services permit intermediate costs reduction for manufacturing, i.e. outsourcing by each manufacturing firm is achieved at lower costs. This can permit the realization of higher money value added per unit of output in manufacturing that in turn can permit both higher wages and profits, on a continuous basis and that can propagate in a cumulative way.

This brings us to the next issue of private and social profitability trade-off. Can the Schumpeterian entrepreneur who initiates division of labor retain the newly created skilled labor force? Or, that other firms would reap the benefits of the skilled labor force created by the innovating firm. Here, the present paper maintains that this problem is over-emphasized in the literature. In fact, the incidence of turnover is more acute when government creates the skilled workers, as in the case of India (Murti & Paul, 2014). In fact, the present paper suggests

that the firms initiating division of labor are in a better position to retain their labor force. What needs emphasis is that the creation of skilled labor force by a firm is specific to division of labor, and therefore, they are part of an interrelated whole. That is, skilled labor force making machines are not attractive unless they come with others who are specialized in trading, for example (i.e., the use of machines by itself would be unprofitable if there is the market constraint). There is also the issue of co-ordination skill that is specific to the entrepreneur (i.e. inalienable to the individual entrepreneur) that also permits learning by doing (to bring about further improvements in the sub-tasks). Then, the issue of purchase of skilled labor force created by a firm (by others) amounts nothing but a decision to purchase the firm itself. This purchase price of skilled labor force, and one has to take into account the labor force can induce higher wages (more than what specialization requires), implies that the incentive (i.e., the net gain) would be very low. Here, there is also the evidence that suggests that, initially, division of labor, at the level of a firm, is associated with a social division of labor, i.e., each innovating firm (entrepreneur) could be specific to a peculiar (but particular) social relationship with a particular locality. This can induce some type of paternalistic organizational forms, with very high power to retain the labor force that they create, even with lower wages (Lawson, 1998). Otherwise, also, Williamson (1963) and Cyert and March (1963) suggest that the advanced organizational forms, say the corporate forms specific to larger volume of output, rely on slack payments; the motive (the present paper suggests) could be to retain skilled laborers by paying them above their opportunity costs. (In fact, then, the present paper suggests that if firms endure such slack payments and still make profits, it highlights the importance of division of labor-led intermediate costs reductions – discussed above).

The incidence of economic progress must be based on external economies created by division of labor.

Therefore, other firms would be far better off (in terms of prospective profits) if they decide to start initiating division of labor on their own. Here, Young (1928) suggests that the incidence of economic progress must be based on external economies created by division of labor i.e., division of labor is seen as an invention with higher prospective profits and others adopt it. This generalized adoption would imply that even if there is some labor turnover, it cancels out the gains and losses to individual firms (as is the case in the advanced countries).

This brings us to the third issue: is there the growth possibility that not only permits different firms to initiate division of labor but also induces the possibility of human capital formation, say, amounting to Stigler's representation of the developed status with capacity for continuous developments without facing skill gap constraints? Here, Padhi (2014a) suggests that there is the Youngian-Kaldorian division of labor-led growth process that

amounts to human capital formation that manifests itself in the continuous development of industrial differentiation, supported by both new tasks and new skill sets that are created endogenously.

Policy Issues

The policy focus of the present paper rests on its preferred causality chain that tries to show that skill gap constraints are the symptoms of the lack of initiation of division of labor-led sophisticated industrial differentiation. For example, outside source of skill formation (say, by government funding) can create the acute problems of labor turnover, whereas firms creating skill sets have the power to retain them. This calls for the re-examination of the three inter-related aspects of the ongoing (relevant) Indian policy focuses; they are: (i) the focus on education to achieve higher rate of literacy (though the focus should be on minimum literacy that empowers one the familiarity with symbolic logic, (ii) the focus on skill creation, and (iii) the subsidies for investment. Here, the paper maintains that the focus on education is important though it can translate into higher demand for higher wages (inevitably); therefore, the focus has to be on higher wages that can co-exist with higher profits. If so, the latter two policy focuses have to be integrated to achieve sophisticated industrial differentiation; the subsidies have to target firm-specific skill formation that amounts to investment subsidies directed at firms that employ higher labor force and targets larger volume of output; the higher labor productivity should be in terms of intermediate costs reductions that in turn permit higher wages and profits. It should be noted that such growth process based on the 'growth of firms', once started, has a tendency to propagate itself in a cumulative way – supporting the coming up of new tasks, new skills without facing skill gap constraints..

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Policy Implications

We start with the observation: "The TVET system (in India) has historically been, like in many other developing countries, supply-driven and mostly government-driven. Historical experience (however) shows that the more effective TVET systems are private sector-driven and also demand-driven" (Mehrotra, 2014: 372 – bracketed terms inserted). In this context, the present paper concerns the conditions that would facilitate the implied desired transition. That is, the present Indian policy focus (only) on the restructuring of the social infrastructure to create skills (Chenoy, 2014; Mehrotra, 2014) that relies on: (i) industry specialists as teachers and trainers, and (ii) the coming up of more 'private' Sector-Skill Councils may not be effective enough. The problem is, apart from the fact that there will always be the paucity of the 'teachers'/specialists when skilled sets are defined by imports of new technologies (that continuously create new tasks, replacing the old ones), the private companies – those who would hire (or de-

mand) – may not, individually, be interested in contributing towards such social infrastructure when the chances of the skilled-labor turnover are very high. In any case, if an exogenous effective transition takes place, the companies have to have the capacity to pay higher wages to retain those who are educated enough to adapt quickly to new challenges/tasks.

The thrust area, as suggested by the present paper (policy focus above) therefore is the possibility of increasing the scope of in-firm training by many private companies, the incidence of which is abysmally low at present (in India), as compared to that of its incidence in the emerging/developed economies (Mehrotra, 2014: 371). Here, the present paper tries to show that the scenario can change and the firms can provide the in-firm training (and pay higher wages) if it is part of more profitable investment opportunities; these have to be based on the scope of further division of labor when the firms provide higher and more productive employment, targeting larger volume of output (and higher profits). These new investment opportunities can embody new challenges – both economic and technical – and government incentives and the inputs (and involvement) of the higher education system matter a lot. However, if the policy environment creates both new tasks (inventions) and specialists, and firms, therefore, get higher profits, it would have a cumulative characteristic, which, as a tendency, and as per the present paper, reduces skill constraints. More importantly, if many companies are so enabled (i.e., create such skill sets), and the consequent labor turnover problem is negligible, the companies together can further be interested in investments in the desired social infrastructure. Then, the specialists-led social infrastructure can keep pace with the coming up of new tasks. Even if the new tasks and specialists, now, are created by the firm, the need for the developed private-sector led social infrastructure is greater. It reduces the capital tied up in the pipeline, i.e., reduces the incidence of frictional unemployment with respect to skilled labor force that otherwise can reduce the productivity of capital. The desired outcome is: it has to be seen as constituting specialized firms, as aspects of sophisticated industrial differentiation that, along with an induced developed higher educational system, reinforces the in-firm training.

References

Baran, P A (1952), "On the Political Economy of Backwardness", *The Manchester School*; reprinted in A N Agarwala and S P Singh (1958), *The Economics of Underdevelopment*. Delhi: Oxford University Press

Bohm, P. (1987), "External Economies", in J. Eatwell, M. Milgate and P. Newman (eds.) The New Palgrave: A Dictionary of Economics, Vol. 2; MacMillan Press Limited, London.

Chenoy, D H. (2014), "STAR Scheme to Catalyze the Skill Ecosystem", *Indian Journal of Industrial Relations*, 49 (3)

Cyert R M & March, J G (1963), Behavioral Theory of the Firm, Prentice Hall

Frank, A. G. (2005), "Is Human Capital a Good Deal"? *Economic and Political Weekly*, XL (19)

Kaldor, N. (1966), Causes of the Slow Rate of Economic Growth in the United Kingdom: Cambridge University Press: London; Re-

printed in F. Targetti & A. P. Thirlwall, (eds). (1989), The Essential Kaldor: Gerald Duckworth and Co, London.

————, (1972), "The Irrelevance of Equilibrium Economics", *Economic Journal*, 82; Reprinted in F. Targetti and A. P. Thirlwall, (eds). (1989), The Essential Kaldor: Gerald Duckworth and Co, London.

Lawson, T. (1998), "Social Relations, Social Reproduction and Stylized Facts", in P. Arestis (ed.), Method, Theory and Policy in Keynes: Essays in Honor of Paul Davidson: Vol. Three. USA: Edward Elgar

Marx, K. (1977), "Machinery and Large Scale Industry" in Clayre, A (ed.), Nature and Industrialization, Oxford: Oxford University Press

Mathur, G. (1984), "The Web of Inequity", Presidential Address at Indian Society of Labor Economics, published in T. S. Papola, P. P. Ghose & A. N. Sharma (eds.) (1993) Labor, Employment and Industrial Relations in India. Delhi: B. R. Publishing

Mehrotra, S. (2014), "Quantity & Quality: Policies to Meet the Twin Challenges of Employability in Indian Labor Market", *Indian Journal of Industrial Relations*, 49 (3)

Murti, A B & Paul, GD, B. (2014), "Key Indicators of Labor Market Flexibility and Skill Shortages", *Indian Journal of Industrial Relations*, 50(2)

Padhi, S P (2014), "Assessing Manufacturing Growth in India: An Alternative View", *Indian Journal of Industrial Relations*,49(3)

————— (2014a), "Human Capital Formation, Good Employment Opportunities & the Firm", *Indian Journal of Industrial Relations*, 50 (2)

Rodriguez_Clare, A. (1996), "The Division of Labor and Economic Development", *Journal of Development Economics*, 49 (3-32)

Stigler, G.J. (1951), "The Division of Labor is Limited by the Extent of the Market", *Journal of Political Economy*, 59 (3)

Williamson, O. (1963), "Managerial Discretion and Business Behavior", *American Economic Review*, 53 (5)

Young, Allyn. A. (1928), "Increasing Returns and Economic Progress", *Economic Journal*, 38(152)

———— (1990), "Nicholas Kaldor's Notes on Allyn Young's LSE Lectures 1927-29", *Journal of Economic Studies*, 17 (3/4)