Human Capital Formation, Good Employment Opportunities & the Firm

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This paper adopts a framework of analysis where education is seen as a narrow specialization to coordinate narrow specializations in production. There is the symbiotic relationship when its development also improves the specializations in production. In this perspective, the human capital formation is an intrinsic aspect of the growth of firms who in trying to achieve higher market access (and higher returns) are responsible for new and good employment opportunities that in turn create external economies permitting higher development status. Much therefore depends on the growth of firms that creates such good employment opportunities.

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Introduction

There is the evidence to the effect of a close association between 'formal' human capital – say educational system with higher degree of specialization – and higher good employment opportunities (and higher development status in production). This can evoke two different perspectives, emphasizing different causality chains. One, the much discussed, is the human capital theory where the (developed) formal human capital – as the output created by formal education system - creates good employment opportunities (Becker, 1993 , 1964; Becker & Chiwick, 1966) and explains higher developed status in production (Schultz, 1961)[1]. This perspective has its criticisms. There are instances where higher investment in human capital has not led to the creation of good employment opportunities (or transformation of production conditions) in the same (underdeveloped) regions (Frank, 2005). One implication is that even if there would the (public?) provision of 'education' that creates

[1] For a broader perspective on this human capital theory, see Narayana (1983) who like Mincer (1974) also gave importance to nature of jobs and skill formation at the work place.

more skilled manpower, it is employment opportunities that give the value in the capital theory: for example, the underemployment possibility would assign a lower weight to human capital index (Mathur, 1984). The incidence of such underemployment possibilities is higher in the underdeveloped countries (Stiglitz, 1988; Rodriguze-Clare, 1994). Moreover, the formalization of such human capital as a growth fact encounters many problems. For instance, the new endogenous growth theories, using the production function approach to growth, emphasize that the resource allocation towards human capital formation can explain 'growth' facts if it creates 'externalities'. However, it has been pointed out that: (i) the Marshallian externalities created by human capital, as an independent argument in the production function, say the creation of 'aggregate knowledge capital' (Romer, 1986) are not empirically important (Pack, 1994), and (ii) a well behaved production function, targeting well behaved resource allocation based on individual initiatives, cannot admit of any such externality (Solow, 2000).

An alternative perspective, which has not received much emphasis, discusses the incidence of effective formal education as a specialization, which draws its strength from the higher developed status of specializations in production. If one acknowledges the existence of sophisticated business knowledge before modern times (for literature see, Burton-Jones and Spender, 2011: 6-7), a broader hypothesis is that it is the incidence of economic progress in specific countries, creating good employment opportunities, that provides the incentive to divert additional resources for investment in formal education to improve up on such commercial knowledge.

This causality chain has not been much discussed. The only discussion is one of learning by doing where the generation of ideas is a side effect of production of capital (Arrow, 1962) and the process could explain the scope for formal education to facilitate such generation of ideas (Lucas, 1988) with spillover growth effects. However, allowing for the fact that learning by doing arises from problem solving and could be specific to new problems or new 'employment opportunities', the basic problem is what explains such good employment opportunities? Why not traditional economies (with traditional firms) make the transition through learning by doing? If greater trading opportunities, new association with new things permit such employment (or production possibilities) (Chaney & Ossa, 2013), what explains such opportunities? The literature also highlights that the impact of learning by doing is limited to achieving only higher labor productivity and such scope of improving productivity through learning by doing decreases if one allows for a given set of production possibilities. Continuous learning depends on continuous growth of good employment opportunities. What explains such a process?

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In these contexts, the paper maintains that an understanding provided by Young (1928), who gives primacy to initial creation of firm-specific informal human capital formation in this causality chain, needs elaboration. The focus is not as such on a firm that creates good employment opportunities. It is on the good employment opportunities that create dynamic external economies and permit the further growth of such employment opportunities, which in turn forms the basis of sophistication in formal human capital formation. More specifically, it highlights a process of change that marks a transition towards narrow specializations, including specialization in education. In this perspective, also, the external economies are important, but their conceptualization (and empirical relevance) could be different. In fact, the new growth theories also draw upon Young (1928) to stress the importance of external economies. The present paper, in this context, tries to show that the Young (1928)'s emphasis on external economies is different. They originate from specific sophisticated informal human capital created by growth-oriented firms, which in turn supports formal education (and formal inventions).

The Firm &Human Capital Formation

There are also theories of firms that highlight the specificity of 'human capital' at the level of firms, which is based on the sophisticated production structure (division of labor) that leads to resource heterogeneity and complexities (and uncertainty) – reflecting absence of universal markets. Here, the Austrian framework of analysis requires human capital at the level of firms to integrate and co-ordinate production (Lachmann, 1977; Lewin, 2011). On the other hand, it has been maintained that market processes reflecting heterogeneity of 'human capital' and the specificity of the nature of such human capital (inalienability) can account for market failures (Coase, 1937; Williamson, 1971; 1973), leading to firms to undertake many of the tasks. It enriches or provides firmer basis of the transaction costs based (Foss, 2011), principal-agent based (Spender, 2011), entrepreneurial based (Loasby, 2011) theories of the firm.[2]

In a way the literature supports the thesis that it is the highly developed status highlighting heterogeneity of human capital (complex production processes), and the existence of uncertainty, which calls for human capital at the level of firm. Such informal human capital formation at the level of firm however requires complex information processing capabilities helped by familiarity with symbolic logic, i.e. the contribution of formal education. In fact, there have been some discussion (following the Beckerian perspective) as to the possibility that in modern times individual knowledge through education adds value to the firm level human capital formation (Von Krogh & Wallin, 2011) or how education impacts entrepreneurial function of the firm (Teece, 2011).

[2] See, Tirole (2007) for the literature on formal development of these theories of firm.

Present Focus

The above stylized facts, in a way, show that the developed status in terms of sophisticated division of labor supports sophisticated existence of both informal and formal human capital formation. It however raises some issues. This literature does not explain the process that marks the transition to such a developed status, and importantly, the role of firms. Is not the division of labor itself depends on informal 'human capital formation'? Second, there are instances of higher specialized firms that reduce market uncertainties/coordination problems. Third, the existing literature by exclusively focusing on the human capital at the level of firm also ignores the increasing importance of human capital created by education system with complex specialization. It does not discuss the process of change where informal human capital formation that leads to formal human capital formation.

Stigler (1951), interpreting Young (1928), also recognized the importance of division of labor for distinguishing 'underdeveloped' countries (firms) from the developed countries (firms), but seemed to suggest that higher (exogenous?) growth prospects results in such developed status that comes with the higher developed status of the educational system. In fact, Stigler (1951) highlights three different conceptualizations of the firms. The traditional firm undertaking simple production and the modern firms seen as a collection of many functions based on division of labor (permitting heterogeneity of human capital at the level of firms, i.e. informal human capital formation), and the specialized firms performing specialized tasks (that are associated with highly developed formal education system providing specialized skills). Stigler's hypothesis is that the nature of firms depends on growth phases: if the traditional firm gets highlighted in static settings, the initial (low) growth phases highlights the vertically integrated firms (informal human capital at the firm level), and the modern specialized firms with higher incidence of formal human capital are specific to higher growth phases[3].

Stigler's hypothesis however is specific to exogenous growth phases, and here an important insight is provided by Young (1928) that highlights the importance of 'informal human capital' that creates external economies and permits the transition to modern growth phase, and the transition from low growth phases to high growth phases. Particularly, it explains: (i) it is the new initiative in terms of division of labor that necessarily implies market failure leading to complexities of functions undertaken by the firm that highlights heterogeneity of 'informal' human capital formation at the level of firm, (ii) this informal human capital formation, insofar as it leads to external economies permits an increase in size of the market that permits the scope of specialized firms along narrow specialization undertaking specialized tasks, including formal education – formal human

[3] The modern firm specific human capital formation, as noted above, however, also allow for vertical integrated firms in higher growth phases, arising from market/coordination failures.

capital formation, and (iii) the effective formal education, necessarily based on division of labor, forms the basis for further division of labor that again gives greater scope of further informal human capital formation, and so on. And, therefore, from the point of view of policy, it highlights the crucial interdependence between informal and formal human capital formation that in turn typifies the dynamics of modern growth phases.

Economic Progress & the Role of Human Capital

Economic progress, on the other hand, is induced by 'persistent search for markets' by new initiatives.

In Young (1928), there is no formal discussion on human capital formation, but the thesis on economic progress provides important insights towards the changing scope of human capital formation. For Young (1928), economic progress cannot be induced by traditional firms undertaking traditional tasks, i.e. even if one assumes some form of knowledge capital, it is not central to economic progress. Economic progress, on the other hand, is induced by 'persistent search for markets' by new initiatives: to quote, "It is dangerous to assign any single factor the leading role in that continuing economic revolution which has taken the modern world away from the world of a few hundred years ago. But is there any other factor which has a better claim to that role than the persistent search for markets? No other hypothesis so well unites economic history and economic theory."

The initiation of modern economic growth (or the phase of modern capitalism) is based on persistent search for markets created by important changes in the production conditions brought about by a new firm. The 'modern firm' targets large volume of production that permits production process to be sub-divided into many processes (industrial differentiation), permitting introduction of machinery, which in turn permits cost reduction. The cost reduction permits the firm to undertake additional trade/service/finance related functions to reach out to more customers (higher market access). Here, Young (1990) specifically mentions of the role of 'informal' human capital that forms the basis of industrial differentiation. To quote, "(W)e abstract outside improvement, unexpected developments, etc., those improvements which would have taken place apart from the growth of the industry though it is a moot point how far these exist. Take the so-called 'revolutionary changes' of the industrial 'revolution'. Modern economic history emphasizes the way the increasing markets led to development. It is an interesting question how far pure science is a function of industry, and how far it goes under its own momentum. It might be a good thing to drop the word 'invention' from our vocabulary; the adapting engineer is the important man" (Young, 1990: 44).

It should be noted that the cost reduction permits additional functions (better employment opportunities) or informal human capital that are firm specific and per-

mits the firm to be seen as a collection of distinct but complementary processes (Stigler, 1951) – it, targeting larger volume of production - would involve: (i) arrangement of informal finance, (ii) informal creation of exact specification of machinery for industrial differentiation, (iii) purchase and storing of materials, (iv) transforming materials into semi-finished goods and semi finished goods into final products, (v) undertaking modern transport, marketing, creation of communication channels, extension of credit to buyers, etc.

As Stigler (1951: 190) noted, the new firm is often a stranger to the 'traditional' established economic system; it requires quantity and quality of materials that it has to make on its own; it must design its own specialized equipment, and often manufacturing it, etc. The firm in other words, cannot depend on existing markets (supplying firms) because the requirement would be too specific to a few number of firms, and the transaction costs, therefore, would be very high (Coase, 1937; Williamson, 1971; 1973). In other words, it is the lack of well-developed market, i.e. the lack of specialized firms owing to limited prior market, because of which the new firm, initiating division of labor, has to depend on its own initiatives, rather than depending on the market forces.

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However, in Young (1928), it is this initiation of division of labor, forming the basis of informal human capital formation, permits higher market access (increasing returns), which in turn forms the basis of formal human capital formation. To elaborate, according to Young (1928) the initiation of division of labor (and trade related advantages) creates important dynamic external economies. The emphasis is on the fact that division of labor creates technological external economies: to quote, "Every important advance in the organization of production, regardless of whether it is based upon anything which, in a narrow sense or technical sense, would be called a new 'invention', or involves a fresh application of the fruits of scientific progress to industry, alters the conditions of industrial activity and initiates responses elsewhere in the industrial structure which in turn have a further unsettling effect. Thus change becomes progressive and propagates itself in a cumulative way" (Young, 1928: 533). This comes close to Scitovsky (1954: 297)'s third example of direct (and non-market) interdependence between producers where adoption of new methods (roundabout methods of production) is made available to others without charge (and is not impeded by patents)[4]; here the focus is not on Adam Smithian emphasis on specialized machinery, but on simple and standardized process that permits technological external economies.

[4] It is clear that large scale production possibilities (with given preferences and endowments) cannot create such externalities that highlight the important resource creating initiatives.

However, as Kaldor (1972) noted, such external economies cannot work if the initial division of labor, targeting large volume of production, entails demand diversion form others, aggregate money expenditure remaining the same. That is, others would not adopt division of labor due to lack of market. In this sense, if division of labor is seen as an independent investment that in the Keynesian fashion leads to an increase in aggregate demand, there would be the incentive for adoption of division of labor by others. The incentive would be to capture higher market share as aggregate demand is increased.

If so, if increased production in one line is also associated with increased production in other lines (increases in market size), there would be an increase in aggregate production (increase in market size). This can form the basis of further division of labor. For example, as market size increases, so also the number of firms adopting division of labor, certain general functions common to firms, such as standardized tasks (in so far as Young emphasizes standardized processes rather than specialized machinery), trade, other services, etc. (and rival functions within the firm), can be undertaken by specialized firms.

The movement from the within the firm specialization to between the firm specialization (industrial differentiation) also creates external economies in terms of the potential to provide the starting point for an altogether new line of business, education for specialized skill formation, higher learning of basic sciences etc (see also, Bohm : 263). In other words, the increased incidence of specializations provides the incentive for 'formal' human capital formation. For example, the search for greater markets through sea route calls for improvement in navigations. In addition, the complex information-intensive coordination amongst industries (specialized tasks created by one industry can be adopted by others and vice-versa), calls for individuals endowed with formal education to react to new information, adapt to it, and process it through symbolic analysis. Third, the process shows that there are powerful incentives to improving up on specializations to have higher market access (and returns) to specific growth oriented firms. Education would then be viewed as a specialization to improve upon specializations that aid higher market access.

In other words, informal human capital formation at the level of firm creates, through technological external economies, the good employment opportunities that requires higher incidence of formal human capital formation. In relation to existing literature on the theory of firm-specific human capital formation, the present Youngian analysis shows as to why heterogeneity of human capital at the level of firms –informal human capital formation - would generally be associated with higher incidence of formal human capital formation.

What is important in dynamic studies is the growth of particular firms -

initiatives in terms of informal human capital that form the basis of division of labor gives concrete shape to deliberate formal human capital creation and deliberate knowledge gathering initiatives. Therefore, in a modern economy, the formal human capital formation comes in many ways (aided by formal learning) - say, specializations in transport, communication, packaging, marketing, finance, R & D efforts, etc., but these aspects of formal human capital is a function of growth, which, in turn, depends on growth of firms targeting industrial differentiation (informal human capital).

Therefore, in this alternative focus, the broader hypothesis is that the nature of firms is important. For instance, the traditional 'underdeveloped' status would highlight traditional firms (proprietorships) performing primarily production related tasks, with negligible incidence of formal human capital. On the other hand, the 'developed' status is generally associated with modern firms (corporations) where the firms would be viewed as a collection of many specialized functions, production being one of them, highlighting the greater incidence of human capital; in fact, it is the incidence of human capital in terms of variety of specialized tasks – be it marketing, trading, finance, skill development, inputs procurement (and inventory management), R & D, etc. that separates out the developed status from the underdeveloped status, and it is immaterial whether a firm is undertaking such tasks, or that there are specialized firms for them – for instance, a very 'high developed' status could be associated with specialized firms undertaking specialized tasks so that even a small production oriented firm would be more efficient than a larger firm doing many tasks. And, importantly, higher specialization is generally associated with higher development of formal education with narrow specializations.

Higher specialization is generally associated with higher development of formal education with narrow specializations.

Concluding Note

In a sense, Youngian analysis of human capital formation is closer to the traditional approach to human capital formation based on the understanding of the dynamics of physical capital accumulation. The focus however is on the capital accumulation that is based on specializations, which supports the specialization in education (and further narrow specializations within it). This causality chain can explain the stylized fact of their association better as compared to the reverse causality running from the provision of education (as such).

This therefore is a focus on the extremely ambitious growth oriented firms – focusing on the active firms that continually try to influence supply conditions to influence demand conditions, i.e. striving for greater market access. However, as Young (1928) noted, nothing much can be inferred from the

growth that is based on scale economies (taking place with a given set of technology, endowments and preferences). The focus has to be on the growth of firms that take advantage of division of labor. One, it creates new good employment opportunities reflecting narrow specializations that induce formal education. That is there is the incentive to understand such specializations that permit higher market access (and increasing returns). Two, it creates external economies so that specialization within the firms give way to specialization between firms – sophisticated industrial differentiation – that promotes/supports formal education in narrow specializations. Third, importantly, it provides the incentive to invest in formal human capital formation to constantly search for greater industrial differentiation, to get higher market access (and returns).

The present perspective, emphasizing the dynamic role of division of labor, needs further elaboration. In Adam Smith, division of labor – the possibility of the breaking down of a larger job into tiny components – has the potential to create repetitive mundane work by labor force, leading to ignorant, stupid labor force. However, in Youngian-Kaldorian perspective, such within specialization creates external economies and permits specializations between firms. As Young (1928) noted, "The successors of the early printers, it has often been observed, are not only the printers of today, with their own specialized establishments, but also the producers of wood pulp, of various kinds of paper, of inks and their different ingredients, of type-metal and of type, the group of industries concerned with the technical parts of the producing of illustrations, and the manufacturers of specialized tools and machines for use in printing and in these various auxiliary industries. The list could be extended, both by enumerating other industries which are directly ancillary to the present printing trades and by going back to industries which, while supplying the industries which supply the printing trades, also supply other industries, concerned with preliminary stages in the making of final products other than printed books and newspapers." "New products are appearing, firms are assuming new tasks, and new industries are coming into being. In short, change in this external field is qualitative as well as quantitative." It is these changes, coming up of new specializations, seen as an interrelated whole, that permit learning by doing, shift of labor force from low productivity to high productivity jobs and highlight the role of effective formal human capital formation.

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To conclude, this perspective focuses on the process of change that, instead of creating mundane stationary works, embodies an intense desire to learn through effective formal education (providing the base). This framework not only provides the possibility of additional resources for the growth of formal edu-

cation[5] but also would provide an understanding of the conditions under which formal education is associated with good employment opportunities (i.e. as an outcome of general economic progress).

References

Arrow, K. G. (1962), "The Economic Implications of Learning by Doing", *Review of Economic Studies*, 29

Becker, G. S. (1964, 1993), Human Capital. Chicago: Chicago University Press

Becker, G. S. & Chiswick, B. R. (1966), "Education and the Distribution of Earnings", *American Economic Review*, 56

Blitch, C. P. (1983), "Allyn Young on Increasing Returns", *Journal of Post Keynesian Economics*, 5.

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.

Burton-Jones, A. & Spender, J. C. (eds.) (2011), The Oxford Handbook of Human Capital. Oxford: Oxford University Press

Chaney, T. & Ossa, R. (2013), "Market Size, Division of Labour, and Firm Productivity", *Journal of International Economics*", 90

Coase, R. H. (1937), "The Nature of Firm", *Economica*, 4

Foss, N. J. (2011), "Human Capital and Transaction Cost Economics", in A. Burton-Jones and J. C. Spender (eds.) The Oxford Handbook of Human Capital. Oxford: Oxford University Press

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

Kaldor, N., (1972), "The Irrelevance of Equilibrium Economics", *Economic Journal*, 82.

Lachmann, L. M. (1977),Capital, Expectations and the Market Process Mission, K S: Sheed Andrews & McMed.

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

Lahiri, S.& Sylwester, K. (2005), "Education Expenditure and School Participation: A Theoretical and Empirical Analysis", in S. Lahiri and P. Maiti (eds.), Economic Theory in a Changing World. New Delhi: Oxford University Press.

Lewin, P. (2011), "A Capital Based Approach to the Firm: Reflections on the Nature and Scope of the Concept of Capital and its Extension to Intangibles", in A. Burton-Jones and J. C. Spende (eds.), The Oxford Handbook of Human Capital. Oxford: Oxford University Press

Loasby, B. J. (2011), "Human Capital, Entrepreneurship, and the Theory of the Firm", in A. Burton-Jones and J. C. Spende (eds.), The Oxford Handbook of Human Capital. Oxford: Oxford University Press

Lucas, R. E. (1988), "On the Mechanism of Economic Development", *Journal of Monetary Economics*, 22

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

Mincer, J. (1974), Schooling, Experience and Earnings, New York: Columbia University Press

[5] For instance, in a static general economic framework, Lahiri & Sylwester (2005) point to the dilemmas that even if education improves upon performance of invested resources, it (as a prior commitment through public funding) may reduce the availability of resources for investment.

Narayana, D. L. (1983), "Human Resources and Productivity": Presidential Address at Indian Society of Labor Economics, in T. S. Papola, P. P. Ghose and A. N. Sharma (eds.) (1993) Labor, Employment and Industrial Relations in India. Delhi: B. R. Publishing

Pack, H. (1994), "Endogenous Growth Theory: Intellectual Appeal and Empirical Shortcomings", *Journal of Economic Perspectives*, 8

Rodriguez-Clare, A. (1996), "The Division of Labor and Economic Development", *Journal of Development Economics*, 49

Romer, P. M. (1986), "Increasing Returns and Long-Run Growth", *Journal of Political Economy*, 94

————— (1990), Endogenous Technological Progress", *Journal of Political Economy*, 98

————, (1991), "Increasing Returns and New Developments in Growth Theory" in W. A. Barnett (ed.), Equilibrium Theory and Applications: Cambridge University Press

Schultz, T. W. (1961), "Investment in Human Capital", *American Economic Review*, 51

Scitovsky, T. (1954), "Two Concepts of External Economies," Journal of Political Economy; Reprinted in A. N. Agarwala and S. P. Singh, eds. (1958), "The Economics of Underdevelopment: Oxford University Press, Delhi

Solow, R. M. (1999), "Neoclassical Growth Theory", in J. B. Taylor and M. Woodford (eds.), Handbook of Macroeconomics, Vol. 1A. Amsterdam: Elsevier

———— (2000), Growth Theory: An Exposition: Oxford University Press, Oxford.

Spender, J. C. (2011), "Human Capital and Agency Theory", in A. Burton-Jones and J. C. Spende (eds.), The Oxford Handbook of Human Capital. Oxford: Oxford University Press

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

Teece, D. (2011), "Human Capital, Capabilities, and the Firm: Literati, Numerati, and Entrepreneurs in the Twenty-First-Century Enterprise", in A. Burton-Jones and J. C. Spende (eds.), The Oxford Handbook of Human Capital. Oxford: Oxford University Press

Torole, J. (2007), The Theory of Industrial Organization. New Delhi: Prentice-Hall of India

Von Krogh, G. V. & Wallin, M.W., "The Firm, Human Capital and Knowledge Creation", in A. Burton-Jones and J. C. Spende (eds.), The Oxford Handbook of Human Capital. Oxford: Oxford University Press

Williamson, O.E. (1971), "The Vertical Integration of Production: Market Failure Considerations", *American Economic Review*, Papers and Proceedings, 61

————————, (1973), "Market and Hierarchies: Some Elementary Considerations", *American Economic Review*, Papers and Proceedings, 63

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

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