Sticky Knowledge Externality: An Instrument to Access Innovation

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Abstract:
The present paper aims to focus on: how small firms of an informal localized industry get access to new economic knowledge production, i.e. innovation. It is often observed that several informal localized industries are agglomerated in specific spatial clusters in particular geographical horizon. Several factors determine the location of these informal businesses and industries. The present study is confined to stress a particular factor, namely innovation. The large firms of the industry get access to this innovation through their own R&D. However, small informal firms cannot execute this R&D due to their insufficient fund. The present study is, therefore, confined to explore: how small firms of any informal industry access to this new economic knowledge production thereby ensure their survival and contribute to industrial growth. To reveal this, the present study selects a single industry, the Gems and Jewellery industry in West Bengal. The selection has been based on the simultaneous existence of small, informal and big formal production units in spatial clusters incorporating high growth potential, large employment opportunities, and increasing volume of industrial exports. The micro-level field studies, sampling design and data analysis of the study are based on the standard model approach in order to accept spatial heterogeneity.

Keywords: Informal sector, cluster economy, externality, location
JEL Classification: E26, F02, J61, R10

1. Introduction

The present paper is an effort to focus on: how small firms of an informal localized industry access to innovation, i.e. new economic knowledge production. The issue becomes crucial since large firms of the industry bear their own R&D units, while small firms lack this due to their shortage of capital. However, it is necessary for the small firms to become familiar with the ongoing changes in the market just to ensure their survival within the industry. Therefore, it becomes important to examine what strategies the small informal firms of the industry are adopting to get access in the new economic knowledge production. The present study is an effort to capture this issue.

It is often observed that several informal localized industries[1] are agglomerated[2] in specific spatial clusters[3] in particular geographical horizon. In this, the production units are concentrated[4] in specific geographical spaces. Several factors determine location of such informal industries. Transport cost advantage, Supply of raw materials, Patronage of a court, Presence of a town, Economies of scale and Factor mobility are a few of them. The references of the factors are confined to the theories of Classical theories of Location Economics and to the New Economic Geography.[5]The present study is, however, confined to a particular factor, namely innovation (i.e. new economic knowledge production). It is observed that the large firms of the industry get easy access to this new economic knowledge production through their own R&D. However, small informal firms cannot execute this R&D due to their insufficient fund. Therefore, it becomes important to explore the issue: how small firms of any informal localized industry access to this new economic knowledge production and promote industrial growth. The present study is an effort to execute the phenomenon.

In this sense, the study becomes closer to the context of Location Economics literatures which analyze economic organization of a particular region. Since the aspect of Regional Economics analyzes the entire economic system of a region, the study is framed within the broader context of Regional Economics to include spatial dispersion and coherence of any economic activity within and between regions.[6] Economic Geography, on the other hand, analyzes how an economic system is formed in a particular location or space. In this sense, the present study is also concerned about the literature of Economic Geography.[7] Further, since Urban Economics analyzes the uneven distribution of agglomerated production units across spaces, the study of Urban Economics refers significant contribution to our study.[8]

To reveal the issue, the present study is confined to Gems and Jewellery industry in West Bengal. The industry has been selected on the basis of its spatially clustered production, simultaneous existence of small, informal and big formal production units, high growth potential, large employment generation, and increasing volume of exports. Five separate locations of the industry have been selected

for the study irrespective of the heterogeneous nature. These are: Bowbazar (Central Kolkata), Sinthi (North Kolkata), Elgin Road (South Kolkata), Domjur (Howrah)[9] and Daspur-Ghatal (West Midnapore).

2. Methodology of Analysis

The logical argumentation of the study is based on literature support, case studies and primary survey results. The survey process is exhaustive. The survey is based on qualitative purposive sampling with semi-structured questionnaire and indirect interview method. The micro-level field studies, sampling design and data analysis are based on the standard model approach. The implication is that the selection of the sampling region does not depend on data availability (or data non-availability) and avoids spatial homogeneity[10]. The production units of a cluster within an industry are considered to be non-homogeneous. However, the spatial distribution of production units of a single industry is cross-sectional, given and known. Sometimes an ethnographic study has been approached due to data non-availability and non-responses in the sample survey area.

3. Sticky Knowledge Externality as a Tool to Access Innovation

In the informal sector activities, skill incorporates something more than the usual concept of learned capacity or abilities that one possesses. Here, the domain-specific skill plays a significant role in the sphere of production.[11] For example, in case of the Gems and Jewellery industry in West Bengal, skill refers to the incorporation of finer craft works while preparing jewelleries with simple tools, e.g. cutting and fitting stones, carving of intricate designs, colouring and finishing etc. These added qualities are learned by the artisans of their industry from their teen age within a familiar socioeconomic environment from near ones. The incorporation of such a skill is called social skill. Social skill is nothing but the skill that facilitates interaction and communication with others in the society. In absence of supply of formal training procedure and appropriate measures of labour productivity, social skill is often acquired in an informal set up to express worker's expertise, specialization, and innovative capacity which are reflected in the wages of the informal sector workers.

The process of learning such skills is called socialization.[12]In the process, acquirement of social skill depends on the length of the training period – larger is the training period, larger is the skill acquired, and higher is the wage level. It is not an easy task to acquire such skill and is a long-term phenomenon - often training continues for 5-6 years to 10-12 years even. The already existing social rules and relations created, communicated, and changed (in verbal and nonverbal ways) refer significant arrays in the process of socialization. The social capital[13] invested becomes a crucial determinant in such a skill formation process. Here, social capital is nothing but a reference (even often oral) by any of his senior, experienced community member(s) who is/are already established in the informal labour market. The trainer (often called 'ustaad' or 'master') checks his trainee's patience, trustworthiness, eagerness, innovativeness, knowhow, tricks required in the work, sustainability, and adaptability with changes in the market during the entire training period.

Here, acquirement of such a social skill incorporates both qualitative and quantitative aspect. Hence, access to such social skill requires some socio environmental stimuli. In an informal industry, such stimuli appear in various forms - for instance, community networks. The supply of such socioeconomic stimuli makes interaction and communication of social skills among the community members much easier and cost-effective one, even often oral. Moreover, the nature of the informal labour market makes crucial influences there. Even if the competitive structure throws some risk and insecurity for the worker, a skilled worker gets extra job security in the competitive market structure since it is easier for him to leave the current employer and to get/arrange a new employer in absence of much formal paper works and contract(s) made.

To measure or estimate such social skill, knowledge endowment is a significant component. In an informal set up with informal bonding and belongingness among the community workers, this knowledge endowment often appears in the form of knowledge spillover which becomes much easier with easy flow of knowledge -such a knowledge flow appears even in gossiping in streets and tea stalls. Actually, such a knowledge spillover and knowledge flow may be viewed in an economic sense arising out of four things: Marshallianlabour market pooling,2. Pecuniary externalities,3. Variety of non-traded inputs supplied at the local level, and4. Information spillovers, both in product and labour market processes.

Here arises the aspect of knowledge externality. We actually consider here that knowledge is produced in an informal set up - therefore, estimation of knowledge production function appears to be difficult. Hence, we accept knowledge as a function of skill. However, it is difficult to assess social skill (hence knowledge production). This is due to the inherent informality of the occupation. Moreover, we have to keep in mind Krugman's famous argument that "knowledge flows are invisible, they leave no proper trail by which they may be measured and tracked".

Due to these difficulties in estimating knowledge, we accept the other aspect of measurement of knowledge production function, i.e. to measure externality. To assess knowledge externality in an informal occupation, the quality aspect of innovation becomes necessary to assess. In this, the process of inter-firm knowledge spillover is approached within a spatial cluster of production. The instances may be derived from Bowbazar. The big houses of Bowbazar Gems and Jewellery industry that often generates this kind of innovation through R&D informal mechanisms since they have their own R&D units. Such innovations appear in various forms, e.g. introduction of new product variety of the jewelleries, introduction of better packaging and leveling etc. However, the small informal firms become unable to make this costly R&D. They get access to this new knowledge production in the market through effective knowledge spillover. Often, such a knowledge spillover appears through verbal and non-verbal communications within spatial community

members (e.g. within the migrant labourers of Midnapore or Howrah). The small firms use such informal operations and spillovers as necessary tools to get access in new knowledge production function.

To explain such knowledge spillover by the small firms of the industry, the aspect of tacit knowledge becomes important.[14]Tacit knowledge is the knowledge which can spill over easily and incorporate some economic value.[15]Further, when this tacit knowledge is uncertain in nature, it is referred as sticky knowledge.[16] Such a tacit knowledge spillover (hence extraction of positive knowledge externality) appears to be uncertain (hence sticky) in nature while transmitting through direct and face-to-face interactions with frequent and repeated contacts (in a non-market environment) among the informal community workers within a spatial cluster.

Though uncertain in nature (hence a stochastic distribution appears there), the small informal producers of the industry are bound to use this sticky knowledge flow as an effective tool to get access in the new knowledge production. For this reason, they often maintain emotional tie-up and effective communication with their labourers and henceforth they execute positive production externalities by extracting positive knowledge externalities.

This sticky knowledge spillover (thereby extracting positive knowledge externality) becomes easier in the informal industries with easy labour flows, particularly when the voice of the worker becomes ineffective in the parent firm and/or his loyalty is sufficiently weak to the parent firm. In such cases, the informal worker not only switches over to a new firm for higher wages with better work conditions but presents himself in the new workplace along with his acquired know-how and knowledge in the old firm - which reduces costs of discovery and its exchanges to the producer of the new firm.

Here, the Marshall-Arrow-Romer (MAR)[17]externality suggests that an increased concentration of a particular industrial activity within a specific geographical region facilitates knowledge spillovers (hence knowledge externality) across firms, thereby promotes incentives to innovative activity and inter-firm spillovers. This is the case of Bowbazar, Domjur and Sinthilocations in the Bengal Gems and Jewellery industry. However, Jacobs externality and Porter externality suggest that local competition is suitable to extract knowledge externalities.[18]

Moreover, a sticky knowledge spillover, thereby extracting positive knowledge externalities, appears to be stochastic due to its uncertain nature. The growth of any geographical location, as is the case of Bowbazar, Domjur and Sinthi, depends upon how small informal firms of the localized industry positively execute externalities in production. If it is not the case, as in the case of Elgin Road in South Kolkata and Daspur-Ghatal in West Midnapore, growth of the existing location is hampered and the location becomes a small, isolated cluster in the map of the industry without any major linkages[19] with other locations of the industry excepting linkages in the labour market (mobility) processes.[20] This stochastic behavior appears to be one significant explanation for: why some clusters (i.e. Bowbazar, Domjur and Sinthi) grow with increase in number of small and medium informal production units operating there and why other locations (Elgin Road and Daspur-Ghatal) cannot.[21]

4. Conclusion

In case of agglomeration of informal production units within a specific geographic area, a decreasing cost industry may appear due to competitive forces of the market that contributes to its growth. However, the other reason may be that the small firms in this case strongly rely upon extraction of positive knowledge externality. There are positive knowledge spillovers appearing in the location for which a (small informal) firm of a particular industry locates in a place where other firms of the same industry are located. This may be due to information sharing, labour pooling and existence of specialized suppliers – the other reason may be extracting positive knowledge externality. It provides an incentive for the small informal firms to locatetheir production plants in those clusters where positive (knowledge) externalities appear. It is a common practice in several informal occupations, as in the case of Bengal Gems and Jewellery industry as well. The present study is an effort to execute this practice. Such a tendency also leads to inter-cluster trade and exchanges among informal sector producers and businesses, thereby promoting its growth – which has also been approached in the study.

5. End Notes

1. The issue of 'localized industry' owes its origin to the writings of Alfred Marshall. A localized industry is an industry concentrated in certain geographical spaces. To Marshall, an "industrial district" means an area (a district) where a concentration of firms has settled down in a particular industry or in a group of industries. However, the idea of industrial district does not simply refer to a "localized industry" but the idea refers more than it. Usually, a "localized industry" is an industry concentrated in certain geographical spaces. But an "industrial district" refers concentration of firms in an industry (or a group of industries) has settled down.

2. The term 'agglomeration' of firms refers to decline in average costs in production as more production occurs within a specified geographic area [Anas, Arnott and Small 1998]. In other words, it relies strongly on increasing returns to scale, considering internal and external economies of scale. However, the concept of agglomeration in the literature of Handerson (1974, 1977, 1988, 2000) and Tabuchi(1998) is due to positive external economies of scale which are industry-specific.

3. Cluster of enterprises is a geographical concentration of micro, small, medium and large enterprises producing same or similar type of goods and services.

4. As referred by Brulhart (1998), while concentration analyzes location across space of a few well-defined sectors, agglomeration analyzes location across space for a larger part of economic activity, and specialization deals with share of a particular location in a specific industry in comparison to share of other locations in that industry.

5. Ref: Saha, Sukanta (2015), An Informal "Industrial District" Syntax: From Marshall to Krugman (Forthcoming), Splint International Journal of Professionals, Vol. II, No-5.

6. In its basic essence, Location Economics relates to the context of Regional Economics and Economic Geography. While Regional Economics analyzes the economic system of a region, Location Economics attempts to study the economic organization of a region and between regions. Following Nijkamp (1986) and Mills (1986), the field of Regional Economics covers the analysis of spatial dispersion and coherence of economic activity.

7. On the other, Economic Geography analyzes how an economic system is formed in a particular location or space. Its application is common to explain agglomeration of production units in a single industry or several industries. To Dicken&Lloyd (1990), Economic Geography is the study of spatial organization of any economic system.

8. Urban Economics relates much to Economic Geography, which considers that economic geography is not evenly distributed across space - rather it observes uneven distribution of agglomerated production units is observed. Actually, it is the analysis of Urban Economics that originated with Von Thunen's "Der IsolierteStaat in Beziehung aufLandschaft und Nationalokonomie". Later, it was translated by C. M. Wartenberg as "Von Thunen's Isolated State" (1966) and appeared in mainstream discussion.

9. Domjur and Panchla in Howrah has been considered as 'growth pole'. The concept of economic growth pole was introduced by French economist Francois Perroux (1949). The idea is based on external economies of scale, agglomeration of small scale industries, and linkage effect. The concept states that a combination of these three at a particular geographical space is sufficient to make an area a growth pole to the region (or district).

10. Starrett (1978) has countered the assumption of homogeneous spaces. Starrett's 'Spatial Impossibility Theorem' assumes spatial heterogeneity and refers that market unevenness is developed by several factors other than spaces. To Starrett, people cluster in urban centers considering localized increasing returns (or indivisibilities) and transport cost.

11. Skills can often be divided into domain-general and domain-specific skills. For example, in the domain of work, some general skills are observed, e.g. time management, teamwork and leadership, self-motivation and others, whereas domain-specific skills would be useful only for a certain job, e.g. carving raw gold to assigning intricate design, cutting stones, polishing, finishing etc. to produce gold jewelleries.

12. 12.Ref: Saha, Sukanta and S. Kundu (2013), 'Informal Schooling: Towards an Inclusive Society' in Sen, N., Tundawala, A. and Sengupta, A. (ed.) 'Towards an Inclusive Society: Understanding the Role of Education and Citizenship in the Indian Context', Rachayita, Kolkata.

13. Social capital is social organizations (such as trust, norms, reciprocity, co-ordination, interactions belongingness and networks) between producers and workers that facilitate better co-ordinated actions.

14. The idea of tacit knowledge may be found in the literature of Jacobs (1969). The distinction between information and tacit knowledge lies in the fact that the marginal cost of transmitting tacit knowledge is the least with frequent social interactions and communications, despite the fact that the marginal cost of transmitting information across space has declined much over time [Glaeser et al, 1992].

15. Ref: Saha, Sukanta (2015), Argument for Tacit Knowledge Spillover: The Case of Informal Localized Industries (forthcoming), based on the Seminar Proceedings publication titled "Social Capital, Skill, Knowledge Spillover and Externality: The Case of Informal Location Industries" in "Emerging Rural Transformation and Resource Utilization in the Post-globalization Period", 2013, the Department of Economics, RabindraBharati University, in collaboration with National Bank for Agriculture and Rural Development (NABARD).

16. The idea of sticky knowledge is applied by Von Hipple (1994) and Manski(2000).

17. To Scitovsky(1954), incorporation of imperfect competition initiates internal economies of scale that implies market power. Scitovsky distinguishes between "pure" (technological) and "pecuniary" external economies. The former affects firm's production function (e.g. Marshallian "information spillover"). Arrow (1962) identifies externalities associated with knowledge which is non-exclusive and non-rival in use. However,Romer (1986) and Krugman(1991), Lucas (2001) and Lucas and Rossi-Hansberg (2002) have relied upon increasing returns in production which generates externalities.
One implication is that industry-specific external economies can rationalize city system. Black and Henderson (1999) give stress upon positive externality. However, in reality, cities are both specialized and diversified (Glaeser et al, 1992). Each industry has its optimum size - sub-optimization of a city leads to welfare-improving profit-opportunity based mobility of entrepreneurs (Becker and Handerson, 2000).

18. In 1957, Gunnar Myrdal introduced the concept of circular or cumulative causation. In this, once a region (or country) takes lead in the process of economic development, positive external economies of scale in the region (or country) appears there – which ensures that the location will become an attractive place to invest and more attractive location for the labourers to work. The existence of strong localized spillovers leads to the establishment of a core in the region with large market and a periphery [Dicken and Lloyd 1990].

19. Ref: Saha, Sukanta (2015), Formal-Informal Linkage and Tie up of Informal Labour: A Study Focused on Gold and Jewellery Industry, West Bengal, India,The International Journal Of Management, April Issue 2015.

20. Ref: Mabogunje, 1970; Arizpe, 1981; Djajic, 1986; Borcocz, 1987; Portes &Borcoz, 1987; McKee &Tisdell, 1988; Fawcett, 1989; Massey, 1990; Kritz et al, 1992; Martin, 1992; Gurak&Caces, 1992; Appleyard, 1992; Massey et al, 1993; Bocker, 1994; Bohning, 1994; Martin & Taylor, 1996; Rotte et al, 1997; Waldorf, 1998; Levitt, 1998; Massey, 1999; Taylor, 1999; Vertovec, 1999; Olesen, 2002; De Haas, 2003; van Dalen et al, 2005.
21. Ref: Saha, Sukanta (2015), Argument for Informal Cluster Industry Formation: The Case of Sinthi Gold &Jewellery Industry, Journal DeshVikas, Vol. 2 Issue 1 April-June.

6. Acknowledgement

7. References

i. Anselin, Luc, Spatial Econometrics: Methods and Models, 1988, Dordrecht, The Netherlands, Kluwer Academic Publishers.
ii. Baldwin, R. E., R. Forslid, P. Martin and F. Robert-Nicoud, The Core-periphery Model: Key Features and Effects', in Baldwin, R. E., R. Forslid, P. Martin, G. I. P. Ottaviano and F. Robert-Nicoud (ed.), Economic Geography and Public Policy, 2003, Princeton, Princeton University Press, pp. 213-235.
iii. Brulhart, M., 'Economic Geography, Industry Location and Trade: The Evidence', 1998, The World Economy, 21(6), 775-801.
iv. Dawkins, C. J., Regional Development Theory: Conceptual Foundations, Classic Works and Recent Developments, Journal of Planning Literature, Vol. 18, No. 2, 2003, November.
v. Fujita, M., P. Krugman and A. Venables, The Spatial Economy: Cities, Regions and International Trade, 1999, Cambridge, MIT Press.
vi. Gayer, H. S. (ed.), International Handbook of Urban Systems: Studies of Urbanization and Migration in Advanced and Developing Countries, 2002, Cheltenham, Edward Elgar.
vii. Gelfand, Alan E., Peter J. Diggle, Montserrat Fuentes & Peter Guttorp (ed.), Handbook of Spatial Statistics, CRC Press, 2010, New York, Chapman & Hall Book.
viii. Glaeser, E. L. and D. C. Mare, 'Cities and Skills', Journal of Labour Economics 19(2), 2001, pp. 316-342.
ix. Handerson, J. Vernon and Jacques-Francois Thisse (ed.), Handbook of Regional and Urban Economics, Vol. 4, Cities and Geography, 2004, Amsterdam, Elsevier.
x. Huriot, J. M. and J. F. Thisse (eds.), Economies of Cities: Theoretical Perspectives, 2000, Cambridge, Cambridge University Press.
xi. Krugman, Paul, Geography and Trade, 1991, Cambridge, MIT Press.
xii. Krugman, Paul, The New Economic Geography, Now Middle-Aged, presented to The Association of American Geographers, 2010, Apr. 16.
xiii. Marshall, A., Principles of Economics, 1890, London, MacMillan.
xiv. McCann, Philip, Urban and Regional Economics, 2007, New York, Oxford University Press.
xv. Rosenthal, S. S. and W. C. Strange, 'Geography, Industrial Organization, and Agglomeration', Review of Economics and Statistics 85(2), 2003, pp. 377-393.
xvi. Saha, Sukanta (2015), An Informal "Industrial District" Syntax: From Marshall to Krugman (forthcoming), Splint International Journal of Professionals, Vol. II, No-5.
xvii. Saha, Sukanta (2015), Formal-Informal Linkage and Tie up of Informal Labour: A Study Focused on Gold and Jewellery Industry, West Bengal, India,The International Journal Of Management, April Issue.
xviii. Saha, Sukanta (2015), Argument for Tacit Knowledge Spillover: The Case of Informal Localized Industries (forthcoming), based on the Seminar Proceedings publication titled "Social Capital, Skill, Knowledge Spillover and Externality: The Case of Informal Location Industries" in "Emerging Rural Transformation and Resource Utilization in the Post-globalization Period", 2013, the Department of Economics, RabindraBharati University, in collaboration with National Bank for Agriculture and Rural Development (NABARD).
xix. Saha, Sukanta (2015), Argument for Informal Cluster Industry Formation: The Case of Sinthi Gold and Jewellery Industry, Journal DeshVikas, Vol. 2 Issue 1 April-June.
xx. Saha, Sukanta (2015), Spatial Concentration: Specificity and Informality, Journal Social Vision, Vol. 1 Issue 4 Jan-March.
xxi. Saha, Sukanta and S. Kundu (2013), 'Informal Schooling: Towards an Inclusive Society', in 'Towards an Inclusive Society: Understanding the Role of Education and Citizenship in the Indian Context', Rachayita, Kolkata.
xxii. Wheaton, W. C. and M. J. Lewis, 'Urban Wages and Labor Market Agglomeration', Journal of Urban Economics 51, 2002, pp. 542-562.