

Inter Linkages between Technology and Livelihood: A Case of Furniture Industry in India

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Abstract

With new modular forms of production and innovations in designs, craft, and material sciences, furniture industry in India has been going through a complex dynamics that seeps through production units that are mostly unorganised in nature. It appears as technology becomes more malleable, value chains strive hard to adjust with these changes through learning by doing and appropriate forms of labour market flexibilities. Moreover, owing to flexibilities ushered in by emerging international business models, in recent times, the industry appears to have been caught in diverse strategic milieus that may have emanated from economies of communication, scope that has been bred by innovative designs, and new collaborative formats in supply chains. Juxtaposing these technological contexts with livelihood, we explore the emerging dynamics in the industry, in particular new formats of supply chain, skill sets, new occupations, entrepreneurial possibilities and so on. In this paper, we use unit records of national sample surveys and annual survey of industry to capture the triad of livelihood, adoption of technology and business in Indian furniture industry.

Key Words: Technology, Furniture Industry, Business models, livelihood

1. Introduction:

We study recent dynamics that emanate from sources such as evolving flexibilities in technology, cumulative innovative processes, novel international business models, and how it has been shaping interesting strategic contexts, with special reference to furniture industry in India. What makes furniture industry an interesting case is while the industry produces intermediate goods for other industries, it has an ever growing segment of demand that is made of final consumption units such as households. Quiet vividly, there is clear rationale for positing the furniture industry that embodies both manufacturing and service characteristics. Put differently, furniture industry as a continuum appears to be an ensemble of diverse producing units that immensely vary in scale, scope, and the breadth of the value chain. For example, there may be simple production units, owned by proprietor/s, that are principally engaged in only raw material to product transformation on the basis of advanced orders, while at the other extreme producing units through a complex value chain may engage in producing and selling of diverse products, not merely dependent on advanced orders, rather being engaged in dynamic aggregation of future and present demand. It is important to note that as shown in the example the simple production units, while they may look quiet lean and averse to risk it may not make much sense if these units are assumed to be alienated from the complex interplay of strategy and

technology (Milgrom & Roberts, 1990). Why we argue so? Presumably, keeping the units so lean by being dependent on discrete orders for produces intuitively these units tend to survive longer even while they continue to be dwarf. However, this local stability seems to be short living especially when new technology, new knowledge, new designs, new business models, and so on jointly envelope the business space through diverse dynamic and complex spirals. Our argument losses veracity if the production process is pivotally determined by the neo classical notion of indivisibilities. On the other hand, with advancements in information communication technology embedded in value chains, capturing the production to the sales, and communication based supply chains such as electronic commerce/mobile commerce, there seems to be more scope for modular business to business and business to final consumer streams. This implies that even simple units, to sustain and grow, may not be averse to explore new vistas of collaborative participation in the value chain, new technologies designs and so on. In emerging economies such as India, drawing cues from the data and patterns, the value chain is largely unorganised in nature, owned by proprietors and employing a big pool of informal workers. In this paper we juxtapose above mentioned technological, strategic, and business context with the system of livelihood, to explore how production units adapt to changes in technology and value chain.

While the paper reviews technological-business dynamics in the global manufacturing system with special reference to furniture industry, we provide a snap shot of Indian furniture industry, in particular business and institutional aspects. Moreover, we present the system of employment prevalent in Indian furniture industry. Based on field research and in-depth interviews with chief stakeholders of select enterprises, we develop case studies that would caricature the linkage between technology, business and livelihood. For this paper, apart from the primary data collected from the field, we use unit records of National Sample Survey (NSS) and Annual Survey of Industries (ASI) to create a macro picture of the phenomenon researched in the paper.

The paper is divided into five sections. Section two provides an overview of furniture industry in India. Section three discusses a frame to analyse livelihood scenarios. Section four brings out inter linkage between adoption of technology, business models, and livelihood. Section five concludes the paper.

2. Furniture Industry in India

Furniture and Woodcraft from India has been evolving as a dynamic value chain that is built around the triad of livelihood, business and technology. In recent times, it appears Indian furniture industry has been stepping to the vibrant global trade. Indian furniture Industry is the 14th largest furniture market in the world, while it is significantly driven by a huge middle-class population. The annual turnover of Indian furniture industry is estimated at INR 887.50 million in 2014. But the industry contributes only 0.5% to India's GDP. The expected projection by 2019 is INR2708 billion at a compound annual growth rate of 25% for the period of 2015-2019 (Indian Mirror, 2016).

It is important to note that even in contemporary times Indian furniture industry appears to remain hugely labour intensive and unorganized (Indian Brand Equity Foundation, 2015). The employment size of Indian furniture is expected to grow exponentially by 2022 (NSDC, 2014). The figure 1 shows India's top 10 states in terms of Persons Employed in furniture industry. The state wise distribution of the persons employed in furniture industry shows that West Bengal is the state which has the largest persons employed in the industry (16.9%), followed by Uttar Pradesh (11%) and Maharashtra (9.6%), while Bihar and Kerala account for 6.8% and 6.5% of the persons employed in the industry, respectively.

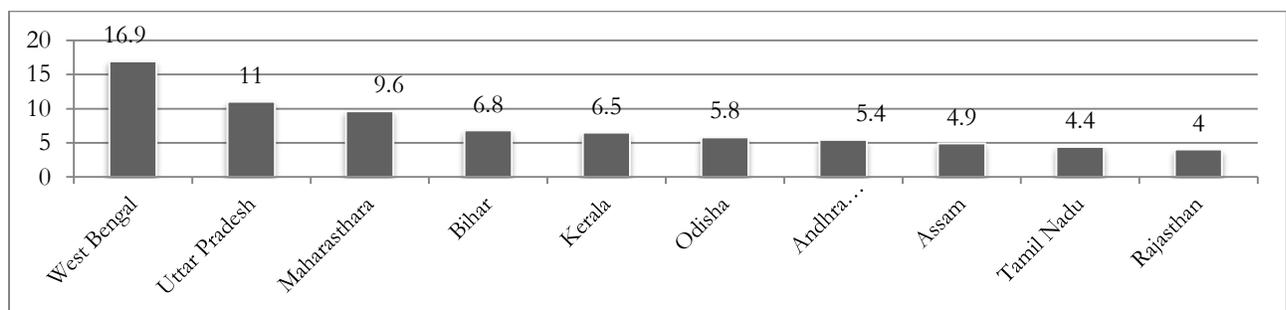


Figure 1: State Wise distribution of the Persons employed in Furniture Industry in India
Source: Computed by authors from National Sample Survey 68th round unit records

Figure 2 depicts state wise median wage distribution among the states which have prominent share in the persons employed in furniture as seen in the furniture industry in India (figure 1). As shown in the figure, Kerala reports the highest median wage (Rs.2100 per week) followed by Maharashtra (Rs.1500 per week), Tamil Nadu and Odisha (Rs.1400 per week apiece), while West Bengal shows the lowest median wage (Rs.750/- per week), followed by Uttar Pradesh (Rs.980/- per week) and so on.

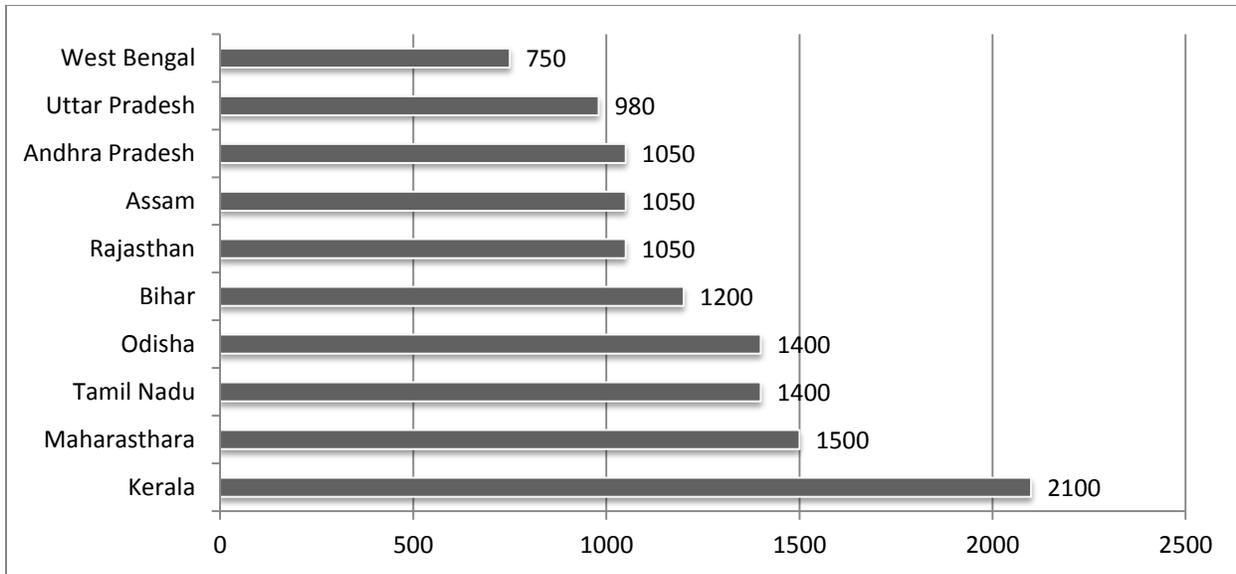


Figure 2: State wise distribution of Median wage/earning in furniture industry in India
 Source: Computed by authors from National Sample Survey 68th round unit records

Figure 3 presents the distribution of persons employed in furniture industry as per the economic activity they are engaged. The economic activity wise distribution of the persons employed in the furniture industry in India shows that manufacture of furniture made of wood accounts for 89% of the employed persons in the industry, while manufacture of furniture of metal emerges as the second largest employer (6.5%). Rest of the persons employed fall in the remaining activities such as manufacturing of plastic furniture, pillows, and mattress carpets and so on.

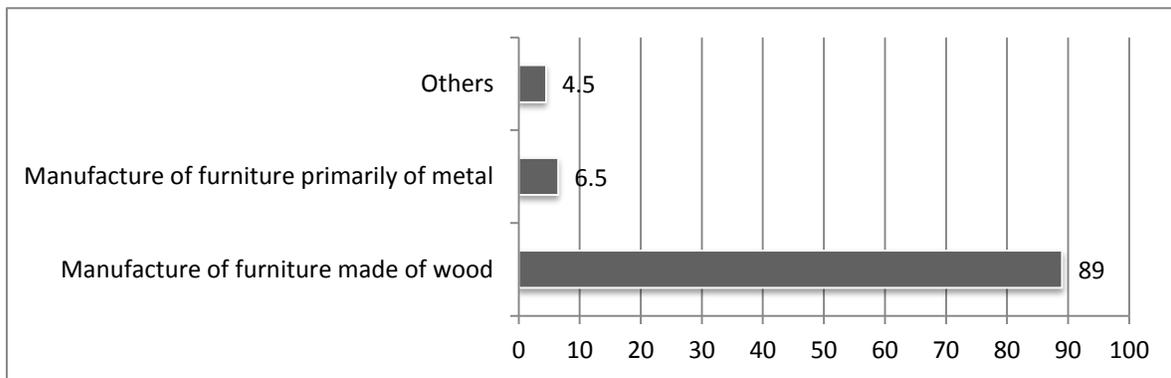


Figure 3: Economic activity wise distribution of persons employed in furniture industry in India
 Source: Computed by authors from National Sample Survey 68th round unit records

Table1 captures the household level characteristics of persons employed in Indian furniture. The distribution of persons employed in Indian furniture industry based on the place of residence shows that 64.7% of the persons employed reside in the rural area. Slightly above four fifth of employed persons in Indian furniture industry are Hindus, followed by Islam (13%) and Christianity (2.7%). While 55.2% of the employed persons belong to Other Back Ward Classes (OBCs), a percentage of the share of Scheduled Caste (SC) and Scheduled Tribe (ST) are 18% and 4%, respectively. It is interesting to note that the share of general category which is more than one third of the country's total population does not have proportionate representation while OBCs emerge are the principal social group in the distribution; this pattern seems to emanate from the linkage between economic activities, occupations, and caste system in India.

Table 1: Household Characteristics of Persons Employed in Furniture Industry (India) 2011-12

Area of residence	Percentage
Rural	64.7
Urban	35.3
Religion	Percentage
Hinduism	82.0
Islam	13.0
Christianity	2.7
Others	2.3
Social Category	Percentage
Scheduled Tribe	4.0
Scheduled Caste	17.7
Other Backward Classes	55.2
Others	23.1

Estimated N= 2102774 from a sample of 1100

Source: Computed by authors from National Sample Survey 68th round unit records

As depicted in table 2, 23-35 emerges as the mode age for persons employed in Indian furniture industry, accounting for 39%, while age groups 15-22 and 60 and above form 12% and 6%, respectively. Perhaps this pattern point to that the sector, presumably, lags in drawing the youngest population to the work force while the age group 23-45 forms two third of employment. This means the furniture industry is a destination for the youth who are the age group of not pursuing higher education. However, this pattern appears only to be valid for male because female participation in the industry is abysmally low (0.8%). The distribution of persons employed in furniture industry according to the general education level shows that 25.4% of the total persons employed is having a middle school level education which most represented category, followed by Primary level education (20.5%) and Secondary level education (17.1%). It important to note that the 70% of the total persons

employed in the furniture industry has not studied beyond middle school. The attainment of vocational training seems to be one of the key factors in the furniture industry, since this stream of education imparts knowledge about the state of art, basic technologies and the craft. While only 1.4% of the total persons employed have attained formal vocational training, 43.5% have obtained the training through informal channels. However, a whopping 55% have not yet attained vocational training. Moreover, percentage of employed persons with technical education is not even 1%. Unequivocally, above patterns say that the stock of human resources who have received proper training and education in technical and vocational realms seem to fall short of the critical mass of quality talent pool that supports the growth of livelihood and business systems.

Table 2 Personal Characteristics of Persons employed in Furniture Industry (India) 2011-12

Age	Percentage
15-22	11.7
23-35	38.9
36-45	25.8
46-59	17.6
60 and Above	6.0
Sex	Percentage
Male	99.2
Female	0.8
Educational Attainment	Percentage
Not Literate	14.1
Just Literate	10.6
Primary	20.5
Middle	25.4
Secondary	17.1
Higher Secondary/Diploma	9.5
Graduate	2.7
Post Graduate	.1
Attainment of Vocational Education	Percentage
Formal	1.4
Informal	43.5
No vocational education	55.1
Attainment of Technical Education	Percentage
Diploma	.5
PG Diploma	.1
No technical education	99.4

Estimated N= 2102774 from a sample of 1100

Source: Computed by authors from National Sample Survey 68th round unit records

Table 3 provides basic features of employed persons in Indian furniture industry, capturing employment status, engagement in subsidiary activity, employment according to usage of electricity in enterprise, employment according to workforce size, and nature of employment. As far as employment status is concerned, the category ‘employer’, perhaps a proxy for entrepreneurship, is just 1.4%, while 51% of persons employed are engaged in household enterprise as own account worker. Interestingly, 23% are into casual work. Share of regular salaried and wage employed is merely one sixth. Around One tenth of the persons employed are helpers who work with household enterprises. Drawing cues from this pattern, we argue that furniture industry in India seem to look more like a system of livelihood than a full fledged stream of business. Quiet importantly, 13% of the employed in the industry resort to engaging in subsidiary activities; seemingly they adapt to harsh part of life by diversifying livelihoods rather than maximizing their earning opportunities. It note worthy that slightly more than a half of employed are with the enterprises that do not use electricity. This information throws interesting hints about the role of human craft rather than modern capital goods in shaping the furniture industry of India, although in the emerging business and technological contexts electricity would be an important factor to elevate the systems of production and service to more value adding ones. As emerging from the table, a whopping 92% of employed are with enterprises that employ less than 10 persons, showing discernibly low operating scales prevalent among the furniture enterprises in India. Contrary to this, percentage of employed who are with enterprises that employs at least twenty persons is just 1.5%. Further, only 1% of the employed are entitled to any type of social security, throwing obvious pattern of indecent work in the industry.

Table 3 Features of Employment in Furniture Industry (India) 2011-12

Employment Status	Percentage
Worked in household enterprise self-employed own account worker	51.1
Employer	1.4
Worked as helper in household enterprise	9.3
Worked as regular salaried wage employee	15.6
Casual Labour	22.6
Persons engaged in Subsidiary Activity	Percentage
Yes	12.8
No	87.2
Persons in employment according Usage of Electricity in Enterprise	Percentage
Yes	46.6
No	51.4
Do not know	2.0

Persons in employment according to employment size	Percentage
Less than 6 employees	82.7
6 to 9 employees	8.7
10 & above but less than 20 employees	4.6
20 & above employees	1.5
Not known	2.6
Nature of Employment	Percentage
Informal	99.0
Formal	1.0

Estimated N= 2102774 from a sample of 1100

Source: Computed by authors from National Sample Survey 68th round unit records

Figure 4 portrays the distribution pattern of employed persons in furniture industry in India across different types of enterprises based on ownership is captured in the figure 4 and it shows that 88% of the persons employed in the furniture industry is engaged in the proprietary enterprises headed by a male. The participation in public/private limited companies is only 3% which more or less forms the organized sector in the industry. Enterprises out of local partnership either within the house hold or with other households are another category and even though it engages only 3% of the total persons employed the industry.

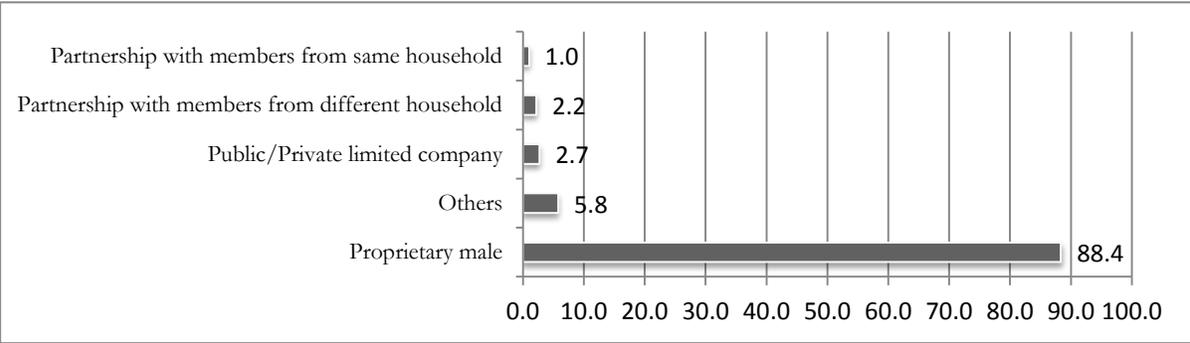


Figure 4: Distribution of employed according to the type of organisation

Estimated N= 2102774 from a sample of 1100

Source: Computed by authors from National Sample Survey 68th round unit records

The previous analysis was on the basis of employment data, generated from the unit records national sample survey 68th round. Now, we turn to national sample survey 67th round unit records that provide us data on unorganized enterprises in India. We extracted data of enterprises that manufacture furniture. To spot enterprises that make furniture we used National Industrial Classification 2008 five digit codes with respect to furniture manufacturing, covering wood and non wood based activities. As shown in table 4, we present percentage distribution of unorganized enterprises according to type of ownership, social category of the owner, type of enterprise, location of the enterprise status of the

enterprise, and use of Information and Communication Technology. A whopping percentage of enterprises are owned by the Male Proprietors (97%), while partnership with members of different households owned enterprises form not even 1%. This pattern, while a stylized fact in gendered societies such as India, points to tenacity of family based business ownership structures that have been built by highly clustered a few strong interpersonal ties. While systems of this sort tend to be embedded with locally stable ownership but not so capable of bringing novelty and innovation, competitive value chains seem to require ownership systems that hover around collaborations/partnerships from outside the family; this is something close to 'strength of weak ties' (Granovetter, 1973). Interestingly, small business systems that are built around home based livelihoods tend to mix strong and weak business ties to sustain the enterprise (Uzzi, 1997). Aligning with the pattern of previously discussed employment data, 57% of enterprise owners belong to Other Backward Classes (OBC), while the category 'others', largely capturing forward caste persons, account for 30% of the enterprises. It is important to note that 10% of enterprise owners belong to schedule caste. Percentage of owners who belong to scheduled tribes is just 3%. These patterns seem to signify obvious reproduction of social structure to owning unorganized enterprises as well, thus, positing an empirical base for future explorative research on the complex social embedding that shrouds livelihoods. From the table, quiet clearly, close to two third of enterprises are own account enterprises that are unlikely to be good cases for entrepreneurship or business venturing, rather these entities are classified as vulnerable employment by International Labour Organisation (ILO, 2009) since owners of these units are not significantly different from the working poor who strive hard to hover around the subsistence earnings. Amongst unorganized furniture enterprises, establishments form only 36%. Another interesting pattern is about location of the enterprise. In the whole distribution, 41% of enterprises operate outside hold with fixed structures, while 42% exist within household premises. It is interesting to note that 10.1% of the enterprises in unorganized sector belong to the category of 'street vendors'. Analyzing the status of the enterprises in the unorganized sector in the furniture industry 50% of the enterprises are in a stagnant state where they are just maintaining a status quo while 40.2% of the enterprises are expanding. It is interesting to note only 9.8% of the enterprises have reported a contracting effect. Another key factor to be looked into in the enterprises in unorganized industry is use of Information Communication Technology (ICT) where the study has looked into the use of computer and use of internet; only 2.1% of the enterprises in the industry use computers and only 1.1% of enterprises use internet. Quiet obviously, drawing cues from patterns on type of ownership, social category, type of enterprise, location, whether the enterprise is expanding or not, and use of ICT, we may posit that elevating the

vulnerable own account work system to more dynamic enterprises entails progressive changes in property rights manifest in ownership, integrate network of weak and strong ties and skills in ICT. As we go on, we elucidate these aspects.

Table 4 Distribution of Unorganised Enterprises in Furniture Industry

Type of Ownership	Percentage
Proprietorship Male	96.7
Proprietorship Female	0.8
Partnership with member of same household	2.3
Partnership with members of different household	0.4
Social Category of the owner	Percentage
Schedules Caste	2.8
Scheduled Tribe	10.4
Other Backward Communities	57.0
Others	30.1
Type of Enterprise	Percentage
Own Account Enterprise	64.0
Establishment	36.0
Location of the Enterprise	Percentage
Within household premise	42.1
Outside household with fixed structures	40.9
Outside household premise with temporary structure	1.0
Outside household premise without any structure	0.8
Mobile Market	5.3
Street Vendors	10.1
Status of the Enterprise	Percentage
Expanding	40.2
Stagnant	50.0
Contracting	9.8
Use to Information Communication Technology	Percentage
Computer	2.1
Internet	1.1

Estimated N= 700929 from a sample of 5500

Source: Computed by authors from National Sample Survey 67th round unit records

Our previous discussion has been around unorganised enterprises that manufacture furniture in India. It would be interesting to see some features of organised enterprises in Indian furniture industry, capturing Investment in Plant and Machinery, International Standardization Organisation Certification (ISO), place of enterprise, type of enterprise and ownership of enterprise. To capture that data, we use Annual Survey of Industries unit records 2008-09. As shown in tale 5 close to four fifth of enterprise report that value of investment in plant and machinery is less than one crore, while enterprises having investment in plant and machinery worth more than 10 crore is just 5%. Only 11.6% organised

furniture enterprises have acquired ISO certification that is crucial to compete in the international business. Therefore, quite clearly, drawing cues from the fact that good chunk of organised manufacturers have not got ISO certification points to the hunch that Indian furniture enterprises lag behind building competences that are needed to perform well in the international business. Contrary to the case of unorganized enterprises that are concentrated in the rural, 73% of organised enterprises are in the urban. This means that these enterprises feed into a different business to business and business to customer value chains. Further only one third of the enterprises are owned by the individual proprietors, while close to 40% are owned by companies (Public Limited Company-12% Private Limited Company-27%). Close to 23% of units are owned by partnerships. Nearly 95% of enterprises are owned by the private. This points to an interesting argument that Pareto improvements that should go into strengthening both organised and unorganized enterprises may not necessarily emanate from the same sources, rather unorganized enterprises need more flexibilities in envisaging collaborative organizations and skills in ICT, while organised ones require capabilities to participate in a dynamic international business system.

Table 5 Distribution of Features of Organized Industries in Furniture Industry

Investment in Plant and Machinery	Percentage
Less than One Crore ¹	79.1
One crore to 5 crore	12.9
5 crore to 10 crore	3.4
More than 10 crore	4.6
ISO Certification	Percentage
Yes	11.6
No	88.4
Place of Enterprise	Percentage
Rural	26.7
Urban	73.3
Type of Organisation	Percentage
Individual Proprietorship	32.7
Partnership	22.7
Public Ltd Company	11.6
Private Ltd Company	27.1
Others	6.0
Ownership of the Enterprise	Percentage
Wholly State and/or Local Government	4.0
Central/State/Local Government Jointly	.4
Joint Sector Public	.8
Wholly Private Ownership	94.8

N=251

Source: Computed by authors from Annual Survey of Industries 2008-09

¹ One crore means 10 million.

Demand for Furniture in Indian market has been steadily growing, and reported a growth of 12% during the period of 2007-2012 and is expected to grow at 15% during the period 2012-2017. Indian furniture market seems to be tilting more towards organised sector and it is characterised by increased demand for readymade, branded furniture. Consumer preference is moving towards high-end, low maintenance, quickly installable products. (NSDC, 2014) Import and Export scenario in Indian furniture industry has received a boost with deregulations in the government policies especially the deregulations in import policies where 100% foreign direct investments were allowed in furniture manufacturing. This has resulted in multinational furniture brands to start their operations in India and they are slowly capturing the market. The total furniture imports to India has grown at a Compound Annual Growth Rate of 17% during 2008-2013, and furniture imports accounts for 0.2% of total imports to India at 2012. Preferences of emerging upper middle class and the middle class urban population are the key drivers in increased imports of furniture along with the reduction on imports tariff. The export scenario in India is promising where the major buyers from India are United States of America and United Kingdom which together account for 47% of the total furniture exports from India. (NSDC, 2014)

The existence of organized and unorganized sectors in furniture industry makes the industry's market structure complex where each of the sectors follows its own value chain according to the sector specifications. Indian furniture industry faces a number of challenges in exploring the positive market situation existing in the domestic and international market. The issue of Lack of Labour Supply is one of the major challenges. The increased affinity to the white/blue collared jobs and the job in the furniture industry does not stand high in social status and unorganized nature of the work and the seasonality of the work add on to lack of preference among job seekers. Lack of Standards and Certification is another major issue which is a major reason for which the industry remains unorganized and not attracting labour force. There are only few institutes which cater to the skill needs of the furniture industry. Lack of standardization agencies or certification center leads to no quality check, addressing the issue of wage and capacitating of the labour force. Skill Gap is another major problem that seems to have been resulted of unorganized nature of the industry and lack of training institutes and certification process. Automation is considered the future of all industries and the trend is emerging in the furniture industry. Therefore the workforce who is skilled in technologies becomes quite critical for higher order attainments by enterprises (NSDC, 2014).

It is worth noting that expenditure on furniture and furnishing has been growing at a compound annual growth rate of 9.51% during 2004-05 and 2010-11. It appears a revival of real estate and increase in disposable income of the middle class and upper middle class has created a favorable condition for furniture industry. As a result consumer preference seems to have been changing along with the rise in purchasing power of high and middle income consumers. Emerging segments like Modular kitchen, Glass glazing, false ceiling, wall tiles, wallpaper, interior designing seem to be the principal drivers for positive impact on production and result in expansion of the sector and there by attracting man power to the industry (NSDC, 2014; Indian Brand Equity Foundation, 2015). Thus, Indian furniture Industry seems to be moving in a direction that calls for employing persons with specific and specialized skill sets and transforming organised and unorganized enterprises to dynamic and innovative units. We summarise above discussion in figure 5.

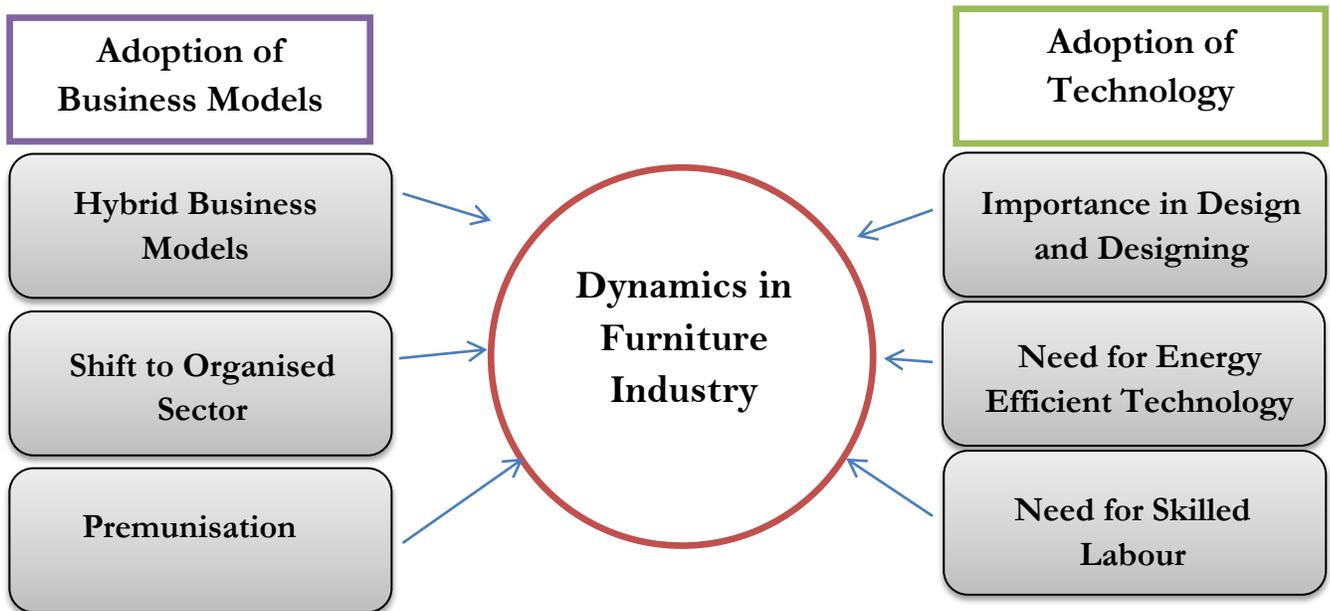


Figure 5: Dynamics in Furniture Industry in India
 Adopted from: (NSDC, 2014)

3. Sustainable Livelihood Approaches: A theoretical position in analyzing the Furniture Industry in India

An overview of the furniture industry, the dynamics of technology in the furniture industry, emerging business models in the industry affects the labour market in a complex manner and hence the welfare of the labour. This demands a structured way of looking at the issue where the factors of technology and new business models and their influence on the life of the labour are assessed. The focus is on how the new dynamics is affecting the life and welfare of the labour involved in the industry and hence the concept of livelihood is being

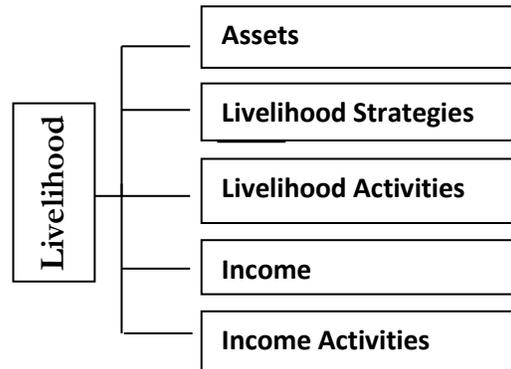
In the spectrum of development discourse livelihood is a concept which has a theoretical and operational significance and calls for a clarity at both dimensions. In a classic 1992 paper, Sustainable Rural Livelihoods: Practical concepts for the 21st Century, Robert Chambers and Gordon Conway proposed the following composite definition of a sustainable rural livelihood:

“A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term.” (R Chambers and G R Conway, 1992)

This definition opens up an entire spectrum of concepts which essentially forms the operational part of the larger concept of livelihood. The major aspects which we have to focus in an operational context of livelihood are the following:

‘Vulnerability Context’ is another concept in the milieu of livelihood which holds a central position in the operational part of the concept. Putting it starkly, vulnerability context is the set of factors/condition which affects/influences the trajectories of livelihood and initiates changes in the livelihood patterns. (R Chambers and G R Conway, 1992; Department for International Development, 2001, p. 6)

The operational part of the livelihood and the dynamics of the livelihood include a number of interrelated aspects which has to be taken into serious consideration in tracing the dynamics of the livelihood. Roughly stating these are the factors which influence the livelihood of either and individual/household/community. It can be represented as follows (figure 6):



Adapted from (Department for International Development, 2001, pp. 6-7)

Figure 6: Principal aspects of livelihood

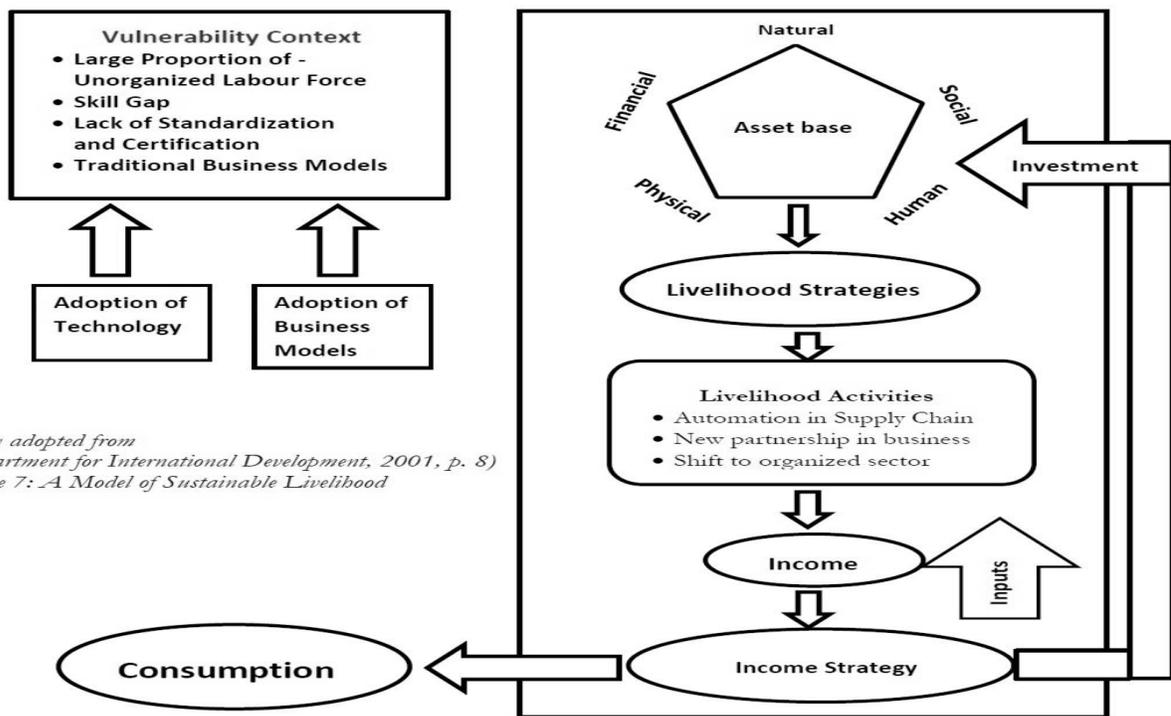
People/Household/Communities draw on a set of **assets** of different forms as an essential part of the livelihood. Carney (1998) identifies set of five assets (Human Capital, Natural Capital, Financial Capital, Physical Capital and Social Capital) which is by and large integrated into the DFID model of livelihood. While the earlier approaches has taken into account, income and activities as factors of livelihood. The way in which these assets have to be delineated to build on a livelihood pattern refers to the **livelihood strategy**. That is which asset has to be used, in what situations and in which order to make optimal use of the same. There can be strategies adopted, some are regular, which are continuous and predictive, some are reactive, which are in response to a particular external condition, some are constitutional/structural decision which alters the whole livelihood pattern. The adopted livelihood strategies will lead to a number of **livelihood activities** initiated by people. These are activities which are very familiar for people and are being part and parcel of their life and have to be in focus of any developmental effort. This forms the essential part of any livelihood analysis process. Individual/Household/Community will derive **income** from the livelihood activities initiated and the may be counted in the form of money, goods and services. This essentially leads to another set of decision on how to distribute the income generated and that forms the **income strategy**. The distribution of the income happens generally in four areas, inputs for furthering the livelihood activities, social payments (taxes, loans etc), investment (education, physical assets, savings) and household consumption. (Department for International Development, 2001, pp. 6-7)

Looking into the dynamics of livelihood and the analysis of livelihood calls attention to another set of facts that has to be integrated into the livelihood analysis and which definitely has a significant influence on the livelihood patterns. These factors focus more on to the socio-political aspects and integrate a broader frame into livelihood analysis. The first factor is the local community: the social groupings/social setting where the individual individual/ household/ community exist. It reflects differing combinations of the places (the locality or neighbourhood) and the people (the kin, religious, ethnic, occupational grouping or other social and economic characteristics) where an individual/household/community exists. The second influencing factor is the external institutional **context** characterized by the socio-political-legal economic and institutional actors, these factors link people and places into regional, national and global systems. Nature and operation of government, structure and strength of civil society and operation of market forms the major elements in defining external institutional context. The wider natural environment also forms an extremely important factor in the functioning of livelihoods. These are factors which are by and large out of control of individuals/households/community. The level and timing of rainfall, resource flows and extreme events such as cyclones, earthquakes or droughts definitely affect the livelihood patterns. (Department for International Development, 2001, pp. 11-12)

Integrating the dynamics in the furniture industry in India and the livelihood approach the paper tries to examine and validate the influence of the Adoption of Technological Changes and Adoption of new Business models in the in furniture Industry in India and its influence on livelihood of the labour force.

4. Inter-linkage of Adoption of Technology and Business Models on Livelihood in Indian Furniture Industry

We explore the linkage between adoption of technology, business models, livelihood of persons who are engaged in Indian furniture by using National Sample Survey(NSS) 68th Round, National Sample Survey (NSS) 67th round on unorganized sector and Annual Survey of Industries (ASI) 2008-09. The household level data drawn from the NSS 68th round provides the distribution of persons employed in the furniture industry, while NSS67th round form the base for obtaining data on the unorganized sector enterprises. The ASI 2008-09 data describes the patterns pertinent to the organized sector in the furniture industry. Quite important, we examine the interaction between adoption of technology, business models, and the livelihood of the persons employed in the furniture industry by drawing cues from select variables. We use the median wage and median count of employed persons as the indicators of livelihood, while we draw pattern of median surpluses generated by enterprises to present the degree of enterprise' performance. For assessing the adapting technologies, we use proxies like ICT use (for



Partly adopted from
 (Department for International Development, 2001, p. 8)
 Figure 7: A Model of Sustainable Livelihood

unorganized enterprises), investment in plant and machinery and ISO certification (for organised enterprises), and vocational training and technical education and persons employed in enterprises using electricity (for employed persons). Table six outlines the above discussing using a simple schema.

Table 6: Proxy variables for Adoption of technology, business models and livelihood across different data sources

Data Source	Proxy Variable for Adoption of Technology	Proxy variable for adoption of new business models and strategies	Proxy variable for Livelihood
National Sample Survey 68th Round	Attainment of Vocational Education	Type of Enterprise	Wage
	Usage of Electricity in the Enterprise	Number of workers in the enterprise	
	Attainment of Technical Education	Nature of the Employment	
National Sample Survey 67th Round	Use of Computer	Type of ownership	Surplus & Employment
	Use of Internet	Social Category of Owner	
		Location of Enterprise	
		Type of Enterprise	
Status of Enterprise			
Annual Survey of Industries 2008-09	Investment in Plant and Machinery	Type of Organization	Wage
	ISO Certification	Type of Ownership	

Table 7 provides distribution of median wage of the persons employed in the furniture industry and attainment of vocational education, persons employed in enterprises using electricity in the enterprise/employment activity and attainment of technical education. The median weekly wage of persons employed who attained formal vocational education was Rs.1650/-, while those who attained informal vocational training earned a weekly median wage of Rs.1050/-. What this pattern points to is human capital formation that provides skill in craft and technologies seem to generate positive payoffs to employed persons. Persons working in enterprises using electricity earned more wages than persons who are employed in enterprises that do not use electricity. This seems to suggest that wages tend to go up with up scaling of processes in furniture industry. Therefore, quiet evidently, when enterprises opts for scale up gradation, supposing employees are appropriately skilled and being absorbed in advanced processes tend to cause rise in earnings. The distribution of wage with attainment of technical education shows persons employed with higher technical education earn more than others, in particular those persons with post graduate diploma qualification in technical disciplines. The analysis of variance in median wage with respect to attainment of vocational education, usage of electricity in enterprises

and, attainment of technical education shows that wage significantly varies across categories. Hence it may be inferred that contexts to adoption of technologies through above analysed proxies tend to generate positive changes in wages that improves livelihood outcomes.

Table 7 Distribution of Median Wage and Adoption of technology in Furniture Industry

Attainment of Vocation Education	Median Wage(Rs Per Week)
Formal	1650.00
Informal	1050.00
No vocational training	1050.00
Usage of Electricity in Enterprise	Median Wage(Rs Per Week)
Yes	1050.00
No	900.00
Not Known	750.00
Attainment of Technical Education	Median Wage(Rs Per Week)
Diploma	1050.00
PG Diploma	3500.00
No	1050.00
Analysis of Variance Median Wage	Statistical Significance (p)
Wage and Attainment of Vocational Education	p < 0.01
Wage and Usage of electricity in enterprise	p < 0.01
Wage and Attainment of Technical Education	p < 0.01

Estimated N= 2102774 from a sample of 1100

Source: Computed by authors from National Sample Survey 68th round unit records

Table 8 depicts the distribution of median wage of the persons employed in the furniture industry and type of enterprise, number of workers, and nature of employment is being analysed and interesting results are emerging. Analysis of median wage across type of enterprises shows that enterprises which enter into ‘partnership with members outside the household’ is having the highest wage (Rs.2200 per week) which is followed by ‘partnership with members of same household’ (Rs.1270/- per week.. This indicates the emergence of a new business space and adoption of new business strategies in the industry and which is validated by the narratives from the field where it has been reported by owners of two enterprises²

“I was struggling to meet both ends meet when I was working as a casual carpenter and it was difficult for to find job for even two days in a week. Initially I collaborated with a nephew of mine where we established a workplace near to my house and started doing good.”

² We conducted interviews of owners and persons employed in three unorganized furniture enterprises: 1 in Mumbai, 1 in Kozhikode, Kerala, and 1 in Thiruvanthapuram, Kerala.

Regarding the partnership with member for outside the household the owner of small scale furniture enterprise located in Mumbai reports that

“I had a manufacturing and sales of unit for wooden furniture which was essentially managed by my family members and my son and me was the major players we were doing business according to orders we receive. After a point of time we were facing acute shortage of raw materials and had suffered due to high transportation cost. Immediately we struck a deal with a three saw mills and relocated our production unit to a place near the saw mill which has primarily taken care of our raw material issue and in due course of time we started building contacts and got into partnerships with a few more carpenters around and business started growing and it was a win-win situation for all the players.”

Analysing the median wage across the number of workers per enterprise shows that the median wage of the persons employed tend to go up as the number of workers in the enterprise increases. Analysing median wage and the nature of the employment, persons employed in formal employment earned a median wage of Rs.4550/- per week compared to Rs.1050/- per week in the informal employment. The analysis of variance in median wage across type of enterprise, number of workers in the enterprise and nature of enterprise shows that there is a significant difference in the median wage. Based on the above pattern, we may surmise that changing business models to a collaborative mode through partnership with outside the family, sounding like strength weak ties (Granovetter, 1973), and having an integrated network of strong and weak ties (Uzzi, 1997), these enterprise may scale to better realms of performance, eventually cascading to better livelihood systems.

Table 8 Distribution of Median Wage across enterprise characteristics in Furniture Industry

Type of Enterprise	Median Wage (Rs Per Week)
Male Proprietorship	1050.00
Partnership with members from same household	1270.00
Partnership with members from different household	2200.00
Government/public sector	1020.00
Public/Private limited company	1250.00
Co-operative societies/trust/other nonprofit institutions	480.00
Others	1050.00
Number of Workers	Median Wage(Rs Per Week)
Less than 6	1000.00
6 to 9	1050.00
10 & above but less than 20	1400.00
20 and above	2000.00
Nature of Employment	Median Wage(Rs Per Week)
Informal	1050.00
Formal	4555.00

Analysis of Variance of Median Wage	Statistical Significance (p)
Wage and Type of Enterprise	p < 0.01
Wage and Number of workers in an enterprise	p < 0.01
Wage and Nature of Employment	p < 0.01

Estimated N= 2102774 from a sample of 1100

Source: Computed by authors from National Sample Survey 68th round unit records

Table 9 presents the influence of the adoption of technology and new business models and strategies on the livelihood of the persons employed in Indian unorganized sector by using data from National Sample Survey 67th round that presents features of enterprise in unorganized sector in Indian furniture industry. Analysis of usage of Information Communication Technology (ICT) in enterprises has shown that enterprises which computers and having access to internet earned significantly higher the median surplus, reasonable proxy for profit, than the enterprises which do not use ICT. It may be noted that the enterprises which are owned in partnership with members from different households has highest median surplus of Rs. 9675/-per month and employees three individuals per firm. It is interesting to note that the female headed enterprises comes second in the median surplus and employs two individuals. It is also important to note that male proprietorship is a type of ownership which has the lowest median surplus Rs.4400/- per month. This again point to the aspects of associational behavior and idea of strength of weak ties (Granovetter 1973). The social category representation of the owner of the enterprise and median surplus generated by the firm brings out some interesting results, enterprises which are owned by individuals from general category reports highest median surplus (Rs. 5070/- pm) over firms owned by individuals from OBC category (Rs.4400/-pm). This trend is interesting when it is analysed in the backdrop of OBC being the major stake holder of the industry. Analysis of the location of the enterprise reports that enterprises which are 'located outside household in a temporary structure is generating highest surplus (Rs.6200/-pm) and which is very closely followed by enterprises which are 'located outside household with fixed structures (Rs.6000/-pm) and both these enterprises are employing two individuals in the enterprise. Analyzing the median wage and median employment distribution to type of enterprise reports interesting patterns, Establishments are reported to have a very high surplus (Rs.6000/-pm) compared to own account work enterprises (Rs.3500/-pm). Another interesting feature of enterprises in unorganized sector in furniture industry is status of the enterprise; how the enterprise if developing. It is reported that the enterprises which are expanding is having highest median surplus (Rs.5500/-pm) and median employment (2) compared to stagnant enterprises which fare at Rs.4000/- pm surplus and employing one individual per enterprise. Analysis of Variance of median surplus and median employment is calculated and it shows that and both the

median surplus and the median employment have significant difference when compared to all the features of unorganized enterprises in furniture industry in India. The features of unorganised enterprises in furniture industry in India which is analysed here forms proxies to the adoption of technology and adoption of business models and strategies. Analysis of variance of median surplus and number of persons employed, across proxy variables for adoption of technology and business models and strategies, shows significant difference. Hence it may be inferred that adoption of technology and adoption of new business models in furniture industry positively influences the livelihood of the work force in the industry.

Table 9 Distribution of Median Surplus and Median Employment across Industry characteristics of unorganized sector in Indian furniture Industry

Use of Computers	Median Surplus	Median Employment
Yes	12000.00	3.00
No	4300.00	1.00
Use of Internet	Median Surplus	Median Employment
Yes	15670.00	3.00
No	4400.00	1.00
Type of Ownership	Median Surplus	Median Employment
Proprietorship Male	4400.00	1.00
Proprietorship Female	5470.00	2.00
Partnership with member of same household	5000.00	1.00
Partnership with members of different household	9675.00	3.00
Social Category of the Owner	Median Surplus	Median Employment
Scheduled Tribe (ST)	3500.00	2.00
Scheduled Caste (SC)	3500.00	1.00
Other Backward Classes (OBC)	4000.00	1.00
Others	5070.00	1.00
Location of the Enterprise	Median Surplus	Median Employment
Within household premise	3500.00	1.00
Outside household with fixed structures	6000.00	2.00
Outside household premise with temporary structure	6200.00	2.00
Outside household premise without any structure	4000.00	1.00
Mobile Market	3750.00	1.00
Street Vendors	3200.00	1.00
Type of Enterprise	Median Surplus	Median Employment
Own Account Enterprise	3500.00	1.00
Establishment	6000.00	2.00
Status of the Enterprise	Median Surplus	Median Employment
Expanding	5500	2
Stagnant	4000	1
Contracting	3200	1
Analysis of Variance Median Surplus	Statistical Significance (p)	
Median Surplus and Use of Computer	p < 0.01	
Median Surplus and Use of Internet	p < 0.01	
Median Surplus and Type of ownership	p < 0.01	

Median Surplus and Social Category of Owner	p < 0.01
Median Surplus and Location of Enterprise	p < 0.01
Median Surplus and Type of Enterprise	p < 0.01
Median Surplus and Status of Enterprise	p < 0.01
Analysis of Variance Median Employment	Statistical Significance (p)
Median Employment and Use of Computer	p < 0.01
Median Employment and Use of Internet	p < 0.01
Median Employment and Type of ownership	p < 0.01
Median Employment and Social Category of Owner	p < 0.01
Median Employment and Location of Enterprise	p < 0.01
Median Employment and Type of Enterprise	p < 0.01
Median Employment and Status of Enterprise	p < 0.01

Estimated N= 700929 from a sample of 5500

Source: Computed by authors from National Sample Survey 67th round unit records

Table 10 identifies the patterns in enterprises in organized sector and its distribution of median wage across features of enterprises in organized sector. The analysis of investment in plant and machinery in industries shows that the enterprises which has invested above Rs.10 crore report to pay the highest wage Rs.98666/-per annum followed by enterprise which invest Rs.1 crore to 5 crore (Rs.70942/- per annum) and it is interesting to note that the industries which have an investment below one crore reports the minimum wage (Rs.48015/- per annum) The ISO certification is another feature of the enterprises which came under analysis and it may be noted that industries which has an ISO certification reports a median wage of Rs.80678/- per annum and those which does not have certification reports a median wage of Rs.50341/- per annum. Analysing the type of organization it may be noted that Private Limited companies reports highest median wage (Rs.77097/- per annum) followed by Public Corporations (Rs.70829/- per annum) and it is interesting to note that the village industries are generating a median wage of Rs.69409/- per annum It is extremely important to note that ‘individual proprietorship’ is the kind of enterprise which reports the lowest wage (Rs.39135/- per annum). This assumes significance in terms of the business models emerging in the organized furniture industry in India which thrives more on associational models rather than individual operations and process. Analysing the type of ownership of the industry it reports that enterprise in the category ‘Joint Sector Public’ reports the highest median wage (Rs.65416/-pa) which is followed by Wholly state and/or Local Government which is at Rs.62420/- per annum. Hence median wage for the work force reports significant difference across categories in the proxy variables featuring the adoption of technology and business models, it may be inferred that these variable seem to have positive impact on the livelihood context.

Table 10: Enterprise features of organized enterprises in furniture industry in India

Investment in Plant and Machinery	Median wage (Rs. pa)
Less than or Equal to One Crore	48015
One crore to 5 crore	70942
5 crore to 10 crore	61380
Above 10 crore	98666
ISO Certification	Median Wage(Rs. pa)
Yes	80678
No	50341
Type of Organization	Median Wage(Rs. pa)
Individual Proprietorship	39135
Joint Family	68289
Partnership	50097
Public Ltd Company	65722
Private Ltd Company	77097
Government Departmental Enterprise	68235
Public Corporation	70829
Village Industries	69409
Cooperative societies	68282
Others	39109
Type of Ownership	Median Wage(Rs. pa)
Wholly State and/or Local Government	62460
Central/State/Local Government Jointly	36459
Joint Sector Public	65416
Wholly Private Ownership	52777
Analysis of variance of Median Wage	Statistical Significance (p)
Wage and Investment in Plant and Machinery	p < 0.01
Wage and ISO Certification	p < 0.01
Wage and Type of Organization	p < 0.01
Wage and Type of Ownership	p < 0.01

N=251

Source: Computed by authors from Annual Survey of Industries 2008-09

5. Concluding Remarks

What emerges in this study by analyzing multi units-employed persons, organised enterprises and unorganised enterprises- is that the furniture manufacturing in India presents a complex, but an interesting triad of Livelihood, Technology Adoption, and Business. Unequivocally, while there may be aspects that integrate both organised and unorganized enterprises in Indian furniture industry, both these streams seem to face unique challenges. An important aspect for the unorganized enterprises to progress towards a win-win scenario (Pareto improvement) for business and livelihood is to adopt business models that break the barriers impose by not so dynamic family based enterprise system along with leap forging into ICT adoption. However, for the organised enterprises it is important to upgrade the capability to the global benchmarks for rising to realms of sustained performances. From enterprises when we move to livelihoods, in particular employment in order to transform the existing

system of employment in Indian furniture industry it becomes critical to lay focus on human capital formation and decent working and living conditions.

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