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Drivers of SME Formation in Indian States: The Empirics

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Drivers of SME Formation in Indian States: The Empirics

Abstract: The development of small and medium enterprises (SMEs) sector is a key policy priority as these enterprises play a critical role in the growth and development process of any economy. The present study is motivated to explore the regional dimensions of entry of new SMEs across Indian states and sectors covering an extensive study period 1980–2007. It further expands the literature on formation of firms from the sub-national perspective, empirically uncovering regional factors that significantly determine the formation of new firms. Findings suggest that new SME formation in India is characterized by a concentrated regional pattern during the study period with a few regions accounting for disproportionate share of the number of new SMEs formed. Also, Indian sub-national entities exhibited considerably disparity in the entry rate of new SMEs. Regional factors like local market size, availability of skills, technological specialization of manufacturing sector, land transportation networks, and entrepreneurial culture tend to play positive role in the formation rate of SMEs in Indian states.

Key Words: SMEs, India, Regions, Entry Rate

1. Introduction

The very existence of small and medium enterprises (SMEs) sector is deemed to be critical for the growth and development of any economy. The SME sector contributes a significant stake of national output, employment, number of enterprises and export earnings in both high-income and developing economies. SMEs contribute over 55 per cent of Gross Domestic Product (GDP) and over 65 per cent of total employment in high-income countries, while the corresponding shares for middle-income countries are 70 and 95 per cent and for low-income countries shares are 60 and 70 per cent (OECD, 2004). In India, MSMEs accounted for 31.8 per cent of gross value added during 2016–17, 48.1 per cent of total export during 2018–19 and estimated number of workers in unincorporated non-agriculture MSMEs stood at 11.1 crore during 2015–16 (PIB, 2019). Therefore, development of SME sector has emerged as a key policy priority in both developed and developing countries. In addition to enhancing competitiveness of existing SMEs, SME development strategy must focus on facilitating formation of new SMEs.

Higher rate of SMEs formation is found to be positively related to the growth of an economy (Gallagher and Robson, 1994; Djankov et al., 2002) and generation of employment (Thurik and Wennekers, 1999). Moreover, formation of new firms also brings in numerous new products, processes and technologies in the market, improving the efficiency and productivity of industries (Acs and Audretsch, 1990; Geroski, 1989). A continuous inflow of new firms, apart from bringing in new technology with them, is likely to pressurize existing firms to continue advancing their technology and efficiency and help in removing slacks in business operation. Likewise, the entry of new firms increases the competition and diversification among firms (Fritsch and Falck, 2003).

Formation of new SMEs may play a decisive role in the removal of developmental disparities among various countries as well as different subnational regions within a country. In a vast developing country like India characterized by widespread spatial heterogeneity, the formation of new firms in the backward regions will reduce the developmental inequality among various subnational regions. Given the continued socio-economic disparities along with growing geographical concentration of economic activity, the study of regional economies is gaining importance with the advancement of various regional theories like regional innovation system (Cooke, 2001), learning region (Florida, 1995; Rutten and Boekema, 2007) and cluster (Porter 1990; 1998). In India, regional differences are quite strongly represented by the disparities among various Indian states.

In the above backdrop, the present study is motivated to explore the regional dimensions of entry of new SMEs across Indian states, specifically those SMEs established since the 1980s and surviving till 2006–07. An emerging literature is enlightening the notion of new firm formation from the regional perspective (e.g. Fritsch, 1997; Baptista and Preto, 2011); where regional or local factors are found to be playing a significantly positive role in determining the formation of new firms in a region (Glaeser et al., 1992; Lee et al., 2004), this study examines the role of spatial factors like agglomeration, skill, demand, infrastructure etc. in the observed regional patterns of SMEs formation in India.

This study contributes to the literature in a number of ways. First, it expands the literature on formation of firms from the sub-national perspective and uncovers the formation of new SMEs in an emerging economy namely, India. Utilizing the unit-level data of 4th All India Census of Micro Small and Medium Enterprises (MSME) 2006–07, this analysis covers an extensive study period 1980–2007 of new SMEs formation in the registered sector, across Indian regions, states and sectors. Presently, such a study on regional patterns of new SMEs formation is not yet available. Second, it also revisits the empirical role of theoretically determining factors of new firm formation in the subnational context of India with a multidimensional empirical framework controlling for unobserved spatial heterogeneity through panel fixed effects estimation. Third, it may also indicate the direction in which changing policy environment in India has affected SMEs formation.

The Indian literature presents two strands of thought while discussing the impact of different policy environment on the emergence and existence of SMEs in India, especially since the 1990s' economic reforms. It was recognized that economic reforms have not only opened the windows of opportunities for the new and emerging SMEs but also posed the threats of competition for the existing SMEs (Tendulkar and Bhavani, 1997; Bhavani, 2002). Das and Pradhan (2010) and Das (2008) have argued that the changing policy instruments and economic reforms have impacted relatively bigger of the small-scale sector while majority of the small firms are crippled with persisting constraints with respect to loan-finance, infrastructure, and technology support. Small firms are now facing competition at a global level with the implementation of measures like de-reservation, increasing openness to foreign investment and technology, removal of non-tariff barriers, widespread reduction in import duties and adoption of product patent regime (Pradhan, 2011a). The increased FDI inflows and imports into the Indian economy has affected the SMEs depressingly (Subrahmanya, 2004). While some policy supports like fiscal and financial incentives, special incentives to backward regions and reservation of items for SME sector are still argued to have somehow compensated the depressing impact of globalisation on Indian SMEs (Subrahmanya, 1995). Thus, it will be useful to examine these encouraging and depressing impacts of changing policies on the formation of Indian SMEs.

The present study is divided into six sections. Section-2 presents the trends and patterns of SMEs formation across subnational regions in India. Based on the year of installation of initial plant and machinery/equipment, the formation year of SMEs are determined for the registered sector unit level data of the 4th Census of MSMEs and different measures like number of new SMEs formed and entry rates are estimated[1]. In the absence of year of initial machinery

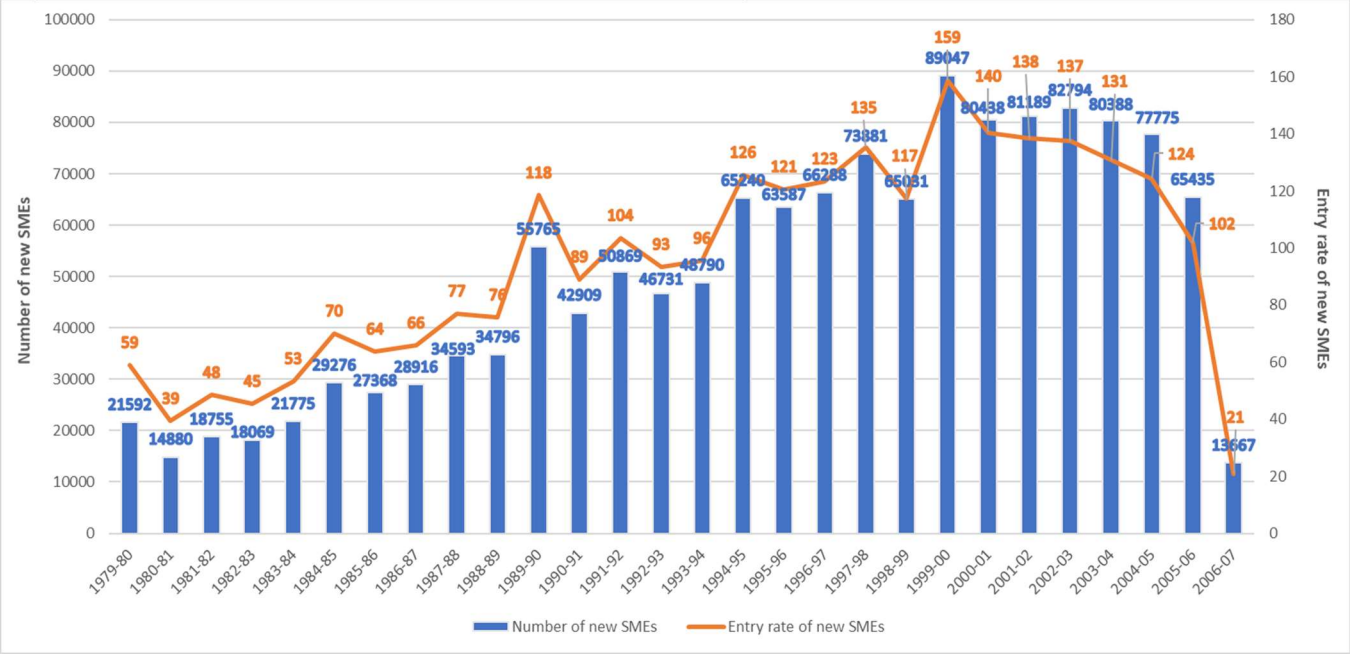
[1] Results from the 4th Census of MSMEs 2006-07 are provided separately for two sectors namely, registered and unregistered. The registered sector covers enterprises registered with District Industries Centres, Khadi and Village Industries Commission/Khadi and Village Industries Board, Coir Board and factories falling under the

installation, the year of initial production was used. The use of the census data implies that the study will covers only those SMEs formed during 1980–2007 and which have survived till the year of 2007. The entry rate for new SMEs formation is defined as the number of new SMEs formed per 1000000 working-age population (ages 15–59). This is basically the labour market approach to the estimation of the regional rate of new firm formation (Audretsch and Fritsch, 1994). Section-3 deals with the theoretical aspects of new firm formation and develops the empirical framework for the analysis of regional patterns of formation of Indian SMEs. Section-4 presents the econometric specification of the model, method of estimation and data sources and measurements. Section-5 summarizes empirical findings on the regional determinants of SMEs formation. The last section concludes the study.

2. Regional Patterns of Emergence of New SMEs

Considering the number of new SMEs formed and level of their entry rate annually, Indian economy has exhibited largely rising SME entrepreneurship trend during 1979–80 to 2002–03 while both the number and entry rate of new SMEs have fallen during 2002–03 to 2006-07 (Figure-1). Five-years periodic analysis since 1979–80 as summarized in Table-1 confirmed that the number of SMEs formed has grown from 97665 during 1980–84 to 423414 during 2000–04. The increase in the number of new SMEs formed has been regionally widespread with all the Indian regions reporting rising SME numbers successively up to 2000–04 and thereafter each region experienced a decline in the absolute number in the period of 2005–07. As the period 2005–07 covers three-years period as compared to 2000–04 covering five-years, this decline in the absolute numbers of new SMEs formation is partially understandable.

Figure-1: Number of new SMEs formed and their entry rate in India, 1979-80 to 2006-07



Note: Entry rate is the number of newly formed enterprises in the region per 1 million labour force (working age population, 15-59 age).

Source: Authors' estimation based on unit level data for registered sector, 4th MSME Census 2006–07 and Population Census data on working-age population.

coverage of section 2m(i) and 2m(ii) of the Factories Act, 1948 used by the Annual Survey of Industries. All other enterprises constitute the unregistered sector.

Similarly, entry rate of new SMEs for India as a whole has consistently increased from 49 SMEs during 1980─84 to 141 SMEs during 2000─04 (Table-1, Figure-2) and then declined to 82 during 2005─07. The rates of formation of new SMEs have increased for all the Indian regions over the different periods from 1980─84 to 2000─04 while they have declined during 2005─07, except for Central India. This implies the fact that an increasing number of working-age individuals (individuals in the age group of 15-59) are taking up entrepreneurship as a source of occupation by establishing SMEs in India. This rising tendency of entrepreneurship in India during the last three decades since 1980s is contributed by most of the Indian regions.

While the absolute number of new SMEs formed and entry rate have increased successively for different periods from 1980─84 to 2000─04, a distinct slowdown in their growth can be discernible during 2005─07. The growth rate of number of new SMEs formed increased from just 3 per cent during 1980─84 to above 10 per cent during 1985─94 but it then decelerated considerably to -33 per cent during 2005─07 (Table-1). The growth of entry rates of new SMEs has fallen from more than 8 per cent during 1985─94 to -34 per cent during 2005─07. These trends clearly suggest that the late 1980s and the early 1990s were the boom periods for formation of new SMEs in the Indian economy. However, the increased competition in the form of dismantling of product reservation for small firms, entry of large number of foreign firms and large-scale imports appear to have shrunk the business opportunities for small entrepreneurs. Also, different subnational regions have depicted different entrepreneurial responses to the changing macroeconomic environment. While West India and South India have largely shown similar decelerating growth trends in the number of SMEs formed and entry rates, North India has shown growth rate of more than 13 per cent during 1995─2004 before experiencing negative growth.

The geographical composition of new SMEs formation throws a concentrated regional pattern with West India, South India and North India together contributing more than 76 per cent of the number of new SMEs formed during 1980─84 (Table-1). The combined share of these top three regions went above 82 per cent during 1985─2004. The rise of South India as a hotbed for SMEs entrepreneurship is quite spectacular whose share in number of national SMEs formation increased successively from 26 per cent during 1980─84 to 44 per cent during 1995─99. Thereafter, the share of South India declined to 30 per cent during 2005─07. While the share of West India has fallen from 24 per cent in the early 1980s to 20 per cent in the period 2005─07, that of North India initially fell to 17 per cent during 1995─99 from 23 per cent in the early 1980s but since then it started increasing to reach above 26 per cent during 2005─07. The other regions namely, Central India and East India have also depicted the declining share, whereas North-east India has reported negligible shares in the number of newly formed Indian SMEs over the study period.

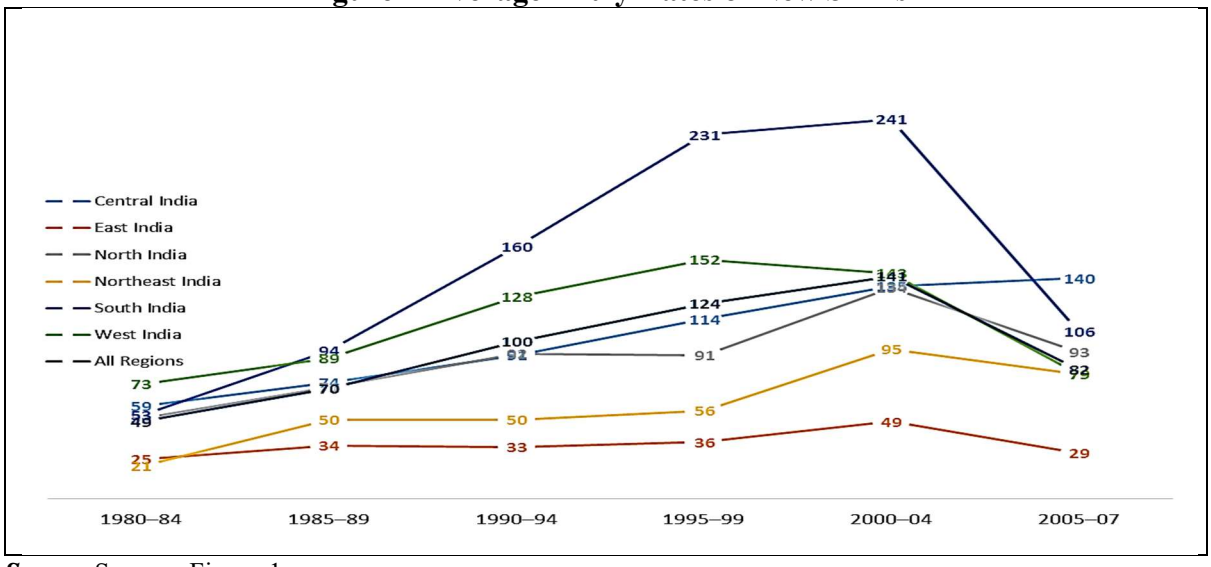
For each period from 1980─84 to 2005─07 Indian regions exhibited considerably disparity in the entry rate of new SMEs. During 1980─84, the entry rate varies from a high of 73 firms in West India to the low of 21 firms in Northeast India. The gap between the regions having highest and lowest entry rates or the range of entry rates for Indian regions, thus, was 52 firms in the said period. Subsequently, the range of entry rate for these regions has increased to 60 firms, 127 firms and 195 firms respectively during 1985─89, 1990─94 and 1995─99. For each of these periods, South India depicted the highest regional entry rate for new SMEs while East India possessed the lowest entry rate. West India has consistently the second highest entry rate during these periods. However, the range of entry rate decreased to 192 firms during 2000─04 and further to 111 firms during 2005─07. These trends confirmed the continuing regional disparities in the ability of different regions to host new SMEs in India.

Table-1 Formation of New SME in India, Numbers & Entry rates

Region	New SMEs formed											
	Number						Annual Average entry rates (No.)					
	1980–84	1985–89	1990–94	1995–99	2000–04	2005–07	1980–84	1985–89	1990–94	1995–99	2000–04	2005–07
Central India	10535 (10.79)	14946 (9.39)	20205 (8.05)	25350 (7.42)	31385 (7.41)	21204 (13.17)	59	74	91	114	135	140
East India	11284 (11.55)	17350 (10.90)	18707 (7.46)	21506 (6.30)	31917 (7.54)	12203 (7.58)	25	34	33	36	49	29
North India	22489 (23.03)	35463 (22.27)	51672 (20.59)	57156 (16.74)	93729 (22.14)	42587 (26.44)	51	71	92	91	134	93
Northeast India	1471 (1.51)	3913 (2.46)	4429 (1.77)	5687 (1.67)	10899 (2.57)	5839 (3.63)	21	50	50	56	95	79
South India	25083 (25.68)	50039 (31.43)	94805 (37.79)	149648 (43.83)	168852 (39.88)	47681 (29.61)	53	94	160	231	241	106
West India	26803 (27.44)	37514 (23.56)	61084 (24.35)	82093 (24.04)	86633 (20.46)	31538 (19.58)	73	89	128	152	143	79
All Regions	**97665 (100)**	**159226 (100)**	**250902 (100)**	**341440 (100)**	**423414 (100)**	**161052 (100)**	**49**	**70**	**100**	**124**	**141**	**82**
Annual Average Growth Rate (%)												
Central India	15.75	2.43	8.63	5.65	19.61	-29.88	12.44	-0.17	7.61	5.75	17.25	-31.77
East India	2.24	7.65	4.80	7.32	15.99	-41.15	-0.29	5.23	3.18	6.13	13.86	-42.45
North India	5.14	10.05	1.00	13.32	13.94	-34.42	2.26	7.36	-1.26	11.00	11.25	-36.08
Northeast India	20.09	18.34	4.62	1.63	23.03	-36.75	16.67	15.33	2.01	-0.77	20.18	-38.19
South India	10.48	14.89	20.02	7.32	-1.44	-31.51	7.81	12.37	17.69	5.46	-3.09	-32.62
West India	-5.21	11.94	9.37	4.46	2.02	-27.11	-7.88	9.13	6.63	1.95	-0.40	-28.80
All Regions	**2.98**	**10.78**	**10.27**	**7.01**	**5.52**	**-32.67**	**0.27**	**8.17**	**8.11**	**5.22**	**3.38**	**-34.16**

Note: Percentage share to all regions is in parenthesis.
Source: Same as Figure-1.

Figure-2 Average Entry Rates of New SMEs



Source: Same as Figure-1.

The participation of Indian states in national SMEs formation too differs widely which are summarised in Table-2. Of the 35 Indian states including union territories in the dataset, just top 15 states accounted for the major share in number of new SMEs formed for each of the period from 1980–84 to 2005–07. The share of top 15 states stood more than 90 per cent suggesting wide spatial concentration in the emergence of new SMEs in India. Again, it should be noted that with the passage of time not only the disparity in terms of number of SMEs

formation has increased among Indian states but also the compositions of largest contributing states have changed. For example, the period 2000─04 has top two states namely, Tamil Nadu and Uttar Pradesh, contributing more than 15 per cent share in the number of national SMEs formation, and then other leading three states of Gujarat, Karnataka and Kerala each contributing with more than 10 per cent share. Together these top five states have contributed national SMEs formation with round about 64 per cent share in 2000─04. In contrast, the largest five states during 1980─84 were Gujarat (15 per cent), Madhya Pradesh (9 per cent), Tamil Nadu (9 per cent), Rajasthan (7 per cent) and Karnataka (7 per cent) together they were contributing with 47 per cent share.

Table-2 The 15 Largest States for SME Formation in India

Region	New SMEs formed											
	Number						Annual Average entry rates (No.)					
	1980─84	1985─89	1990─94	1995─99	2000─04	2005─07	1980─84	1985─89	1990─94	1995─99	2000─04	2005─07
Andhra Pradesh	3822 (3.91)	7683 (4.83)	9272 (3.70)	8046 (2.36)	6910 (1.63)	4395 (2.73)	25	44	48	38	30	29
Assam					6840 (1.62)	4044 (2.51)					88	79
Bihar	3796 (3.89)	8589 (5.39)	9364 (3.73)	9492 (2.78)	10589 (2.50)	3920 (2.43)	20	42	42	44	48	27
Chhattisgarh	2228 (2.28)	3445 (2.16)	4024 (1.60)	5117 (1.50)			59	82	84	97		
Gujarat	14917 (15.27)	24105 (15.14)	43237 (17.23)	52356 (15.33)	48047 (11.35)	12909 (8.02)	157	220	354	380	309	128
Haryana	3523 (3.61)	4651 (2.92)	7492 (2.99)	7853 (2.30)		2904 (1.80)	102	118	166	150		71
Jharkhand		2249 (1.41)	3181 (1.27)	3493 (1.02)	4844 (1.14)			42	55	52	65	
Karnataka	6493 (6.65)	12360 (7.76)	19172 (7.64)	35202 (10.31)	42604 (10.06)	13395 (8.32)	62	107	148	239	262	126
Kerala	5835 (5.97)	11213 (7.04)	26576 (10.59)	48129 (14.10)	44977 (10.62)	7786 (4.83)	78	135	296	501	447	124
Madhya Pradesh	8308 (8.51)	11500 (7.22)	16182 (6.45)	20233 (5.93)	26718 (6.31)	19150 (11.89)	59	72	92	120	154	170
Maharashtra	5101 (5.22)	7916 (4.97)	12054 (4.80)	19342 (5.66)	21013 (4.96)	10880 (6.76)	28	39	52	74	72	57
Odisha	1618 (1.66)				7083 (1.67)	2820 (1.75)	22				65	40
Punjab	8926 (9.14)	10942 (6.87)	8930 (3.56)	6020 (1.76)			188	207	153	90		
Rajasthan	6362 (6.51)	4981 (3.13)	5267 (2.10)	9343 (2.74)	16083 (3.80)	7489 (4.65)	70	48	44	68	104	72
Tamil Nadu	8765 (8.97)	18531 (11.64)	39536 (15.76)	57887 (16.95)	73674 (17.40)	21813 (13.54)	61	116	227	309	365	167
Uttar Pradesh	5478 (5.61)	13460 (8.45)	28013 (11.16)	34736 (10.17)	70685 (16.69)	29388 (18.25)	19	40	76	86	159	100
Uttarakhand					8514 (2.01)	5602 (3.48)					347	348
West Bengal	4660 (4.77)	5075 (3.19)	4662 (1.86)	5283 (1.55)	9400 (2.22)	3819 (2.37)	30	29	24	24	38	24
Top 15 states	89831 (91.98)	146699 (92.13)	236961 (94.44)	322534 (94.46)	397982 (93.99)	150314 (93.33)						
All States	**97665 (100)**	**159226 (100)**	**250902 (100)**	**341440 (100)**	**423414 (100)**	**161052 (100)**	**49**	**70**	**100**	**124**	**141**	**82**

Note: Percentage share to all regions is in parenthesis.
Source: Same as Figure-1.

The high contribution of Tamil Nadu in national SMEs formation is driven by the convenient industrial policies of state, locational advantages like healthy infrastructure and skilled workforce. Similarly, the high contribution of Uttar Pradesh in national SMEs formation is believed to be driven by the easy availability of inexpensive labour force. The state of Gujarat is known for its entrepreneurial culture, industry friendly policies and availability of good

infrastructure like, power, transportation etc. which make the state of Gujarat to be one of the attractive states for entrepreneurship in India.

While looking at entry rates of SMEs among top 15 Indian states accounting for the number of new SMEs formed, one can again observed considerable spatial variation in the entry rate. The difference between highest and lowest entry rates for these states turns out to be 169 firms during 1980─84: 188 firms in the case of Punjab to 19 firms of Uttar Pradesh. The range of SME entry rates for states then considerably increased to 477 firms during 1995─99 before falling to 324 firms during 2005─07.

Overall, these statistics on formation of new SMEs in India across different regions and states shows that the number and entry rate of new SMEs have increased in magnitude but with successively slower rate of growth. Also, there exists considerable regional heterogeneity in the emergence of new firms. It becomes, therefore, inevitable to explore the regional sources or determinants of continued regional disparities in the formation of SMEs in India.

3. New Firm Entry and Space: Theoretical Background

The formation of new firms reflects entrepreneurial activity undertaken by individuals in a given economy. For Cantillon (1755) individuals become entrepreneurs when they organize production and exchanges to earn uncertain profit in the marketplace[2]. Enterprises are born as a result of these actions undertaken by entrepreneurs. Say (1803) put individuals turning entrepreneurs at the centre of the entire process of production and distribution[3]. Schumpeter (1911) visualized entrepreneur as the economic actor who causes development by introducing new combinations of resources. These combinations may take the form of a new or an improved product, a new use of an existing good, a new production method, opening up of a new market and changes in economic organization. He termed the carrying out of new combinations of resources as 'enterprise' and individuals whose function it is to carry them out as 'entrepreneurs'. Knight (1921) has modelled entrepreneurial action of individuals on their subjective abilities to bear uncertainty and make judgmental decision.

The interplay between the psychological behaviour of individuals (e.g. achievement seeking, risk loving, autonomy motivation, leadership, etc.) and socio-business environmental characteristics of the location wherein individuals reside like product market characteristics, input market conditions, government policies, cultural values, etc., can explain regional formation rates of new enterprises (Reynolds and Storey, 1993; Shane, 2004; Giannetti and Simonov, 2004; Lundström and Stevenson 2005; Sternberg 2009). Very often these location-related environmental forces provide a powerful incentive for personal beliefs and perceptions of individuals which in turn shape their entrepreneurial intentions (Begley et al., 2005;

[2] "The farmer is an entrepreneur who promises to pay the property owner, for his farm or land, a fixed sum of money (generally assumed to be equal in value to a third of the production) without assurance of the profit he will derive from this enterprise...,he conducts the enterprise of his farm with uncertainty." pp. 74 in Cantillon, R. (1755), *Essai sur la Nature du Commerce en Général*, English translated published in 2010 as *An Essay on Economic Theory*, Alabama: Ludwig von Mises Institute.

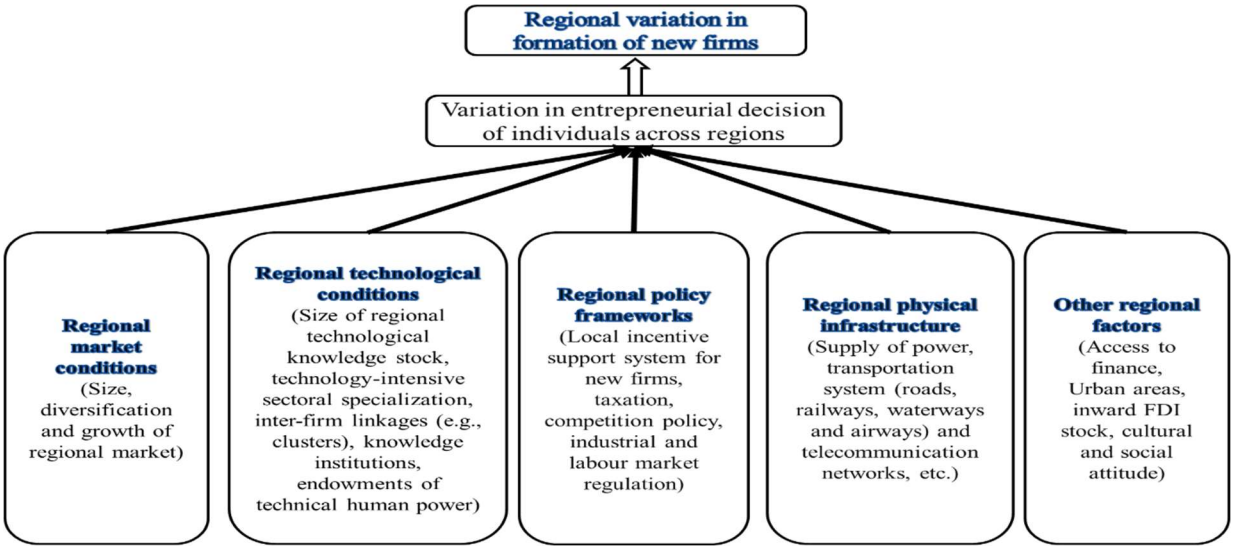
[3] "…the occupation of adventurer is ... necessary for the setting in motion of every class of industry whatever; that is to say, the application of acquired knowledge to the creation of a product for human consumption." pp. 103 in Jean-Baptiste Say, J. B. (1803), *Traité d'économie politique ou simple exposition de la manière dont se forment, se distribuent et se composent les richesses,* English translation published in 1834 as A Treatise on Political Economy; or The Production, Distribution and Consumption of Wealth, Philadelphia: Grigg & Elliot.

Sternberg, 2009; Kibler, 2013). Regions with better situational factors may motivate more entrepreneurial action by individuals who identify and pursue situational opportunities.

In the above context, the present study has proposed an analytical framework as summarized in Figure-3, which stresses various aspects of location like local market, technology, business supporting infrastructure and policy environments for a way to think about entrepreneurial activities and the formation of new firms on a regional context. Accordingly, the regional variation in new firm formation is proposed to be rationalized by spatial differences in the above-mentioned factors.

A number of empirical studies have shown the existence of substantial disparity in new firm formation across countries as well as within a country among its subnational regions (Reynolds et al., 1994; Armington and Acs, 2002; Reynolds, 2011). Reynolds et al. (1994) drawing upon findings from seven developed economies (France, Germany, Ireland, Italy, Sweden, United Kingdom and the United States) during the late 1980s concluded that the new firm birth is positively determined by demand growth reflected by population growth and income growth, an industrial base dominated by small firms and a strong urbanization context representing the advantages of agglomeration.

Figure-3 Conceptual framework on formation of new firms



Source: Authors' construction.

Klapper et al. (2010) have observed a pronounced regional difference in the enterprise density with developed region possessing fifty-five firms for every 1000 active individuals during 2000–08, whereas all the other regions (Africa & Middle East, Asia, Eastern Europe & Central Asia, Latin America & Caribbean, Developing Region) shown a density lower than forty firms. The enterprise entry rates for different regions are observed to be varying from 6.6 per cent to 10 per cent during this period. Results from random- effects generalized least squares (GLS) suggest that enterprise entry per capita is significantly and positively related to the access to finance (represented by the ratio of domestic credit to GDP) and GDP per capita while negatively related to entry barriers (proxied by the number of procedures to start a business).

Thus, countries with higher levels of economic development, ease of access to finance and lower entry barriers have seen relatively higher magnitude of new firm formation.

Armington and Acs (2002) reported significant differences in new firm formation/birth rate across U. S. states/labour market areas during 1994–1996. Highest firm birth rates are all in the West or South while lowest birth rates are in the Northeast and the Midwest. Regional differences in industry intensity, population growth, income growth and level of human capital are observed to be significant determinants of variations in the firm birth rates among U.S. labour market areas.

For Turkey, Gaygısız and Köksal (2003) found a substantial regional variation in new firm formation with western Turkey having high firm birth rates while eastern Turkey is characterized by low firm birth rates[4]. The firm birth rate of Marmara region was 17 times larger than that of the Eastern Anatolian region in 1985. By 1990, the firm birth rate of Marmara region turns out to be 53 times larger than that of South Eastern Anatolian region, which is the region with the lowest firm birth rate. Moreover, regional variation in small and new firm formation across the regions of Turkey is observed to be positively and significantly related to regional demand growth, agglomeration, the share of technicians in the labor force, and low rates of unemployment.

Močnik (2010) investigated the determinants of new firm formations in Slovenia and found that the gross rate of entry of new firms is positively associated with GDP per capita, rate of unemployment and productivity growth. In case of India, quality of physical infrastructure, workforce education, household banking access, and agglomeration conditions (supplier and customer strengths) are found to have strongly positive effect in predicting district level entry employment while stringency of labour laws is observed with a strongly negative sign (Ghani, 2014).

Zoltan et al. (2009) formulated and tested the *knowledge spillover theory* suggesting that entrepreneurial opportunities arise because incumbent organizations are not able to fully commercialize the results from their strategic investments in knowledge and ideas. Empirical results from cross-country analysis shows that countries with higher knowledge stock, expenditures on education, economic growth, and lower regulatory barriers (measured in terms of public expenditures and personal tax rate) tend to possess greater entrepreneurial activity.

Theories of *New Economic Geography*, Cluster and *Regional Innovation System* also have significant predictive power in mapping inter-regional differences in new firm formation. Krugman (1991) proposed that regions with larger local markets and/or growing demand become attractive for entry of new firms as proximity to the larger customer base allow saving on transportation costs and realization of scale economies. Marshall (1890) has already noted the tendencies of specialized industries to get concentrated in particular localities because of external economies from availability of skilled labour, existence of supporting and ancillary trade and the specialization of firms in different stages and branches of production. Porter (1990, 1998) proposed, clusters reflecting spatial concentration of interconnected firms, suppliers, related industries, and specialized institutions as important sources for nation's competitive position. Localized knowledge spillovers, increased innovation and productivity are natural incentives for firms producing related products to be close to each other. Wennberg and Lindqvist (2010) provided evidence that the economic benefits offered by clusters to the

[4] Firm birth rate is the number of new SMEs in a region per 100000 individuals in labor force.

participating firms are more crucial for newly started entrepreneurial firms. Thus, regions with more clusters may host increasing number of new firms.

As the identification and exploitation of opportunities by entrepreneurs is greatly shaped by the level of regional knowledge stock, disparities in innovation performances of regions may explain the regional patterns of formation of new firms. The literature on *Regional Innovation System* describes innovation as a localised interactive learning process involving firms, local resources and supporting institutions (Asheim, 2001; Doloreux and Parto, 2004; Pradhan, 2011b). Therefore, regions which support higher knowledge creation activities by putting in place a well-developed innovation ecosystem may witness greater entry of new firms.

Based on the brief review of literature above, the following groups of regional factors are identified to be potentially important for regional variation in new firm formation:

3.1 Market conditions

Markets in different regions vary in their size, growth and diversification. As entrepreneurship is largely an economic activity, specific regional market characteristics may offer more opportunities and returns to such activity. The large size of the regional market facilitates entry of new firms by providing them benefits from concentration of production with increasing returns and saving on transport costs (Krugman, 1991; Fujita et al., 1999), presence of specialized suppliers and labour pool. High growth of regional market represents expanding consumer demand with a preference for more diversification, which are likely to support creation of new firms. The regional gross state domestic product (*SDP*) and regional per capita SDP (*PSDP*) are respectively used as proxies for the absolute size of the regional market and the sophistication of regional demand for more product varieties.

3.2 Technological conditions

The technological level of a region may be the most critical regional characteristics that influence the entry of new firms (Zoltan et al., 2009). Greater stock of technological knowledge of a region implies increased technological opportunities and significant intra-temporal knowledge spillover in a spatial proximity context, which are essential conditions for the emergence of new entrepreneurs. Since past ideas facilitate the formation of new ideas, innovative regions may witness a higher incidence of new technologies being introduced by new entrepreneurs. This is in addition to the formation of new firms as a result of spin-offs from existing innovative firms in the region. Following this argument, it is postulated that regions possessing greater stock of technological knowledge (*STKS*) represented by patent stock are expected to facilitate the entry of new firms.

The technological structure of the industrial base of a region is another regional factor relevant for exploring inter-regional variation in the emergence of new firms. The growing specialization in technology-intensive manufacturing activities manifests itself in local technological development and productivity growth in dynamically linked industries while it also generates extensive knowledge spillovers (Pradhan and Das, 2013; Guerrieri and Milana, 1995). These factors may in turn be associated with increased firm entry. Therefore, the size of technology-driven manufacturing industries relative to total manufacturing sector of a region (*SPL*) is expected to have a positive role in the formation of new firms.

3.3 Spatial agglomeration

A vast body of literature suggest that economic activities are spatially concentrated (Marshall, 1980; Porter, 1990; Krugman, 1991). Regions successful in boosting the extent of spatial concentration of productive units are likely to benefits from localized knowledge flows and spillovers, labour market pooling, input sharing, and demand proximity (Pradhan and Das, 2015; Muro and Katz, 2010; Das, 2005). These advantages are stronger for clusters, which is the product-specific spatial agglomeration of production where firms producing same products are engaged in locally embedded exchanges and knowledge spillovers. Urban centres/cities have become another form of spatial agglomeration as they offer a number of agglomeration related advantages to the incumbent as well as new firms, namely, proximity to demand, variety and access to urban assets that provide conducive environment for innovation (Athey *et al*., 2007). Thus, it is proposed that regions possessing higher spatial density of firms (*SCON*) and greater number of urban locations (*TWN*) are likely to host increased entry of new firms.

3.4 Factor and infrastructural conditions

The regional disparities in the formation of new firms may also be related to the inter-regional differences in the endowment of skills and availability of quality infrastructure like reliable supply of power, transportation system (roadways, railways and airways), ports, and telecommunication networks. A higher level of human capital in a location affects new firm formation in two ways, firstly it gives business start-ups access to the required endowment of skilled workforce and secondly it increases the entrepreneurial likelihood of more educated individuals by enhancing returns to entrepreneurship. Jiménez et al. (2015) reported that the tertiary education rate has a positive impact on formal entrepreneurship in a cross-national study for the period 2000–2007. It was inferred that this type of education enhances entrepreneurial capabilities by increasing individuals' self-confidence, reducing perceived risk and improving their abilities to identify, evaluate and exploit business opportunities. Hence, we have hypothesized that regional higher education enrolments (*SKL*) is likely to have a favorable effect on the entry of new firms.

Levels of physical infrastructure available in a region can contribute to the start-up activity (Audretsch et al., 2015). In location theories, firms choice of plant location is to minimize the distances to market and raw materials (Weber, 1929) or to seek agglomeration economies offered by spatial concentration of production (Krugman, 1991). Local development of transport infrastructure in the form of better roads and railway networks tend to bring firms closer to markets and lower transportation costs. Smith and Florida (1994) and Melo et al. (2010) have provided empirical support for a positive relationship between the transport networks and location choice of plants or firm formation. The availability of telecommunication infrastructure will lower telecommunication costs providing access to information, networking and better processes and organizational coordination, which are expected to increase the likelihood of firm formation. Similarly, the availability and reliability of energy supply such as electricity is essential for the development of entrepreneurship (Ogbor, 2009).

3.5 Loan finance

A number of studies have suggested that entrepreneurship is promoted by financial development and increases in credit availability (Evans and Jovanovic, 1989; Guiso et al.,

2004; Hurst and Lusardi, 2004; Cetorelli and Strahan, 2006). As most enterprises in developing countries like India comprises of SMEs having inadequate access to loan finance (Morris *et al*., 2001), so enhancing the accessibility to finance could be another important regional factor relevant to the creation of new firms. Regions with higher spatial density of financial institutions and supply of credit may provide greater incentives for the start-up enterprises.

3.6 Regional entrepreneurial culture

Inter-regional variation in the creation of new firms may stem from differences in entrepreneurial culture across regions. The significance of cultural factors in entrepreneurship has often been emphasized in the literature (Thornton et al., 2011; Berger, 1991). Regions possessing specific socio-cultural tradition involving shared norms, beliefs and values that provides impetus for risk taking attitudes and entrepreneurial behavior of individuals may be predicted to present greater number of new firms. As youths coming from a business family background show a positive attitude towards entrepreneurship (Goel et al., 2007), most dominating regions in hosting existing firms are likely to reveal more positive cultural attitude for entrepreneurship. In India, West India, South India and North India are known to be more enterprising regions than East India, Central India or Northeast India. Thus, the regional disparities in the number of incumbent enterprises employed to capture regional heterogeneity in entrepreneurial culture (*REC*) is likely to be related with higher formation rates of new firms.

3.7 Regional distribution of FDI

Regional distribution of foreign direct investment (FDI) may also explain the disparities in regional propensity to form new enterprises. The presence of increasing number of foreign firms in a region will expand the supply capacities and increases competition in the local market with their superior knowledge and tangible assets. This may reduce market opportunities for start-up businesses. However, as foreign firms get more embedded in the host region by creating forward and backward linkages and knowledge-spillovers, these firms may also contribute to conducive environment for new firms. The net influence of FDI inflows on new firm formation is thus appears theoretically ambiguous.

4. Econometric specification, estimation method and data sources

The theoretical discussion in the foregoing section on the determinants of regional disparities in the formation of new firms can be summarized in the econometric relationship formulated in Equation-1. As our basic objective is to explain regional variation in new SME formation in the Indian context, Indian states are taken as the subnational regional units for our analysis.

$$FNF_{kt} = \beta_0 + \beta_1 SDP_{kt} + \beta_2 SDPG_{kt} + \beta_3 PSDP_{kt} + \beta_4 STKS_{kt} + \beta_5 SPL_{kt} + \beta_6 SCON_{kt} + \beta_7 TWN_{kt} + \beta_8 SKL_{kt} + \beta_9 SPWR_{kt} + \beta_{10} STRP_{kt} + \beta_{11} STI_{kt} + \beta_{12} SFN_{kt} + \beta_{13} SEC_{kt} + \beta_{14} SFDI_{kt} + \varepsilon_{it} \quad \text{.....(1)}$$

Where explanatory variables are as measured in Table-3 and ε_{it} is the random error term.

The specific measurement of the dependent variable (*FNF*) adopted in the study requires some clarification. In the literature, the regional rate of new firm formation has been estimated from two different perspectives (Audretsch and Fritsch, 1994). In the ecological approach, the entry rate was calculated by standardizing the number of new firms to the population of incumbent firms in the region. This approach views the activities of existing firms as impetus for creation of new firm. In the labour market approach, the entry rate is measured by standardizing the

number of new firms to the size of regional labour force. This approach treats the creation of new firms as resulting from individual action. As it is the individuals and not the firms that start new firms, labour market approach has been largely preferred in the empirical studies. The present study too has taken a labour market approach and used the size of labour force as the relevant group for standardizing the number of new firms.

Table-3 Description and Measurement of Variables

Variables	Symbols	Measurements
Dependent Variable		
Formation of New Firms	FNF_{kt}	Natural log of number of new SMEs formed per one lakh (i.e. 1,00,000) working-age population (ages 15-59) in *k*th Indian state in the year t.
Independent variables		
Demand conditions		
State Domestic Product	SDP_{kt}	Natural log of net state domestic product (constant 1999-2000 Indian Rs.) of *k*th Indian state in year t.
Growth of SDP	$SDPG_{kt}$	Annual percentage change in NSDP (constant 1999-2000 Indian Rs.) of *k*th Indian state in year t.
Per capita SDP	$PSDP_{kt}$	Natural log of per capita NSDP (constant 1999-2000 Indian Rs.) of *k*th Indian state in year t.
Regional Technology		
State Technological Knowledge Stock	$STKS_{kt}$	Number of cumulative patent applications from *k*th Indian state since 1989–1990) per one billion Rs. of NSDP (current price) in year t.
State's Technological Specialization in Manufacturing Sector	SPL_{kt}	Net Value Added (NVA) of high technology manufacturing sectors as a per cent of NVA of total manufacturing sector of *k*th Indian state in year t.
Spatial Agglomeration		
Spatial Concentration of Firms	$SCON_{kt}$	Natural log of number of organized sector factories per 1000 sq km of area of *k*th Indian state in year t.
Towns	TWN_{kt}	Number of towns per 1000 sq km of area possessed by *k*th Indian state in year t.
Factor and infrastructural conditions		
State Skills Availability	SKL_{kt}	Number of higher education enrolments per organized sector factory in *k*th Indian state for *t*th year.
State Power Availability	$SPWR_{kt}$	Power generated (GWh) per one lakh population of *k*th Indian state for *t*th year.
State Land Transport Infrastructure	$STRP_{kt}$	Total road and railway line length (km) per square km area of *k*th Indian state for *t*th year.
State Telecom Infrastructure	STI_{kt}	Telephones per 100 population in *k*th Indian state for *t*th year.
Loan Finance		
State Finance Availability	SFN_{kt}	Credit advances in Indian Rs. crore by scheduled commercial banks per organized sector factory in *k*th Indian state for *t*th year.
Entrepreneurial Culture		
Regional Entrepreneurial Culture	REC_{kt-1}	Number of existing SMEs per one lakh working-age population in *k*th Indian state in the year t-1.
FDI Location		
State's Inward FDI	$SFDI_{kt}$	Cumulative FDI inflows since 1982–83 into *k*th Indian state as a per cent of NSDP (current price) of *k*th Indian state in year t.

Note: (i) High-technology manufacturing sectors include chemicals, pharmaceuticals, electrical & optical equipment, machinery & equipment and transport equipment; (ii) Dependent variable and all the independent variables, except $SDPG_{kt}$ and SPL_{kt}, are expressed in natural logarithm. While taking natural log of the entry rate, cumulative patent per one billion Rs. of NSDP and cumulative FDI inflows as a per cent of NSDP we have added 1 to these series due to presence of zero values in these series.

4.1 Method of estimation

Given the panel structure of the dataset, the study has considered panel estimation of fixed-effects and random-effects as such methods allows for controlling unobservable individual-specific effect. The panel regression has the following form (see Baltagi, 2008):

$$y_{it} = \propto + X'_{it}\,\beta + v_i + \varepsilon_{it} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad (2)$$

Where β is $K \times 1$ and X_{it} is the ith observation on K explanatory variables. α is a constant. v_i which differs between units is the unit-specific residual and ε_{it} denotes the usual residuals. Subscript t denotes time while i denotes individuals.

The study employed the Sargan-Hansen statistic which is robust to arbitrary heteroskedasticity and within-group correlation to choose between fixed effects and random effects estimators (Schaffer and Stillman, 2010). The traditional Hausman specification test presently only handles non-robust standard errors. The Breusch and Pagan Lagrangian Multiplier (LM) test was also used to check the suitability of random effects vis-à-vis pooled OLS. For our data, the Breusch and Pagan test consistently suggested the use of random effects estimator over pooled OLS estimator while Sargan-Hansen statistic suggested the use of fixed effects as more appropriate than random-effects (Table-4). As a result, the study has used fixed effects estimation for the empirical analysis.

Theoretically, fixed effects is amount to use of OLS on the following equation:

$$(y_{it} - \bar{y}_i) = (X_{it} - \bar{X}_i)\beta + (\varepsilon_{it} - \bar{\varepsilon}_i) \ldots\ldots\ldots\ldots\ldots \qquad (3)$$

Where $\bar{y}_i = \sum_t y_{it}\,/T_i$, $\bar{X}_i = \sum_t X_{it}\,/T_i$, and $\bar{\varepsilon}_i = \sum_t \varepsilon_{it}\,/T_i$

4.2 Data Sources

The data on state-wise number of new SME formation by years has been estimated from registered sector unit level dataset of the 4th All India Census of MSME, 2006-07[5]. Under the Micro, Small and Medium Enterprises Development (MSMED) Act, 2006, firms with an accumulated value of plant and machinery up to ₹100 million in the case of manufacturing and up to ₹50 million in the case of services are taken to constitute the MSME sector. The 4th MSME Census surveyed a total of 15,52,491 working MSME units in the registered sector. For determining the establishment year of the enterprises, we have used the installation year of initial plant and machinery or equipment and in case this information is missing, the year of initial production was used instead. While the formation year of Indian SMEs in the registered sector could be traced back to 1901, the study focuses on the period 1989-1990 to 2006-2007 for descriptive analysis and the period 1990-1991 to 2006-2007 for econometric study. The restriction of the period for the econometric analysis is dictated by the availability of state-level explanatory factors and SME formation data, which is available up to 2006-07.

[5] The registered MSME sector covers enterprises registered with District Industries Centres, Khadi and Village Industries Commission/ Khadi and Village Industries Board, Coir Board and ASI (Annual Survey of Industries) factories falling under the coverage of Section 2m(i) and 2m(ii) of the Factories Act, 1948 but within the investment limit for MSMEs as per MSMED Act, 2006.

Since three Indian states like Bihar, Uttar Pradesh and Madhya Pradesh got bifurcated in 2000, bifurcated period data for newly created states were merged (Jharkhand with Bihar, Uttarakhand with Uttar Pradesh and Chhattisgarh with Madhya Pradesh) so that we have consistency of dealing with the combined states only. Dependent as well as explanatory variables for newly divided states such as Uttarakhand and Uttar Pradesh, Jharkhand and Bihar, and Chhattisgarh and Madhya Pradesh for years after 2000 were appropriately weighted by population shares or area shares or GDP shares of divided states to arrive at series for the combined entities.

The information related to the labour force or the working-age population for Indian states were obtained from various decadal population census conducted by the Office of the Registrar General & Census Commissioner. People aged 15─59 years are taken as the group of working-age population. As the census data for working population is available at every 10 years, namely at 1981, 1991, 2001 and 2011, the values for the intermediate years are obtained by interpolation on the basis of growth rate over the 10-year period[6].

The Central Statistical Organization (CSO) has been the primary source for derivation of data related to state level real Net State Domestic Product (NSDP), growth of real NSDP, and real per capita NSDP. State-wise origin of patent applications has been obtained from various annual reports of the *Controller General of Patents, Designs & Trademarks*. For calculating state level technological specialization of manufacturing sector, data on net value added for total manufacturing and high technology industries were compiled from various reports of *Annual Survey of Industries* (*ASI*), CSO. High-technology manufacturing segment is defined to include chemicals, pharmaceuticals, electrical & optical equipment, machinery & equipment, and transport equipment. The number of organized sector factories per state and number of towns per state were respectively collected from the *ASI* and *Census of India* 1991 and 2001.

Higher education enrolments of Indian states have been drawn from various issues of the *Selected Educational Statistics* published by the Department of Higher Education under the Ministry of Human Resource Development (MHRD), Government of India and various annual reports of the MHRD and [7]. The *Compendium of Selected Indicators of Indian Economy* (Volume I) of the CSO (2009) provided teledensity data for Indian states. Total road and railway route length information were compiled respectively from various issues of *Basic Road Statistics of India*, Ministry of Road Transport and Highways and *Indian Railway Yearbook*, Ministry of Railways. Statistics on gross power generation by states is taken from the *Annual Report on the Working of State Electricity Boards & Electricity Departments* of the Planning Commission (Power and Energy Division) and various General Reviews published by Central Electricity Authority, Ministry of Power, Government of India. Credit advance by commercial banks by states is sourced from various volumes of *Handbook of Statistics on Indian States* brought by the Reserve Bank of India.

[6] The methodology of mid-year estimation of population has been used for interpolation. Let the working-age population is denoted by WP. The study has calculated an arithmetic growth rate for WP, Growth = [((WP_{t+10}-WP_t)/ WP_t)*(1/10)] and then used this growth rate to estimate values for intermediate years. For example, WP_{t+1} = [WP_t +(Growth* WP_t)].

[7] Higher education enrolments include enrolments in universities, deemed universities, institutions of national importance, research institutes, colleges for professional education (e.g. engineering, technology, architectural and medical colleges), colleges for general education and polytechnics.

State-wise FDI stock was calculated by accumulating FDI inflows data since 1982─83. While the FDI inflows data from 1982─83 to 2003─04 are on approval terms, those from 2004─05 onwards are on actual basis. Figures on foreign collaboration wise FDI inflows during 1982─83 to 2003─04 came from various *Monthly Newsletter* of erstwhile Indian Investment Centre with supplementary information from *SIA Newsletter* and annual compilations of Foreign Collaborations by the Department of Scientific & Industrial Research (DSIR), Ministry of Science & Technology. Data on FDI inflows from 2004─05 onwards was obtained from *SIA Newsletter* (Annual Issue) various years. It needs to be noted that the data related to the sub-period since 2004─05 is actual FDI inflows data regionally classified as RBI (Reserve Bank of India) regions like Delhi region (comprises Delhi and parts of Uttar Pradesh and Haryana), Mumbai region (comprises of Maharashtra, Dadra & Nagar Haveli and Daman & Diu), Chennai region (consists of Tamil Nadu and Puducherry), etc. State-wise FDI inflows data for these three years from 2004-05 to 2006-07 was arrived at by using member states average shares in RBI regional total during the period January 2001 to August 2004.

5. Empirical Results and Inferences

The regression equation-1 was estimated for a sample of 21 Indian states including union territories for the period 1990-1991 to 2006-2007. In the preliminary investigation, the sample reveals a strong multicollinearity problem. The mean value of variance inflating factor (VIF) for the independent variables in the sample comes out to be 5.38 while the condition number was 243.

The VIF for $SCON_{kt}$, TWN_{kt}, $STKS_{kt}$, $STRP_{kt}$, STI_{kt}, and SFN_{kt} respectively are 19.71, 8.39, 6.85, 6.77, 6.10 and 5.12. To address this problem, the study adopted a modified Gram-Schmidt orthogonalization procedure (Golub and Van Loan, 1996) to create a new set of orthogonal variables for those state-specific factors possessing a VIF of 5 or above. This is a successive orthogonalization process where the list of variables should be arranged in accordance with their importance. For determining the importance of different regional factors in the state-wise rate of formation of SMEs, the study relied on the size of the absolute value of the partial correlation between each of these regional variables and the formation rate of SMEs in Indian states. Hence, the independent variables for orthogonalization were arranged according to the size of their partial association with the states' entry rate of new SMEs[8].

A re-examination of multicollinearity test on the new matrix of transformed explanatory variables reveals a mean VIF of 2.74 and a maximum VIF value of 4.8 for individual explanatory variables. This indicates that orthogonalization of concerned explanatory variables has been successful in addressing the severity of multicollinearity in the sample.

Findings

Empirical results obtained from fixed effects estimation with robust standard errors are summarized in Table-4. The estimation was conducted for the state-wise entry rates of new SMEs in all the sectors and then separately for entry rates of SMEs in the primary sector, tertiary sector, and the manufacturing sector. As manufacturing covers wide variety of products, the estimation further divides the manufacturing sector into three technological sub-categories, namely high-technology manufacturing, medium-technology manufacturing, and

[8] The order of regional variables for orthogonaliztion used in the study is SFN_{kt}, STI_{kt}, $SCON_{kt}$, $STKS_{kt}$, TWN_{kt}, and $STRP_{kt}$.

low-technology manufacturing[9]. The special focus on manufacturing is due to the fact that it is the key sector for industrialization and currently it is under the policy focus of both the central and state governments to improve national and global competitiveness. The 'Make in India' programme of the Government of India is clearly targeted at the manufacturing sector.

The F-values for all the estimated models are observed to be statistically different from zero, which indicates that the fitted specifications are quite significantly explaining the regional profile of entry rates of new SMEs and relevant spatial factors indeed are included. R-squared for all sector shows that the fitted model (i.e., all explanatory variables taken together) accounts for about 34 per cent variation in SME entry rate within each of the states overtime. In the disaggregated level estimations, the variation in the SME entry rate captured by estimated models for tertiary and manufacturing sector is about 32-33 per cent but the same is quite modest at 19 per cent for the primary sector. Explanatory powers of the estimated models in case of technological subsample estimations of the manufacturing ranges between 28–29 per cent of the changes in SME entry rate within Indian states.

Among the regional market related factors, SDP_{kt} turns up with a positive coefficient across estimations and assumed statistical significance for SMEs entry rates in all the sectors combined, tertiary sector, total manufacturing, medium-technology and low-technology manufacturing. Thus, states offering relatively larger size of local markets are better placed in achieving higher rate of new SMEs formation. This fact holds for all the economic sectors taken together while it is specifically the case for tertiary and total manufacturing sectors. The coefficient of SDP_{kt} is, however, statistically not different from zero in the case of primary sector.

$SDPG_{kt}$ has a negative coefficient throughout and become statistically significant only in the estimations for the tertiary sector and high-technology manufacturing. This finding is on the contrary to our expectation as high growth is often treated as an indicator of expanding business opportunities. A possible reason that could have led to this contrarian outcome is that expanding employment opportunities from high growth in services and high-technology manufacturing may be inducing individuals to take up jobs than opt for self-employment through entrepreneurship in these sectors. Also, high growth of service sector and high-technology manufacturing products during the liberalized business environment may be assuring incumbent and rapidly growing firms an increasing market shares, which may allow them to erect entry barriers for new start-ups.

Except the primary sector and high-technology subsample, $PSDP_{kt}$ has a strongly negative effect on the entry rates of new SMEs, indicating that states with predominately lower per capita NSDP have a higher formation rate of new SMEs than states with higher per capita NSDP. This result contradicts our proposed hypothesis that states with sophisticated demand proxied by per capita NSDP may host greater number of new SMEs. A reasonable explanation would be that SME start-ups in India are more concerned with supplying to a less sophisticated local demand than a highly sophisticated local demand. States with high per capita income is

[9] This is following the OECD classification of the manufacturing sector where high-technology segment is assumed to include chemicals, pharmaceuticals, electrical & optical equipment, machinery & equipment and transport equipment. Industries like pulp and paper products, publishing and printing, textiles and textile products, food including beverages and tobacco, wood and wood products, leather and leather products, other manufacturing, and diversified are categorized as low technology manufacturing. Medium-technology manufacturing consist of coke and refined petroleum products, rubber and plastic products, other non-metallic mineral products, and basic metal and metal products.

likely to shows a local demand which is more inclined for differentiated products whereas SMEs are known to be operating more in the case of standardized and simple products.

Table-4: Regional Determinants of New SMEs Formation across Indian States

Dependent Variable: Natural log of SME entry rate

Independent Variables	Coefficients (Robust t-statistics)						
	All Sectors	**Primary Sector**	**Tertiary Sector**	**Manufacturing**			
				Total	**High-tech.**	**Medium-tech.**	**Low-tech.**
SDP_{kt}	2.992** (2.842)	0.529@ (1.621)	2.249** (2.300)	2.774** (2.802)	1.058 (1.436)	1.916** (2.557)	2.704** (2.516)
$SDPG_{kt}$	-0.00608 (-1.462)	-0.000649 (-0.616)	-0.00665** (-2.217)	-0.00478 (-1.239)	-0.00555* (-1.750)	-0.00291 (-1.031)	-0.00270 (-0.824)
$PSDP_{kt}$	-2.781** (-2.285)	-0.560 (-1.503)	-2.311** (-2.280)	-2.568** (-2.239)	-0.915 (-1.345)	-1.808** (-2.514)	-2.602* (-2.049)
$STKS_{kt}$	0.0358 (0.245)	0.00512 (0.135)	-0.0337 (-0.354)	0.0419 (0.290)	-0.0318 (-0.343)	-0.00968 (-0.0858)	0.0486 (0.359)
SPL_{kt}	0.00508* (1.772)	0.00262* (1.821)	0.00180 (0.811)	0.00516* (1.849)	0.00497*** (3.058)	0.00545** (2.681)	0.00333 (1.192)
$SCON_{kt}$	0.0810 (0.164)	0.0818 (0.890)	0.275 (0.727)	0.0194 (0.0424)	0.121 (0.456)	0.221 (0.664)	-0.0770 (-0.193)
TWN_{kt}	0.0320 (0.438)	0.0157 (0.805)	0.0858 (1.431)	0.0244 (0.356)	0.00753 (0.152)	0.0193 (0.402)	0.0606 (0.827)
SKL_{kt}	0.361** (2.598)	0.0790** (2.787)	0.224* (1.929)	0.328** (2.535)	0.139 (1.494)	0.223** (2.247)	0.281** (2.270)
$SPWR_{kt}$	0.0719 (0.659)	-0.0269 (-0.875)	0.115 (1.385)	0.0627 (0.597)	-0.0102 (-0.183)	-0.0296 (-0.467)	0.120 (1.092)
$STRP_{kt}$	0.102* (2.026)	0.0160 (1.544)	0.109*** (2.969)	0.0867* (1.820)	0.0419 (1.540)	0.0438 (1.396)	0.0987* (2.015)
STI_{kt}	-0.620* (-1.896)	-0.0428 (-0.640)	-0.313 (-1.431)	-0.602* (-1.908)	-0.153 (-0.843)	-0.197 (-0.888)	-0.661** (-2.275)
SFN_{kt}	-0.677*** (-5.146)	-0.0390 (-1.113)	-0.467*** (-4.792)	-0.634*** (-4.714)	-0.350*** (-3.420)	-0.397*** (-3.731)	-0.555*** (-4.544)
$SFDI_{kt}$	-0.00223 (-0.510)	-0.00122@ (-1.625)	0.00146 (0.468)	-0.00214 (-0.520)	-0.000413 (-0.182)	-0.00158 (-0.634)	-0.000251 (-0.0605)
REC_{kt-1}	1.182*** (6.898)	0.152** (2.173)	0.935*** (6.540)	1.067*** (6.362)	0.508*** (5.075)	0.552*** (5.787)	1.011*** (5.390)
Constant	-58.02*** (-3.215)	-9.525* (-1.758)	-42.41** (-2.534)	-53.72*** (-3.119)	-21.62 (-1.534)	-36.14** (-2.528)	-51.64*** (-2.892)
F(14,24)	30.23	5.87	17.07	27.93	17.0	77.05	12.03
Prob > F	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	356	356	356	356	356	356	356
R-squared	0.338	0.188	0.321	0.328	0.283	0.290	0.290
No. of Indian states	21	21	21	21	21	21	21
Test of over identifying restrictions: fixed vs random effects!							
Chi-sq(14)	83.929	183.809	349.870	94.891	97.682	176.513	120.839
Prob > Chi-sq	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Breusch and Pagan Lagrangian Multiplier test for random effects							
Chibar2(01)	75.07	23.26	274.02	71.48	64.81	3.19	179.75
Prob > Chibar2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0371	0.0000

Note: Robust t-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1; @ p<0.12, R-squared is within R-squared; !- Sargan-Hansen statistics estimated using xtoverid STATA ado (Schaffer and Stillman, 2010); SFN_{kt}, STI_{kt}, $SCON_{kt}$, $STKS_{kt}$, TWN_{kt}, and $STRP_{kt}$ are orthogonalized variables as described in the text.

Therefore, results on regional market related factors suggest that potential SMEs' decision to enter in a state is positively determined by the size of local demand while the growing sophistication of local demand may in fact reduces their entry rate. Further, higher economic growth may witness diminishing scope for the entry of new start-ups when expanding work opportunities promote individuals to choose jobs over entrepreneurial opportunities through self-employment and when high growth in the liberalized period end up disproportionately rewarding incumbent large firms the increasing market shares.

The role of regional technological variables in explaining the inter-state patterns of entry rate of new SMEs is found to be mixed. Technological knowledge stock measured by cumulative patents, $STKS_{kt}$ has mixed signs of its coefficient across estimations but none attained any acceptable level of statistical significance. The specialization of Indian states on technology-intensive manufacturing activities represented by SPL_{kt} turns up with a positive sign throughout. This positive relation between technology-intensive specialization of the manufacturing sector and SME entry rate has attained modest statistical significance embracing all the sectors together, the primary sector, total manufacturing and its sub-sample estimations for high- and medium-technology industries.

The insignificant effect of $STKS_{kt}$ suggest that states' higher stock of technological knowledge plays diminutive role in causing any significant change in entry rate of new SMEs. One has to take into consideration the fact that patent activities are undertaken by organized sector and comparatively large-sized enterprises and, hence, their relevance for formation rate of SMEs is pretty low. As SMEs predominantly form a part of the unorganized sector of the economy, an alternative measure of regional technological knowledge stock like cumulative R&D investments might have performed differently. Moreover, irrespective of the technological nature of the industries, it may be that incumbent large firms in these industries are more efficient at exploiting R&D, thus, leaving less possibilities for entry of new SMEs. This is similar to the finding reported by Zoltan et al. (2009) that extensive knowledge exploitation by incumbents reduce entrepreneurial activity.

Moderately effective positive sign of SPL_{kt} indicates that states with higher technology-intensive structure of manufacturing sector tend to possess greater entry rate of new SMEs in general and also in the case of total manufacturing and its two technological sub-groups of industries. It may be because the technology-intensive manufacturing sector of a state may be generating knowledge spillovers on residual sectors like the primary sector, thus, creating more favourable conditions for the entry of new SMEs.

Among the agglomeration related factors, $SCON_{kt}$ and TWN_{kt} both consistently appeared with a positive coefficient across estimations, except a negative sign of the former in the sub-sample of low-technology manufacturing industries. Invariably both of their coefficients are statistically not different from zero for all the estimations. These results indicate that greater spatial density of existing firms and greater number of urban locations in a state may not affect the formation rate of new SMEs. Overall, SMEs compared to larger firms tend to be geographically more dispersed in a state to reduce inter-regional and rural-urban disparities in growth (Das, 2008). The 4th All India Census of MSME shows that above 45 per cent of MSMEs are in rural areas. It is possible that states with higher geographical concentration of firms of the same and related subsectors (i.e., clustering) could have been a better measure of agglomeration for examining formation of new SMEs.

SKL_{kt} representing the availability of human capital consistently has a positive coefficient and turns significant for all the estimations, except subsample of low-technology industries. This would confirm that Indian states possessing higher endowments of skilled human-power are able to maintain higher entry rate of new SMEs in all the three sectors of the economy, namely primary sector, tertiary sector and manufacturing sector.

The performance of physical infrastructure variables in explaining inter-state patterns of new SMEs formation is, however, observed to have mixed role. $SPWR_{kt}$ has an insignificant coefficient throughout the estimations while $STRP_{kt}$ has a positive coefficient and significantly different from zero in the estimations for all the sectors combined, tertiary sector, manufacturing sector and sub-sample of low-technology manufacturing industries. Clearly, the availability of electricity is less related to the regional emergence of new SMEs in India while the availability of widespread land transportation networks tends to possess a positive impact on the entry of new SMEs. Again, on the contrary to the expectation, STI_{kt} is observed with a significantly negative sign across estimations and turns modestly significant for all the sectors taken together, manufacturing sector and sub-sample of low-technology manufacturing industries. Apparently, states having relatively lower levels of local telephone density have seen relatively higher entry rate of new SMEs. Firm size is known to matters in firm's adoption of new technologies like information and communication technologies (ICTs), specifically small firms tend to have lower rates of adoption as compared to large firms (Commander, et al., 2011). Thus, telephone density might be more important for large firms than SMEs.

Institutional credit, SFN_{kt} has a strong negative effect, except for the primary sector estimation. Apparently, states possessing relatively higher levels of per capita credit advancement by commercial banks have seen lower entry rates of new SMEs. In the liberalized regime, the growth rate in institutional credit to MSMEs almost halved during the first half of the 2000s as compared to 1990s (Nair and Das, 2019) and as indicated by 4th MSME Census that only 11.71 per cent of Indian MSMEs have availed institutional credit while 87.23 per cent were self-financed entities. Further, credits by commercial banks in a state often come with several problems like inadequate credit limit sanction, delay in disbursement of long-term loans, hesitation of bankers in providing fresh working capital and collateral guarantee (Morris et al., 2001), which are likely to discourage new SMEs from accessing institutional credit. As greater portion of credit advancement by commercial banks has gone to non-MSMEs in states while MSMEs remained predominantly self-financed, entry rate of new SMEs is inversely related to bank credit.

$SFDI_{kt}$ is largely found to have a negative effect but insignificant. So, the increasing presence of foreign companies in a state is unlikely to impact business opportunities for potential SME start-ups. This insignificant effect of foreign firms might have resulted from the facts that foreign affiliates operate in the organized sector of the economy and provides differentiated goods and services that might be targeted at different customer base than types of goods and services offered by SME sector.

As hypothesized, REC_{kt-1}, representing entrepreneurial culture of the state is found to have exerted a positive effect on the entry of new SMEs into Indian states. Therefore, states which possess greater proportion of its working-age population taken to entrepreneurship in the past are likely to have higher rates SME entry in the current time period. This finding is in tune with earlier research that entrepreneurial culture possesses a significant positive effect in explaining cross-country differences in entrepreneurship rates (Suddle et al., 2010).

6. Concluding Remarks

This study has made a preliminary analysis of the regional patterns of formation of new SMEs in India. Based on the unit level data from 4th MSME Census 2006–07, it estimated the number and entry rate of new SMEs across regions, states and periods. In general, the formation of new SMEs in Indian economy is found to be characterized by several distinctive facts.

The number and entry rate of new SMEs formed have increased since the early 1980s to the early 2000s but both with successively slowing growth rate. This is generally true for most Indian regions. Moreover, the formation of new SMEs took place disproportionately across the space and its predominant share comes from a few Indian regions and states. The top three regions in terms of the number of new SMEs formed include South India, West India and North India. For recent periods, leading states for creation of new SMEs are Tamil Nadu, Uttar Pradesh, Gujarat, Karnataka and Kerala. The regional disparities are also visible when one considers the inter-state patterns of entry rate of new SMEs. The range of entry rates of new SMEs among Indian states has increased over time before showing a reduction during 2005–2007.

These trends suggest the importance of examining regional heterogeneity among Indian states in terms of formation of new SMEs. The fixed effects estimation on the determinants of state-wise SME entry rates confirm that regional factors do exert strongly distinctive effects on the entry rate of new SMEs among Indian states. While the absolute size of the market facilitates higher entry rate, its higher growth and growing sophistication of local demand (proxied by per capita NSDP) create conditions for success of incumbent firms in the differentiated product market, which ultimately reduce entry opportunities for SMEs.

Indian states possessing relatively technology-intensive manufacturing sector are found to be successful in achieving higher entry rate of new SMEs. It goes without saying that technology-intensive manufacturing industries spur innovation, generate higher productivity and cause knowledge-spillovers to the rest of the economy. Such technology-intensive industries are the critical factors for Indian states not just to attain greater industrialization but also formation of SMEs.

Further, states with higher endowments of skilled human-power and better land transportation networks are found to be outperforming other states in terms of SMEs formation. Strong entrepreneurial culture of the state also acts as an incentive for individuals to choose the path of entrepreneurship and, hence, promote greater entry of new SMEs.

The study offers several policy implications. State policymakers can expand the entry rates of SMEs by focusing on the improvement in the supply of skilled labour force through expansion of higher education, enlargement of road and railway networks, increasing manufacturing specialization on technology-intensive activities and promotion of entrepreneurial culture of the state. It is also vital that problems faced by SMEs in accessing institutional credits must be addressed by removing systemic bias and procedural hurdles as shortage of working capital is a very significant factor behind sickness in SMEs. Institutional credit flows to SME sector, particularly those in the manufacturing sector, is required to be strengthen. Adoption of ICTs by SMEs may be promoted so that SMEs like their large counterparts could also reap the ICT-enabled productivity gains.

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