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Productivity, Profitability and Status of Growth of Micro Manufacturing Enterprises in West Bengal: An Empirical Analysis

Bhabasankar Das

Ph.D Research Scholar, Dept. of Economics, Vidyasagar University, Midnapore, West Bengal, India

Abstract: ***Present paper makes an attempt to analyse the productivity and profitability of Micro Manufacturing Enterprises (MMEs) in general and their status of growth in particular in the context of West Bengal. Productivity of MMEs is significantly high in Establishments than that of Own Account Enterprises (OAEs). The study establishes that the labour Productivity of MMEs significantly associated with location of enterprise, nature of enterprise, nature of operation, life-span of enterprise and government assistance. Productivity of MME is high if it runs business in outside household premises and it has spent higher life time and received assistance from the government. Productivity of MMEs is high if it is owned by general caste household and for seasonal and casual enterprises. The labour productivity also depends on capital-labour ratio. The profit share is relatively high in OAEs than that of Establishments. The study establishes that the profit share of MMEs significantly associated with location of enterprise, nature of enterprise, nature of operation, sector, social ownership and life-span of enterprises. Profit share is high for Perennial enterprises and it is low for seasonal and casual enterprises. Government assistance does not significantly affected by the profit share of MMEs. The expanding status of growth is significantly realized for high productive, high profitable, rural located, Establishment and perennial enterprises. The growth is contracting for low productive, seasonal and casual enterprises. It seems to be stagnating for low productive and Own Account Enterprises. For Establishment enterprises the status of growth is expanding where as for OAEs status of growth is stagnating. Growth Status of MMEs is not significantly affected by government assistance.***

Keywords: Micro Manufacturing Enterprise, Productivity, Profitability, Status of growth.

1. Introduction

Micro Manufacturing Enterprises (MMEs) occupy an important and strategic place in the economic growth and equitable development by creating employment, enhancing income, strengthening purchasing power, lowering costs, adding business convenience and creating entrepreneurial spirit among the households. MMEs play an important role to facilitate an effective mobilization of resources of capital and skill which might otherwise remain unutilized. MMEs refer to an economic unit engaged in the production of manufacturing goods where investment (on plant and machinery) do not exceed Rs. 25 lakh. This sector is identified with features like reliance on indigenous resources, family ownership of enterprise, small scale of operation, labour intensive, adapted technology and minimum skill. They possess the features like self-employment generation, employment to poor and women, use of local resources and low capital input, meeting basic needs of the poor, self-satisfaction on the job, entrepreneurship, innovative and fair income distribution among the poor.

The present scenario of MMEs growth is still underdeveloped in rural areas of West Bengal. In West Bengal, micro entrepreneurs face a number of constraints on business growth. Lack of access to financial capital has received much attention amongst donors and practitioners, as witnessed by the rise of the microfinance movement. But while there is a lot of optimism about the power of finance for MMEs, development a growing literature shows that success cannot be taken for granted and may critically depend on the entrepreneur's educational back ground, business skills, and mind set. But in the rural area, most of the micro entrepreneurs are poorly educated, less efficient, and low skilled. They don't have access the modern technology properly. Their business management and product distribution system are very bad. Micro entrepreneurs are facing the problem of access to market. Larger manufacturing and services industries for increased market access, enhanced investment flows, skills development and technological advancements. The products of large enterprises are reaching in the rural household through their marketing channels. Large enterprises are trying to capture the whole market in urban as well as in the rural area. MMEs are faces through competition with the large industries. But whatever may be the situation MMEs are indispensible for livelihood of a significant portion of the society.

In West Bengal agriculture is the mainstay of majority of people. The agriculture sector is basically of subsistence in nature and therefore the products from the agricultural sector can hardly meet the household needs throughout the years. Unemployment and under employment are a growing problem in rural areas of West Bengal. Self-employment and micro business opportunities can be especially important for non-traditional entrepreneurs including women, low-income individuals, and dislocated or underemployed workers in rural area. Alam (2009) finds that the level of employment by MME sector is significantly higher than that of large scale industries and hence the contribution of MME is rather more pervasive compared to the large industries and is more prominent at the grassroots level. In West Bengal, out of total manufacturing employment only 11.6 percent are employed in the organized manufacturing sector i.e, in the factory sector and remaining 88.4 percent are employed in the

unorganized manufacturing sector (ASI 2011, NSSO 2011). Within unorganized manufacturing sector the share of employment in MMEs is 99.8 per cent. More than 27,63,784 MMEs are operating in West Bengal where 50,06,261 persons are employed (NSSO 2011). That is, one MME exists per 7 households in West Bengal. In this brief background the present paper explores to analyse the productivity, profitability and status of growth of Micro Manufacturing Enterprises in West Bengal.

2. Review of Literature

MMEs act as reduction of poverty and vulnerability of poor through enabling them to enhance self-empowerment and social dignity. Chowdhury (2009) finds that MMEs are instruments that allow poor to enhance their income, build assets, and take part in community actions. Hussain (2000) points out that MMEs are important sources of employment creation, income generation, product diversification and economic growth. Agyapong (2010) points out that MMEs have been identified to play key roles in a society including contributing to jobs through innovations and creativity as well as aiding human resources development. Subedi (2006) reveals that the livelihoods of the entrepreneurs have been improved to large extent after the undertaking of Micro Enterprising activities and they have been able to satisfy their most needs and to accumulate assets. Kanitkar (1994) examines micro entrepreneur's motivation shifting from an agriculture-based occupation to a non-farm activity, their approach to raising resources for their enterprises and the factors that facilitated entry of the rural entrepreneurs into a micro business activity. He also advocates that MMEs growth stimulates competition and entrepreneurship which, in turn, enhances efficiency, innovation, and productivity growth. Subramaniam (2010) finds that MMEs are important in creating employment and entrepreneurial talent among the Malaysian youth. MMEs provide young and budding entrepreneurs an opportunity to be involved in entrepreneurships that require less financial commitment.

Objectives

The present paper sets the following objectives to study:

a) To analyse the characteristics of Micro Manufacturing Enterprises in West Bengal.
b) To analyse the factors that affect the productivity and profitability of Micro Manufacturing Enterprises in West Bengal.
c) To analyse the factors that affect the status of growth of Micro Manufacturing Enterprises in West Bengal.

Database & Methodology

Present study is based on National Sample Survey Organization (NSSO) 67th Round Survey on *Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India 2011*. This report published on February 2013. As per the Micro, Small and Medium Enterprises Development (MSMED) Act, 2006 the enterprises are broadly classified into two categories, namely manufacturing enterprises and service enterprises. Both categories of enterprises have been further classified into micro, small, medium and large enterprises based on their investment in plant and machinery (for manufacturing enterprises) or on equipments (in case of service enterprises). In case of Micro Manufacturing Enterprises, in our country, the investment in plant and machinery do not exceed 25 lakh rupees as per MSMED Act 2006. From 67th Round NSSO Unit Level data, we have found 9032 sampled of MMEs in West Bengal with the investment in plant & machinery does not exceed 25 lakh rupees. By posting combined weight multiplier we have estimated total number of MMEs in West Bengal. Among total MMEs in West Bengal, 2161735 are located in rural area and 602048 in urban area. The estimated numbers of Own Account Enterprises are 2432482 and Establishment units are 331301. The survey explores different aspects of MMEs by the means of ownership, location, nature of operation, social ownership, life-span, number of month operated, number of working hours, gross output, gross value added, employment, productivity, profitability and status of growth separately for OAEs and Establishments. The data was analyzed quantitatively using descriptive statistics, F statistics, t statistics, and multinomial probit regression analysis while Chi - Square distribution was used to find out the associations between variables.

3. The characteristics of Micro Manufacturing Enterprises in West Bengal

Ownership and Location

Table 1 shows the percentage distribution of the MMEs by type of ownership and sector. Proprietary enterprises (i.e. enterprises owned by a single household) had the highest share (95.2 per cent) of MMEs, out of which 51.8 per cent of the proprietors are females and the rest are males. Only 5 per cent of enterprises are operated on a partnership basis. The share of ownership of self help groups, trusts and others are miniscule. For male owned enterprises, Establishment units are higher than OAEs, but for female, OAEs is higher than Establishment unit. For male owned proprietary MMEs the share of OAEs is 35 per cent in rural West Bengal and little higher (47 per cent) in urban West Bengal. For female owned proprietary MMEs the share of OAEs is 60.4 per cent in rural West Bengal and little lower (48.6 per cent) in urban West Bengal. In rural female owned proprietary MMEs (56.2 per cent) is significantly high as compare to male owned proprietary MMEs (39.1per cent). In urban male owned proprietary MMEs (59.1 per cent) is significantly high as compare to female owned proprietary MMEs (36 per cent). For partnership MMEs, in contrast, Establishment enterprises are higher than OAEs in both rural and urban area. In rural area 4.6 per cent and in urban area 4.5 per cent of enterprises are operated on a partnership with same household. Among partnership enterprises only 0.2 per cent of enterprises are operated on a partnership with different households.

Table 1: Distribution of MMEs by type of the Ownership in West Bengal, 2011

Type of Ownership		Rural			Urban			Rural +Urban		
		OAE	Estt	All	OAE	Estt	All	OAE	Estt	All
Proprietary	Male	35.0	90.0	39.1	47.0	89.1	59.1	37.1	89.5	43.4
	Female	60.4	3.1	56.2	48.6	4.5	36.0	58.3	3.8	51.8
Partnership	Same HHs	4.4	6.5	4.6	4.3	5.1	4.5	4.4	5.8	4.6
	Different HHs	0.1	0.4	0.1	0.1	1.2	0.4	0.1	0.8	0.2
Self-help groups		0.1	0	0.1	0	0	0	0.1	0	0.1
All		100 (2002649)	100 (159086)	100 (2161735)	100 (429833)	100 (172215)	100 (602048)	100 (2432482)	100 (331301)	100 (2763784)

Note: Figures in parenthesis indicate the percentage share.
Source: NSSO Unit Level survey data on Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India 2011.

It is evident that in rural area proprietary female enterprises are higher as compare to proprietary male enterprises. In rural area 60.4 per cent OAEs are run by female proprietary owner. In rural area higher numbers of women are doing their household work and also simultaneously engage in micro manufacturing activities. Proprietary MMEs act as a catalyst to improve in rural area promotion for the socio economic condition of rural women and help them to access and control the resources. It is evident that in urban area proprietary male enterprises are higher as compare to proprietary female enterprises because in urban area most of the enterprises are the big enterprise, establishment unit, manufacturing and services industries. In urban area the micro manufacturing sector is male dominated.

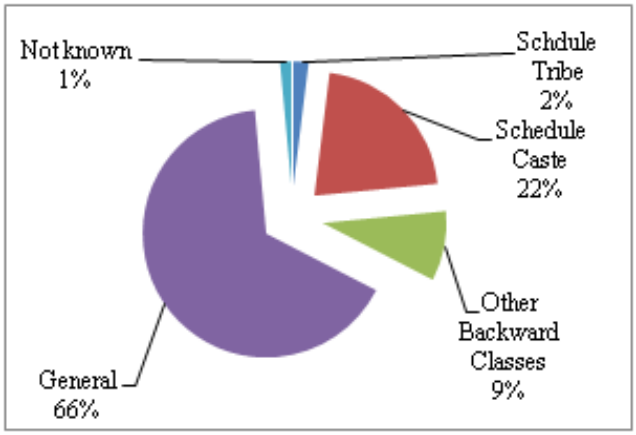

Figure 1: Distribution of MMEs by Social Group of Ownership in West Bengal

The distribution of MMEs by social group of ownership (as shown in Figure 1) revels that majority MMEs (66 per cent) are owned by general caste. In rural area 64 per cent MMEs and in urban area 73 per cent MMEs are occupied by general caste people. The ownership of MME by ST community is significantly low. Out of total MMEs only 2.4 per cent in rural, 0.4 per cent in urban and 2 per cent on the whole have occupied by STs. Their ownership of Establishments is invariably low (1 per cent). The shares of ownership of MMEs by SC and OBC community are also relatively low. About 23.2 per cent in rural and 15.4 per cent in urban of MMEs are owned by SC household. Out of total MMEs only 9.1 per cent on the whole have occupied by OBCs.

Table 2: Distribution of MMEs by type of Location in West Bengal, 2011

Location of Enterprises		Rural			Urban			Rural +Urban		
		OAE	Estt	All	OAE	Estt	All	OAE	Estt	All
Within HH premises		93.4	44.3	89.8	82.0	35.3	68.7	91.4	39.6	85.2
Outside HH premises with fixed location	Permanent structure	5.3	54.3	9.0	15.0	62.9	28.7	7.1	58.8	13.3
	Temporary Structure	0.1	0.5	0.2	0.9	1.0	0.9	0.3	0.8	0.3
	Without structure	0.1	0.3	0.1	0.2	0.3	0.2	0.1	0.3	0.1
Outside HH premise without fixed location	Mobile market	0.4	0.4	0.4	0.6	0.4	0.5	0.4	0.4	0.4
	Street vender	0.7	0.1	0.7	1.2	0.1	0.9	0.8	0.1	0.7
All		100 (2002649)	100 (159086)	100 (2161735)	100 (429833)	100 (172215)	100 (602048)	100 (2432482)	100 (331301)	100 (2763784)

Source and Note: As in Table 1
HH = Household, OAE = Own Account Enterprises, Estt = Establishment

Table 2 shows the distribution of MMEs by the types of location. The types of location are categorized as within household (HH) premises, outside HH premises with fixed location, and outside HH premises without fixed location. The fixed located MMEs are operated in permanent structure, temporary structure, and without structure. Without fixed located MMEs are either of mobile market or street vender in nature. About 85 per cent of MMEs operate within household premises and remaining 15 per cent operate their business outside the household premises. About 13.3 per cent of the MMEs operate in outside household premises with permanent structure and 0.3 per cent in temporary structure and 0.1 per cent enterprises operate in outside household premises without any structure. Only 0.4 per cent and 0.7 per cent of enterprises operate under mobile market and street vender without fixed location. Higher numbers of the OAEs are functioning with in the household premises as compare to Establishment both in rural as well as in urban area. Higher numbers of the Establishment enterprises are functioning outside household premises with permanent structure as compare to OAEs both in rural as well as in urban area.

4. Working Time and Life-span of Micro Manufacturing Enterprises in West Bengal

Table 3: Distribution of MMEs by type of the Nature of operation in West Bengal, 2011

Category	Rural			Urban			Rural + Urban		
	OAE	Estt	All	OAE	Estt	All	OAE	Estt	All
Perennial	97.7	98.7	97.8	98.8	99.9	99.1	97.9	99.3	98.1
Seasonal	2.1	1.2	2	0.5	0.1	0.4	1.8	0.7	1.7
Casual	0.2	0.1	0.2	0.7	0	0.5	0.3	0	0.2
All	100 (2002649)	100 (159086)	100 (2161735)	100 (429833)	100 (172215)	100 (602048)	100 (2432482)	100 (331301)	100 (2763784)

Source and Note: As in table 1

Table 3 shows the percentage distribution of MMEs by type of the Nature of operation. A small portion of enterprises operate only in seasons when the raw materials for the enterprise are available in the season. Broadly, an enterprise may operate more or less throughout the year or in seasons or intermittently throughout the year and accordingly they are termed as perennial, seasonal and casual enterprises, respectively. About 98 per cent of the total enterprises are perennial while the seasonal and casual enterprises together constituted a little more than 1 per cent of the total enterprises. The distribution of MMEs in respect of nature of operation does not differ significantly between rural and urban areas, or between OAEs and Establishments. In rural area 97.8 per cent of the MMEs are perennial while the seasonal and casual enterprises together constituted 2.2 per cent of the total enterprises. In urban area most of the Establishment enterprises are perennial while no seasonal and casual enterprises.

Table 4: Distribution of MMEs by type of the Life-span in West Bengal, 2011

Life-span (years)	Rural			Urban			Rural + Urban		
	OAE	Estt	All	OAE	Estt	All	OAE	Estt	All
0—10	53.5	57.1	53.7	59.8	45.5	55.8	54.6	51.1	54.2
11—20	33.1	30.5	32.9	25.3	37.7	28.9	31.8	34.2	32.1
21—30	11.1	8.4	10.9	10	9.2	9.8	10.9	8.8	10.7
above 30	2.3	4	2.4	4.8	7.6	5.6	2.7	5.9	3.1
All	100 (2002649)	100 (159086)	100 (2161735)	100 (429833)	100 (172215)	100 (602048)	100 (2432482)	100 (331301)	100 (2763784)

Source and Note: As in table 1

From the distribution of life-span of MMEs in West Bengal it is evident that greater numbers of enterprises established during last 10 years- 54.6 per cent of OAEs and 51.1 per cent of Establishment enterprises. The main reason behind this is that during last 10 years a numbers of large manufacturing and service enterprises shut down their production or run away to other place due to the different reasons. People lose their jobs and start the small business within the household premises and used their own resources (or local resources) and use some homemade inputs, use small size of machine and produced by family labour and utilizing into their small size of business, earning income and spent their livelihood and they are employed in MMEs. In West Bengal, higher number of the people are employed in the micro manufacturing activities during last 10 years due to the shortage of big industries. Among OAEs 53.5 per cent in rural and little higher (59.8 per cent) in urban have life-span less than 10 years. For Establishment 57.1 per cent in rural and little lower (45.5 per cent) in urban have life spent less than 10 years. Numbers of MMEs decreased with the increase their life-span. There are 32.1 per cent MMEs with life-span 11 to 20 years, 10.7 per cent with 21-30 years and only 3.1 per cent with 30 years and above (Table 4)

5. Labour Productivity of Micro Manufacturing Enterprises in West Bengal

Labour productivity widely varied across enterprises and location. The labour productivity of OAEs is significantly low in comparison with Establishment enterprises. For OAE 51.4 per cent of MMEs having the labour productivity Rs. 50 per manday or less but in case of Establishment it is only 0.6 per cent. For OAE 96 per cent of MMEs having the labour productivity Rs. 200 per manday or less but in case of Establishment it is 23.1 per cent. For Establishment 63.9 per cent of MMEs having the labour productivity more than Rs. 200 per manday but in case of OAE it is only 4 per cent. For Establishment 36.4 per cent of MMEs having the labour productivity more than Rs. 500 per manday but in case of OAEs it is only 0.3 per cent. Labour productivity is comparatively high in Establishment enterprises than that of OAEs both in rural as well as in urban area. Here we use the t statistics to test the labour productivity between OAE and Establishment.

Table 5: Distribution of Labour Productivity of MMEs in West Bengal, 2011

Labour Productivity per manday	Rural			Urban			Rural + Urban		
	OAE	Estt	All	OAE	Estt	All	OAE	Estt	All
0 —50	55.9	0.4	51.8	30.8	0.8	22.2	51.4	0.6	45.3
51—100	28.8	2.8	26.9	31.8	3.6	23.7	29.3	3.2	26.2
101—200	12.6	24.8	13.5	27.8	14.3	23.9	15.3	19.3	15.8
201—350	2.2	24.1	3.8	7.4	24.3	12.2	3.2	24.2	5.7
351—500	0.3	14.9	1.4	1.2	17.4	5.9	0.5	16.2	2.4
501—1000	0.2	23.1	1.9	0.9	24.0	7.5	0.3	23.5	3.1
above 1000	0.1	9.9	0.7	0	15.7	4.5	0	12.9	1.6
All	100 (2002649)	100 (159086)	100 (2161735)	100 (429833)	100 (172215)	100 (602048)	100 (2432482)	100 (331301)	100 (2763784)

Source and Note: As in Table 1

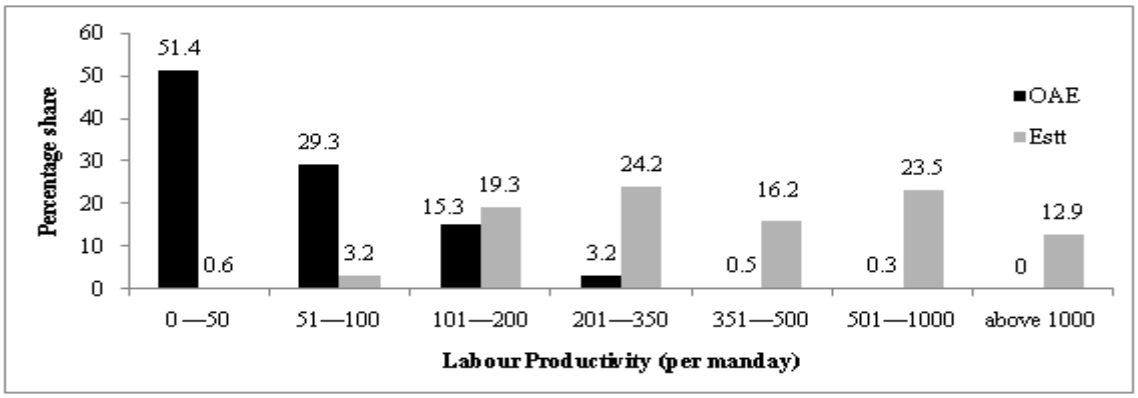

Figure 2: Distribution of Labour Productivity by Types of MMEs

Table 6: Test of Labour Productivity between Establishments and OAEs

	Estt	OAE	Test of $H_0 : \sigma_1 = \sigma_2$ against $H_1 : \sigma_1 \neq \sigma_2$	Test of $H_0 : \mu_1 = \mu_2$ against $H_1 : \mu_1 > \mu_2$
Mean	902.35	106.33	$F = \frac{s_1^2 n_1}{n_1 - 1} \Big/ \frac{s_2^2 n_2}{n_2 - 1}$ = 0.0029	$\frac{\overline{X_1} - \overline{X_2}}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \sim \frac{W_1 t_{\alpha, n_1 - 1} + W_2 t_{\alpha, n_2 - 1}}{W_1 + W_2}$
SD	2280.39	123.37		
SD^2	5200191.9	15221.14		
n	4205	4827		
df	4204	4826	Table value of F is 0.9521 at 1 % level. Therefore, H_0 is not rejected.	Where, $\overline{X}_1$ and $\overline{X}_2$ are respective means. Observed value is 24.21 Since the table value is 1.645 at 1 % level, the observed 'Approximate-t' leads to the rejection of H_0.

Note: μ_1 & σ_1 are the mean & SD of the labour productivity of OAEs, where as μ_2 & σ_2 are the respective values of Estt, statistical tests have been done following the methodology of Goon, Gupta and Dasgupta (1968) pp, 396-404. SD = Standard Deviation, df = degrees of freedom, n = no. of observations

Source: Authors' calculation.

From the test results (Table 6), it is concluded that labour productivity is significantly higher in Establishments than that of OAEs. The main reason behind this is that the establishment entrepreneurs are becoming more progressive in doing their business management and accessing market as compared to OAEs. In rural areas most of the own account entrepreneurs are poorly educated, less efficient, low skilled and utilized their small size of business. Their business management and product

distribution system are relatively insignificant in comparison to Establishment enterprises. They are facing problem of access to market, and unable to adapt modern technology and hence their productivity is relatively low. But the establishment entrepreneurs are able to increase market access, enhanced investment flows, skill development and technological advancements. They are upgrading product quality, improving design and packaging and training to improve competitiveness and able to raise their productivity. Average use of capital per enterprise is important to explain the productivity difference. labour productivity is significantly high in Establishments than that of OAEs because average use of capital for Establishment units is higher than that of OAEs. The labour productivity is significantly high in proprietary male run enterprises than that of proprietary female run enterprises. The productivity is also significantly high in male owned Establishment enterprises as well as OAEs than that of female owned Establishment enterprises and OAEs.

6. Analysis of labour Productivity of Micro Manufacturing Enterprises in West Bengal

Specifications and Source of the Variables

The variables identified to capture these processes and their specifications are presented in below the table 7

Table 7: Notation, Specification, Minimum, Maximum, Mean Standard Deviation (SD) of Variables used in the linear regression Model.

Notation	Specification	Average	Min	Max	SD
LPRD	Labour Productivity of MMEs is measured by gross value added per manday (Rs.).	476.93	1.33	46714.5	1608.3
ESTT	Nature of enterprises: Whether the MME is Establishment or not (Yes = 1, No = 0).	0.47	0	1	0.498
SECT	Sector: Whether the MME is located in urban area or not (Yes=1, No= 0).	0.40	0	1	0.49
LOCN	Location of enterprises: Whether it runs business in outside household premises or not (Yes=1, No=0).	0.46	0	1	0.50
SOWN	Social Ownership: Whether MME is owned by SC or ST or not (Yes=1, No=0).	0.20	0	1	0.40
NOPN	Nature of operation: Whether MME is perennial or not (Yes=1, No=0).	0.98	0	1	0.14
LIFSP	Life- span of MMEs	12.40	0	111	9.27
GOVA	Whether MMEs is received government assistance or not (Yes= 1, No=0).	0.02	0	1	0.12
KIL	Capital-labour ratio of MMEs	73402	0	6678333	150880
PRAT	Profit rate of MMEs is measured by the ratio of net profit to net sells of enterprises.	0.37	-0.24	500	5.64

Source and Note: As in table 1

The variables/factors that determine the household participation in micro manufacturing activities are presented in Table 7. Mean, Standard Deviation (SD) and the notations used for the variables are also listed in the Table.

Social ownership (SOWN) is defined as dummy variable taking the value '1' if it owned by SC and ST household and '0' otherwise. Nature of enterprise (ESTT) is also a dummy variable taking the value '1' if it is Establishment and '0' if it is OAEs. Government assistance (GOVA) is also a dummy variable taking the value '1' if it receives assistance from the government and '0' otherwise. Location of enterprise (LOCN) is also a dummy variable taking the value '1' if it runs business outside the premises and '0' if it runs business within the household premises. Nature of operation (NOPN) is also a dummy variable taking the value '1' if it is perennial enterprise and '0' if it is seasonal and casual enterprise. Sector (SECT) is also a dummy variable taking the value '1' if it located in urban area and '0' if it located in rural area.

Table 8: Correlation Matrix of the selective variables, 2011

	LPRD	ESTT	LOCN	LIFSP	GOVA	PRAT	SOWN	NOPN	SECT	KIL
LPRD	1									
ESTT	0.25**	1								
LOCN	0.19**	0.39**	1							
LIFSP	0.02**	0.10**	0.11**	1						
GOVA	0.14**	0.09**	0.06**	0.02	1					
PRAT	-0.33**	-0.59**	-0.34**	0.05**	-0.11**	1				
SOWN	-0.06**	-0.11**	-0.10**	0.02	0.00	0.10**	1			
NOPN	-0.15**	0.00	0.03**	0.02*	0.01	0.04**	-0.03**	1		
SECT	-0.04**	0.05**	0.11**	0.07**	-0.01	0.02*	0.09**	0.07**	1	
KIL	0.06**	0.09**	0.20**	0.09**	0.06**	-0.05**	0.07**	0.03**	0.19**	1

**Correlation is significant at the 0.01 level (2 tailed) & * correlation is significant at the 0.05 level (2 tailed)

In order to get a preliminary understanding of the nature of the relationship between the dependent and independent variables we calculate the correlation matrix of all the variables that is presented in table 8. It can be seen that LOCN, ESTT, GOVA, KIL, LIFSP are significantly (at 1 percent level) and positively related with LPRD. Here we also saw that SECT, NOPN, PRAT, SOWN are significantly (at 1 percent level) and negatively related with LPRD. It can be seen that SOWN, NOPN, LIFSP, and SECT are significantly (at 5 percent level) and positively related with PRAT. We also saw that LPRD, LOCN, ESTT, KIL and GOVA are significantly (at 1 percent level) and negatively related with PRAT.

Regression Model and Its Estimation for Labour Productivity of MMEs

In this section, an attempt has been made to measure the impact of selected variables or factors on micro manufacturing enterprises productivity over the period.

Specification of the function

The study assumes that productivity (Y_i) of MMEs depends on nature of enterprise (ESTT), location of enterprise (LOCN), social ownership (SOWN), K/L ratio (KIL), government assistance (GOVA), nature of operation (NOPN) and life-span of enterprise (LIFSP).

$Y_i = (ESTT, LOCN, SOWN, NOPN, LIFSP, GOVA, KIL)$

The linear regression equation based on the above function can be written as:

$LN\ (Y_i) = \alpha + \beta_1\ ESTT + \beta_2\ LOCN + \beta_3\ SOWN + \beta_4\ NOPN + \beta_5\ LIFSP + \beta_6\ GOVA + \beta_7\ KIL + U_i$

Table 9: Regression Results for Estimation of the Labour Productivity

Variables	co-efficients	t-values	Tolerance	
constant	4.434	65.06***		No. of Obs. 9032
ESTT	1.514	75.15***	0.834	F = 1555.47***
LOCN	0.559	27.57***	0.825	R^2 = 0.637
SOWN	-0.101	-4.41***	0.982	Adj. R^2 = 0.636
NOPN	-0.419	-6.21***	0.997	
LIFSP	0.005	5.36***	0.979	
GOVA	0.678	7.54***	0.980	
KIL	$1.756E^{-6}$	16.24***	0.958	

Notes: **Significant at 5 percent level and *** 1 percent level.

Labour Productivity of MMEs is significantly explained by nature of enterprise (ESTT), location of enterprise (LOCN), life-span of enterprise (LIFSP), government assistance (GOVA), nature of operation (NOPN), and social ownership (SOWN). Labour Productivity of MMEs are positively and significantly associated with location of enterprise (LOCN), nature of enterprise (ESTT), life-span of enterprise (LIFSP) and government assistance (GOVA). Labour Productivity of MME is higher if it runs business in outside household premises and it has spent higher life time and it has received assistance from the government. Productivity of MME is significantly high in Establishment enterprises than that of OAEs. The main reason behind is that through the establishment entrepreneur are becoming more progressive in doing their business management and accessing market as compared to OAEs. Establishment entrepreneur are able to increased market access, enhanced investment flows, skill development and technological advancements. Labour Productivity of MMEs is negatively associated with social ownership (SOWN) and nature of operation (NOPN). Productivity of MMEs is higher if it is owned by general caste household and for Seasonal and Casual enterprises. The labour productivity also depends on capital-labour ratio (Table 9).

7. Profitability of Micro Manufacturing Enterprises in West Bengal

Table 10 shows the percentage distribution of MMEs by profit share. Here net surplus is the profit of the enterprises and it is measured by excluding the factors cost like raw materials, wage, rent and interest from the income of enterprises. Profit share is the ratio of net profit to net income of enterprises. In rural area 0.6 per cent OAEs having the profit share less than 60 per cent but in case of Establishment it is 55.1 per cent. For Establishment 55.1 per cent in rural and little lower (51.5 per cent) in urban have the profit share more than 60 per cent. For OAE 98 per cent of MMEs having the profit share more than 80 per cent but in case of Establishment it is only 9.6 per cent. For OAE 86.5 per cent of MMEs having the profit share 100 per cent but in case of Establishment it is only 0.4 per cent. Profit share is significantly high in OAEs than that of Establishment both in rural as well as in urban area. Here we use the t statistics to test the profit share between OAEs and Establishments.

Table 10: Distribution of Profit share of MMEs in West Bengal, 2011

Profit share (%)	Rural			Urban			Rural + Urban		
	OAE	Estt	All	OAE	Estt	All	OAE	Estt	All
Negative & '0'	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2
1—30	0.1	16.0	7.2	0	5.6	2.8	0.1	11.6	5.4
31—60	0.3	38.8	17.4	0.6	45.8	23.1	0.4	41.8	19.7
61—80	0.9	34.7	15.9	1.9	39.7	20.7	1.3	36.8	17.8
81—99	6.1	9.7	7.7	20.6	8.5	14.6	11.5	9.2	10.4
100	92.4	0.5	51.6	76.7	0.3	38.6	86.5	0.4	46.4
All	100 (2002649)	100 (159086)	100 (2161735)	100 (429833)	100 (172215)	100 (602048)	100 (2432482)	100 (331301)	100 (2763784)

Source and Note: As in Table 1

Thus, from the test results (Table 11), it can be concluded that profit share is relatively high in OAEs than that of Establishments. The main reason behind this is that most of the own account entrepreneurs start their enterprise within the household premises and used their own resources (or local resources) and low capital input, produced by family labour and utilized their small size of business. In most of the cases they don't pays factors cost like raw materials, wage, rent, interest, and enjoy all the profit by themselves. Most of the Establishment enterprises have access loan, used the hired labour and hired assets and start the business outside the household premises. The Profit share of Establishment enterprises is relatively low because they pay the factor cost like raw materials, wage, interest and rent of hired assets. However, average volume of profit share by OAEs is relatively high, for utilizing into their small size of business, as compared to Establishment.

Table 11: Test of Profit Share between Establishments and OAEs

	OAE	Estt	Test of $H_0 : \sigma_1 = \sigma_2$ against $H_1 : \sigma_1 \neq \sigma_2$	Test of $H_0 : \mu_1 = \mu_2$ against $H_1 : \mu_1 > \mu_2$
Mean	98.30	56.21	$F = \frac{\frac{s_1^2 n_1}{n_1 - 1}}{\frac{s_2^2 n_2}{n_2 - 1}}$ =0.204 Table value of F is 0.95 at 1 % level. Therefore, H_0 is not rejected.	$\frac{\bar{X}_1 - \bar{X}_2}{s\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}} \sim \frac{W_1 t_{\alpha, n_1 - 1} + W_2 t_{\alpha, n_2 - 1}}{W_1 + W_2}$ Where, $\bar{X}_1$ and $\bar{X}_2$ are respective means. Observed value is 127.53. Since the table value is 1.645 at 1 % level, the observed 'Approximate-t' leads to the rejection of H_0.
SD	9.81	20.64		
SD^2	86.77	426.15		
n	4827	4205		
df	4826	4204		

Note: μ_1 & σ_1 are the mean & sd of the profit share of OAEs, where as μ_2 & σ_2 are the respective values of Estt, statistical tests have been done following the methodology of Goon, Gupta and Dasgupta (1968) pp, 396-404. *Source:* Authors' calculation.

Regression Model and Its Estimation for Profitability of Micro Manufacturing Enterprises

In this section, an attempt has been made to measure the impact of selected variables or factors on micro manufacturing enterprises profitability over the period.

Specification of the function

The study assumes that profit share (Y_i) of MMEs depends on nature of enterprise (ESTT), location of enterprise (LOCN), nature of operation (NOPR), sector (SECT), social ownership (SOWN), government assistance (GOVA) and life- span of enterprise (LIFSP).

Y_i = (ESTT, SECT, *LOCN*, SOWN, *NOPN*, *LIFSP*, *GOVA)*

The linear regression equation based on the above function can be written as:

$Y_i = \alpha + \beta_1 ESTT + \beta_2$ SECT $+ \beta_3 LOCN + \beta_4$ SOWN $+ \beta_5 NOPN + \beta_6 LIFSP + \beta_7 GOVA + U_i$

Table 12: Regression Results for Estimation of the Profit share

Variables	Co-efficients	t-values	Tolerance	No. of Obs. 9032 F = 1168.74*** R^2 = 0.509 Adj. R^2 = 0.508
constant	0.943	56.28***		
ESTT	-0.402	-80.83***	0.806	
SECT	0.013	2.92***	0.970	
LOCN	-0.014	-2.84***	0.822	
SOWN	0.015	2.72***	0.976	
NOPN	0.028	1.66*	0.968	
LIFSP	0.001	3.78***	0.981	
GOVA	-0.06	-2.75***	0.977	

Note: **Significant at 5 percent level and *** 1 percent level.

Profit share of MMEs are positively and significantly associated with social ownership (SOWN), nature of operation (NOPN), sector (SECT) and life-span of enterprise (LIFSP). Profit share of MMEs is negatively associated with location of enterprise (LOCN), nature of enterprise (ESTT). Profit share is relatively high in OAEs than that of Establishments. Because most of the own account entrepreneurs start the small business within the household premises had used their own resources and use some natural and homemade inputs, produced by family labour and utilized their small size of business. They don't pays factors cost like raw materials, wage, rent, interest, and enjoy all the profit by themselves. But Establishment enterprise profit share is relatively low because they pay the factor cost like raw materials, wage, interest and rent of hired assets. Profit share is high for perennial enterprises and it is low for seasonal and casual enterprises. Profit share of MMEs is high if it owned by SC and ST household and it runs business within the household premises and it has spent higher life time. Profit share of MMEs is also negatively associated with government assistance (GOVA). Government assistance does not significantly affected by the profit share of MMEs.

8. Status of Growth of Micro Manufacturing Enterprises in West Bengal

In NSSO survey 2011, the status of growth of enterprises is classified in four categories viz, expanding, stagnant, contracting and others on the basis of their performance during last three years. The status of growth of these enterprises with life-span less than 3 years not specified and treated as others. The survey reveals that in West Bengal, the status of growth is expanding in 34.6 per cent MMEs whereas around 46.1per cent of MMEs are stagnating. Only 11.4 per cent MMEs are contracting. It has been observed that OAEs are more stagnating as compared to establishments in rural as well as in urban area. In rural area, 10.7 per cent of OAEs are contracting during last three years of operation while in urban area it is 14.9 per cent. From the status of growth of MMEs in West Bengal it is evident that Establishment enterprises are more promising. High number (as well as share) of Establishment MMEs have been showing expanding in their nature of growth in comparison with OAEs on the whole 38 per cent Establishment MME are expanding in comparison with 34 per cent of OAEs.

Table 13: Distribution of MMEs by type of the Growth Status in West Bengal, 2011

Category	Rural			Urban			Rural + Urban		
	OAE	Estt	All	OAE	Estt	All	OAE	Estt	All
Expanding	35.7	37.4	35.8	27.2	38.1	30.3	34.2	37.8	34.6
Stagnant	47.0	46.2	46.9	44.6	38.6	42.9	46.6	42.3	46.1
Contracting	10.7	8.2	10.5	14.9	13.3	14.4	11.4	10.8	11.4
Others	6.6	8.2	6.7	13.3	10.0	12.4	7.8	9.2	7.9
All	100 (2002649)	100 (159086)	100 (2161735)	100 (429833)	100 (172215)	100 (602048)	100 (2432482)	100 (331301)	100 (2763784)

Source and Note: As in Table 1

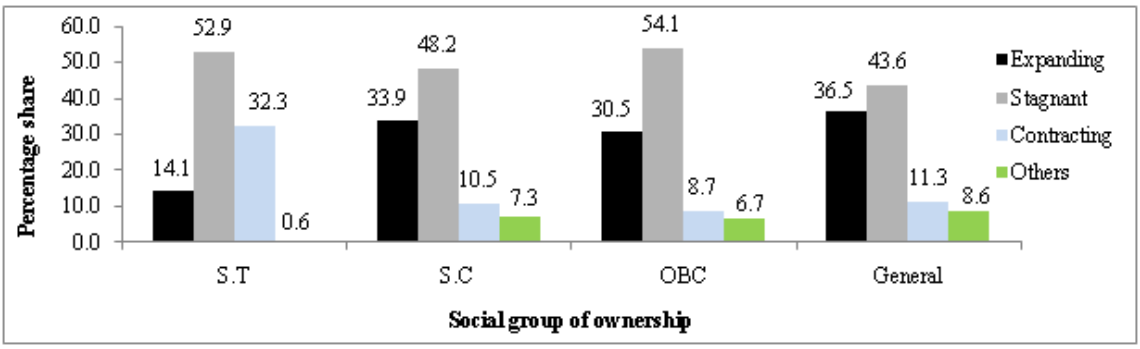

Figure 3: Distribution of Growth Status of MMEs by Social Group of Ownership

Figure 3 shows the distribution of the status of growth by social group of ownership. For ST owned MMEs 14.1 per cent are expanding, 52.9 per cent are stagnating. It is observed that higher number of ST owned enterprises are contracting (32.3 per cent) as compared to SC, OBC and general caste owned enterprises. For SC owned MMEs 34 per cent are expanding and 48.2 per cent are stagnating. It is observed that higher number of OBC owned enterprises are stagnating (54.1per cent) as compared to SC, ST and general caste owned enterprises. For general caste owned MMEs 36.5 per cent are expanding and 43.6 per cent are stagnating. It is observed that higher number of general caste owned enterprises are expanding (36.5 per cent) as compared to ST, SC and OBC owned enterprises (Figure 3).

Regression Model and Its Estimation for Status of Growth of MMEs

Multinomial Probit Model is used to explain the status of growth of Micro Manufacturing Enterprises. The Model is specified as follows: the data consists of status of growth of MMEs are facing four choices- expanding, stagnating, contracting and others, which are coded as 1, 2, 3 and 4. It is assumed that we have a set of observations Y_i, for i = 1...n, of the outcomes of multi-way choices from a categorical distribution of size m = 4. Along with Y_i there are a set of k observed values $x_{1,i}$, ..., $x_{k,i}$ of explanatory variables like LPRD, ESTT, SECT, NOPN, GOVA, LOCN and PRAT.

The outcomes Y_i are described as being categorically-distributed data, where each outcome value h for observation i occurs with an unobserved probability $p_{i,h}$ that is specific to the observation i in hand because it is determined by the values of the explanatory variables associated with that observation. i.e,

$$Y_i|x_{1,i},\dots,x_{k,i} \sim \text{Categorical}(p_i,\dots,p_m), \text{ for } i = 1,\dots,n$$

or equivalently

$$\Pr[Y_i = h|x_{1,i},\dots,x_{k,i}] = p_{i,h}, \text{ for } i = 1,\dots,n,$$

for each of m possible values of h.

Multinomial probit is often written in terms of a latent variable model (Imai and Van Dyk 2005)

$$Y_i^{1*} = \beta_0 . X_i + \epsilon_1$$
$$Y_i^{2*} = \beta_1 . X_i + \epsilon_2$$
$$\dots\dots\dots\dots\dots$$
$$Y_i^{m*} = \beta_m . X_i + \epsilon_m$$

Where, $\epsilon \sim N(0, \Sigma)$ then

$$Y_i = \begin{cases} 1 \; if \; Y_i^{1*} > Y_i^{2*}, \dots . Y_i^{m*} \\ 2 \; if \; Y_i^{2*} > Y_i^{1*}, Y_i^{3*}, \dots . , Y_i^{m*} \\ \dots\dots\dots\dots\dots\dots\dots\dots \\ m \; otherwise \end{cases}$$

That is,

$$Y_i = \arg\max_{h=1}^{m} Y_i^{h*}$$

Note that this model allows for arbitrary correlation between the error variables, so that it doesn't necessarily respect independence of irrelevant alternatives. The likelihood function for multinomial probit is derived under the assumption that all decision-making units face same choice set, which is the union of all outcomes observed in the dataset.

Status of growth of MMEs is positively and significantly associated with labour productivity (LPRD), nature of enterprise (ESTT), location of enterprise (LOCN), nature of operation (NOPN) and profit rate (PART). The expanding status of growth is significantly realized for high productive, high profitable, rural located, Establishment and perennial enterprises. The growth is contracting for low productive, seasonal and casual enterprises. It seems to be stagnating for low productive and Own Account Enterprises. For Establishment enterprises status of growth is expanding where as for OAEs status of growth is stagnating. The main reason behind is that through the establishment entrepreneur are becoming more progressive

in doing their business management and accessing market as compared to OAEs. They are able to increased market access, enhanced investment flows, skill development and technological advancements. Whereas most of the own account entrepreneurs are poorly educated, less efficient, low skilled and utilized their small size of business. Their business management and product distribution system are very bad. They are facing problem of access to market and unable to adapt modern technology and hence their productivity is relatively low. Rural located and perennial types of enterprises are also experienced stagnating nature of growth. Growth Status of MMEs is not significantly affected by government assistance.

Table 14: Multinomial Probit Estimation of Status of Growth of MMEs

Multinomial Probit Regression, No of obs. = 9032, Log likelihood = -10788.52, Wald chi^2 (18) = 259.92, Prob> chi^2 = 0.0000						
Variables	Expanding		Stagnating		Contracting	
	co-efficient	z values	co-efficient	z values	co-efficient	z values
constant	0.148	0.89	0.441	2.66***	0.065	0.36
LPRD	0.000028	1.73**	-0.000068	-3.54***	-0.00016	-4.28***
ESTT	0.242	4.28***	-0.146	-2.61***	-0.039	-0.61
SECT	-0.170	-3.26***	-0.111	-2.17**	0.055	0.95
LOCN	0.139	2.48***	0.206	3.71***	0.194	3.08**
NOPN	0.655	3.94***	0.694	4.17***	-0.189	-1.87*
GOVA	0.036	0.15	-0.024	-0.10	-0.076	-0.25
PRAT	0.033	2.35***	0.00039	0.10	-0.0045	-0.50

(Status of growth = 4 is the base outcome)
*** Significant 1 percent level, ** significant at 5 percent level, * significant at 10 percent level.

9. Summary and Conclusion

It is observed that the MMEs in West Bengal have made significant contribution towards generation of employment and output in the state economy. In West Bengal, on an average one MME is exists per 7 households. About 51 per cent of MMEs are owned by women compared to 44 per cent owned by men and only 5 per cent owned by partnership basis. In West Bengal it is evident that greater numbers of MMEs are established during last 10 years-54.6 per cent of OAEs and 51.1 per cent of Establishment enterprises. Productivity of MME is high if it runs business in outside household premises and it has spent higher life time and received assistance from the government. Productivity of MMEs is significantly high in Establishments than that of OAEs. Productivity of MMEs is higher if it is owned by general caste household and for seasonal and casual enterprises. The labour productivity also depends on capital-labour ratio. The study establishes that the profit share of MMEs depends on location of enterprise, nature of enterprise, sector, life-span of enterprise, nature of operation and social ownership. Profit share is relatively high in OAEs than that of Establishments. Profit share is high for perennial enterprises and it is low for seasonal and casual enterprises. Government assistance does not significantly affected by the profit share of MMEs. The expanding status of growth is significantly realized for high productive, high profitable, rural located, Establishment and perennial enterprises. The growth is contracting for low productive, seasonal and casual enterprises. It seems to be stagnating for low productive and Own Account Enterprises. Growth Status of MMEs is not significantly affected by government assistance.

References

[1] Acs, Z. J., and Audretsch, D. B. (1990), *The Economics of Small Firms: A European Challenge*, MA: Kluwer Academic Publishers, Boston.
[2] Acs, Z. J., and Audretsch, D. B. (1993), *Small Firms and Entrepreneurship*, MA: Kluwer Academic Publishers, Boston.
[3] Alam, M.N. (2009), Interest-Free Microfinance to Micro Entrepreneurs in Rural Bangladesh: A Study Based on an Institutional-Network Approach, *Paper Presented at the First International Conference held at ULB Brussles*, June 2-4, 2009.
[4] Agyapong, D. (2010), 'Micro, Small and Medium Enterprises Activities, Income Level and Poverty Reduction in Ghana -A Synthesis of Related Literature', *International Journal of Business and Management*, Vol.5, No.12, December 2010, pp.196-204
[5] Adhikari, B. (2010), 'Economic Empowerment of Women: An Impact Study of Microenterprises in Nuwakot District', in Micro-Enterprise Development Programme (MEDEP)/UNDP Ministry of Industry (ed.), *Micro-Enterprises, Development for Poverty Alleviation*, Nepal, pp.138-48.
[6] ASI (2011), Annual Survey of Industries, 2011-12, Volume-1, Ministry of Statistics and Programme Implementation, Central Statistics Office, Government of India, Kolkata.
[7] Das, P. (2012) 'Microenterprise and Household's Livelihood Strategy: An Analysis', in S. Roy *(ed.), Microenterprise in India*, Concept Publication, New Delhi.
[8] Gebreeyesus, M. (2009), 'Innovation and Microenterprises Growth in Ethiopia', *United Nations University Working Paper Series*, No 2009-053.
[9] Hussain, M.N. (2000), 'Linkages between Small and Medium Enterprises and Large Industries for Increased Markets and Trade: An African Perspective', *Economic Research Paper*, No.53, African Development Bank.

[10] Imai, K., and Van Dyk, D. (2005) 'MNP: R Package for Fitting the Multinomial Probit Model', *Journal of Statistical Software*, May 2005, Volume 14, Issue 3.
[11] Kanitkar, A. (1994), 'Entrepreneurs and Micro-Enterprises in Rural India', *Economic & Political Weekly*, Vol. 29, No. 9 (Feb. 26, 1994), pp. M25-M30.
[12] NSSO, National Sample Survey Office (2011), *Economic Characteristics of Unincorporated Non-agricultural Enterprises (Excluding construction) in India*, NSSO 67th Round, Report No. 549 (67/2.34/2).
[13] NSSO, National Sample Survey Office (2011), *Operational Characteristics of Unincorporated Non-agricultural Enterprises (Excluding construction) in India*, NSSO 67th Round, Report No. 546 (67/2.34/1).
[14] Subedi, B. (2006), 'Products Marketing by Entrepreneurs: A Case Study of MEDEP in Dhanusha District', in Micro-Enterprise Development Programme (MEDEP)/UNDP Ministry of Industry (ed.), *Micro-Enterprises, Development for Poverty Alleviation*, Nepal, pp.183-92.
[15] Subramanian, T. (2010), 'Microenterprise and Employment Creation among the Youth in Malaysia', *Joti*, vol. 15, December 2010, pp.151-66