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ARTHA VIJÑĀNA

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Articles

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From September 2022, the Journal announced an expansion in its focus. The journal would hence forth have a broader and an inter-disciplinary approach. Articles in the areas of economic sociology, political economy are also welcome. *Artha Vijnana* is committed to publishing high quality research, aimed at the broad audience of academicians, practitioners and policy makers, across South Asia and beyond.

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Contact Details

E-mail	*arthavijnana@gipe.ac.in*
Postal contact	The Managing Editor *Artha Vijnana* Gokhale Institute of Politics and Economics BMCC Road, Pune - 411004, India

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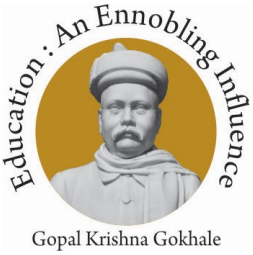

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Announcement

Artha Vijnana announces the institution of the Gopal Krishna Gokhale Memorial Annual Prize, awarded in recognition of the paper of most outstanding merit appearing in *Artha Vijnana*, irrespective of the author's age. This prize carries an award of ₹10,000, to be shared equally between all authors. In addition, *Artha Vijnana* announces the institution of the Prof. D R Gadgil Memorial Annual Prize, awarded in recognition of the paper of most outstanding merit appearing in *Artha Vijnana*, by a single author of below 40 years of age. This prize carries an award of ₹10,000.

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Small Firms and Covid-19 Disruptions: Survey-based Evidences and Policy Implications

Shromona Ganguly

This article attempts to understand the impact of Covid-19 induced disruptions on the business activities of micro, small and medium enterprises (MSMEs) in the Southern State of Tamil Nadu, through a primary survey conducted in Chennai, Coimbatore, Sivakasi, Tiruppur and Tiruchirappalli districts of the State during February-March 2022. Survey results indicate that MSMEs' sales and liquidity were severely affected during the pandemic, with 65 per cent of the surveyed firms reporting decline in sales and 86 per cent reporting decline in liquidity. The proportion of firms receiving some Government support during Covid-19 was the highest in the micro category. Among various schemes, the outreach of the Emergency Credit Line Guarantee Scheme (ECLGS) was found to be highest. Econometric analysis suggests that the incidence of shutdown was significantly higher among the 'micro' category. Further, revenue loss to a greater extent was more likely among the manufacturing MSMEs as compared to the MSMEs in the services sector, though job losses due to retrenchment was more likely in the case of MSMEs in the services sector. Exporting firms, firms with a website and firms selling online were less likely to face a sharp fall in liquidity. Though MSMEs were found to be optimistic about overall business situation and turnover going forward, these firms remained wary of increased cost of finance, raw material, and wage bill.

Keyword: Micro, Small and medium enterprises (MSMEs), Credit, Covid-19 Pandemic, Manufacturing, Services

I Introduction

World-wide, evidence suggests that small firms remained particularly vulnerable to the Covid-19 disruptions leading to substantial loss of revenue, liquidity shock and business closures (Shinozaki and Rao 2021, Bartik, *et. al.* 2020, Apedo-Amah, *et. al.* 2020) However, the magnitude of such impact varies widely across regions,

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Shromona Ganguly, Department of Economic and Policy Research, Reserve Bank of India (RBI), Mumbai 400001, Email: shromona.iimc@gmail.com

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sectors, and a number of firm-specific factors such as extent of digitalization (Abidi, *et. al.* 2022), trade participation and gender of the entrepreneur (Igarashi, *et. al.* 2021). In India too, though gradual recovery is observed in terms of profitability and liquidity in manufacturing firms since March 2020, the pace of recovery has been uneven within the sector, with bottom 25 per cent firms in terms of asset size being hard hit by the pandemic (Figure 1).

Figure 1a: Profitability and Liquidity of Manufacturing Firms

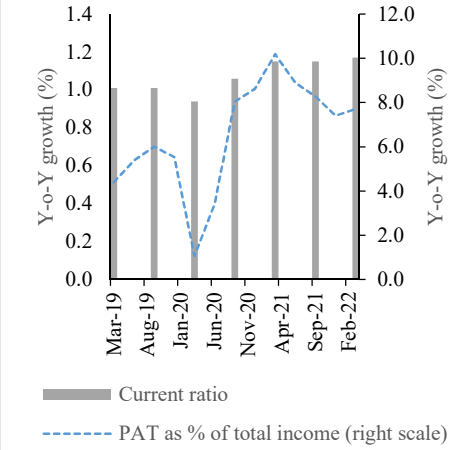
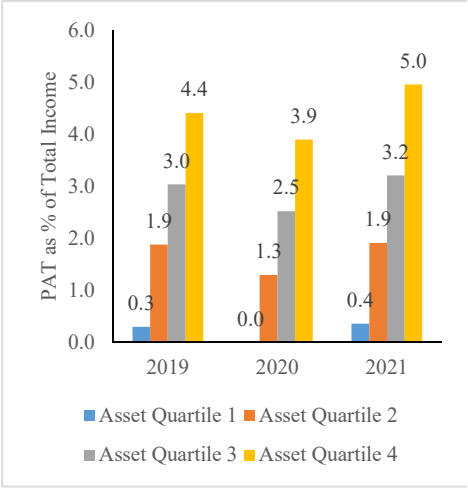


Figure 1b: Profitability Ratios across Various Size Category: Manufacturing Firms



Note: Figure 1b shows median profitability ratios for a sample of 7693 manufacturing firms for which balance sheet data was available for all the years between 2019-2021. Firms are categorized based on their asset size.
Source: Industry Outlook, CMIE and Prowess Database, CMIE.

The micro, small and medium enterprise sector assumes importance in Indian economy due to their ability to create employment, balanced regional development, and export promotion. Within the industrial sector, MSMEs remained particularly vulnerable to Covid-19 induced disruptions, as these firms often lack the scale of production to absorb sudden shocks, coupled with their difficulty to access formal credit markets, delayed payment and labour shortage resulting from the health crisis. The uneven recovery within the registered manufacturing sector itself, is only indicative of a presumably even slower recovery in the unorganized manufacturing sector after Covid 19 outbreak. However, analysing these, remained difficult due to lack of recent data on the sector. To shed light on the impact of Covid-19 on small businesses, a survey of micro, small and medium enterprises (MSMEs) operating in Chennai, Coimbatore, Sivakasi, Tiruppur and Tiruchirappalli districts in the state of Tamil Nadu was conducted during February-March 2022. The survey was focused on understanding the extent of the Covid-19 impact on such businesses in terms of

revenue, liquidity, and continuation of business operations. Further, it also sheds light on difficulties faced by firms as well as firms' responses to adapt to the new normal. In this survey, an attempt was undertaken to understand the extent of outreach of various government support policies announced for MSMEs immediately after the Covid-19 outbreak.

This article documents the major findings of the impact of Covid-19 on a total of 134 small firms whose responses were collected through the survey. Section II discusses the recent performance of the industrial sector in Tamil Nadu, along with measures adopted by the State Government to support the MSMEs sector since Covid-19 outbreak. Section III describes the sample characteristics, followed by Section IV on impact of Covid on their business and Section V on firms' responses to Covid-19 disruptions. Section VI delineates the firms' future outlook on various parameters such as overall business situation, turnover, sales, cost and availability of finance, wage and other input costs. Finally, econometric analysis in Section VI estimates the differential impact of Covid-19 based on key firm characteristics such as of size, sector, Udhyog Aadhar registration status, exporting status, type of organisation, and age. Section VII concludes the study with major findings from earlier sections.

II MSMEs in Tamil Nadu: Recent Performance and Policy Initiatives

Industrial activity in Tamil Nadu took a severe setback-with the onslaught of the pandemic in March 2020. Subsequently, the Index of Industrial Production (IIP) in Tamil Nadu for April-June 2020 registered a sharp decline of 48.8 per cent, higher compared with the decline observed at the all-India level (35.6 per cent) (Source: MoSPI). This decline was broad-based, with all the three components of IIP contracting during the same time. The decline was sharpest in manufacturing, followed by electricity and mining. However, as the impact of first wave of Covid waned, the industrial sector of Tamil Nadu bounced back, registering a y-o-y increase of 5.46 per cent in Q2 2020-2021, in contrast to a contraction at the all-India level. The recovery was propelled by manufacturing, while mining and electricity sector continued to remain in contractionary zone, bearing the brunt of economic slowdown. The steady pace of recovery of the industrial sector in the state continued till the first quarter of 2021-2022, with manufacturing sector registering a robust y-o-y growth of 77 per cent in Q1: 2021-2022. However, the growth rate slowed down again from Q2 2021-2022 onwards as the economy was hit by the virulent second wave (Figure 2a). The monthly movement of IIP in the state reveals a sharp decline in Tamil Nadu's IIP in May 2021 following re-imposition of lockdown in the state, though the fall in manufacturing IIP was less severe as compared with the first wave (Figure 2b). With the industrial sector of the state adapting to the new normal, the impact of third wave was less pronounced, as seen in the state's IIP (growth of 6.9 per cent (y-o-y) in January 2022.

Figure 2a: Trend in Industrial Activity

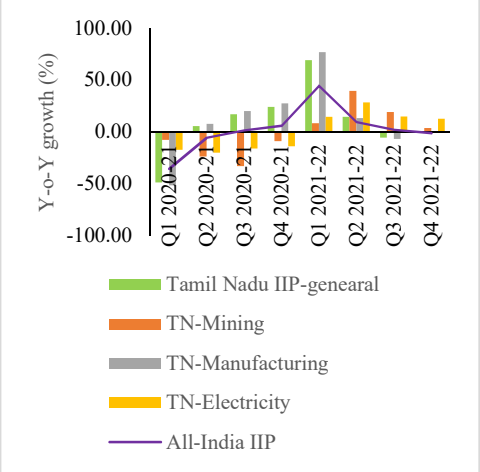
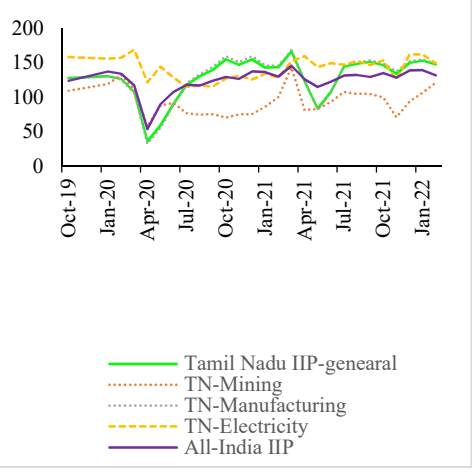


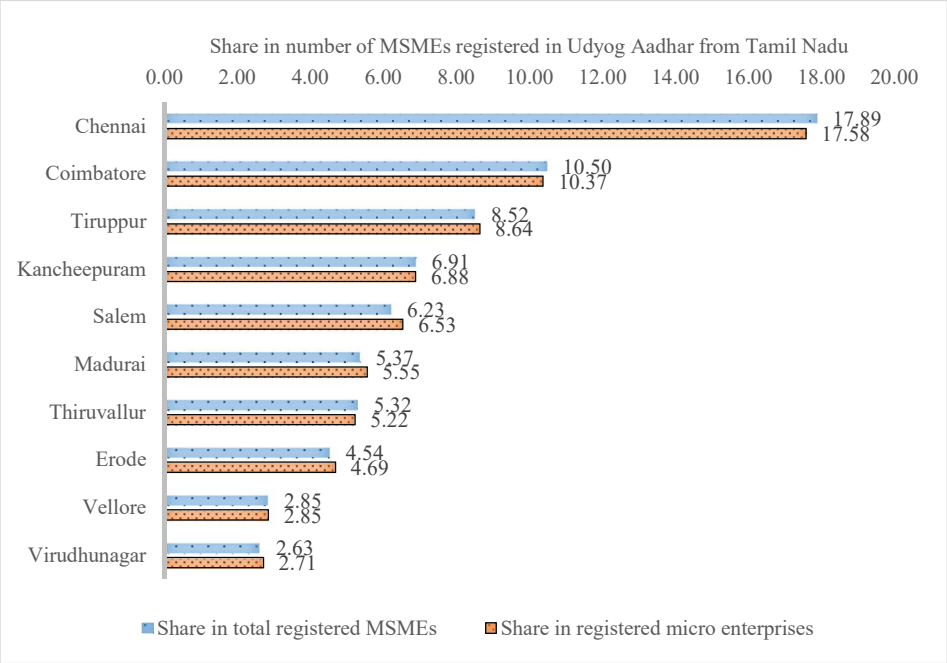
Figure 2b: Monthly Movement in IIP



Source: Department of Economics and Statistics, Government of Tamil Nadu and MoSPI.

Tamil Nadu has a vibrant industrial sector which accounts for close to 26 per cent of the state's Gross State Value Added (GSVA) in recent years. In addition, the latest available data from the Annual Survey of Industries (2018-2019) shows that Tamil Nadu has the maximum number of registered factories in the country (accounting for 15.73 per cent of all factories in India) as well as factory employment (16.5 per cent) and ranks third in terms of its share in GVA in factory output (11 per cent), preceded by Gujarat (15 per cent) and Maharashtra (13 per cent). Tamil Nadu also ranks top among states in terms of its share in number of unincorporated entities in India (12.14 per cent).[1] As per the latest data available on Udyam registration, Tamil Nadu ranks third in terms of its share (12.48 per cent) in the number of MSMEs registered as cooperatives in the Udyam portal, after Rajasthan (15.34 per cent) and Maharashtra (15.25 per cent). While the share of all southern states stands at 25.86 per cent, Tamil Nadu dominates the southern region, followed by Karnataka, Kerala, Telangana and Andhra Pradesh. Further, district-wise disaggregated data shows that two districts from Tamil Nadu, *viz.,* Coimbatore and Madurai rank third and fourth, respectively within the list of top 10 districts in the country in terms of number of MSMEs. In the state, MSMEs produce over 6000 different products, both for domestic and international markets. Majority of MSMEs in Tamil Nadu are concentrated in sectors such as food and beverages, textile and apparel, machinery and equipment, electronics, leather, rubber and plastics, chemicals and wood products. Within the state, Chennai, Coimbatore, Tiruppur and Kancheepuram have a concentration of MSMEs, with these four districts accounting for 44 per cent and 43 per cent of total registered MSMEs and total registered micro units, respectively, in the state (Figure 3). At present, there are a total of 127 industrial clusters developed by the Tamil Nadu Small Industries Development Corporation Ltd (TANSIDCO).

Figure 3: Top Ten Districts in Tamil Nadu in Terms of Presence of MSMEs



Source: Ministry of MSME, GoI.

Though MSMEs actively contribute to making the state a major industrial hub of India, these firms face a plethora of challenges in a rapidly changing business environment, mainly in terms of sustaining competitiveness as well as scaling up. Recognising these challenges, the Government of Tamil Nadu (GoTN) has been formulating policies to help the sector grow and achieve its full potential (Appendix Table 1). The Vision Tamil Nadu 2023 which identifies manufacturing as one among the ten thrust areas for achievement of various long-term goals, it also envisions cluster development in the state with the objective of employment generation and geographically diversified growth.

To help MSMEs sail through the tough times of Covid-19, Tamil Nadu government took several steps. On March 31, 2020, GoTN announced Covid Relief and Upliftment Scheme (CORUS) through the Tamil Nadu Industrial Investment Corporation (TIIC) to provide relief to the sector. Under this scheme, collateral-free loans up to ₹25 Lakh were sanctioned to existing MSME borrowers in the state through TIIC to tide over the liquidity crunch faced by these entities. In addition, MSMEs were exempted from the payment of stamp duty for registration of agreements executed by micro, small and medium enterprises (MSME) for loans taken under the Aatma Nirbhar Bharat Scheme till March-end 2021. Furthermore, registration fee for MSMEs was reduced from one per cent to 0.1 per cent in respect of the agreements on deposit of title deeds for loans. Apart from these, with the objective to augment local manufacturing capacity of medical

equipment and drugs, GoTN introduced a special incentive scheme combining financial assistance and ease of starting business for MSMEs producing Covid related essentials such as ventilators, PPE kits, N95 masks, anti-malarial/anti-viral drugs, multi para monitors.

To create a vibrant entrepreneurial ecosystem in the state, GoTN provides various types of subsidies such as capital subsidy, subsidy for technology upgradation and energy efficiency enhancement, payroll subsidy to eligible MSMEs (Appendix Table 2).[2] To promote entrepreneurship, self-employment and make educated youth of the state industry-ready, GoTN also runs two employment-focused schemes, namely, Unemployed Youth Employment Generation Programme (UYEGP) and New Entrepreneur cum Enterprise Development Scheme (NEEDS). In continuation with its effort to boost the entrepreneurial ecosystem, state government announced a Micro Cluster Development Programme in Budget 2022-2023 with an allocation of ₹50 Crore for developing select micro clusters in Tirunelveli, Kanchipuram, Cuddalore and Madurai districts. To facilitate formal credit flow to MSMEs through enhanced guarantee coverage, the state government has set up the Tamil Nadu Credit Guarantee Scheme through an MoU with the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), Government of India with an initial corpus of ₹100 Crore in March 2022.

III A Short Description of the MSMEs Covered in the Survey

Since there is no formal firm-level database containing information on MSMEs in India, convenience sampling method[3] was adopted, whereby at the first stage, all major MSME associations in the state were contacted to get the name and contact details of 20 of their members, out of which at least 10 should be micro units. After obtaining the required details, a questionnaire-based survey of the MSMEs was conducted through mail/telephone. The sample consisting of 134 MSMEs closely represented the geographical spread of MSMEs within the state, with the prominent presence of units located in Chennai (22 per cent), Kancheepuram (16.4 per cent), Madurai (13.43 per cent), Thiruvallur (12 per cent), Coimbatore (7.4 per cent), Virudhunagar (6.7 per cent) Tiruppur (four per cent) and Tiruchirappalli (four per cent). The firms were predominantly from manufacturing (87 per cent) while MSMEs engaged in services and trade consisted of remaining 13 per cent. Within the manufacturing MSMEs, machinery, engineering and auto components sector had a strong presence (18 per cent of manufacturing MSMEs), followed by garment/textile industry (12 per cent), and rubber/plastic industry (nine per cent). Within the services MSMEs, construction and professional /scientific/technical services had a prominent presence, while 4 per cent were trading MSMEs. More than half of the sample consisted of micro firms, while small and medium firms accounted for 34 per cent and eight per cent of the sample.[4] In the sample, 96 per cent of these MSMEs registered in Udyam/Udyog Aadhar portal while remaining four per cent were not registered. Further, 74 per cent of these entities were also

incorporated under Factories Act, 1948.[5] 32 per cent of surveyed firms exports their product in international markets. Regarding the organization type, majority of the surveyed entities were private limited (37.9 per cent), followed by proprietorship (33.3 per cent) and partnership (28 per cent). Among the respondents, 68.8 per cent were the owners of the entities, 15 per cent indicated their designation as "managers", eight per cent as partners and directors.[6] Further, a majority of these MSMEs (62.6 per cent) have their own websites, indicating a basic level of technology adaption.

To get an idea of the age profile of the sample, the questionnaire included a question on the year of incorporation/starting business to the firms. The sample was dominated by group of firms which came into business during the post liberalization period. While 78.6 per cent of sample firms came into existence after 1990, relatively new generation firms (which were established after 2015) comprised 13.7 per cent of total sample size. The sample had a wide presence of firms operating with more than 20 employees, while only 8.5 per cent of respondent firms have less than five employees.[7]

With the objective of understanding the extent of use of technology in day-to-day business, the survey asked the firms whether they use the trade receivable discounting system (TReDS) developed by the RBI for bills discounting. It was found that only 10 per cent of the MSMEs in the sample use TReDS to manage their liquidity. Further, 76 per cent of MSMEs in the sample had an outstanding loan taken for the purpose of their business, as on the day of the response and for most of these firms, the major customer group were private companies (67 per cent), followed by PSUs /government departments (3.4 per cent) and individuals (12 per cent). Further, in the sample, the mean annual gross revenue and expenditure of micro firms are found to be 16 times and 17 times lower respectively compared to the small and medium (SME) group. A significant difference is also observed between these two groups in terms of employment size, exporting status, presence of new firms (firms established after 2015) and firms registered under Factories Act 1948. Though there was no significant difference between micro and SME group in terms of proportion of firms with bank debt, proportion of firms which applied for a bank loan during 2020 and 2021 was significantly higher in the SME group (Table 1).

Table 1: Sample Characteristics

Sr. No	Attributes/category	Micro	Small and medium	t-stat/Chi2
1	Annual gross revenue (mean) (₹ Crore)	2.085867	32.3598	24.36
				(0.0)
2	Annual gross expenditure (mean) (₹ Crore)	1.467817	25.03307	18.21
				(0.0)
3	Proportion of firms			
3.1	Number of employees			
3.1.1	Less than 5	14.66	0	
3.1.2	5-10	34.66	3.63	40.619
3.1.3	10-20	28	23.63	
3.1.4	Above 20	22.66	72.7	
				(0.00)
3.2	With bank debt	74.67	78.57	0.2706
				(0.603)
3.3	Firms using TrEDS	6.85	14.81	2.1434
				(0.143)
3.4	Exporting Firms	24.66	41.07	3.9378
				(0.047)
3.5	New age firms	19.44	3.45	3.8079
				(0.051)
3.6	Firms with Udhyog Aadhar registration	97.3	94.64	0.6073
				(0.436)
3.7	Firms registered under factories act 1948	64.29	87.04	8.2412
				(0.004)
3.8	Firms with a website	57.33	69.64	2.0749
				(0.15)
3.9	Firms receiving government support	54.67	66.07	1.7311
				(0.188)
3.10	Firms that applied for a bank loan during 2020 or 2021	52.7	62.26	5.3302
				(0.021)

Note: Last column reports t-test or Chi^2 test statistics along with p-values in parentheses to test equality of mean and proportion, respectively.

IV Impact of Covid-19 on Business

Incidence of Temporary Shutdown: Regarding shutdown of business during Covid 19, close to half of the respondents indicated that they had to shut down their business, apart from the forced shutdown during the lockdown imposed by government authorities. In half of such cases, the shutdown period was one to three months while for 21 per cent of such cases, the shutdown was for more than three months. Disaggregated analysis shows that micro firms were more affected by the disruption, with a greater number of micro units shutting down operations for a

longer time horizon (more than three months). Incidence of shutting down temporarily (1-3 months) was highest among the small firms (Figure 4a). Sector-wise, incidence of longer shut down was more in services/trade, while many manufacturing firms returned to their operations in about a months' time (Figure 4b). This could be partly attributed to the contact intensive nature of several services, which were disrupted due to the lockdown restrictions imposed from time to time.

Figure 4a:Incidence of Shutdown: Category-wise

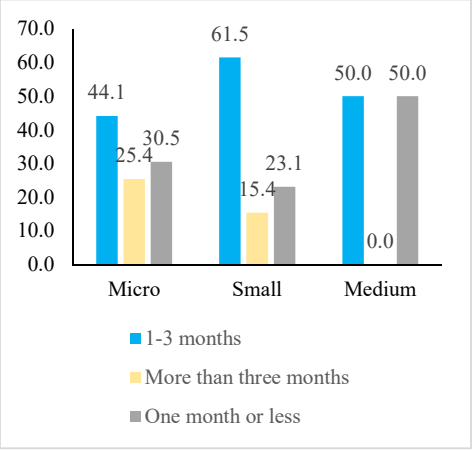
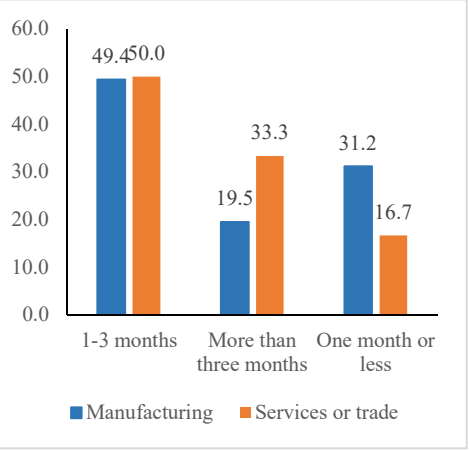


Figure 4b:Incidence of Shutdown: Sector-wise



Impact on sales and cash flow: When asked about the magnitude of change in the sales during March 2020 as compared with the previous years, most firms (65 per cent) indicated decreased sales, and 33.3 per cent firms indicated a sharp drop in their sales revenue (more than 40 per cent drop in sales). Close to 15 per cent indicated a moderate increase in their sales while less than one per cent indicated a sharp increase in sales (more than 40 per cent increase) (Figure 5a).[8] Those firms which indicated a moderate increase in sales, mostly pertain to sectors such as manufacture of air pollution control equipment, chemical, garment, commercial and industrial refrigerator equipment, food product, glass/glassware, Sidhaa and Ayurveda medicine manufacturing. Further, 42.6 per cent of the firms indicated sharp reduction in liquidity, while 43.4 per cent indicated moderate reduction in liquidity, which shows the strained liquidity condition of the sector after the outbreak of Covid-19. Across various categories, micro firms were the most affected, with 39 per cent indicating a sharp decrease in sales and 47 indicating a sharp reduction in cash flow. Notably, close to 85 per cent of MSMEs in the sample had an outstanding bank loan, that indicated a decrease in cash flow and 43 per cent of them indicated a sharp decline in cash flow. This implies the contingent stress on the banking sector in the event of repayment failure by these MSMEs.

Figure 5a: Impact on Sales

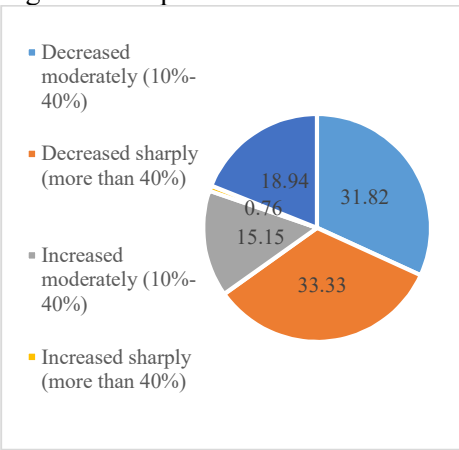
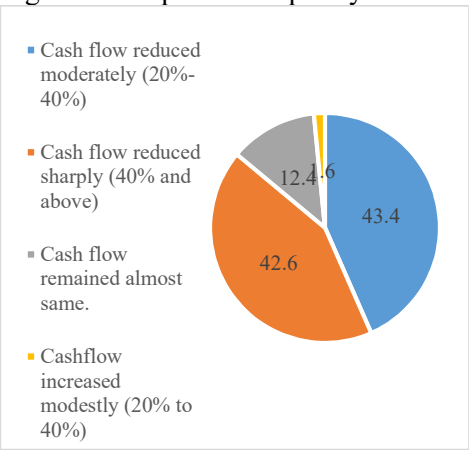


Figure 5b: Impact on Liquidity



There were significant differences in the response pattern between exporting and non-exporting firms with respect to their liquidity position. A higher proportion of non-exporting MSMEs reported reduction in sales, in contrast to 2.4 per cent exporting MSMEs reporting a sharp rise in sales. The proportion of MSMEs indicating a sharp drop in liquidity was significantly higher in the non-exporting group whereas a higher proportion of exporting MSMEs indicated a moderate decline in liquidity. Five per cent of exporting MSMEs indicated a moderate decline in liquidity (Figure 6a and 6b).

Figure 6a: Impact on Sales: Exporting and Non-exporting Firms

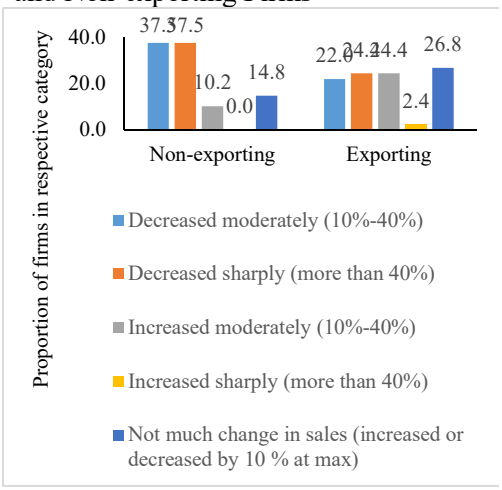
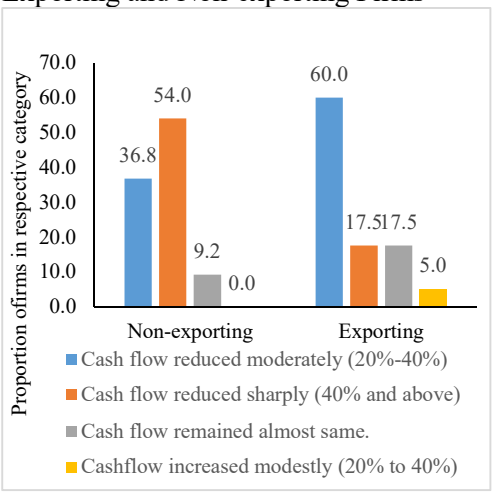


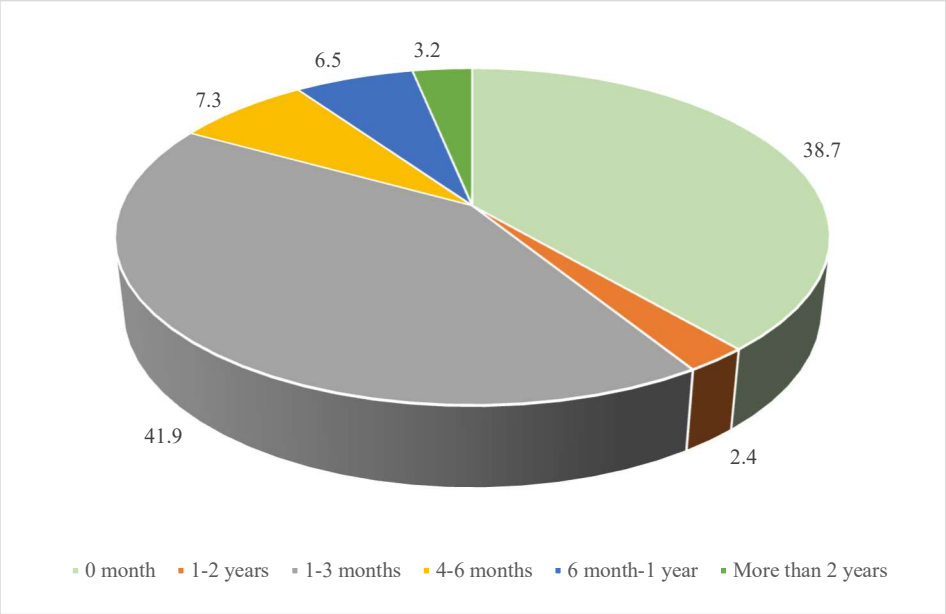
Figure 6b: Impact on Cash Flow: Exporting and Non-exporting Firms



To understand the present liquidity condition of the sector, firms were asked the number of months they can run the business with their own savings and without

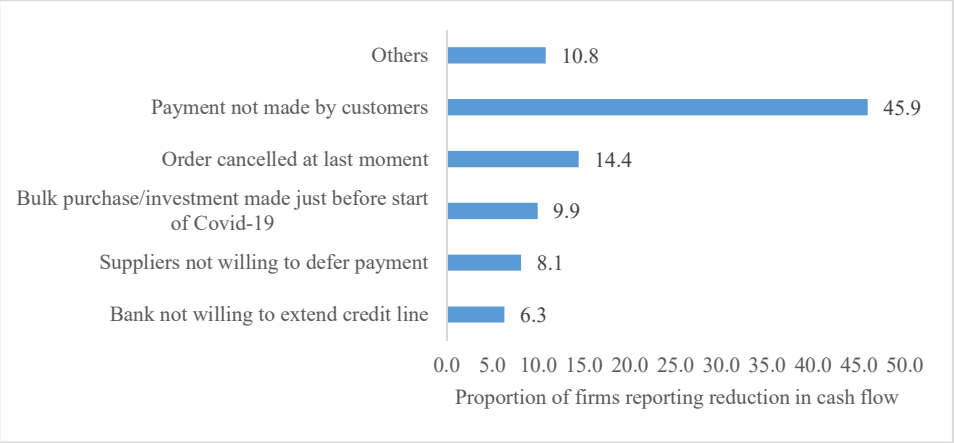
resorting to any loan from external sources. In response, 42 per cent firms said they can run their business without external funding for 1-3 months, whereas 39 per cent firms chose the option "less than a month" (Figure 7). Across size categories, the proportion of firms indicating heavy dependence on external finance (those who chose option "less than a month") stood at 42.5 per cent, 39 per cent and 10 per cent, respectively, for micro, small and medium firms.

Figure 7: Present Liquidity Position



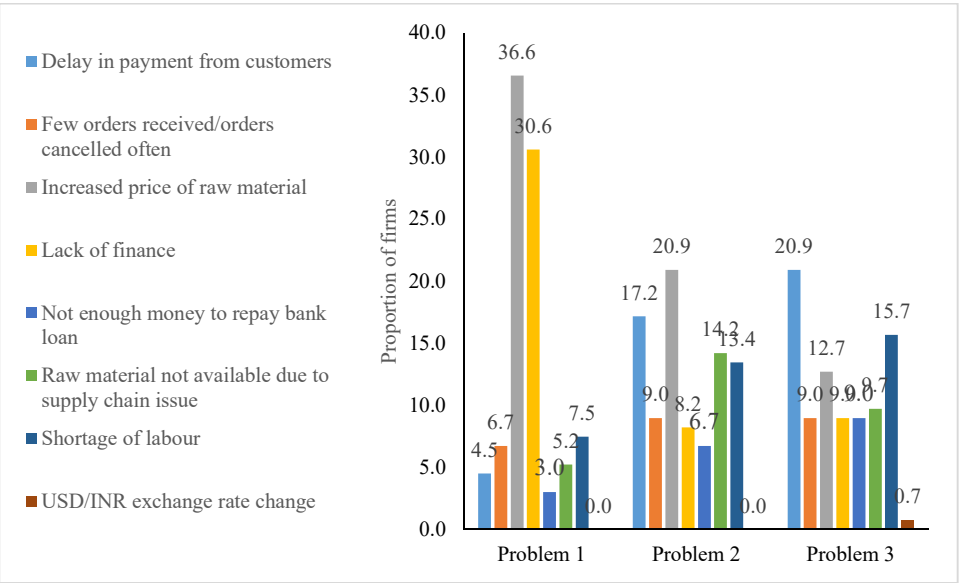
When asked about the most important reason for reduction of cash flow, 45.9 per cent of the firms whose cash flow had reduced, indicated that "payment not made by the customer" has been the most prominent reason, followed by 'cancellation of order at the last moment'. In addition to these, many firms indicated that the expenditure incurred by them just before the pandemic had further strained their cash flow, since few could anticipate occurrence of such a catastrophic event. While cash flow dried because of nil/delayed payment by customer, suppliers were not willing to defer payment, adding to their woes. About six per cent of the firms said that the most important reason for reduction of cash flow was unwillingness of banks to extend credit line. Among other reasons, steep increase in steel prices, reduction in orders in anticipation of slowdown and disruption in production process due to non-availability of raw material were cited by the firms as a cause for reduced cash flow (Figure 8).

Figure 8: Reason for Reduced Cash Flow



Major problems faced by MSMEs during Covid-19 period: Firms were asked to rank three major problems they faced during Covid-19 according to the severity of the problems, among a list of issues given to them as options. Regarding the most severe problem (or issue which was ranked 1 in terms of severity), increased price of raw material was a prime issue faced by many (36.6 per cent), followed by lack of finance (30.6 per cent), shortage of labour (7.5 per cent) and reduced order (6.7 per cent). Among other categories, delay in payment by customers, availability issue of raw material due to supply chain disruptions and exchange rate uncertainty were cited as major problems faced by the firms (Figure 9).

Figure 9: Major Problems Faced During Covid-19

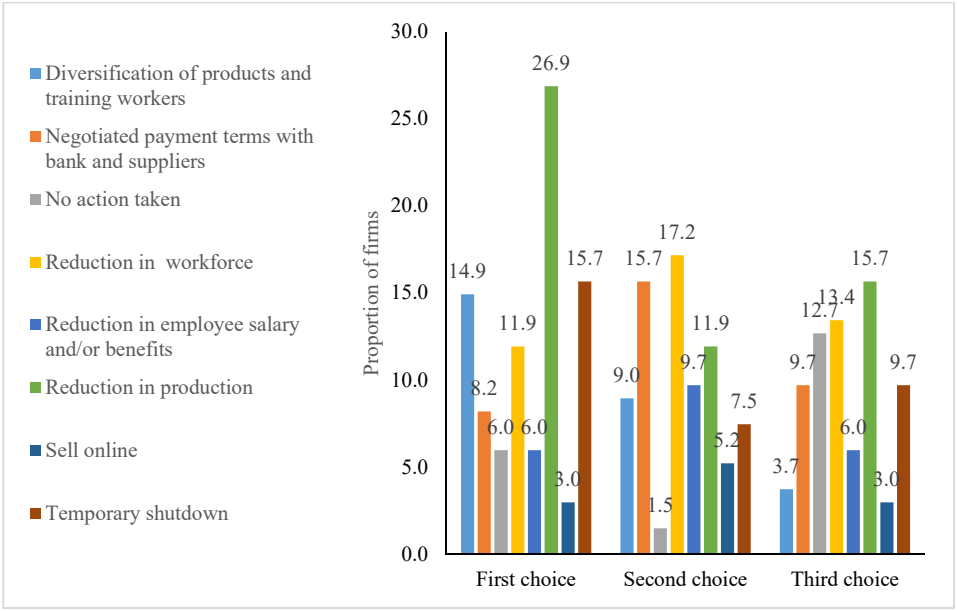


Regarding the issue related to availability of formal finance, firms were asked whether they had applied for a bank loan in 2020 or 2021 and if yes, whether the bank loan was sanctioned. 54 per cent of the firms said that they had applied for a bank loan during the last two years. Among these firms, 83 per cent said that their loan application was granted while remaining 15 per cent said that their loan application was rejected. Further, when asked about alternate sources of funding in case obtaining bank loan was not possible, firms responded that required fund mostly came from family and friends, selling assets/leasing out land or advanced payment from the customers, apart from loans from NBFCs/co-operatives or even moneylenders.

V Responses to Covid-19 induced disruptions

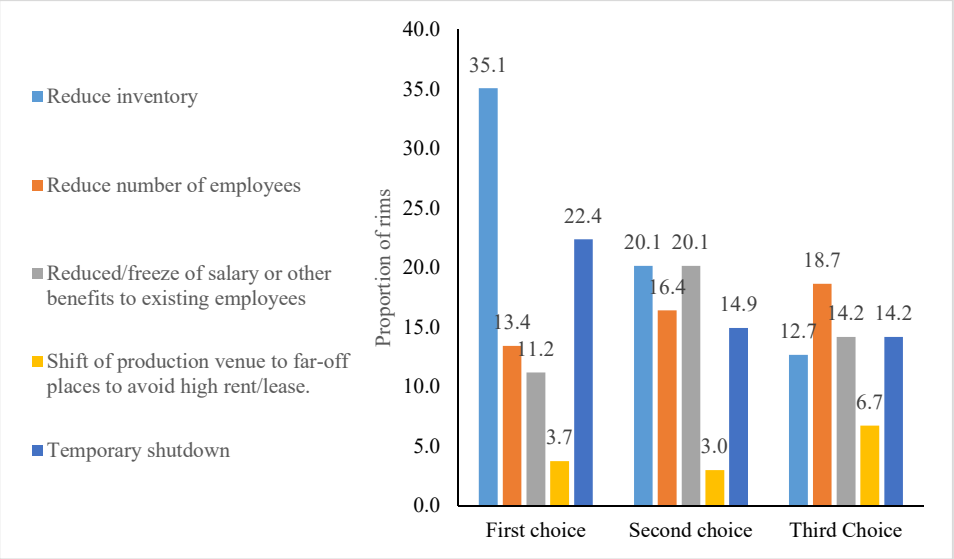
Firms were asked to choose among a list of possible actions which they had taken to tide over the crisis induced by Covid-19, apart from mentioning any other important steps taken by them which were not part of the list. Survey responses indicate that many firms reduced their production as a first line measure to adjust with future uncertainty and lull in demand. Many even resorted to temporary shutdown. While diversification of business/products and training workers were an important strategic decision for many, decline in sales also resulted in reducing the size of the workforce. Reduction of employee salary/benefits to mitigate the hardship caused by business slowdown remained the most preferred option for close to 6 per cent of the surveyed firms (Figure 10).

Figure 10: Responses to Covid-19 Disruptions



As a part of the survey, firms were specifically asked about the most preferred step taken by them to manage expenditure during the slowdown. Inventory reduction was a primary step taken by most of the firms to cut costs, apart from temporary shutdown, downsizing workforce and reduction in salary. About 4-6 per cent of the surveyed firms indicated that shift of production venue to far-off places to avoid high rental cost, was also a measure adopted by them. In addition, increased automation, reduction in travel and advertisement expenses, modifying/streamlining production process and energy usage to minimise wastage along with postponing capital goods purchase were some of the steps undertaken by the MSMEs to cut expenditure (Figure 11).

Figure 11: Expenditure Control Measures by MSMEs



About 59.5 per cent of the MSMEs in the sample received some government support during Covid-19. On a positive note, a proportion of firms receiving some sort of government support was found to be the highest in the micro enterprise category (Figure 12a). Among various schemes, the outreach was found to be highest in the case of the Emergency Credit Line Guarantee Scheme (ECLGS), which accounted for 69.2 per cent of the total MSMEs availing of government support, followed by the policy of disbursing collateral free loan (25.6 per cent), tax support (16.7 per cent) and EPF support under Pradhan Mantri Garib Kalyan Package (PMGKP) (Figure 12b). Firms were also asked about the action they want the government to take, in order to improve their situation. Majority (80 per cent) responded saying they want some sort of price control (raw material) measures, followed by a policy to facilitate access to bank loan, existing bank loan restructuring and mandatory procurement from MSMEs for all government projects, handholding of MSMEs in terms of providing access to E-markets, as

well as TReDS platform for bills discounting and change in legal system to facilitate land acquisition. Almost 9 per cent of the MSMEs responded saying a robust system towards social protection to workers (for example supply of PPE kits, information dissemination about Covid 19) would be useful.

Figure 12a: Proportion of Firms Receiving Government Support

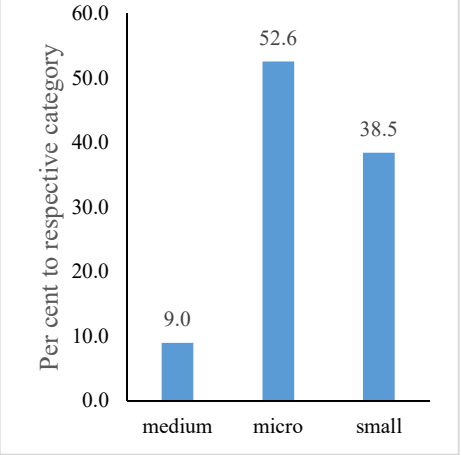
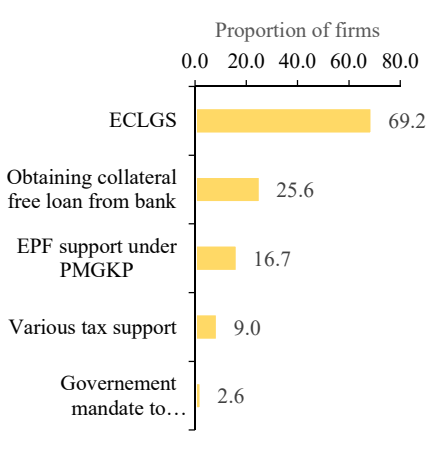


Figure 12b: Various Governement Support Received by the MSMEs



To analyse the differential impact of Covid-19 in terms of incidence of shutdown (apart from lockdown imposed by government authorities), revenue loss, liquidity shock, retrenchment of labour on MSMEs across various categories, logistic/ordered logistic regressions were estimated (Table 2). Dependent variables are dummies derived from firms' responses to the questions concerning whether there was business closure during last two years, what is the extent of revenue and liquidity loss and whether firms downsized their workforce as a response to falling revenue after Covid-19 outbreak. For example, to gauge the impact of firm attributes on closure, we have constructed dummy CLOSURE which takes value 1 if the firm responds as "yes" to the question "Apart from the lockdown period imposed by central/state, whether the company was shut down temporarily due to Covid-19 pandemic as business was not viable?". Similarly, "Retrenchment Dummy" is defined as a dummy which takes value one in case of firms which indicate "reduction in workforce" as one of the top three responses adopted to cope with the difficult time against the backdrop of Covid. The dummies "Revenue loss" and "Liquidity shock" are defined as ordered variables which takes value in the range 0-4 and 0-3 respectively, with a higher value indicating more revenue loss and more liquidity crunch. for firm responses Dummies MICRO, MANF, NEWAGE, FA_1948, EXPORT, GOV_SUPPORT, LOAN and EMP_20 indicate whether the firm belongs to micro category, manufacturing industry, started operation after 2015, registered under Factories Act 1948, exporting outside India, received some government support, has an

outstanding bank loan and has more than 20 hired employees, respectively. Firms either with a website or selling online as a response to Covid-19 are considered as IT enabled (indicated by dummy variable IT). While model 1 and 2 are standard logistic models with dependent variable being a binary one, model 2, 3 are ordered logistic regressions as the dependent variables have more than two categories.[9]

Table 2: Differential Impact of Covid-19: Logistic Regressions

Explanatory variables	Temporary Shutdown (Dependent variable: Shutdown dummy)	Revenue loss (Dependent variable: Revenue loss categorical variable)	Liquidity Shock (Dependent variable: Liquidity shock categorical variable)	Retrenchment of labour (Dependent variable: Retrenchment dummy)
	1	2	3	4
MICRO	3.468087	0.7786908	1.711811	0.9670257
	(0.01)	(0.542)	(0.365)	(0.943)
MANF	0.6759458	3.094521	-	0.3012842
	(0.57)	(0.065)	-	(0.079)
NEWAGE	1.319737	1.073485	0.5444953	0.4148614
	(0.662)	(0.895)	(0.472)	(0.183)
FA_1948	2.486615	1.161487	9.664179	0.4449653
	(0.055)	(0.703)	(0.003)	(0.076)
IT	1.031194	2.664643	3.026376	0.8592589
	(0.944)	(0.011)	(0.072)	(0.722)
EXPORT	0.5086414	1.916927	10.00786	0.4776481
	(0.157)	(0.117)	(0.00)	(0.124)
GOV_SUPPORT	1.237912	1.280741	1.098618	1.314348
	(0.634)	(0.512)	(0.862)	(0.53)
LOAN	1.313507	1.017902	0.5360098	1.146934
	(0.584)	(0.966)	(0.277)	(0.781)
EMP_20	0.987944	1.191834	2.643582	0.5829332
	(0.981)	(0.688)	(0.12)	(0.274)
χ^2	20.94	21.94	40.85	15.14
Prob (>Chi2)	0.0129	0.0091	0	0.0873
Pseudo R^2	0.1271	0.0693	0.2357	0.0916

Note: Table one reports odds ratios with associated p-values in parentheses.
Source: Staff calculation based on survey data.

The results indicate that within the MSMEs, the incidence of shutdown was statistically significantly higher among the 'micro' category. However, in terms of the impact of the pandemic on revenue, liquidity and labour force, micro firms did not seem to have any statistically significant differential impact as compared to small or medium category. On the other hand, revenue loss to a greater extent was more likely among the manufacturing MSMEs, though job losses due to retrenchment were more likely in the case of MSMEs in the services sector. Though MSMEs registered under factories act were more likely to shut down their

business temporarily and experience sharp fall in revenue, they were less likely to retrench labour as compared with firms which are not registered under Factories act, partly reflecting the various labour law related stipulations for these firms. Finally, IT enable (enabled?) firms (as defined above) were found to be significantly less affected in terms of revenue or liquidity loss as compared with firms without a website or online sales. While exporting firms were significantly less likely to face a sharp fall in liquidity in their balance sheet, there was no significant differential impact of Covid-19 among firms having an outstanding loan, or government support. Lastly, no significant impact of Covid-19 was observed among various size categories based on number of workers.

VI Future Outlook

To assess the outlook of the sector, respondents were asked to gauge the trend in various parameters such as overall business situation, turnover/sales, inventories, cost of finance, profit margin and salary/expenses in the next quarter (April-June 2022) as compared to the current quarter (January-March 2022). Further, to assess the medium-term outlook, respondents were asked to predict trends of the same set of parameters during Q2 and Q3, 2022-23 (July-December 2022).

Net responses (NR) have been calculated against each parameter as a proportion of optimistic responses minus proportions of pessimistic responses.[10] Generally, 'increase' is considered as an 'optimistic' response, except in cost related parameters and inventories where 'decrease' is considered an 'optimistic' response[11]. Positive value of the net responses (NR) indicates expansion and negative value indicates contraction. The present survey results indicate that MSMEs were broadly optimistic about the overall business situation going forward. However, there were signs of pessimism observed in the context of cost and availability of finance, rising input costs and wages, along with shrinking profit margin. With economic recovery gaining pace, firms expected improvement in turnover/sales and reduced inventory due to stronger demand going forward (Table 3).

The positive sentiment about overall business outlook is observed to get stronger during Q2 and Q3, 2022-2023, though MSMEs continued to be pessimistic about rising input cost as well as a higher wage bill, coupled with rise in cost of finance (Table 4). Net responses pertaining to inventory indicated reduction of inventory in the short run but on a longer time horizon, it is expected to increase. This could be partly attributed to MSMEs anticipating a sudden surge in demand in Q2: 2022-2023 along with reduced capacity due to Covid-19 induced business disruptions since 2020.

Table 3: Assessment of Next Quarter (April-June 2022) as Compared to the Current Quarter (January-March 2022)

Parameter	Decrease (%)	Increase (%)	No change (%)	Net Responses
Overall Business Situation	25.6	42.1	32.2	16.5
Turnover/sales	28.1	46.3	25.6	18.2
Full time employees	20.8	27.5	51.7	6.7
Part time/contractual/outsourced employees	26.2	24.3	49.5	-1.9
Inventory/stocks	31.6	30.7	37.7	0.9
Cost of finance	9.7	47.8	42.5	-38.1
Availability of finance	35.5	19.1	45.5	-16.4
Salary/wages	0.9	74.4	24.8	-73.5
Cost of inputs (raw material, energy, water, etc)	4.5	88.4	7.1	-83.9
Expansion of business through new investment	15.3	27.0	57.7	11.7
Profit margin	56.4	15.4	28.2	-41.0

Source: Staff calculations based on survey responses.

Table 4: Medium Term Outlook (Q2 and Q3, 2022-23)

Parameter	Decrease (%)	Increase (%)	No change (%)	Net Responses
Overall Business Situation	17.6	51.3	31.1	33.6
Turnover/sales	19.8	56.9	23.3	37.1
Full time employees	14.3	33.9	51.8	19.6
Part time/contractual/outsourced employees	20.0	22.9	57.1	2.9
Inventory/stocks	24.8	41.6	33.6	-16.8
Cost of finance	7.2	51.4	41.4	-44.1
Availability of finance	23.0	23.0	54.0	0.0
Salary/wages	4.5	70.5	25.0	-66.1
Cost of inputs (raw material, energy, water, etc.)	5.5	80.9	13.6	-75.5
Expansion of business through new investment	17.0	33.0	50.0	16.0
Profit margin	43.4	30.1	26.5	-13.3

Source: Staff calculations based on survey responses.

VII Conclusions and Policy Implications

MSMEs act as an engine of growth and employment generation accounting for close to eight per cent of total output of the industrial and employing around 11.13 Crore workers.[12] However, due to unavailability of data, assessing various important parameters related to the sector remains challenging for the policymakers and researchers. This article aims at filling this gap by documenting MSMEs' business situation in Tamil Nadu after the Covid-19 outbreak as well as various actions by the MSMEs as a response to tide over the present crisis. The survey finds that MSMEs' sales and liquidity were severely affected during the pandemic due to several factors such as demand slowdown, delayed payment by

the customers and suppliers not willing to defer payments. Non-exporting MSMEs were more affected, while a small proportion of exporting MSMEs reported moderate to significant increase in sales and cash flow. Temporary shutdown was implemented by many MSMEs as a response to the business slowdown, coupled with reduction in workforce and salary/other benefits. Increased price of raw material, lack of finance and shortage of labour remained some of the major problems of MSMEs during Covid-19. Though MSMEs were found to be optimistic about overall business situation and turnover going forward, these firms remained wary of increase in cost of finance, raw material, and wage bill.

Being an important sector from the perspective of employment generation and balanced regional development, the MSMEs need attention from the policymaker, especially at the backdrop of Covid-19 induced disruptions. MSMEs perennially face certain issues such as lack of marketing ability, lack of timely access to formal credit markets, delayed payment by the customers, and lack of skilled workforce. Several policy initiatives have been put in place over the years to mitigate their problems both at the national level as well as by respective state governments. These include, but are not limited to, inclusion of MSMEs in the priority sector by the RBI and specified lending target for this sector by the commercial banks, production linked incentive schemes by the government for the sector, credit guarantee trust for easing credit access, mandatory procurement norms for the public sector enterprises, apart from various supporting capacity and skill building programme introduced from time to time for the benefit of the sector. However, as the survey results presented in the article indicates, Covid-19 has exacerbated two major issues for the sector. These are; lack of liquidity due to delayed payment in the backdrop of general economic downturn and shortage of skilled labour as labour migration took place especially during prolonged lockdown period in 2020. Recognising the issue of delayed payment faced by the MSMEs, Government of India has implemented the 45 days payment moratorium for the benefit of MSMEs' suppliers. However, delay in payment remains a problem from the sector, as evidenced in the survey results, which could be attributed to limited bargaining power of the MSMEs and fear of losing business. In this regard, technology enabled solution such as the trade receivable discounting (TReDS) platform introduced in 2014 by the RBI could be an enabler. Unfortunately, use of TReDS by MSMEs is yet to take off mainly due to lack of awareness. A more concerted approach is required in this regard to create awareness in the sector about the existence of TReDS. Further, Government has been taking steps towards formalisation of the sector by introducing Udhyam Aadhar registration process. However, anecdotal evidences show that many MSMEs do not want to register themselves in this portal due to fear of inclusion in the tax network as well as sharing sensitive information in the portal. There is a need to create a special campaign, both by the state governments and the commercial banks to identify segments of the MSMEs which are averse to registration, listen to their issues, try to address these issues as well as spread awareness about benefits of registrations. In sum, though there are many policies

aimed to mitigate the woes of MSMEs; going forward by a more integrated approach would help MSMEs to reap the benefit of various schemes. In addition, spreading financial education among them would also help them avoid the trap of usurious interest rate that comes along with informal finance. At the same time, technological innovation in the financial sector and constant deliberation towards design and adoption of an appropriate credit appraisal method, to identify potential gazelles in the sector by the banking sector, would be crucial to unleash the full potential of the MSME sector in our country.

Endnotes

1. Source: NSSO survey on unincorporated non-agricultural enterprises, 73rd round (July 2015-June 2016).
2. Apart from this, to encourage the competitiveness of the sector, the state government reimburses payment by MSMEs to acquire quality certification, as well as patent registration, subject to terms and conditions. To promote balanced regional growth, MSMEs from backward blocks are given 50 per cent reimbursement of the stamp duty and registration fees. Further, to encourage fund raising from capital markets, government has introduced a scheme of financing 50 per cent of the listing expenses.
3. Convenience sampling method, despite its shortcomings, was a preferred method in the present case, in the absence of any population information. Further, effort has been taken to increase representativeness of the sample by ensuring the geographical spread of the sample of firms, in line with data obtained from Udyog Aadhar database and presence of micro units.
4. As per latest Udyog Aadhar registration data, almost 88 per cent of the total MSMEs registered from Tamil Nadu, are micro units, while 12 per cent are small units and less than one per cent are medium units. Hence, to get a representative sample, each MSME Association in the state was requested to ensure at least 20 per cent presence of micro units in the responses received from their members.
5. The Factories Act, 1948 is applicable to any factory using power and employing 10 or more workers and if not using power, employing 20 or more workers. Units, which are registered under this act, are subject to various laws concerning occupational safety, health and general working conditions along with the wellbeing of workers.
6. To ensure that responses to survey questionnaire were given by individuals who have a holistic view of the sector, as well as recent government policies, participation of owners and partners was encouraged.
7. In several countries, the definition of SMEs is based on the number of employees. For example, in European Union, small businesses are defined as firms operating with fewer than 250 persons (along with upper limit on turnover) and in the US small businesses are defined as businesses operating with less than 500 employees where as per the Small Business Administration (SBA).
8. Only one respondent pertaining to the chemical sector (manufacturing) has indicated a sharp increase in sales in the response.
9. Firms were asked to choose the most appropriate among the four options given to them, which best reflects the extent of fall in revenue and cash flow in 2020 as compared with the previous years; (i) decreased sharply (more than 40 per cent) (ii) decreased moderately (10-40 per cent), (iii) no significant change (+-10 per cent variation) (iv) increased moderately (10-40 per cent) (v) increased sharply (more than 40 per cent). Only one firm indicated a sharp increase in revenue, which has been omitted from the econometric analysis as an outlier observation.

10. It is a standard method used in various RBI surveys such as industrial outlook survey and consumer confidence survey, to understand the stances taken by the respondents.

11. The method followed here is in line with calculation of net responses in the Industrial Outlook Survey (IOS), RBI where 'below average' is considered as 'optimistic' for inventory related parameters.

12. As per the estimate given in National Account Statistics 2023 and NSSO Survey on Unincorporated Non-Agriculture Enterprises-73rd round).

References

Abidi, Nordine and Sakha, Sahra and Herradi, El (2022), *Digitalization and Resilience: Firm-Level Evidence During the COVID-19 Pandemic* (February 1, 2022), IMF Working Paper No. 2022/034, Available at https://www.imf.org/en/Publications/WP/Issues/2022/02/18/Digitalization-and-Resilience-Firm-level-Evidence-During-the-COVID-19-Pandemic-513169

Apedo-Amah, Marie Christine, Besart Avdiu, Xavier Cirera, Marcio Cruz, Elwyn Davies, Arti Grover, Leonardo Iacovone, Umut Kilinc, Denis Medvedev, Franklin Okechukwu Maduko, Stavros Poupakis, Jesica Torres and Trang Thu Tran (2020), *Unmasking the Impact of COVID-19 on Businesses: Firm Level Evidence from Across the World,* Policy Research Working Paper No. 9434, World Bank, https://openknowledge.worldbank.org/handle/10986/34626

Bartik, A., M. Bertrand, Z. Cullen, E. Glaeser, M. Luca, and C. Stanton (2020), The Impact of COVID-19 on Small Business Outcomes and Expectations, *Proceedings of the National Academy of Sciences*, 117(30): 17656–17666.

Igarashi, T., A. Takeda, H.T. Truong and T. Sonobe (2021), *Evolving Impacts of the COVID-19 Pandemic on Micro, Small, and Medium-Sized Enterprises in Asia*, ADBI Working Paper 1286. Tokyo: Asian Development Bank Institute, Available: https://www.adb.org/publications/evolving-impactscovid-19-pandemic-micro-small-and-medium-sized-enterprises-asia

Shinozaki, S. and L. Rao (2021), *COVID-19 Impact on Micro, Small, and Medium-Sized Enterprises under the Lockdown: Evidence from a Rapid Survey in the Philippines*, ADBI Working Paper No. 1216. Tokyo: Asian Development Bank Institute.

Appendix Table 1: Major Schemes by Government of Tamil Nadu for Facilitating Growth of MSMEs

Scheme Name	Eligibility Criteria/Scheme Details
Capital Subsidy	All micro enterprises, all small and medium enterprises established in identified sectors/industrially backward blocks/agro-based SMEs.
Low Tension Power Tariff	All micro manufacturing units going for expansion and diversification using Low Tension Power Supply.
Payroll Subsidy	Same as capital subsidy.
Back-ended Interest Subsidy	To support MSEs to undertake technology up-gradation/modernisation back-ended interest subsidy at the rate of 5 per cent on term loan availed up to ₹5 crore, subject to a maximum of ₹25 lakh per enterprise for a period of 5 years.
PEACE (promotion of energy audit and conservation of energy)	75 per cent of the cost of energy audit subject to a ceiling of ₹1 lakh per energy audit per unit is reimbursed. Further, 50 per cent of machinery and other equipment cost for improving energy efficiency is reimbursed, subject to a maximum of 10 lakh per enterprise.
Q-CERT (reimbursement of charges for quality certification)	Reimbursement of 100 per cent of payments made to the consultancy and certification agencies towards acquiring such Quality Certifications.

Scheme Name	Eligibility Criteria/Scheme Details
	subject to a ceiling of ₹2 lakh for National Certification & ₹10 lakh for International Certifications.
Unemployed Youth Employment Generation Programme (UYEGP)	Any individual above 18 years with a minimum educational qualification of pass in VIIIth standard.
New Entrepreneur cum Enterprise Development Scheme (NEEDS)	Individual based Capital Subsidy at the rate of 25 per cent of the project cost (not exceeding ₹75 lakh), is being given along with 3 per cent interest subvention on term loan is given to promising entrepreneurs with education qualification of at least HSC level.

Appendix Table 2: Quantum of Subsidy Provided by State Government to MSMEs under Various Schemes

(₹crore)

Year	Capital Subsidy	Low Tension Power Tariff (LTPT) Subsidy	Generator Subsidy	Unemployed Youth / employment Generation Programme	New Entrepreneur-cum-Enterprise Development Scheme (NEEDS)*	Others**	Total
1	2	3	4	5	6	7	8
2012-13	60.0	6.0	23.5	14.7	23.9	0.3	128.3
2013-14	70.0	6.0	8.0	15.0	43.5	0.4	142.9
2014-15	70.0	6.0	8.0	18.2	11.5	0.4	114.0
2015-16	80.0	6.0	42.0	34.6	45.1	0.4	208.1
2016-17	80.0	6.6	8.0	33.8	76.3	0.4	205.1
2017-18	160.0	6.0	2.0	30.0	58.6	1.5	258.1
2018-19	360.0	7.0	2.0	27.6	65.8	1.3	463.7
2019-20	209.9	9.8	1.0	26.1	78.4	1.6	326.8
2020-21	270.00	10.00	-	33.00	86.93	1.19	401.12
2021-22 (Actual)	360.00	8.59	-	40.92	97.25	7.27	514.03
2022-23 (BE)	300.00	10.00	-	40.00	100.00	13.30	463.30

Notes: * Includes both capital subsidy and interest subvention, ** Includes interest subsidy for technology upgradation/ modernisation, credit guarantee fund trust scheme, incentives to MSME unit to Promote Energy Efficiency (PEACE), Reimbursement for acquiring quality certification (Q-Cert).

Source: Micro, Small and Medium Enterprises Department, Government of Tamil Nadu.

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Regional Variation in Provider Choice for Inpatient and Outpatient Services among Indian Households: How Much a Supply-Side Factor?

Bidisha Mondal

In an attempt to understand the role of supply-side infrastructure in provider choice, the study looks into the regional variation in provider choice in healthcare among Indian households both for inpatient and outpatient services. Since provider choice is often documented to be influenced by various socioeconomic, demographic and ailment-related demand-side factors like income class, gender, disease type, etc., the purpose of this study is to unearth the regional variation in provider choice after controlling for these other factors and also to see if there is any association between the regional variation in provider choice and regional variation in prevalence of different types of providers. The study uses the database of Social Consumption: Health Survey, 75th round to look into the provider choice among Indian households and the databases of Rural Health Statistics and Economic Census, 6th round to get information about the supply-side infrastructure of healthcare. Along with descriptive statistics, multinomial logit model for the outpatient cases and binary logit for the inpatient cases have been used here. The study adds to the existing knowledge by confirming the strong existence of regional variation in provider choice even after controlling for the observed demand-side influencers of provider choice. The congruence between regional variation in likelihood of choosing one type of provider over the other, and regional variation in prevalence of these providers, reaffirms the role of supply-side factors in provider choice.

Keyword: Catastrophe, Health expenditure, OOP

I Background

Provider choice in healthcare being a complex concept, needs to be evaluated from many angles. It depends on the affordability, physical accessibility, and acceptability of services along with adequacy of supply of different providers of healthcare. Whereas the adequacy of supply is often measured by indicators such as number of health care professionals or hospital beds per capita, the physical accessibility often measures how geographically distant the facilities are and the travelling costs and other inconveniences to obtain healthcare from the providers. As in case of rural areas specially, the indirect costs associated with travelling to

Bidisha Mondal, Independent Researcher, Gurugram 122002, Haryana,
Email: itsmebidisha1@gmail.com, Mobile: +91-7838616553.

the facilities act as deterrents to seek treatment more in comparison to urban areas (Uplekar and George 1994). The acceptability of services depended on the relevance and effectiveness of the services available to the population. Financial barriers often influence patients' choice of a health care provider (Gulliford, *et. al.* 2002) (Kasthuri 2018) ((Balarajan, Selvaraj, and Subramanian 2011).

The existing literature also throws light on provider choice. Although proximity plays an even more important role in provider choice in case of acute illnesses and in case of chronic illnesses, cost of treatment is an important influencer (Raza, Poel, Panda, Dror and Bedi 2015). But sometimes, the lack of good quality facilities often leads individuals to visit hospitals in urban areas as can be seen from huge influx of rural population to the major hospitals in cities like Delhi. In rural India, often the private practitioners offering medical treatment aren't legally qualified enough to prescribe medication (Rohde and Viswanathan 1995). It has been found that around 80 per cent of the qualified private physicians work in urban areas (Costa and Diwan 2007). Although two-thirds of hospitals are located in urban areas (Duggal R. 1997) and thus urban people receive better access to the health facilities as compared to rural people, the number of facilities including both public and private, is still inadequate to serve the health care needs of urban population (Gupta an Dasgupta 2013). Whereas supply-side factors like distance to the facility, patient-friendly attitude of health care professionals, and appropriateness of care are significant determinants of choice between public and private providers, socioeconomic characteristics also influenced the provider choice to a large extent (Černauskas, Angeli, Jaiswal and Pavlova 2018) (Ager and K. 2005).

Patients' choice of provider is supposed to bring competition and efficiency by looking for high-quality services with cost minimization by a comparison of prices and quality of different providers and choosing the best provider. This selection process, by encouraging the providers to compete for patients, is assumed to improve quality and decrease costs (Dixon, Robertson and Bal 2010) (Grytten and Sorensen 2009) (Vrangbaek, Robertson, Winblad, Van and Dixon 2012). (Burge, *et. al.* 2006). But generally a structure of provisioning often determined the utilization patterns in Indian states (Baru 2006). A few studies analyzing the provider choice have often suggested that the gap in the healthcare market which the public sector failed to fill up, led to the growth of the private sector (Chatterjee P. 2008), (Sengupta and Nundy 2005) (Shah and Mohanty 2010). Although the existence of private sector can be traced back to the time of independence, the growth of private providers increased sharply during 1990s. During this phase, the pro-market thinkers argued in favour of the private sector in comparison to public sector on the ground of economic efficiency; limited fiscal capacity led to a limited role of public sector in the healthcare market and the welfare consequences of this change were often ignored. However, unlike many other countries which followed a pro-market approach, the state lagged in playing the role of a strong regulator in Indian healthcare market. Recently in 2010, the Clinical Establishment Act was passed to regulate all types of healthcare providers. Private sector in health care

has been heterogeneous in nature in India. It comprised of several kinds of systems within, for example allopathic, homeopathic, ayurvedic, unani, etc. Of the private providers, in 2011 around 71 per cent comprised of own account workers (OAEs); 29 per cent of the establishments are registered establishments; the share of allopathic facilities among total private providers being 76 per cent, consisting of hospitals, individual practitioners, diagnostic centres, etc. The regional distribution of private facilities reflect a high percentage of OAEs in rural areas with an unsatisfactory level of compliance with the criterion of healthcare practices, without any formal degree/education and the rural areas lacked formal, organized, good quality healthcare facilities. Across the states, the private health enterprises and private allopathic enterprises are found to be concentrated in the high-income, economically prosperous states. The same trend isn't there for public allopathic hospitals (Hooda 2015). Although the percentage of households seeking medical service increased from 34 per cent in 2005-2006 to 45 per cent in 2015-2016, the likelihood of those seeking care from the private sector is higher than the public sector. Whereas in case of public sector, the government and municipal hospitals are the major providers of health services, in the private sector the dominant providers are private doctors and clinics. The share of service provision by the private sector is around 56 per cent in urban areas, whereas the share is 49 per cent in rural areas. The common reasons cited for not using government facilities are poor quality of services, no nearby government facility and long waiting queues (ICF 2017). Studies show that even poor families utilize services from private health care providers over the free/subsidized public health care for a multitude of reasons like long waiting queues, distant location of the facility, unclean premises, rude behaviour of the staff and unavailability of services: most of it can be rectified with minimal resource input or good behavioural practices by the public healthcare (Patel and Nayak 2010). In case of inpatient services, often affordability is another factor leading to choose public services over private ones, reason for choosing private facility had been the proximity in location or non-availability of public hospitals (Dilip and Duggal 2004). In some types of treatment in public facilities, due to lack of awareness and also due to the intrusiveness and rigidity of the treatment form, the patients find it unacceptable and they choose to visit private facilities. Free services were able to attract very few patients ((Pinto and Udwadia 2010). With people choosing private sector over public sector to address health care needs, despite cost of services being 2.2 to 24.3 times higher in private sector in comparison to public sector, it indicates that even after affordability being a critical factor, its non-congruence with accessibility and acceptability in public healthcare sector is leading people to choose private over public (NCMH, National Commission of Macroeconomics and Health Report 2004) (NCMH 2005). However, a growing body of international research suggests that public financing and provision of healthcare is a characteristic of high-performing and equitable health systems (Oxfam 2009). Thus although socio-economic, demographic characteristics, and ailment-related factors like gender, age, caste, income level, education level, insurance coverage, type of ailment are

also found to influence the provider choice (Dey and Mishra 2014) (Mondal and Dubey 2020) (Chatterjee, Nayak, Mhakud, and Chatterjee 2018) (Perianayagam and Goli 2013), some of the research works either based on interviews conducted in a small area or based on surveys concluded that lack of public healthcare infrastructure had driven people to usage of private facilities.

Whereas this study also tries to explore the importance of supply-side infrastructure in provider choice, the novelty of the study lies in controlling for the effects of demand-side characteristics and using a nationally representative current database making the findings more reliable and broad-based. Region representing supply-side of health infrastructure, the study looked into the regional variation in provider choice and also whether the regional variation in the likelihood of choosing one provider over the other after controlling for the demand-side factors is in congruence with the regional variation in supply-side infrastructure.

I Database, Methodology and Variables

The major database used in the study is the Social Consumption: Health Survey, the 75th round of the National Sample Survey. The National Sample Survey Organization (NSSO) conducts large-scale, population based, nationally representative surveys. The 75th round of NSS surveys was carried out from July 2017 to June 2018 and the purpose of the survey was to collect information on various aspects of health, for example ailments of household members, health care access, provider choice, availing of different medical services of the ailing members, health care expenditure and its components, etc., at the household level. Beside this, the survey also provides information on the basic demographic and socio-economic particulars of the household members. The other databases are Rural Health Statistics and Economic Census, 6th Round. The Rural Health Statistics gives information on public health infrastructure and human resources. It is a health facility level data reported by the states/UTs, annually published by the Ministry of Health and Family Welfare. The Rural Health Statistics, 2019-20, the latest available round has been used here. The Economic Census enumerates all the establishments engaged in agricultural and non-agricultural activities. The fieldwork for the 6th Economic Census was done during January 2013 to April, 2014.

Apart from the descriptive statistics, I have used multinomial logit model for analyzing the outpatient cases and binary logit model for the inpatient services. In case of both the multinomial logit model and the binary logit model, the dependent variable has the type of provider and the reference category had been the public facilities. In case of the multinomial logit model, the other two categories are the private hospitals and private clinics. However, in case of binary logit model, the other category has been the private hospitals. The main predictor variable in the regression models had been the regional dummies. The Indian states and Union territories have been divided into six regions. The Northern region consisted of Jammu and Kashmir, Himachal Pradesh, Punjab, Chandigarh, Uttaranchal,

Haryana, Delhi, Rajasthan and Uttar Pradesh. The north-eastern region comprised of Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya and Assam. The central region consisted of Chhattisgarh and Madhya Pradesh. The eastern zone included Bihar, West Bengal, Jharkhand and Orissa. The Western region consisted of Gujarat, Daman and Diu, D & N Haveli, Maharashtra and Goa. The Southern region included Andhra Pradesh, Karnataka, Lakshadweep, Kerala, Tamil Nadu, Puducherry, A & N Islands, and Telangana. Among the regional dummies the Southern region has been the reference category. The control variables had been the area of residence, with the rural being the reference category; seriousness of illness with being ill being the reference category and restricted activity while being confined to bed being the other categories; ailment category with communicable diseases being the reference category and non-communicable diseases and injuries being the other categories; expenditure quintiles with the lowest quintile being the reference category; gender with male being the reference category; social group with others being the reference category and Scheduled Tribe (ST), Scheduled Castes (SC) and Other Backward Castes (OBC) being the other categories; relation to head with head/spouse of head being the reference category and all others forming the other category; marital status where currently married ones are the reference category and others including separated, widowed, divorced, and never married being the other category; age-groups with 0-14 years being the reference category and the other age-groups being 15-29 years, 30-44 years, 45-59 years and above 60 years; highest education level among the household members with illiterates being the reference category and literate with/without formal schooling, below primary to middle school, middle to higher secondary, graduates, post-graduates and above being the other categories; insurance coverage with not being covered being the reference category and government-sponsored health coverage and coverage by other insurance schemes forming the other groups. Among these variables only the information on seriousness of illness wasn't available for the inpatient cases, thus not included in the logit regression.

III Results

The results section includes four sub-sections. The first sub-section describes about how the provider choice varies with the socio-economic, demographic and health-related factors. The second sub-section speaks about how the provider choice varies across the regions. The third sub-section talks about the regional variation in supply-side health infrastructure and the last gives us the results from the regression analysis.

Provider choice varying with the socio-economic, demographic and health-related factors of ailing persons

Outpatient Cases

In case of outpatient services, in around 46 per cent of cases, people sought care from private clinics, in 30 per cent of cases from public hospitals and 24 per cent of cases from private hospitals. The percentage of cases availing treatment in the private hospitals is higher in urban areas than in rural areas. A look into provider choice across different social categories would reveal that the usage of public hospitals is highest among ST/SC groups closely followed by OBC category with the usage being lowest among others. For the head/spouse of the head, the share of cases treated in private hospitals is much higher than others. Also among the currently married, the usage of private hospitals is much higher compared to never married/widowed/divorced/separated ones. The provider choice varies across the age-groups too. For the more aged, the usage of both public and private hospitals increases and that of private clinic declines. As the education level of the head of the patient's household increases, availing treatment in public hospital declines. In case of non-communicable diseases and injuries, seeking treatment from private hospitals is much higher than the case of communicable diseases. The share of cases treated in private clinic is much higher in case of communicable diseases than non-communicable diseases or injuries. The share of ailment episodes treated in private hospitals goes up as the income level of the households goes up and the shares of private clinic and public hospitals go down when the income level falls. The share of cases treated in public hospitals is much higher for those with government-sponsored insurance schemes than those without any coverage (Table 1).

Inpatient Cases

In case of inpatient services, around 58 per cent of the patients visited private hospitals; a higher percentage visited private hospitals in urban areas than in rural areas. The share of people visiting private hospitals is higher among the patients belonging to others and OBCs, compared to ST/SCs. Among those patients having education level higher than secondary level, the share of seeking services from private hospitals is much greater than others, also the share increases in case of upper expenditure quintiles and in case of non-communicable diseases and injuries, in comparison to communicable diseases. The share is less among those with government-sponsored insurance coverage than among those without any coverage (Table 1).

Table 1: Provider Choice across Socio-economic, Physical and Geographical Characteristics

	Outpatient cases			Inpatient cases	
	Public	Private hospital	Private clinic	Public	Private
All	30.15	24.33	45.52	41.72	58.28
Place of residence					
Rural	32.55	21.77	45.69	45.34	54.66
Urban	26.23	28.53	45.24	35.06	64.94
Gender					
Male	29.85	25.11	45.04	40.66	59.34
Female	30.4	23.67	45.93	42.83	57.17
Social category					
ST/SC	36.13	18.7	45.17	54.13	45.87
OBC	32.09	25.51	42.39	38.51	61.49
Others	23.9	26.57	49.54	36.29	63.71
Relation to head					
Head/spouse of head	31.57	27.44	40.99	42.25	57.75
Others	27.99	19.58	52.43	41.29	58.71
Marital status					
Currently married	30.34	27.61	42.04	42.16	57.84
Never married/widowed/ separated/divorced	29.89	19.92	50.18	41.11	58.89
Age-group					
0-14 years	25.42	15.64	58.94	40.58	59.42
15-29 years	27.13	21.07	51.8	45.87	54.13
30-44 years	28.39	22.34	49.27	41.68	58.32
45-59 years	31.98	28.46	39.56	41.72	58.28
Above 60 years	33.6	28.4	37.99	38.94	61.06
Education level (max education level of the household)					
Illiterates	33.52	21.2	45.28	45.72	54.28
Literate without formal schooling, below primary	34.31	21.21	44.48	45.06	54.94
Primary, Upper primary, Middle	31.76	21.58	46.66	47.1	52.9
Secondary, Higher-secondary	27.09	29.5	43.41	34.86	65.14
Graduates and above	18.62	32.34	49.05	21.54	78.46
Expenditure quintiles					
Expenditure quintile1	35.78	14.53	49.69	52.4	47.6
Expenditure quintile2	31.97	15.2	52.83	50.77	49.23
Expenditure quintile3	33.37	20.64	45.99	45.51	54.49
Expenditure quintile4	32.11	26.96	40.93	41.31	58.69
Expenditure quintile5	23.84	33.05	43.11	29.18	70.82
Ailment type					
Communicable diseases	27.99	15.24	56.77	45.72	54.28
Non-communicable diseases	31.24	28.21	40.55	39.75	60.25
Injuries	28.73	30.82	40.46	40.16	59.84
Insurance coverage					
Government sponsored (e.g., RSBY, Arogyasri, etc.)	39.02	32.47	28.51	46.6	53.4
Government/PSU as an employer (e.g. CGHS, reimbursement from govt., etc.)	36.82	25.05	38.13	33.17	66.83

	Outpatient cases			Inpatient cases	
	Public	Private hospital	Private clinic	Public	Private
Government/PSU as an employer (e.g. CGHS, reimbursement from govt., etc.)	25.91	30.52	43.56	25.34	74.66
arranged by household with insurance companies	5.73	37.62	56.65	7.32	92.68
Others	28.74	21.69	49.57	33.24	66.76
Not covered	27.45	33.71	38.84	42.28	57.72

Source: Social Consumption: Health Survey.

Provider Choice Varying across the Regions

Since the focus of the study is to look into the regional variation in provider choice, I have looked into the shares of cases treated across the type of facilities across the regions.

Outpatient Cases

The share of ailment episodes being treated in public hospital is the highest in the north-eastern zone with 46 per cent, followed by the Southern, central and east zones. The shares are much lower at 23 per cent and 25 per cent in the Northern and the Western zones respectively. The share of cases receiving treatment in private hospitals is the highest in the Southern zone and the share is much higher than other zones. The shares are very low at five per cent and eight per cent in east and north-east regions, respectively. The share for private clinics is the highest in the Eastern zone, followed by north, west, north-east and central and the share is the lowest in the Southern zone (Table 2).

Inpatient Cases

The share of patients visiting public hospitals is the highest in north-eastern region and the share is much higher in comparison to other regions. The next highest share of patients visiting public hospitals is in the Eastern region, followed by the central region. The share is the lowest in the Western region, followed by the Southern region (Table 2).

Table 2: Provider Choice across Different Regions in Outpatient Cases

	North	Northeast	Central	East	Western	Southern
Outpatient Cases						
Public	22.56	46.37	34.59	32.17	25.27	36.72
Private hospital	20.3	8.38	21.39	4.82	26.76	41.18
Private clinic	57.14	45.25	44.02	63.01	47.97	22.1
Inpatient Cases						
Public	37.53	80.98	48.42	61.87	25.19	35.82
Private hospital	62.47	19.02	51.58	38.13	74.81	64.18

Source: Social Consumption: Health Survey.

Supply-Side Conditions

When asked about the reasons for not availing government resources, among largest percentage of cases of all the regions, the reason had been unavailability of specific services, unsatisfactory services, doctor unavailable, facility too far and involves long waiting which can all be termed as supply-side bottlenecks in health infrastructure in case of both outpatient and inpatient cases. However, the situation differs moderately across the regions. These supply-side difficulties explain the highest share of cases in the Northern region and the lowest in case of north-eastern region in case of outpatient cases while in case of inpatient cases, the highest in central and the Northern regions and the lowest in the north-eastern region. The preference for a trusted doctor/hospital is the next significant reason for not availing government resources in both for outpatient and inpatient cases (Table 3). Also free medical services offered from government, is the lowest in case of the Northern zone in case of outpatient services and in the Western region in case of inpatient services (Table 4).

Table 3: Reasons for Not Availing Government Resources across the Regions in Inpatient and Outpatient Cases

	North	Northeast	Central	East	Western	Southern
Outpatient cases						
required specific services not available/ available but quality not satisfactory/doctor not available/ quality satisfactory but facility too far/ quality satisfactory but involves long waiting/ financial constraint	71.71	53.74	61.3	59.68	58.75	62.3
preference for a trusted doctor/hospital	0.55	0.45	0.14	1.08	0.46	0.11
others	22.78	24.3	31.89	31.12	36.13	33.18
Inpatient cases	4.97	21.51	6.66	8.11	4.67	4.4
required specific services not available/ available but quality not satisfactory/doctor not available /quality satisfactory but facility too far/ quality satisfactory but involves long waiting/ financial constraint	74.89	51.82	75.28	70.78	68.33	70.33
preference for a trusted doctor/hospital	0.07	4.3	0.69	0.19	0.47	0.07
others	21.01	33.8	14.8	23.73	25.74	23.83
	4.03	10.08	9.23	5.31	5.45	5.77

Source: Social Consumption: Health Survey.

Table 4: Availability of Any Free Medical Service in Government Hospitals across the Regions in Case of Inpatient Services

Whether any medical service offered free in government hospitals	North	Northeast	Central	East	Western	Southern
Outpatient cases	18.17	34.98	30.54	24.25	20.22	33.15
Inpatient cases	34.68	73.04	46.59	59.31	23.3	35.14

Source: Social Consumption: Health Survey.

The average number of sub-centres, primary health centres and community health centre per one lakh population reveals that the number of sub-centres is the highest in central zone followed by the number in the North-eastern zone. The number of sub-centres is much lower in other zones. The number of primary-health care centres is the highest in north-eastern zone followed by central zone and the Southern zone. The number is much less in other zones. The number of community health centers is highest in the north-eastern zone followed by central zone. In case of CHCs too, the number is much lower in other zones (Table 5).

Table 5: Public Health-Care Facilities at State-Level

	Sub-centre (Total) per one lakh population	PHCs (Total) per one lakh population	CHCs (Total) per one lakh population
Northern zone			
Chandigarh	0.00	4.55	0.19
Delhi	1.54	3.25	0.14
Haryana	10.32	1.91	0.52
Himachal Pradesh	30.65	8.57	1.34
Jammu & Kashmir	21.77	8.01	0.67
Punjab	10.98	1.90	0.56
Rajasthan	19.74	3.61	0.90
Uttarakhnad	18.31	2.92	0.67
Uttar Pradesh	10.40	1.74	0.36
Total	12.72	2.56	0.51
North-Eastern zone			
Assam	15.00	3.21	0.62
Arunachal Pradesh	26.23	8.96	4.34
Manipur	14.64	3.26	0.60
Meghalaya	14.93	4.82	0.94
Mizoram	33.72	5.92	0.82
Nagaland	20.98	6.92	1.06
Tripura	27.25	3.05	0.60
Sikkim	25.06	4.09	0.33
Total	17.13	3.72	0.77
Central zone			
Chhattisgarh & Madhya Pradesh	21.75	3.18	0.69
Total	21.75	3.18	0.69
Eastern zone			
Bihar	9.88	1.95	0.06
Jharkhand	11.66	1.06	0.54
Orissa	15.93	3.28	0.91
West Bengal	11.35	1.50	0.38
Total	11.53	1.90	0.36

	Sub-centre (Total) per one lakh population	PHCs (Total) per one lakh population	CHCs (Total) per one lakh population
Western zone			
Dadra & Nagar Haveli and Daman & Diu	16.53	2.21	0.68
Goa	14.95	4.05	0.41
Gujarat	15.16	2.97	0.60
Maharashtra	9.48	2.38	0.37
Total	11.51	2.60	0.45
Southern zone			
Andhra Pradesh & Telangana	10.83	2.12	0.43
Karnataka	15.44	4.15	0.34
Puducherry	6.49	3.13	0.32
Tamil Nadu	12.08	2.61	0.55
Andaman & Nicobar Islands	32.58	7.09	1.05
Lakshadweep	17.06	6.20	4.65
Total	12.54	2.86	0.45

Source: Rural Health Statistics 2019-2020, Ministry of Health and Family Welfare, Government of India, New Delhi

The average number of public health facilities with the number of workers is less than five, is highest in central zone. The number is much less in other zones. The number of private healthcare facilities with less than five workers is the lowest in North-eastern zone. The number is much higher in other zones. The average number of public health facilities with the number of workers higher than five per one lakh population, is highest in North-eastern zone with the number being 3.4. In all other zones, the number is less than 1.5. The average number of private health facilities with the number of workers more than five per one lakh population, is highest in the Western zone, followed by the Southern zone. The number is much less in other zones.

So the numbers say that the public health facilities are higher in both central and north-eastern zones compared to other zones. However, in case of central zone the number of private facilities is also not less unlike the case of the North-eastern zone. The number of private health facilities is much higher in the Western and the Southern zones compared to other zones. The high usage of public facilities for both outpatient and inpatient cases in the North-eastern region is possibly associated with the high number of public facilities available there. Also the highest share of private hospitals in treating inpatient cases in the Western region being followed by the Southern region and the highest share of outpatient cases being in private hospitals in the Southern region might be associated with the high number of private facilities in those regions.

Table 6: Public and Private Health Care Facilities according to Size (no. of Workers) across States

	No. of workers equal to or less than 5		No. of workers greater than 5	
	Public	Private	Public	Private
Northern zone				
Chandigarh	0.76	2.75	0.57	2.94
Delhi	0.81	5.31	0.85	4.06
Haryana	4.00	17.19	1.42	4.01
Himachal Pradesh	26.08	11.03	4.40	2.46
Jammu & Kashmir	35.32	11.86	3.52	1.01
Punjab	7.10	32.60	2.01	5.28
Rajasthan	15.11	19.86	2.37	2.43
Uttarakhnad	14.59	8.90	2.23	2.97
Uttar Pradesh	2.96	13.79	0.58	1.77
Total	7.34	15.90	1.31	2.44
North-Eastern zone				
Assam	6.03	3.40	2.95	1.87
Arunachal Pradesh	9.68	10.98	6.07	1.81
Manipur	7.56	6.16	2.98	2.84
Meghalaya	9.50	3.88	4.28	1.82
Mizoram	5.56	7.93	6.56	3.01
Nagaland	8.49	7.18	6.37	2.93
Tripura	15.84	3.02	3.10	0.57
Sikkim	18.67	9.01	4.59	0.98
Total	7.52	4.15	3.40	1.89
Central zone				
Chhattisgarh & Madhya Pradesh	14.83	18.98	1.36	1.51
Total	14.83	18.98	1.36	1.51
Eastern zone				
Bihar	1.62	12.79	0.37	1.04
Jharkhand	5.47	12.63	0.68	1.25
Orissa	8.73	10.75	1.47	1.59
West Bengal	4.05	11.43	1.64	2.00
Total	4.01	12.00	1.01	1.47
Western zone				
Dadra & Nagar Haveli and Daman & Diu	1.02	21.98	0.17	3.58
Goa	7.40	4.18	2.81	7.13
Gujarat	2.20	13.98	1.03	4.05
Maharashtra	4.12	30.26	1.50	5.69
Total	3.47	24.39	1.34	5.12
Southern zone				
Andhra Pradesh & Telangana	5.23	18.77	1.23	5.16
Karnataka	4.07	26.83	1.88	4.72
Puducherry	7.69	52.89	3.77	9.22
Tamil Nadu	3.25	12.37	0.95	2.96
Andaman & Nicobar Islands	29.43	8.93	10.25	4.47
Lakshadweep	7.76	4.65	10.86	3.10
Total	4.31	19.08	1.35	4.33

Source: Economic Census, 6th Round.

Regression Analysis

Belonging to urban areas increases the likelihood of visiting private hospitals and private clinic with reference to public hospitals. In case of the regions, the Southern region is taken as the reference category. In case of seeking outpatient care, visiting a private hospital is less likely than visiting a public hospital in all the regions. Belonging to the Eastern region and north-east region makes visiting private hospitals least likely than visiting a public hospital. Belonging to the Western and central regions increases the likelihood of visiting private hospitals. In case of visiting private clinic for outpatient services, the likelihood is highest for the Northern region, followed by the Eastern, the Western and then central regions. In case of inpatient cases, the likelihood of visiting private hospital is higher only in the Western region when the reference category is the Southern region. In all other regions, the likelihood of visiting private hospital for seeking inpatient care is less likely than the Southern region. Belonging to the north-eastern region makes it least likely to seek service from private hospitals, followed by the Eastern region. Among the regions other than the Southern region, belonging to the Northern region makes it most likely to seek service from private hospitals, followed by the central region.

In case of outpatient services, as the seriousness of illness intensifies, the likelihood of visiting private clinics in comparison to public hospitals increases. In case of both: the non-communicable diseases and injuries, in comparison to communicable diseases, the likelihood of visiting private hospital increases with the frequency being higher in case of injuries in both outpatient and inpatient services. The likelihood of visiting private clinics is less compared to visiting public hospitals in case of non-communicable diseases with reference to communicable diseases in outpatient services. Belonging to the uppermost expenditure quintile increases the likelihood of visiting private hospitals or private clinics in outpatient cases and increases the likelihood of visiting private hospitals for inpatient cases, in comparison to visiting public hospitals. The likelihood of visiting private hospitals and private clinics in comparison to visiting public hospitals declines for ST, SC, and OBCs consecutively, in comparison to other castes. The likelihood of seeking service from private hospitals rather than from public hospitals, declines in case of others in comparison to currently married ones. The likelihood of visiting private clinic declines for other age-groups in comparison to 0-14 years in outpatient services. In case of private hospitals, the result is significant only in case of those above 60 years and the likelihood declines in comparison to those in 0-14 years of age in outpatient services. Also, the likelihood of visiting private hospitals is less for all other age-groups other than those in 0-14 years for inpatient services. As the education level of the highest educated family member increases to middle school, secondary and higher-secondary and above, the likelihood of visiting private hospital increases for both outpatient and inpatient services. In case of private clinics, the likelihood increases for graduates, post-graduates and above, in comparison to those in 0-14 years for

outpatient cases. In case of inpatient services, coverage of government-sponsored insurance schemes decreases the likelihood of seeking service from private hospitals, with reference to those without any insurance coverage at all. Coverage of other insurance schemes like employer-provided ones, purchased from private insurance companies increases the likelihood of seeking healthcare services from private hospitals.

Table 7: Results from Multinomial Logit Model for Outpatient and Inpatient Services

Public hospital (Base outcome)	Outpatient cases				Inpatient cases	
	Private hospital		Private clinic		Private hospital	
	Relative risk ratio	p> |z|	Relative risk ratio	p> |z|	Odds ratio	p> |z|
Urban (where rural is the reference category)	1.04	0.6	1.04	0.6	0.9	0.01
Region (with the southern India being the reference category)						
North	0.87	0.14	3.41	0.00	0.92	0.14
North-East	0.18	0.00	1.46	0.08	0.14	0.00
Central	0.68	0.047	2.06	0.00	0.73	0.00
Eastern	0.13	0.00	3.07	0.00	0.36	0.00
Western	0.82	0.04	2.59	0.00	1.6	0.00
Seriousness of illness (ill being the reference category)						
Restricted activity	1.08	0.46	1.4	0.001		
Confined to bed	1.05	0.51	1.23	0.002		
Ailment category (with communicable diseases being the reference category)						
Non-communicable diseases	1.46	0.00	0.77	0.001	1.34	0.00
Injuries	2.13	0.00	0.93	0.69	1.4	0.00
Expenditure-quintiles (quintile 1 being the reference category)						
Quintile2	0.97	0.87	1.28	0.03	0.99	0.92
Quintile3	1.1	0.45	1.12	0.27	1.07	0.35
Quinitle4	1.25	0.11	1.21	0.09	1.15	0.06
Quinitle5	1.63	0.00	1.58	0.00	1.54	0.00
Gender (Male being the reference category)	0.96	0.56	1.07	0.25	0.98	0.64
Social group (others being the reference category)						
ST	0.6	0.00	0.54	0.00	1.45	0.00
SC	0.62	0.00	0.7	0.00	2.2	0.00
OBC	0.68	0.00	0.81	0.00	2.25	0.00
Relation to head(Head/spouse of head being the reference category)	1.00	0.98	1.09	0.34	1.1	0.16
Marital status (Currently married being the reference category)	0.79	0.00	0.95	0.56	0.98	0.67
Age-group(0-14 being the reference category)						
15-29 years	0.88	0.39	0.7	0.00	0.6	0.00
30-44 years	0.77	0.09	0.72	0.02	0.84	0.05
45-59 years	0.76	0.05	0.6	0.00	0.81	0.02
Above 60 years	0.7	0.00	0.55	0.00	0.81	0.01
Highest Education among the household members (with category 1 being the reference category)						

Public hospital (Base outcome)	Outpatient cases				Inpatient cases	
	Private hospital		Private clinic		Private hospital	
	Relative risk ratio	p> |z|	Relative risk ratio	p> |z|	Odds ratio	p> |z|
Literate with/without formal schooling	0.95	0.67	0.77	0.009	0.92	0.19
Below primary to middle school	0.92	0.36	1.01	0.91	0.92	0.14
Middle to higher-secondary	1.23	0.035	1.06	0.53	1.39	0.00
Graduates, post-graduates and above	1.72	0.00	1.58	0.00	2.38	0.00
Insurance(Not covered being the reference category)						
Government-sponsored	0.86	0.06	0.85	0.066	0.75	0.00
Other insurance schemes	1.03	0.82	1.09	0.46	1.66	0.00
Constant	1.13	0.55	0.92	0.67	0.73	0.027

IV Discussion

Among the demand-side factors, the choice of provider also tends to get influenced by the type of ailment, the income group and insurance coverage. The patients with non-communicable diseases and injuries are found to visit private hospitals more than public hospitals in comparison to those with communicable diseases. This might be happening due to advanced and sophisticated medical techniques available in the private hospitals to deal with non-communicable diseases and greater trust in the quality of health professionals and their services. Persons belonging to upper expenditure quintiles also avail of medical services more from private hospitals than public hospitals or private clinics. This can also be related to the higher trust in the quality of services provided by the private hospitals and higher affordability among people in upper expenditure quintiles.

Now, after controlling for the influence of demand-side factors, it is found that regional dummies are significant in north-east and the Eastern zone in case of choosing private hospitals and in all the zones except the Eastern zone in case of choosing private clinics in comparison to public hospitals. A look into the value of the coefficients would reveal that in case of the Eastern zone, visiting a private hospital is even less likely than in north-eastern zone in comparison to visiting public hospitals. In case of private clinics, although visiting a private clinic is less likely than visiting a public hospital, there is some regional variation in relative terms of likelihood. In case of the Eastern zone, the likelihood of visiting private clinic is highest in the Eastern zone followed by that in the Western zone. The likelihood is lowest in the Southern zone, followed by that in north-eastern zone. Between rural and urban areas, the urban residents are found to be more likely to visit private hospitals and private clinics in comparison to public hospitals. The influence of supply-side factors on the provider choice is evident from the regional variation in the likelihood of different providers being chosen. This is often indicative of significant regional variation in supply-side factors.

The regional variation in public health infrastructure is often the result of variation in state expenditure on health. The difference in per capita health expenditure by the states is sometimes manifold. Apart from the inter-state

variation, a much higher proportion of both central and state government resources were found to be allocated to urban-based services in comparison to rural areas. Again as the ability of the states depended on their income levels, the low-expenditure states are also the low-income states. An interesting fact in this regard is that most of these low-income states allocate a relatively higher percentage of their gross state domestic product on health compared to the high-income states, but due to the low income level, the per capita expenditure turns out to be low (Rao and Choudhury 2012) (Selvaraj and Karan 2009) (National Health Accounts, India 2004-05, 2009) (Peters, Yazbeck, Ramana, Pritchett and Wagstaff 2002).

As the results suggest existence of regional variation in supply-side factors in influencing provider choice, there are a few grave concerns, particularly in the case where dearth of public sector provision is driving patients to visit private hospitals/private clinics.

Firstly, in the current provider payment mechanism of fee-for-service system, the private healthcare providers being guided by profit motive, will tend to arrange overprovision of healthcare than medically needed. In case of both inpatient and outpatient services, for identical ailments, the average cost of treatment per episode are multiple times higher in private facilities compared to public facilities. Also medical expenditure comprised a much higher percentage of total expenditure in case of private facilities compared to public facilities. Studies have shown that for a significant number of households, regarding both inpatient and outpatient cases, out-of-pocket expenditure being the dominant source of healthcare financing, the healthcare payments had to be done through borrowings. Sometimes, in case of inpatient services, even among the insured patients, a much higher percentage of persons admitted in private hospitals needed to incur OOP expenses, compared to those in public facilities. Also the median payment was much higher for those in private hospitals than in public hospitals. Based on a nationally representative survey data in 2004, it is found that expenses for outpatient treatment is even more impoverishing than inpatient expenditure involving relatively small but more frequent payments. During the recent years, there has been a shift of the government from the provision of free healthcare, to focusing on extending insurance coverage with giving more space to the private sector for the provision of healthcare. Now this shift in policy of greater reliance on public-funded private delivery system, would impose financial burden on the government health budget too, along with the households' budget. Although the insurance schemes majorly cover inpatient expenses, a few of them like CGHS also cover some outpatient services. Thus the financial burden on government budget would intensify due to both inpatient and outpatient services. Thus it will be a critical challenge for the government to take care of the competitive dynamics between public and private sector and to see that the public sector facilities are not deprived of resources which are given to the private sector as subsidies (Dutta and Choudhuri 2020) (Berman, Ahuja and Bhandari 2010) (Singh, *et. al.* 2018) (Nandi, Schneider and Dixit 2017) ((Basu, Andrews, Kishore, Panjabi and Stuckler 2012) (Ghosh 2011).

While analyzing the wide variation in inter-state differential in OOP healthcare spending in India, the importance of socio-economic factors are often highlighted. In case of high spending states, specially the high income level is often found to be a more significant explaining factor of OOP expenses among households, than in case of low-spending states (Dwivedi and Pradhan 2017). The effect of increase in state-level public health spending has been a decline in mortality probability rate, across all age-groups (Farahani, Subramanian and Canning 2010). The high-income states with higher per capita government expenditure on medical and public health provides better per capita availability of health personnel and physical infrastructure, improving healthcare utilization and health outcomes. In states with low public health spending, availing treatment, for both in inpatient and outpatient services, imposes higher financial burden on the households compared to those in states with high public health spending. Finally the states with low public healthcare spending face a higher burden of diseases, low life expectancy and higher mortality rate (Purohit 2004).

Apart from the high medical inflation in the private healthcare market, another concern is the quality of services by the private providers. Due to the heterogeneous growth of the private sector in India, various kinds of private providers like formal and informal, for profit and not-for-profit corporations, small, medium and large corporates came into existence. The share of Own Account Enterprises (OAEs), run by individual practitioners had been around 71.3 per cent, being the dominant healthcare provider in India. They generally provide outpatient services. It has been observed that majority of the qualified solo practitioners serve the urban areas, whereas the unqualified ones cater to the rural areas. The practitioners also include those who either have dubious qualifications or no qualifications at all, sometimes spouses of the doctors who substitute while the doctor is away and sometimes sons/daughters inheriting the medical practice from their parents. Along with this, a mushrooming growth of private hospitals is also witnessed in metropolitan cities (George, Shah and Nandraj 1993) (Kumar S. 2015) (Group 1997) (Rama 1998) (Kabra and Patni 1991) ((Duggal, Nandraj and Vadair 1995) (Kumar, Patel Bella and Prasad 1992) (Yesudian 1994) (Viswanathan and Rohde 1990) (Jesani and Anantharam 1993). However, the common belief of the private sector providing high quality of services, has been refuted by many studies. In a survey conducted in Andhra Pradesh, it was found that there was almost no difference in waiting time between private hospitals and public hospitals. The satisfaction regarding interpersonal communications and cleanliness was better for private facilities than for public facilities. The results from patient interviews show that the level of overall patient satisfaction was low in both the public and private facilities and similar in both the facilities. On the criteria of access, availability, interpersonal communication, infrastructure and technical aspects of care, the public facilities scored higher (Mahapatra 2003). Another study in a district of Maharashtra found that unnecessary or irrational use of drugs and injections and use of hazardous drugs were prescribed more in the private sector (FRCH, 1993). The MFC study, Bombay group, 1993, found that

many of the doctors in the private sector get angry if asked about the side-effects regarding drugs prescribed or the diagnosis and a large percentage of patients expressed dissatisfaction with the behaviour of the doctors. The group also found poor sanitary conditions and lack of adequate space in private hospitals, inadequate number of toilets, in comparison to bed numbers (Group 1993).

The regional difference in the supply-side of health infrastructure often arises because of the difference in average income levels between regions. Although in case of the public healthcare market, providers are supposed to be assigned independent of competence, in case of private providers the average competence of providers often increases from poor to rich areas. The private providers serving in poor areas were not only less trained but also at every education level they were less competent in the poor areas, compared to rich areas. However, often it is found that the poor are not choosing better providers from the public sector. The anecdotal evidence suggests that it is because of the misbehaviour the poor face in public facilities (Das and Hammer 2007).

V Conclusion

The study pointed out that provider choice gets majorly influenced by the supply-side of health infrastructure. Along with this, the literature suggests high medical costs in private healthcare which is again not being associated with increase in quality of service, cause huge burden on households' healthcare budget. Thus, there are majorly two policy recommendations - one for the long-run and one for the short-run.

The long-run policy is obviously the increased spending on public healthcare infrastructure, improve the quality of service and also deal with the regional imbalance in public health infrastructure. The public expenditure on health has been around 1.25 per cent of GDP according to the 2017-2018 budget estimates which is the lowest among the BRIC countries. The World Bank data says that the domestic general government health expenditure as a percentage of current health expenditure, is merely 27.13 per cent in 2017 leading to a very high OOP expenses, around 62.4 per cent of current health expenditure (Source: National Health Accounts, World Bank Data). Making public health services more available and accessible would ensure greater access to health care services for a larger section of population, particularly the lower income groups.

In the short run, there is an urgent need to regulate the private healthcare sector. The lack of transparency about the charges of treatment and appropriateness of treatment, has been a widely shared grievance against the private healthcare sector, and inadequate regulation is cited as a reason behind that. In as many as 16 states, there is no legislation which requires the private clinical establishments to get a license to function. In 2010, the Clinical Establishment Act was passed covering all the clinical establishments whether public or private, and all medical services by the recognized systems of medicine. This act was initially applicable in four states of Arunachal Pradesh, Himachal Pradesh, Mizoram and

Sikkim and all the union territories. The other option to not adopting this act was to enact their own state level legislation on similar lines. The need of the hour is to ensure effective implementation of the Clinical Establishment Act or similar state-specific legislations to protect the patients from the unfair and profit-motivated practices of the private healthcare market (Nandraj 2012) ((Shukla, Pawar and More 2021).

References

Aday, L.A. and R. Andersen (1974), A Framework for the Study of Access to Medical Care, *Health Service Research*, 9(3): 208-20.

Ager, A. and Katy Pepper (2005), Patterns of Health Service Utilization and Perceptions of Needs and Services in Rural Orissa, *Health Policy and Planning*, 20(3):176-184.

Babitsch, B., D. Gohl and T.V. Lengerke (2012), Re-revisiting Andersen's Behavioral Model of Health Services Use: A Systematic Review of Studies from 1998-2011, *GMS Psycho-Social Medicine*, 9: 1-15.

Balarajan, Y., S. Selvaraj and S.V. Subramanian (2011), Health Care and Equity in India, *Lancet*, V377(9764): 505–515.

Baru, R.V. (2006), *Privatisation of Health Care in India : A Comparative Analysis of Orissa, Karnataka and Maharashtra States*, CMDR Monograph Series No. 43.

Basu, S., J. Andrews, S. Kishore, R. Panjabi and D. Stuckler (2012), *Comparative Performance of Private and public Healthcare Systems in Low and Middle-Income Countries: A Systematic Review*, PLoS Med.

Berman, P., R. Ahuja and L. Bhandari (2010), The Impoverishing Effect of Healthcare Payments in India: New Methodology and Findings, *Economic and Political Weekly*, 45(16): 65-71.

Burge, P., N. Devlin, J. Appleby, F. Gallo, E. Nason and T. Ling (2006), *Understanding Patients' Choices at the Point of Referral,* Europe: Cambridge: Rand.

Černauskas, V., F. Angeli, A.K. Jaiswal and M. Pavlova (2018), Underlying Determinants of Health Provider Choice in Urban Slums: Results from a Discrete Choice Experiment in Ahmedabad, India, *BMC Health Services Research*, 18(1): 1-11.

Chatterjee, C., N.C. Nayak, J. Mhakud, and S.C. Chatterjee (2018), Factors Affecting the Choice of Health Care Utilisation between Private and Public Services among the Elderly Population in India, *The International Journal of Health Planning and Management,* 34(1): 736-751

Costa, A.D. and V. Diwan (2007), Where is the Public Health Sector?' Public and Private Sector Healthcare Provision in Madhya Pradesh, India, *Health Policy*, 84(2-3): 269–276.

Das, J. and J. Hammer (2007), Location, Location, Location: Residence, Wealth and the Quality of Medical Care in Delhi, India, *Health Affairs,* 26(3): 338-351.

Dey, D. and V. Mishra (2014), Determinants of Choice of Healthcare Services Utilization: Empirical Evidence from India, *Indian Journal of Community Health*, 26(4): 356–363.

Dilip, T. and R. Duggal (2004), Un Met Need for Public Health-Care Services in Mumbai, India, *Asia-Pacific Population Journal*, 19(2): 27-40.

Dixon, A., R. Robertson and R. Bal (2010), The Experience of Implementing Choice at Point of Referral: A Comparison of the Netherlands and England, *Health Econ Policy Law*, 5(3): 295-317.

Duggal, R. (1997), Health Care Budgets in a Changing Political Economy. *Economic and Political Weekly*, 32(20-21): 17-24.

Duggal, R., S. Nandraj and A. Vadair (1995), *Health Expenditures across States – Part II*, Regional Disparity in Expenditure.

Dutta, P. and C. Choudhuri (2020), Role of the Private Sector in Escalating Medical Inflation Evidence from 75th Round NSS Data, *Economic and Political Weekly*, 55(22): 18-21.

Dwivedi, R. and J. Pradhan (2017), Does Equity in Healthcare Spending Exist among Indian States? Explaning Regional Variations from National Sample Survey Data, *Journal for Equity in Health*, 16(1): 1-12.

Farahani, M., S. Subramanian and D. Canning (2010), Effects of State-level Public Spending on Health on the mortality prabability in India, *Health Economics*, 19(11): 1361-1376.

FRCH (1993), *Interim Report on Study of Drug Utilisation and Cost in Government Health Care Services in a district by A Phadke.*

George, A., I. Shah and S. Nandraj (1993), *A Study of Houshold Health Expenditure in Madhya Pradesh,* FRCH.

Ghosh, S. (2011), Catastrophic Payments and Impoverishment Due to Out-of-Pocket Health Spending, *Economic and Political Weekly,* 46(47): 63-70.

Group, M.F. (1993), *Patient-Provider Interface: A Public Survey,* Bombay: MFC.

Group, B.H. (1997), *Traditional Medicine Practices in Rural Tribal Areas in India,* Pune: BAIF Development Research Foundation.

Grytten, J. and R. Sorensen (2009), Patient Choice and Access to Primary Physician Services in Norway, *Health Economics, Policy and Law*, 4(Pt 1): 11-27.

Gulliford, M., J. Figueroa-Munoz, M. Morgan, D. Hughes, B. Gibson, R. Beech, and M. Hudson (2002), What Does `Access to Health Care' Mean? *Journal of Health Services Research and Policy*, 7(3): 186–188.

Gupta, I. and P. Dasgupta (2013), Health Seeking Behaviour in Urban Delhi : An Exploratory Study, *World Health and Population*, 3(2): 1-10.

Hooda, S.K. (2015), *Private Sector in Healthcare Delivery Market in India: Structure, Growth and Implications*, ISID Working Paper, 1-36.

ICF, I.I. (2017), *National Family Health Survey (NFHS-4),* Mumbai: IIPS and ICF.

Jesani, A. and S. Anantharam (1993), *Private Sector and Privatisation in Health Care Services,* A Review Paper for the ICSSR-ICMR Joint Panel on Health), Bombay: Foundation for Research in Community Health.

Kabra, S.G. and M. Patni (1991), *A Study of Growth in Health Services Provided by Private Health Care Institutions in Jaipur, Rajasthan,* Jaipur: Voluntary Health Association and Voluntary Health Association of India.

Kasthuri, A. (2018), Challenges to Healthcare in India - The Five A's, *Indian Journal of Community Medicine*, 43(3): 141-143.

Kumar, D., R. Patel Bella and C. Prasad (1992), *Study on Knowledge, Assessment and Practice of ISM Practitioners and Health Functionaries in the Context Delivery of MTP Services in Bihar and Maharashtra,* Baroda: Operations Research Group (ORG).

Kumar, S. (2015), *Private Sector in Healthcare Delivery Market in India: Structure, Growth and Implications*, ISID Working Paper, 1-36.

Mahapatra, P. (2003), Quality of Healthcare in Private and Public Health Care Institutions, *Health Policy Research in South Asia*, Chapter 13: 333-367.

Mondal, B. and J.D. Dubey (2020), Gender Discrimination in Health-Care Expenditure: An Analysis across the Age-Groups with Special Focus on the Elderly, *Social Science and Medicine,* 258.

Nandi, S., H. Schneider and P. Dixit (2017), *Hospital Utilization and Out of Pocket Expenditure in Public and Private Sectors under the Universal Government Health Insurance Scheme in Chhattisgarh State, India: Lessons for Universal Health Coverage*, PLoS One.

Nandraj, S. (2012), Unregulated and Unaccounted: Private Health Providers, *Economic and Political Weekly,* XLVII(4).

Ministry of Health and Family Welfare (2009), *National Health Accounts, India, 2004-05,* New Delhi: Ministry of Health and Family Welfare.

NCMH (2004), *National Commission of Macroeconomics and Health Report.*

---------- (2005), *Financing and Delivery of Healthcare Services in India, Healthcare Financing and Social Protection and Health Insurance in India.*

Oxfam (2009), *Blind Optimism: Challenging the Myths about Private Health Care in Poor Countries.* Oxfam International.

Patel, P.B. and S.N. Nayak (2010), Health Seeking Behaviour of Peri-Urban Community of Chandkheda, *National Journal of Community Medicine*, 1(1): 35-38.

Perianayagam, A. and S. Goli (2013), *Health Insurance and Health Care In India: A Supply-Demand Perspective,* MPRA Working Paper, 1-27.

Peters, D., A.S.Yazbeck, G. Ramana, L. Pritchett and A. Wagstaff (2002), *Better Health Systems for India's Poor: Findings, Analysis and Options,* New Delhi: The World Bank.

Pinto, L.M. and Z.F. Udwadia (2010), Private Patient Perceptions about a Public Programme: What Do Private Indian Tuberculosis Patients Really Feel About directly Observed Treatment? *BMC Public Health*, 10(357): 1-5.

Purohit, B.C. (2004), Inter-State Disparities in Health Care and Financial Burden on the Poor in India, *Journal of Health and Social Policy*, 18(3): 37-60.

Rama, B.V. (1998), *Private Health Care in India, Social Characteristics and Trends,* New Delhi: Sage Publications.

Rao, M.G. and M. Choudhury (2012), *Health Care Financing Reforms in India,* NIPFP Working paper.

Raza, W.A., E.V. Poel, P. Panda, D. Dror and A. Bedi (2015), Healthcare Seeking Behaviour among Self-Help Group Households in Rural Bihar and Uttar Pradesh, India, *BMC Health Services Research*, 16(1): 1-13.

Rohde, J. and H. Viswanathan (1995), *The Rural Private Practitioner,* New Delhi: Oxford University Press.

Selvaraj, S. and A. Karan (2009), Deepening Health Insecurity in India: Evidence from National Sample Survey since 1980s, *Economic and Political Weekly*, 44(40): 55-60.

Sengupta, A. and S. Nundy (2005), The Private Health Sector in India is Burgeoning, But at the Cost Of Public Health Care, 331(7526): 1157-1158.

Shah, U. and R. Mohanty (2010), Private Sector in Indian Healthcare Delivery: Consumer Perspective and Government Policies to promote private Sector, *Information Management and Business Review*, 1(2): 79-87.

Shukla, A., K. Pawar and A. More (2021), *Analysing Regulation of Private Healthcare in India,* OXFAM India.

Singh, T., N. Bhatnagar, G. Singh, S. Kaur, P. Thaware and R. Kumar (2018), Health-Care Utilization and Expenditure Patterns in the Rural Areas of Punjab, India, *Journal of Family Medicine and Primary Care*, 7(1): 39-44.

Statistics Division, Ministry of Health and Family Welfare (2021), *Rural Health Statistics 2019-20*, Government of India, New Delhi.

Uplekar, M. and A. George (1994), *Access to Health Care in India, Present Situation and Innovative Approaches*, Discussion Paper No. 12. Studies on Human Development in India: Foundation for Research in Community Health.

Viswanathan, H. and J.E. Rohde (1990), *Diarrhoea in Rural India, A Nationwide Study of Mothers and Practitioners, All India Summary,* New Delhi: Indian Market Research Bureau, UNICEF.

Vrangbaek, K., R. Robertson, U. Winblad, d.B. Van and A. Dixon (2012), Choice Policies in Northern European Health Systems, *Health Econ Policy Law*, 7(1): 47-71.

Yesudian, C. (1994), Behavior of the Private Health Sector in the Health Market of Bombay, *Health Policy Plan*, 9(1): 72-80.

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An Observational Study of the Determinants of Profitability in the Indian Pharmaceutical Industry

Ariful Hoque and Subhrabaran Das

This study attempts to evaluate the role of various industry-and firm-specific characteristics in determining profitability at the firm level in the Indian pharmaceutical industry. The study has utilized a balanced panel dataset of 72 listed pharmaceutical firms for the period from 1995-1996 to 2019-2020 and employed difference-GMM technique. Empirical results confirm that lagged profitability, market share, export intensity, productivity, and operating efficiency exercise a significant positive influence on firm profitability, whereas industrial concentration, imports of raw material intensity, advertising and marketing intensity, as well as leverage ratio exercise a significant negative impact. The analysis reveals that profitability in the pharmaceutical industry is driven primarily by firm-specific factors and that past profitability and market share together account for most of the variances in firm profitability. Other firm characteristics like export intensity, operating efficiency, productivity and leverage are also significant, but to a lesser extent.

Keywords: Indian pharmaceutical industry, Profitability, Industrial concentration, Total factor productivity, Liquidity, Dynamic panel

I Introduction

In the modern highly competitive business environment, sustainable corporate performance is of the utmost significance, and in order for companies to attain this goal, they must plan, execute, and sustain performance-enhancing strategies (Alarussi and Alhaderi 2018, Cyril and Singla 2020). Although both financial and non-financial measurements are used to assess a company's performance, financial metrics like growth in sales revenue, profitability, innovation, export intensity, etc. are more commonly used. Profitability is the most frequently adopted metric for measuring a firm's performance among the available financial metrics. It is a key indicator of management performance, shareholder' satisfaction, a company's investment appeal and its long-term viability (Bekmezci 2015). Profitable firms

Ariful Hoque, Assistant Professor and Head, Department of Economics, Pandit Deendaya Upadhyaya Adarsha Mahavidyalaya, Eraligool 788723, Karimganj, Assam,
Email: arifulhoque54@yahoo.com
Subhrabaran Das, Professor and Head, Department of Economics, Tripura University (A Central University), Suryamaninagar 799022, Tripura West, Mobile: +91-9401437388,
Email: subhrabaran@rediffmail.com

add value to the economy, employ workers, are more innovative and socially aware, and their tax payments benefit the entire economy. In fact, a profitable firm contributes significantly to the generation of income and overall growth and prosperity of an economy (Odusanya, Yinusa and Ilo 2018). Researchers have thus exerted considerable efforts, applying unique and sophisticated models, to identify both industry-and firm-specific drivers of firm profitability (Al-Jafari and Al-Samman 2015, Nanda and Panda 2018, Tyagi and Nauriyal 2017, Lim and Rokhim 2021, Alarussi and Alhaderi 2018).

The Indian pharmaceutical industry (IPI hereafter) has come a long way, from its infancy as a barely-existent sector in the early 1970s to its current prominence as a leading supplier of healthcare products, meeting nearly all the domestic requirements for drug formulations and roughly 70 per cent of the requirements for bulk drugs (Pradhan 2006, Das and Das 2015). The industry accounts for around two per cent of the GDP (Gross Domestic Product) of the country and provides employment directly or indirectly to around 2.7 million people across the country (Department of Pharmaceuticals 2022). Due to low-cost innovations and the availability of competent labour, the industry has transformed over the years into a global manufacturing hub for generics. With an established network of more than 10,500 production units and 3,000 pharmaceutical companies, the industry has now the highest number (741 sites) of US-FDA (Food and Drugs Administration) approved pharmaceutical plants outside the United States and 4346 ANDA (Abbreviated New Drug Application) market authorizations (FICCI 2022). The IPI is also one of the significant contributors to India's foreign exchange earnings. India's pharmaceutical exports stand at US$ 24.60 billion in 2021-2022 as against US$ 24.44 in 2020-2021 and the domestic pharmaceutical market turnover is valued at US$ 42 billion in 2021 and predicted to hit US$ 65 billion by 2024, and US$ 130 billion by 2030 (India Brand Equity Foundation 2022). Today, the industry ranks second globally in terms of volume, after China, and tenth by value with Germany, Switzerland and the United States occupying the top three positions (Comtrade 2022). Nonetheless, this significantly lower ranking in value terms reflects the fact that the IPI is predominantly a generic player, operating in the low-cost generic pharmaceuticals. It may be mentioned here that the IPI had never been primarily concerned with discovering new drugs; instead, it has traditionally depended on the lenient Indian patent laws for generic R&D efforts. Therefore, profitability in this industry is mainly driven by manufacturing and sale of cheap but high-quality pharmaceutical products. The industry kept growing steadily due to its sizable domestic market and export competitiveness. However, with the introduction of Patent (Amendment) Act of 2005, which rendered the IPI fully TRIPS-compliant, the operational milieu for the industry has experienced a substantial alteration. Given the fact that an industry's viability and expansion depend on its ability to generate profits and that a profitable industry is a major source of employment, income, growth and prosperity for an economy as a whole, what makes firms profitable in an industry is of the utmost concern.

II Literature Review

In the contemporary literature of industrial organization, there are two ways to look at how profitable a firm is; the Structure-Conduct-Performance (SCP) model and the resource-based or firm effect model. According to the SCP model, the degree of concentration in a given industry is the primary factor that drives the firms' behaviour and their profitability. Greater concentration encourages collusion and the colluding firms charge above competitive prices which can result in higher profits (Bain 1965). The model also posits that firms can earn above normal profits through product differentiation even in less concentrated industries. The SCP model, thus, emphasizes factors of profitability at the industry level, like entry and exit barriers, concentration, product differentiation or economies of scale (Scherer and Ross 1990, Worthington and Rees 2001, Goddard, Tavakoli and Wilson 2005). The firm effect model, on the other hand, focuses on firm-specific characteristics when determining firm profitability. The model contends that firms are heterogeneous and that inter-firm differences in efficiency, productivity and managerial competency create variations in profitability across firms. In fact, Demsetz's (1973) superior firm hypothesis asserts that inter-firm productivity differences are the major cause of profit heterogeneity across firms. Firms with higher productivity are more profitable than their less productive counterparts. Peltzman (1977) argues that high firm profitability and high market concentration are caused by differences in productivity levels. Jovanovic (1982) contends that only efficient firms are able to remain competitive and continue operating in the market, while inefficient firms go out of the business. Based on the preceding arguments, a substantial body of empirical research has examined the role of industry-and firm-specific characteristics in predicting profitability of firms (McGahan and Porter 2002, McGahan 1999, Slade 2004, Stierwald 2010). The findings of these studies support both the SCP and the firm effect hypotheses.

In the Indian context, numerous studies have also looked at how profitable Indian firms are by looking at both firm-and industry-specific variables. A few of the most important studies in this area are by Majumdar (1997), Bhayani (2010), Singla (2012), Nanda and Panda (2018) and Cyril and Singla (2020). Concentrating on the literature in the context of IPI, it is observed that there are some studies that have explored profitability determinants of Indian pharmaceutical firms (Mazumdar 2013, Tyagi and Nauriyal 2016, 2017). However, these studies have utilized static panel approach to identify the determinants of firm profitability.

The study is significant for the following reasons. *First*, there are ample numbers of studies available on firm profitability. However, the role of productivity as a determinant of firm profitability has received very little attention. This study adds to the limited literature in this direction. In this study, firm-specific measures of total factor productivity (TFP) have been included in the profitability model. As far as we know, this is the first study on IPI that estimates a profitability model by incorporating firm-level measures of TFP. *Second*, studies available on

the IPI have applied static panel approach to analyze profitability determinants of pharmaceutical firms. In this study, instead of using a static model, the dynamic panel estimation method is used, which addresses heteroskedasticity and endogeneity issues, yielding more robust and reliable results.

III Objectives

The main objectives of the present study are mentioned in the following

- To examine the trend and growth in profitability across different firms in the Indian Pharmaceutical Industry.
- To find out the determinants of firm level profitability in the Indian pharmaceutical industry.

IV Data and Methodology

Data Source

The primary source of data for the present research is Prowess IQ database, maintained by the CMIE (Centre for Monitoring Indian Economy). The sample comprises of firm level data of 72 BSE (Bombay Stock Exchange) listed pharmaceutical firms in the IPI for the period 1995-1996 to 2019-2020. The study period is divided into two sub-periods viz., 1995-1996 to 2004-2005 (Pre-patent period) and 2005-2006 to 2019-2020 (Post-patent period). The sample firms account for an average of 63 per cent of the overall profit earnings of the IPI, and their share of total profit ranges between 51.16 and 82.92 per cent during the sample period. Pharmaceutical firms for which consistent data are available are considered for the study. Thus, the final sample is a balanced panel of 72 firms with 1800 observations.

Methodology

The baseline model for firm profitability takes the following form

$$\pi_{it} = \alpha + \beta X_{it} + u_i + \varepsilon_{it} \quad \ldots(1)$$

The dynamic profitability model is given by

$$\pi_{it} = \alpha + \gamma \pi_{it-1} + \beta X_{it} + u_i + \varepsilon_{it} \quad \ldots(2)$$

Where, π_{it} denotes profitability (measured in term of ROA and NPM) of *i*-th firm in *t*-th time period. π_{it-1} indicates profitability of *i*-th firm in $(t-1)$ period. It is a regressor in the dynamic model that represents the effects of a firm's past profit earnings on its current profitability. The vector X contains the regressors (defined

in Table 1). The parameters to be estimated are α, β and γ . u_i represents the unobserved firm-specific effects and ε_{it} is the usual error component; $\varepsilon_{it} \sim iid(0, \sigma^2)$.

The dynamic model, as given in equation (2), has two significant estimating issues. First, including the lagged dependent variable in the regressors causes autocorrelation in the model. Second, the presence of firm-specific effects $[u_i]$ (Baltagi 2005). Since $\pi_{it-1}$is likely to be correlated with the error term, using traditional estimators like OLS, fixed or random effects to estimate the model give biased and inconsistent results (Schultz, Tan and Walsh 2010). Therefore, equation (2) is estimated using the GMM (Generalized Method of Moments) technique given in Arellano and Bond (1991). Using a differencing transformation, the GMM estimator eliminates firm-specific effects u_i from equation (2) resulting in a model that can be estimated using instrumental variables. The Sargan test is used in order to choose an acceptable set of instruments. In addition, it is an absolute necessity for the GMM that the error component does not have any autocorrelation of the second-order; otherwise, the estimated standard errors will grow without bound (Roodman 2009).

Dependent and Independent Variables

Dependent Variable: Profitability of the firms, measured in terms of ROA (Return on Asset) and NPM (Net Profit Margin), is taken as the dependent variable for the present analysis. While ROA assesses how effectively a firm makes use of its resources to generate profits, NPM reflects the amount of profit that a firm is able to extract from its total sales. A number of studies (Mazumdar 2013, Tyagi and Nauriyal 2017, Nanda and Panda 2018) have considered NPM to measure profitability, while others have taken ROA (Goddard, *et. al.* 2005, Alarussi and Alhaderi 2018, Cyril and Singh 2020, Lim and Rokhim 2021). Thus, in accordance with the previous literature, both NPM and ROA are considered as measures of profitability of firms operating in the IPI.

Independent Variables: The descriptions and justifications of the explanatory variables are discussed as under

Leverage: Financial leverage indicates the proportion of a firm's total liabilities to its total assets. According to the Packing Order hypothesis, leverage and profitability are inversely associated, and competitive firms prefer internal finance over external debt (Myers 1984). While some studies have found that leverage ratio positively affects firm profitability (San and Heng 2011), others have found that it has a negative impact (Mazumdar 1997, Nanda and Panda 2018, Tyagi and Nauriyal 2016). Thus, based on earlier works, it is expected that leverage and profitability are inversely related. Financial leverage is calculated as the ratio of a firm's total debt to its total assets.

Liquidity: A firm's ability to quickly turn an asset into cash is referred to as liquidity. Several studies support a positive liquidity-profitability association because a firm with a high proportion of liquid assets is less susceptible to unanticipated balance sheet adjustments. Thus, a firm with significant liquidity is less likely to fail to meet its short-term financial obligations (Goddard, *et. al.* 2005, Owolabi and Obida 2012, Lim and Rokhim 2021). Others have argued that a firm's profitability will suffer if it maintains too much cash on hand, since those reserves would be better off if invested elsewhere (Bhayani 2010, Goel, Chadha and Sharma 2015). On the basis of the analysis, it is expected that liquidity and profitability are positively related.

Market Share: A firm's market share shows its relative size and market power. The SCP paradigm postulates a direct market share-profitability relationship on the argument that large firms with greater market dominance have a tendency to engage in anti-competitive actions, which allow them to make abnormal profits (Eckard 1995). Alternatively, firms with greater market share might benefit from product differentiation and generate higher profits as a result of lower break-even points (Shepherd 1972, Nagarajan and Barthwal 1990). Thus, numerous researches have established a positive market share-profitability relationship (Goddard, *et. al.* 2005, Mazumdar 2013, Tyagi and Nauriyal 2017). A firm's market share is calculated by dividing its total sales by the total industry sales.

Export Intensity: Openness allows a firm to increase its profits by becoming globally competitive. Wagner's (2007) "learning by exporting" hypothesis posits that exporters with higher productivity enjoy greater profitability. Several previous studies have found that export intensity and profitability are positively associated (Wagner 2012, Majumdar 1997, Vogel and Wagner 2011, Mazumdar 2013, Tyagi and Nauriyal 2017). However, the nature of this relationship is found to be inconclusive by a few scholars (Kongmanila and Takahashi 2009). A firm's export intensity is measured by dividing its total export earnings by its total sales.

Imported Raw Materials Intensity: There have only been a few studies that have looked at how raw material imports affect a firm's performance and profitability (Majumdar 1997, McDonald 1999). Firms that import raw materials are expected to produce high-quality products, which will have a positive impact on profitability (Lall 1986). However, a firm must spend more to import excellent raw materials, which reduces its profitability (Mazumdar 2013). Moreover, greater import intensity is also indicative of lower entry barriers (Tyagi and Nauriyal 2016, 2017). Based on the analysis, it is expected that imported raw materials intensity and profitability are inversely related.

R&D Intensity: Commonly, R&D expenses are perceived as investments in intangible asset. R&D enables firms to reap the benefits of uniqueness and innovation (Scherer 2001, Nagarajan and Barthwal 1990). Several studies have

contended a positive relationship between R&D and profitability (Jaisinghani 2016, Tyagi and Nauriyal 2016, 2017). Few researches have also indicated a negative R&D-profitability relationship (Mazumdar 2013). It is expected that R&D intensity will exercise a positive impact on firm profitability. Since R&D benefits are only realized after a given time, following the major focus on the literature, a 1-year lag in R&D is considered (Jaisinghani 2016).

Advertising and Marketing Intensity: Advertising and marketing prevent new competitors from entering the market and act as a source of product differentiation, both of which increase sales and revenue (Bain 1951, Comanor and Wilson 1972). Advertising and marketing play an important role in acquiring a competitive edge over present and potential competitors, thereby enabling firms to make super-normal profits (Erickson and Jacobson 1992). Several previous studies have found that advertising intensity and profitability are positively related (Shepherd 1972, Bhagwat and DeBruine 2011). Based on the analysis, a positive relationship between advertising and marketing intensity and profitability is expected.

Productivity: Demsetz's (1973) superior firm hypothesis asserts that inter-firm differences in the levels of productivity are the main cause of profit heterogeneity across firms. Therefore, the more productive a firm is, the more profitable it will be. Numerous studies support the notion that only efficient firms thrive and remain in the market, whereas less productive firms shrink and eventually disappear (Peltzman 1977, Jovanovic 1982, Stierwald 2010). Thus, in the light of the earlier works, it is expected that productivity will have a positive impact on firm profitability. In order to estimate total factor productivity (TFP) of the sample firms, a Cobb-Douglas production function has been considered with a single output and four-input framework. From the estimated production function, TFP is calculated by using equation (3) as the actual minus predicted output.

$$\mathrm{Ln}(\mathrm{TFP}_{it}) = \mathrm{Ln}(\mathrm{Y}_{it}) - \hat{\gamma}_1\,\mathrm{Ln}(\mathrm{L}_{it}) - \hat{\gamma}_2\,\mathrm{Ln}(\mathrm{K}_{it}) - \hat{\gamma}_3\,\mathrm{Ln}(\mathrm{M}_{it}) - \hat{\gamma}_4\,\mathrm{Ln}(\mathrm{E}_{it}) \ldots(3)$$

Where, Ln is the natural logarithm. Y, L, K, M and E respectively denote deflated output, labour, capital, material and energy input, and $\hat{\gamma}_1, \hat{\gamma}_2, \hat{\gamma}_3$ and $\hat{\gamma}_4$ are their estimated coefficients.

Operating Efficiency: Operating efficiency reflects management competence. Financial ratios can be used to quantify the qualitative aspects of managerial performance like quality of staff, organizational discipline, control systems etc. Asset turnover can be used to evaluate a firm's operating efficiency, as it measures how well a firm utilizes its resources to generate profits (Vijayakumar 2012). The better the asset management, the greater is the sales and profits. Several studies find a positive asset turnover-profitability relation (Bhayani 2010, Alarussi and Alhaderi 2018). This study includes fixed assets turnover ratio as a proxy for operating efficiency.

Age of the Firm: One school of thought on the topic of age and profitability holds that older and established firms reap greater financial rewards than start-ups because they are more knowledgeable, more adept at capitalizing on opportunities, and less vulnerable to the risks associated with being new in the market (Yazdanfar 2013, Hatem 2014). However, another line of research argues that older firms lose ground to newer ones because they lack the agility to quickly respond to shifting market conditions due to the bureaucratic ossification that always comes with age (Majumdar 1997). The effect of age on firm profitability, therefore, remains ambiguous.

Industrial Concentration: According to the SCP model, greater market concentration results in higher profitability since it makes collusion and the abusive use of market power by dominant firms more likely (Bain 1951). A number of studies support a positive concentration-profitability relationship (Jeong and Masson 1990, McDonald 1999, Resende 2007). However, relatively fewer studies support a negative concentration-profitability relationship (Mazumdar 2013). The extent of concentration within the IPI is measured by the HHI (Herfindahl Hirschman Index), which is calculated using the following formula

$$\text{HHI} = \sum {s_i}^2 \text{, where, } s_i = \frac{\text{i} - \text{th firm sales}}{\text{Total industry sales}}$$

Stronger Patent Regime: It is possible that the more stringent patent regime will have a favourable impact on the profitability of pharmaceutical firms. The introduction of Patent (Amendment) Act of 2005 and its subsequent impacts on R&D, innovations, management competence and competitiveness are expected to offer new markets and business prospects for pharmaceutical firms. However, the new product patent will also have a detrimental effect on profitability as it may prevent firms from duplicating patented drugs. In this analysis, the effect of product patent regime is accounted for by using a dummy variable, which takes the value 1 for 2005-2006 to 2019-2020 and 0 otherwise.

The dependent and independent variables considered for the present analysis are summarized in Table 1.

Table 1: Summary of the Dependent and Independent Variables

Variable	Symbol	Description
Dependent Variable		
Return on Asset	ROA	Net profit divided by total assets of the firm
Net Profit Margin	NPM	Net profit divided by total sales of the firm
Independent Variable		
Firm-Specific Variables		

Variable	Symbol	Description
Market Share	MS	A firm's total sales divided by the aggregate industrial sales
Export Intensity	ES	Export sales divided by total sales turnover of the firm
R&D Intensity	RDS	Expenses on R&D divided by total sales (one period lag is considered)
Imported Raw Materials Intensity	IRMS	Expenses on raw material imports divided by total sales revenue
Advertising and Marketing Intensity	AMS	Advertising, marketing and selling expenditure divided by total sales turnover
Leverage	LR	Ratio of total debt of a firm to its total assets
Liquidity	LIQ	Current ratio (ratio of current asset to current liabilities)
Productivity	TFP	Arrived at by estimating Cobb-Douglas production function
Operating Efficiency	OE	Fixed asset turnover ratio (net sales of a firm scaled by its total fixed assets)
Firm's Age	AGE	Number of years since inception of a firm in BSE
Industry-Specific Variables		
Industrial Concentration	HHI	Sum of squares of sales share of a firm in aggregate industrial sales
Stronger Patent Regime	TD	Time dummy variable, taking the value 1 for 2005-06 to 2019-20 and 0 otherwise

Source: Authors' compilation.

V Empirical Results

Profitability Analysis of Indian Pharmaceutical Industry

The Indian Patent (Amendment) Act of 1970 marked the beginning of the modern pharmaceutical sector in India. This act has substantially altered the structure of IPI by enabling domestic pharmaceutical firms to manufacture cost-effective generic versions of copyrighted pharmaceuticals through 'reverse-engineering'. The Patent Act, 1970 and other government initiatives like DPCO (Drug Price Control Order) of 1970 and FERA (Foreign Exchange Regulation Act) of 1973 have provided a favourable climate for the industry to emerge as a leading producer of healthcare products (Mazumdar 2013). The ability to reverse-engineer and imitate patented drugs without extensive R&D efforts enabled domestic firms to charge significantly lower prices than their overseas competitors and capture a substantial portion of the market. The protected era of development, however, came to an end with the introduction of Patent (Amendment) Act in 2005, which rendered the IPI fully TRIPS-compliant by introducing product patent in place of process patent. With product patent in place, domestic firms have started their own R&D activities as part of their plan to stay in business and grow, and many firms have also begun to engage in CRAMS (contract research and manufacturing services) businesses, mergers and acquisitions (M&A), outsourcing, R&D collaborations, offshore acquisitions to access new markets, and new therapeutic areas (Chaudhuri 2005, Tyagi and Nauriyal 2017). This strategic move from

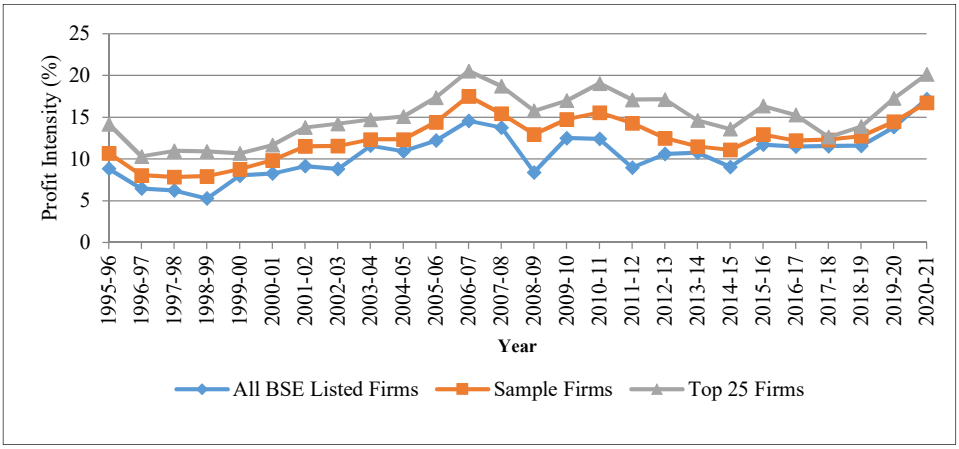
process to product patent has given such a lift to the IPI that it has become one of the most lucrative industries of Indian manufacturing.

The trends in profitability as depicted in Figure 1 show that profit intensities (profit after tax÷total sales) of the top 25 firms (selected as per their average sales revenue for the whole period) and the sample 72 firms are higher than that of all listed firms in all the years. The profit intensity of all listed firms has increased from 8.85 per cent in 1995-1996 to 17.19 per cent in 2020-2021. During the same time period, the profit intensity of the top 25 firms has amplified from 14.19 to 20.15 per cent, while that of the sample firms has risen from 10.7 to 16.75 per cent. There seems to have been a steady rise in the profit intensities of firms after 1998-99. This steady improvement may be attributed to several significant factors, including an increased emphasis on exporting of generic drugs, an increase in FDI (foreign direct investment), off shore acquisitions, outsourcing, and CRAMS business (Ministry of Commerce and Industry 2015, Tyagi and Nauriyal 2016). There appears to be a sharp decline in firm profitability in 2008-2009, owing primarily to the global economic meltdown, which has had an adverse impact on the world demand for pharmaceutical exports. Further, the profit intensities of pharmaceutical firms fell into a precipitous downturn in post-2010, but there have been some encouraging signs of recovery since 2015-2016. This could be attributable to the National Pharmaceutical Policy (NPP) of 2012 as well as the New DPCO of 2013, both of which have contributed to the margin erosion of vital pharmaceutical products. The steep hike in profit intensities of firms in post-2018 could be ascribed to the outbreak of COVID-19 pandemic, which provided opportunities for increased pharmaceutical exports due to a sudden increase in global demand for Indian vaccines and generics. Despite a sharp decline of 1-2 per cent in the global pharma market, India's export of pharmaceuticals have grown by 18.19 per cent in 2020-2021, the highest growth in exports during the last eight years (Ministry of Commerce and Industry 2022). Increased FDI in this sector is also a contributing factor to the industry's rising profits in recent years. The IPI has witnessed an extraordinary 200 per cent increase in FDI during 2020-2021 (Economic Survey of India 2021-2022).

As per CMIE data, the total profit earnings of all listed firms has amplified from a mere ₹10.28 billion in 1995-1996 to ₹590.59 billion in 2020-2021, registering thereby a growth rate of 18.43 per cent over the last 26 years. What makes the IPI so intriguing is the fact that an overwhelming portion of the industry is strongly concentrated within the top 25 firms, which together account for more than 60 per cent (on average) of the total profits earned by the industry. Throughout the entire study period, the sample 72 firms account for 63 per cent (on average) of the overall industrial profit. Estimates of growth rates for the pre- and post-patent periods, as given in Table 2, show that the growth rates of profit for all firms, irrespective of their classifications, are relatively higher during the pre-patent years as compared to the post-patent years. The relatively lower growth rates in the post-patent years could be attributed to factors such as increased

competition and intense price pressure from MNCs, growing R&D along with manufacturing costs, and stringent regulatory barriers like the USFDA.

Figure 1: Comparison of Profit Intensities of Firms in the IPI



Source: Authors' compilation based on CMIE Prowess IQ data, 2022.

Table 2: Growth Rates (%) of Total Profits in the IPI

Period	All BSE Listed Firms	Sample 72 Firms	Top 25 Firms
1995-96 to 2004-05 (Pre-patent period)	22.12*	24.19*	29.35*
2005-06 to 2020-21 (Post-patent period)	14.49*	11.48*	14.46*
1995-96 to 2020-21 (Entire period)	18.43*	17.53*	21.11*

Notes: Growth rate is calculated by using a semi-log trend equation $lnY_t = \alpha + \beta t + u_t$; * indicates significant at $p < 0.01$.

Source: Authors' calculation based on CMIE Prowess IQ data, 2022.

Determinants of Firm Profitability

Summary Statistics

Table 3 presents the descriptive statistics of the variables considered for the present study over the period 1995-1996 to 2019-2020. The mean (median) value of NPM for the sample firms is 5.1 per cent (5.4 per cent). The value of NPM ranges between -92.1 and 44.9 per cent, with a standard deviation of 11.9 per cent. Similarly, the sample firms achieve a mean (median) ROA of 6.1 per cent (5.7 per cent), indicating that majority of the sample firms are profitable. The descriptive statistics also show that exports account for more than one-fourth of the total revenues earned by the firms. The mean R&D expenditure of the sample firms is found to be 2.1 per cent of total sales. Besides, there is substantial variation across

sample firms with regard to other variables such as market share, firm age, productivity, liquidity and leverage.

Table 3: Summary Statistics of the Variables

Variable	Mean	Median	Std. Deviation	Minimum	Maximum
NPM	0.051	0.054	0.119	-0.921	0.449
ROA	0.061	0.057	0.084	-0.697	0.416
MS	0.007	0.002	0.012	8E-06	0.074
HHI	0.020	0.019	0.003	0.017	0.027
ES	0.268	0.184	0.264	0.000	0.993
RDS	0.021	0.007	0.039	0.000	0.865
IRMS	0.131	0.078	0.141	8E-05	0.851
AMS	0.057	0.049	0.042	0.000	0.249
LR	0.269	0.262	0.187	5E-05	0.989
LIQ	1.672	1.335	1.209	0.080	15.45
OE	4.737	3.220	4.793	0.060	0.060
TFP	2.634	2.634	0.351	1.228	5.055
AGE	31.79	26.00	20.23	1	97
TD	0.600	1.000	0.490	0	1

Source: Authors' calculation on the basis of Prowess IQ data, 2022.

Correlation Analysis

Before proceeding with the estimation, it is important to check the amount of multi-collinearity among the explanatory variables, as the presence of multi-collinearity might have damaging effects on regression results. The pair-wise correlation matrix of the independent variables is presented in Table 4. It can be observed that the coefficients of correlation are not of a magnitude that would lead to collinearity issues, and they are significant at the conventionally accepted levels. Some moderate level of correlation is found to exist between market share and R&D intensity (0.33), TFP and market share (0.47), leverage and liquidity (-0.47) and between advertising intensity and firm age (0.38). The pair-wise coefficients of correlation, in all the cases do not exist 0.5. The only exception is the correlation between Herfindahl index and time dummy (-0.75). However, the suggested rule of thumb is that multi-collinearity be considered problematic whenever the coefficient of correlation between two regressors is greater than 0.80 (Gujrati 2006). Therefore, the presence of multi-collinearity is not a serious issue for the present analysis.

Table 4: Correlation Matrix of the Independent Variables

Var.	MS	HHI	ES	RDS	IRMS	AMS
MS	1					
HHI	0.02	1				
ES	0.17 *	-0.08 *	1			
RDS	0.33 *	-0.09 *	0.12 *	1		
IRMS	0.03	-0.01	0.34 *	0.12 *	1	
AMS	0.14 *	-0.1 ***	-0.11 *	0.04 ***	-0.36 *	1
LR	-0.13 *	0.13 *	0.09 *	-0.11 *	0.04	-0.2 *
LIQ	0.07 *	-0.08 *	-0.11 *	0.04 *	-0.1 **	0.09 *
TFP	0.47 *	-0.23 *	-0.1 ***	0.16 *	-0.01	0.25 *
OE	-0.1 **	0.05 ***	-0.24 *	-0.13 *	0.16 *	0.08 *
AGE	0.18 *	-0.24 *	-0.16 *	-0.04 ***	-0.17 *	0.38 *
TD	-0.001	-0.75 *	0.17 *	0.13 *	0.02	0.10 *

Var.	LR	LIQ	TFP	OE	AGE	TD
MS						
HHI						
ES						
RDS						
IRMS						
AMS						
LR	1					
LIQ	-0.47 *	1				
TFP	-0.23 *	0.07 *	1			
OE	-0.3 *	0.08 *	0.22 *	1		
AGE	-0.31 *	0.10 *	0.24 *	0.29 *	1	
TD	-0.18 *	0.09 *	0.26 *	-0.1 *	0.30 *	1

Note: *- $p < 0.01$; **- $p < 0.05$; ***- $p < 0.10$.

Source: Authors' calculation on the basis of CMIE Prowess IQ data, 2022.

Regression Results

The results of dynamic panel regression models with ROA and NPM as the dependent variables are presented in Table 5. It is clear that the Wald statistic, which determines whether the regressors are jointly significant, rejects the null hypothesis that there is no relationship between the variables. Since the p-value for Sargan test is insignificant, it can be concluded that the over-identifying restrictions are appropriate. It is to be worth noting that Sargan test could be unreliable if the number of instruments exceeds the number of groups. For the present case, the test is unlikely to be weakened since the number of instruments (57) does not exceed the number of firms (72). In addition, the p-values for AR (1) and AR (2) tests are 0.00 and 0.70 in Model-1 and 0.000 and 0.20 in Model-2,

respectively. First order autocorrelation is high as expected, whereas second order autocorrelation poses no concern. This provides evidence that the models have accurate specifications. Further, for a very robust analysis, the two-step GMM with Windmeijer corrected standard errors is used. Table 4 shows that the lagged values of ROA and NPM are 0.475 and 0.410, respectively, and are significant at one per cent level of significance. The results signify that past profitability of the pharmaceutical firms exert a positive influence on their current profitability. This also suggests that past profitability can serve as a foundation for continued high profits in the future. This finding is consistent with that of Goddard, *et. al.* (2005) and Jaisinghani (2016).

Table 5: Results of Arellano-Bond GMM (Two-Step) Estimation

	Dependent Variable: ROA (**Model 1**)		Dependent Variable: NPM (**Model 2**)	
Variables	Coefficients	Std. Errors (Corrected)	Coefficients	Std. Errors (Corrected)
ROA_1	0.4754235 ***	0.0728194	…	…
NPM_1	…	…	0.4100262 ***	0.0635988
MS	4.243676 ***	1.153127	3.76834 ***	1.516565
HHI	-1.25524 *	0.7250223	-1.936209 *	1.025904
ES	0.0291782 **	0.0151005	0.0228552	0.024832
RDS_1	0.0349518	0.0475455	0.0343798	0.0507994
IRMS	-0.0775926 ***	0.0232081	-0.0830896 *	0.0498227
AMS	-0.3805026 ***	0.156549	-0.7547257 ***	0.2602595
LR	-0.1392279 ***	0.0363455	-0.1183459 ***	0.0419796
LIQ	0.0030479	0.0034605	0.0138444	0.0128396
TFP	0.0319109 *	0.0181849	0.0914586 **	0.0453175
OE	0.0074182 ***	0.0027676	0.0025738	0.0030002
AGE	-0.0000756	0.000669	-0.0006276	0.0008059
TD	-0.006378	0.0070028	-0.0052448	0.0102773
Wald Test	$\chi^2(12) = 513.84$; Prob>$\chi^2 = 0.000$		$\chi^2(12) = 308.69$; Prob>$\chi^2 = 0.000$	
Sargan Test	$\chi^2(44) = 45.40574$; Prob>$\chi^2 = 0.413$		$\chi^2(44) = 46.9794$; Prob>$\chi^2 = 0.351$	
AR(1)	Z= -2.9529; *p*-Value: 0.0031		Z= -3.8261; *p*-Value: 0.0001	
AR(2)	Z=0.38144; *p*-Value: 0.7029		Z= -1.2806; *p*-Value: 0.2003	

Notes: For Arellano-Bond AR test, the null hypothesis (H_0): No autocorrelation; For Sargan test, the null hypothesis (H_0): Over identifying restrictions are valid; ***- $p < 0.01$; **- $p < 0.05$; *- $p < 0.10$.

Source: Authors' estimation on the basis of CMIE Prowess IQ data, 2022.

It is found that market share has a positive and significant effect on profitability, suggesting that growing shares of the market lead to higher profitability. The result suggests that greater market share enables firms to pursue anti-competitive practices that result in greater profits. Moreover, greater market share enables firms to reap the benefit of product differentiation. This finding of a positive market share-profitability relationship is consistent with that of Mazumdar (2013), Tyagi and Nauriyal (2017) and Jaisinghani (2016). Contrary to

general expectation, industrial concentration, calculated using the HHI, is found to be negative yet significant, in both the models. Mazumdar (2013) and Tyagi and Nauriyal (2016) have also come to the same conclusion about the profitability of IPI at the firm level. In the IPI, the value of HHI is found to be quite low and it has declined from 0.022 in 1995-1996 to 0.018 in 2019-2020. This low value of the Herfindahl index signifies cut-throat competition among firms. Indeed, 96 companies have been found to have left the market since 2004 due to the intense competition in this industry (Das and Das 2015). Further, since many new firms have also entered the industry with innovative products, competition has intensified among the incumbent firms. Therefore, as the value of concentration goes up, firm profitability declines.

As expected, the variable export intensity exercises a positive and statistically significant impact on firm profitability. This finding is in accordance with earlier researches on export intensity and profitability (Majumdar 1997, Wagner 2012, Jaisinghani 2016). The result implies that exports offer more remunerative prices than the domestic market, motivate firms to follow cutting edge production processes and improve product quality to global standards, which help them earn credibility, access more markets, and enhance profitability. In both the models, the coefficient estimate for R&D intensity is found to be positive but insignificant. The possible explanation for such an insignificant relationship may be the lagged effect in R&D. In the regression model, we have accounted for a 1-year lag in R&D variable. It is possible that R&D success may not be captured by this time lag.

The variable imported raw material intensity exercises a negative yet significant influence of profitability of pharmaceutical firms in both the models. The result is consistent with that of Mazumdar (2013) and Tyagi and Nauriyal (2016) in case of Indian pharmaceutical firms. The root cause of such a negative association is the imports of cheap bulk drugs and raw materials from China. In fact, the IPI has imported 3.9 lakh MT of bulk drugs and intermediaries worth ₹28,529 Crore in 2020-2021, with China accounting for ₹19,403 crore [i.e., 68.01 per cent of India's total bulk drug imports] (Ministry of Commerce and Industry 2022). It has also been observed that there are 58 APIs (active pharmaceutical ingredients) for which India's dependency on Chinese imports ranges from 50 to 100 per cent (Department of Pharmaceuticals 2021). Although firms can lower their production costs, by importing cheap raw materials, this raises the cost of process synthesis and other manufacturing costs, resulting in a decline in profitability. Further, high raw material intensity is also indicative of low entry barriers, which typically have a negative impact on profitability. Contrary to the popular belief, the variable advertising and marketing intensity is found to exercise a negative yet strongly significant influence on pharmaceutical firms' profitability, though consistent with the earlier study by Mazumdar (2013). One possible explanation for this seemingly surprising result is that unlike a consumer goods industry in which product differentiation acts as a barrier to entry, greater marketing and advertising expenditure increases market demand and encourages

new firms to enter the market with generics and close substitutes in the IPI. This fosters competition which ultimately leads to a decline in profitability.

In both the models, the variable TFP has a positive and significant association with profitability. The result is consistent with the findings of Stierwald (2010). It suggests that pharmaceutical firms with higher levels of productivity are also the most profitable ones. In other words, pharmaceutical firms that are comparatively more productive enjoy a competitive advantage over their less productive counterparts; the advantage is manifested in better profitability. This finding lends credence to the superior firm hypothesis, provided in Demsetz (1973). As expected, leverage exercises a negative yet significant impact on profit earning of pharmaceutical firms in both the models, and the result is in accordance with that of numerous earlier studies (Majumdar 1997, Nanda and Panda 2018, Alarussi and Alhaderi 2018). The result suggest that the greater a firm's dependency on external financing, the lower its ROA or NPM. This could imply that firms are required to pay a very high interest rate on its external financing, which would have a negative impact on its profitability. Operating efficiency, measured in terms of fixed assets turnover ratio, has a positive association with ROA, which is significant at one per cent level. Thus, a firm's profitability is impacted by assets turnover. Since asset turnover is a proxy for the efficiency with which a firm converts its assets into revenues, a positive association between asset turnover and profitability is indicative of remarkable resource efficiency of the firms. Our finding of a positive asset turnover-profitability relationship is consistent with that of Bhayani (2010) and Alarussi and Alhaderi (2018). The variable age of the firm is not found to be a significant factor affecting profitability of pharmaceutical firms. From the Table 5, it is also observed that liquidity and profitability are positively associated, but this relationship is not significant. Contrary to the expectation, changes in patent regime captured by the dummy variable is found to have a negative influence on firm profitability, although this effect is insignificant in both the models.

VI Conclusion

An industry's viability and expansion depend on its ability to generate profits and a profitable industry is a major source of employment, income, growth and prosperity for an economy as a whole. The present study contributes to the existing branch of research by enhancing our understanding of the factors that determine the firm level profitability within the setting of an emerging industry such as the IPI. By using a dataset of 72 pharmaceutical firms and employing difference-GMM technique (Arellano and Bond 1991), the study tries to identify the potential drivers of profitability at the firm level and evaluates the role of various industry- and firm-specific factors. The sample comprises a high degree of profit heterogeneity, and there is wide disparity in the average profitability across firms, as shown by descriptive statistics. Empirical results suggest that lagged profitability, market share, export intensity, liquidity, productivity and operating efficiency exercise a significant positive influence on profitability of firms in the

IPI, whereas industrial concentration (measured in terms of HHI), import of raw material intensity, advertising and marketing intensity, and leverage ratio have a significant negative influence. The analysis reveals that profitability of the firms in the IPI is driven mostly by firm-specific factors and that past profitability and market share together explain most of the variances in profitability. This lends credence to the firm effect models and in particular to Peltzman's (1977) hypothesis that only profitable and efficient firms are able to thrive and continue in the market. Other firm characteristics like export intensity, liquidity, operating efficiency, productivity and leverage are also significant but to a lesser extent. Nevertheless, the finding of a positive productivity-profitability relationship lends credence to Demsetz's (1973) superior firm hypothesis. The analysis also reveals that pharmaceutical firms can increase their profits through careful management of their assets and a healthy cash flow. One of the two industry-specific characteristics, namely industrial concentration, is found to exercise a significant negative impact on profitability, signifying cut-throat competition among firms. This suggests that it is unlikely for firms to engage in price fixing collusion in order to raise their profits by capitalizing on their dominant market position. Based on the analysis, it is possible to conclude that profitability in the IPI is largely determined by firm-specific characteristics, while industry-specific variables play a negative role, and that past-year profit earnings and market share play the most important role in explaining profit heterogeneity among firms operating in the pharmaceutical industry.

References

Alarussi, A.S. and S.M. Alhaderi (2018), Factors Affecting Profitability in Malaysia, *Journal of Economic Studies*, 45(3): 442-458.

Al-Jafari, M.K. and H. Al-Samman (2015), Determinants of Profitability: Evidence from Industrial Companies Listed on Muscat Securities Market, *Review of European Studies*, 7(1): 303-311.

Arellano, M. and S. Bond (1991), Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *Review of Economic Studies*, 58(2): 277-297.

Bain, J.S. (1951), Relation of profit rate to industry concentration: American manufacturing, 1936-1940, *Quarterly Journal of Economics*, 65(3): 293-324.

Baltagi, B.H. (2005), *Econometric Analysis of Panel Data*, John Willey and Sons, England.

Bekmezci, M. (2015), Companies' Profitable way of Fulfilling Duties Towards Humanity and Environment by Sustainable Innovation, *Procedia-Social and Behavioral Sciences*, 181: 228-240.

Bhagwat, Y. and M. DeBruine (2011), R&D and Advertising Efficiencies in the Pharmaceutical Industry, *International Journal of Applied Economics*, 8(1): 55-65.

Bhayani, S.J. (2010), Determinant of Profitability in Indian Cement Industry: An Economic Analysis, *South Asian Journal of Management*, 17(4): 6-20.

Chaudhuri, S. (2005), *The WTO and India's Pharmaceuticals Industry: Patent Protection, TRIPS,and Developing Countries*, Oxford University Press, New Delhi.

Comanor, W.S. and T.A. Wilson (1972), Advertising Market Structure and Performance, *Review of Economics and Statistics*, 49(4): 423-440.

Comtrade (2022), *United Nations Commodity Statistics Trade Database*, https://comtrade.un.org/ (accessed on 22/10/2022).

Cyril, E.J. and H.K. Singla (2020), Comparative Analysis of Profitability of RealEstate, Industrial Construction and Infrastructure Firms: Evidence from India, *Journal of Financial Management of Property and Construction*, 25(2): 273-291.

Das, P. and S. Das (2015), Competitiveness and its Impact on Research and Development in Indian Pharmaceutical Industry, *Decision*, 42(3): 325-334.

Demsetz, H. (1973), Industry Structure, Market Rivalry, and Public Policy, *Journal of Law and Economics*, 16(1): 1–9.

Eckard, E.W. (1995), A Note on the Profit-Concentration Relation, *Applied Economics*, 27(2): 219-223.

FICCI (2022), Impact of the Pharma Industry on the Indian Economy in the Post-COVID Era, *A Report by KPMG in India and FICCI,* April, https://ficci.in/studies.asp (accessed on 25/10/2022).

Goddard, J., M. Tavakoli and J. Wilson (2005), Determinants of Profitability in European Manufacturing and Services: Evidence from a Dynamic Panel Model, *Applied Financial Economics*, 15(18): 1269-1282.

Goel, U., S. Chadha and A.K. Sharma (2015), Operating liquidity and financial leverage: Evidences from Indian machinery industry, *Procedia-Social and Behavioral Sciences*, 189: 344-350.

Hatem, B.S. (2014), Determinants of Firm Performance: A Comparison of European Countries, *International Journal of Economics and Finance*, 6(10): 243-249.

India Brand Equity Foundation (2022), *Indian Pharmaceuticals Industry Report,* March*,* https://www.ibef.org (Accessed on 29/10/2022).

Jaisinghani, D. (2016), Impact of R&D on Profitability in the Pharma Sector: An Empirical Study from India, *Journal of Asia Business Studies*, 10(2):194-210.

Jeong, K.Y. and R.T. Masson (1990), Market Structure, Entry and Performance in Korea, *Review of Economics and Statistics*, 72(3): 455-462.

Jovanovic, B. (1982), Selection and the Evolution of Industry, *Econometrica*, 50(3): 649–670.

Kongmanila, X. and Y. Takahashi (2009), Innovation, Export Performance and Profitability of Lao Garment Exporters, *International Journal of Economics and Management*, 3(2): 225-236.

Lall, S. (1986), Technological Development and Export Performance in LDCs: Leading Engineering and Chemical Firms in India, *Weltwirtschaftliches Archive*, 122(1): 80-92.

Lim, H. and R. Rokhim (2021), Factors Affecting Profitability of Pharmaceutical Company: Indonesian Evidence, *Journal of Economic Studies*, 48(5): 981-995.

Majumdar, S.K. (1997), The Impact of Size and Age on Firm-Level Performance: Some Evidence from India, *Review of Industrial Organization*, 12(2): 231-241.

Mazumdar, M. (2013), *An Overview of the Indian Pharmaceutical Sector,* Physica-Verlag, Springer.

McDonald, J.T. (1999), The Determinants of Firm Profitability in Australian Manufacturing, *Economic Record*, 75(2): 115-126.

McGahan, A.M. (1999), The Performance of US Corporations: 1981–1994, *Journal of Industrial Economics*, 47(4): 373-398.

McGahan, A.M. and M. Porter (2002), What Do We Know about the Variance in Accounting Profitability? *Management Science*, 48(7): 834–851.

Nagarajan, M. and R.R. Barthwal (1990), Profitability and Structure: A Firm-level Study of Indian Pharmaceutical Industry, *Indian Economic Journal*, 38(2): 70-84.

Nanda, S. and A.K. Panda (2018), The Determinants of Corporate Profitability: An Investigation of Indian Manufacturing Firms, *International Journal of Emerging Markets*, 13(1): 66-86.

Odusanya, I.A., O.G. Yinusa and B.M. Ilo (2018), Determinants of Firm Profitability in Nigeria: Evidence from Dynamic Panel Models, *SPOUDAI-Journal of Economics and Business*, 68(1): 43-58.

Peltzman, S. (1977), The Gains and Losses from Industrial Concentration, *Journal of Law and Economics,* 20(2): 229–263.

Pradhan, J.P. (2006), *Global Competitiveness of Indian Pharmaceutical Industry: Trends and Strategies*, Working Paper 2006/05, ISID, New Delhi.

Resende, M. (2007), Structure, Conduct and Performance: A Simultaneous Equations Investigation for the Brazilian Manufacturing Industry, *Applied Economics*, 39(7): 937–942.

Roodman, D. (2009), How to Do Xtabond2: An Introduction to Difference and System GMM in Stata, *The Stata Journal*, 9(1): 86-136.

San, O.T. and T.B. Heng (2013), Factors Affecting the Profitability of Malaysian Commercial Banks, *African Journal of Business Management*, 7(8): 649-660.

Scherer, F.M. and D. Ross (1990), *Industrial Market Structure and Economic Performance*, Huognton Mifflin, Boston.

Schultz, E.L., D.T. Tan and K.D. Walsh (2010), Endogeneity and the Corporate Governance-Performance Relation, *Australian Journal of Management*, 35(2): 145-163.

Shepherd, W.G. (1972), The Elements of Market Structure, *Review of Economics and Statistics*, 54(1): 25-38

Slade, M. (2004), Competing models of firm profitability, *International Journal of Industrial Organization*, 22(3): 289–308.

Stierwald, A. (2010), Determinants of profitability: An analysis of large Australian firms, *Melbourne Institute Working Paper 3/10*, pp. 1-35.

Tyagi, S. and D.K. Nauriyal (2016), Profitability determinants in Indian drugs and pharmaceutical industry: An analysis of pre and post TRIPS period, *Eurasian Journal of Business and Economics*, *9*(17): 1-21.

---------- (2017), Firm level profitability determinants in Indian drugs and pharmaceutical industry, *International Journal of Pharmaceutical and Healthcare Marketing*, 11(3): 271-290.

Vijayakumar, A. (2012), The Assets Utilization and Firm's Profitability: Empirical Evidence from Indian Automobile Firms, *International Journal of Financial Management*, *2*(2): 32-44.

Vogel, A. and J. Wagner (2011), Robust Estimates of Exporter Productivity Premia in German Business Services Enterprises, *Economic and Business Review*, *13*(1): 7-26.

Wagner, J. (2007), Exports and Productivity: A Survey of the Evidence from Firm-level Data, *World Economy*, 30(1): 60-82.

---------- (2012), Exports, Imports and Profitability: First Evidence for Manufacturing Enterprises, *Open Economies Review*, 23(5): 747-765.

Yazdanfar, D. (2013), Profitability Determinants among Micro Firms: Evidence from Swedish Data, *International Journal of Managerial Finance*, 9(2): 150-160.

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Determinants and Correlates of Skill Development of Labourers in Micro and Small Enterprises in Kerala, India

K.C. Baiju and Praveendas K.

The labour market of India is predominantly centred on the informal sector, which is quite evidenced by its casualisation and contractualization of the labourers. It witnesses the dichotomy of a surge in the job-seeking labour force amidst the dearth of getting skilled. The challenges of the informal sector in India are exhaustively debated and enlisted under various dimensions, viz., low level of employment, non-competence in productivity, lack of credit facilities, lesser technological infusion with market penetration, a dearth in skill sets of both own-account workers and labourers engaged in the informal sector, particularly in the micro small enterprises. The upsurge in the country's demographic dividend interfaced with growing unemployment, leaving a dichotomy in the labour market, i.e., supply-demand mismatch, which is often traced to the paucity of skill sets of the growing job seekers in India, preventing labour mobility and absorption. In the given premise, this paper prioritises the determinants and correlates of skill development and explores their interrelationships to bring in economic gain among labourers in the informal sector, with a specific focus on Micro and Small Enterprises (MSEs), in Kerala, India.

Keywords: Skill development, Economic gain, informal sector and Labour force

I Introduction

The informal economy accommodates a significant component of the global labour force, comprising more than half of all workers worldwide. Additionally, over 90 per cent of Micro and Small Enterprises (MSEs) operate within the informal sector. Informality is a defining characteristic of labour markets globally, encompassing countless economic units and providing livelihoods for hundreds of millions of workers. The term "informal economy" encompasses a wide range of

K.C. Baiju, Professor, Department of Economics, Central University of Kerala, Kasaragod 671316, Kerala, Email: kcbcuk2012@gmail.com

Praveendas K., Research Scholar, Central University of Kerala, Kasaragod 671316, Kerala, Email: pravee305@gmail.com

situations and phenomena, exhibiting diverse forms both within and across economies. The process of formalization and the implementation of measures to facilitate transitions into formality must be tailored to the unique circumstances faced by different countries, economic units, and workers' categories. According to the Economic Survey of India (2021-2022), over 91 per cent of the country's labour force is engaged in the informal sector, which contributes to 50 per cent of the Gross Domestic Product. The Skill India Report (2018) has shed light on the coexistence of a significant pool of unskilled or underutilized labourers alongside a shortage of quality skilled labour within the informal sector. Hence, skill development has emerged as a crucial catalyst in the endeavour to alleviate poverty, combat unemployment, boost productivity, and generate income, thus fostering inclusive growth and sustainable development of the nation.

Skill development enhances the living standards of labourers and bolsters their competitiveness in both national and global labour markets. There is a burgeoning number of educated youths without employment, seeking opportunities through Central Employment Exchanges and State Employability Centres (Annual Report Employment Exchange Statistics 2020). The paradox lies in the dichotomy present in the Indian labour market, characterized by a surge in the job-seeking labour force in contrast to the scarcity of adequately skilled workers (NCAER 2021). Skill development plays a pivotal role in enabling the workforce to adapt to evolving market demands and business environments, harnessing the benefits of innovation and techno-driven risk-taking activities. It encompasses the process of acquiring skills through education, knowledge, competence, advanced training, and practical experience. This virtuous cycle of skill development contributes to higher productivity, increased employment opportunities, income growth, and overall development. Skill development can be enabled through formal education institutions, informal apprenticeships, or non-formal training programmes by strengthening individuals' adaptability to changing market demands and providing them with the necessary skills for techno-driven entrepreneurial activities. It is against this backdrop that the present study tries to explore the determinants and correlates of skill development and their interrelationships to bring in economic gain among labourers in the informal sector, with a specific focus on micro and small enterprises (MSEs) in Kerala, India.

II Review of Literature

Various growth theories such as the innovation theory of growth, human capital theory, and efficient wage theory as well as the theories, proposed by scholars like Schumpeter (1934), Power (1958), Becker (1975), Gregory and Taylor (2008), emphasize the importance of factors such as demographic dividend, human capital, physical investment, saving, and technological change in driving economic growth. Understanding the interrelationships among these fundamental factors and their impact on the output growth of goods and services is crucial for

comprehending the economic framework. Economic gain refers to the improvement in employment and income opportunities for workers and employers, as well as a reduction in production costs within an organization (Meijer and Robin 2022). However, economic benefits also encompass better employment and income prospects for firms based on the productivity and profitability of labourers, contributing to overall economic growth and other societal advantages (Machin and Vignoles 2001).

Skill development initiatives in informal enterprises play a crucial role in improving employability and labour productivity, thereby enhancing competitiveness. Informal enterprises are small-scale organizations operating in the unorganized sector, which are not registered with local authorities and do not pay taxes (NCEUS 2006). They also encompass activities of formal sector organizations that employ informal workers lacking formal work contracts and social safety nets (ILO 1993). The unorganized sector comprises unincorporated private enterprises owned by individuals or households engaged in the production and sale of goods and services, typically operated as proprietorships or partnerships with fewer than ten workers (NCEUS 2007). Workers in the informal sector often belong to socially and economically underprivileged sections of society, including micro-enterprise workers, unpaid family members, casual labourers, home-based workers, migrant labourers, out-of-school youth, street vendors, and domestic workers. These workers often possess limited specialized skills, are engaged in low-grade insecure jobs, earn low incomes, exhibit low productivity, make minimal capital investments, and lack legal employer-employee contracts (ILO 2013, Sunita Sanghi and Kuntal Sensarma 2014). Acquiring new specialized job skills through education and training can break the cycle of unemployment and poverty. This can lead to increased productivity and job opportunities within the micro and small informal enterprises (Baiju 2023, Baiju, *et. al.* 2022, Golda and Baiju 2022, Dickens and Sanghi 2015, Leitch 2006, Krueger and Lindahl 2001, Barro 2001, Hanushek and Kimko 2000). The existing researches primarily focus on employability, skill upgrading, and income potential, particularly among the working-age population that represents the country's demographic dividend.

In India, approximately 90 per cent of the labour force is employed in the informal sector, primarily in low-productivity jobs, with a majority lacking formal skill training (Economic Survey 2018, Ministry of Labour & Employment, 2013-14). Notably, only two per cent of the workforce had undergone skill development training, during a period when India's youth unemployment rate reached a 45-year high of 7.5 per cent in 2023 (CMIE 2023). The extant educational framework fails to furnish young labour force with requisite employable skills, thereby depriving them of opportunities for gainful employment. On the contrary, labours within the unorganized sector frequently acquire skills through informal networks or else experiential learning on the job. In the light of these considerations, there arises the need to bridge the existing research gap by addressing the following questions:

- What are the industry specific factors for skill development leading to economic gain among labourers in informal enterprises?
- What are the key factors among the determinants and correlates of skill development of labourers in selected micro and small enterprises under study area, Kerala?

III Statement of Problem

The informal enterprises economy in India has exhibited the characteristics of low productivity, low industry relevant job skill levels, low wages, and substandard working conditions (ILO 2014). Labourers in informal economy have often been obstructed by barriers in accessing social and economic protection, skill training opportunities, and other benefits commonly enjoyed by other formal labourers. In addition, there is lack of specialized job skills like insufficient Information, Communication and Technological (ICT) skills that are essential for their assigned job. The scarcity of ICT skilled workers within MSEs exacerbates the digital divide, hindering MSEs to harness the full potential of technology for enhancing productivity and competitiveness. Being somewhat less motivated to invest in skill development initiatives, mainly due to lack of awareness, impedes their professional growth and limits the MSE's potential for innovation and adaptation. However, identifying the essential skills and the extent of skill gap among the labourers help to prioritise the requisite skills through specific skill upgradation programmes. This would foster a culture of continuous learning process, promoting innovation and adaptability. The present study is an attempt to prioritise industry relevant, job-specific skill development, with a view to address these multifaceted problems.

IV Objectives of the Study

1. To identify the specific factors of skill development among labourers in selected Micro and Small Enterprises in Kerala.
2. To explore the key determinants and the respective correlates of skill development of labourers in Micro and Small Enterprises in the study area.

V Theoretical Background of the Study

Initiatives for skill development in India have attracted a lot of attention recently, as the nation focuses on enhancing the human capital capacity of its workforce (Anup Kumar 2015). Investing in education is necessary to acquire skills and training, which will increase individual capital, by the concept of human capital that emphasises the role of education and skills training in increasing worker productivity and efficiency of the workers (Blundell, *et. al.* 1999). Based on the theoretical traits of human capital, it is possible to identify the labourers' necessary

skill sets and thereon examine the level of acquired skill sets prevalent among the labourers' engaged in the selected micro and small enterprises. The World Bank highlighted the particular concerns and challenges faced by MSEs in Kerala and theapproaches taken to address skill development in this context, underlining the importance of the identified factor components for development and the integration of MSEs in the informal sectors. Business acumen skills, technological proficiency, job-specific skills, and career growth and development are among the components of the factors that have been found. The study discusses the research design, data analysis and interpretation of results regarding the determinants and correlates of skill development of labourers in MSEs in Kerala, India.

VI Database and Methodology

The present study is based on both primary and secondary data. Primary data were collected from three districts of Kerala- Kannur, Palakkad and Thiruvananthapuram. A stratified random sampling technique was used to ensure labourers representation from the selected six enterprises within the MSEs sector. The primary data was collected from a total sample of 615 respondents through a survey conducted in six types of enterprises selected using well-structured questionnaire. Random sampling method was used for selecting workforce belonging to three selected districts comprising the service and manufacturing sectors including own-account workers and labourers. Of these, 205 respondents each were chosen from the three districts with a break up of 102 rural and 103 urban labourers from each district of the study area.

The study tool included a questionnaire for collecting demographic details and a rating scale (five-point Likert scale) based on the research questions. The reliability of the items was checked and the identification of specific skill factors has been made based on Factor Analysis. The Kaiser-Meyer-Olkin and Bartlett's test of sphericity tests were used to identify the broad factors, the correlated variables corresponding to each factor and to confirm their suitability for structure detection. Pearson Correlation ‘r’ also is used to verify the relationships of latent constructs, if any.

VII Results and Discussion

Socio-Economic Characteristics and Occupational Pattern of the Sample

The demographic profile and occupational pattern of the selected respondents in informal enterprises usually vary by their living environment and working conditions. Normally, workers engaged in informal enterprises experience low-end skill sets characterized relatively low formal education or formal job opportunities resulting in low income (ILO 2002). The demographic profile and occupational pattern of the labourers in the informal enterprises would give

insights in to extent of skill development of labourers in the selected informal enterprises in Kerala (*See* Table 1).

Table 1: Socio-Economic Characteristics and Occupational Pattern of the Sample

Demographic characteristics		N
Gender	Male	336 (54.6)
	Female	279 (45.4)
Age	15-35	181 (29.4)
	36-45	259 (42.1)
	46-59	121 (19.7)
	60 and above	54 (8.8)
Educational qualification		
	>SSLC	514 (83.6)
	HSC	60 (9.8)
	Degree	15 (2.4)
	Technical	25 (4)
	PG	1 (.2)
Work experience	>2 Year	25 (4)
	02-5 Year	45 (7.3)
	05- 10 Year	204 (33.2)
	10 and above	341 (55.3)
Annual Income	> 27000 ₹	82 (13.3)
	27001-2.5 L	400 (65.1)
	2.5 L -5L	130 (21.1)
	5L - 10	3 (.5)
Sector	Manufacturing	348 (56.59)
	Service	267 (43.41)
	Total (N)	615 (100 per cent)

Source: Primary Survey data.

Out of the total 615 sample respondents, more than half of the respondents (54 per cent) are male labourers, whereas 45 per cent of them are female. This ratio indicates that the male labour participation in the micro and small enterprises sector is greater than that of female labourers in the study area, Kerala. When the age-wise participation was analysed, it was found that 19.7 per cent respondents are in between the age group 46 to 60, 42.1 per cent of the respondents belonged to the age group of 36 to 45 and 29.4 per cent was in the Age group 15-35 years. Regarding education, majority of the respondents (83.6 per cent) had only education of 10th class and below, 9.8 per cent with senior secondary level or 12^{th} class, 4.1 per cent with technical education, 2.4 per cent with degree/graduation, and only 0.2 per cent had a post-graduate degree. Altogether the sample respondents of the study were employed in either the manufacturing sector (56.59) or service sectors (43.41) belong to the micro and small enterprises sector in the study area. Among the respondents, 55.3 per cent had more than ten years of work experience, whereas only 4 (0.65%) have a work experience less than two years.

Almost, two third of the sample respondents (65 per cent) maintain an annual household income of 27000-2.5 lakhs INR, and 21.1 per cent have an annual household income in the range of 2.5 -5 lakhs INR. A total of 82 households (13.3 per cent) has a meagre annual household income of less than 27000 INR, which comes under the Below Poverty Line (BPL) households.

Identifying the Determinants and Correlates of Skill Development

Factor analysis is used to identify the determinants and correlates of skill development by reducing many individual items into a fewer number of common underlying factors. It achieves this by explaining the latent correlation between the determinants of Skill Development *(*observed variables). In this process Data preparation, Factor Extraction Method, Factor Rotation Method, Factor scores and Labelling Method and Factor Interpretation (Fabrigar, Wegener, *et. al.* 1999, Taherdoost, *et. al.* 2020) were involved. The Bartlett's test of sphericity (approximately Chi-square = 4828.265, df =190, significance 0.000) and the Kaiser-Meyer-Olkin Measure of sampling adequacy (value 0.761) confirmed that there was correlation among variables for justifying the application of factor analysis.

In the procedure, only factors whose Eigen values were greater than 1 were selected (Malhotra and Birks 2007). For the purpose of the study six components were extracted, each with eigenvalues greater than 1, ensuring their reliability and significance in representing latent constructs like components of skill development or character traits. The loaded values of these components illustrate the strength of influence that each determinant of skill development (observed variable) has on a specific factor. Meanwhile, the cumulative variance percentages offer valuable insights into the overall variability explained by these factors. These loaded values along with the cumulative percentage of the variance are tabulated in Table 2.

Table 2: Total Variance Explained with Initial Eigen Values

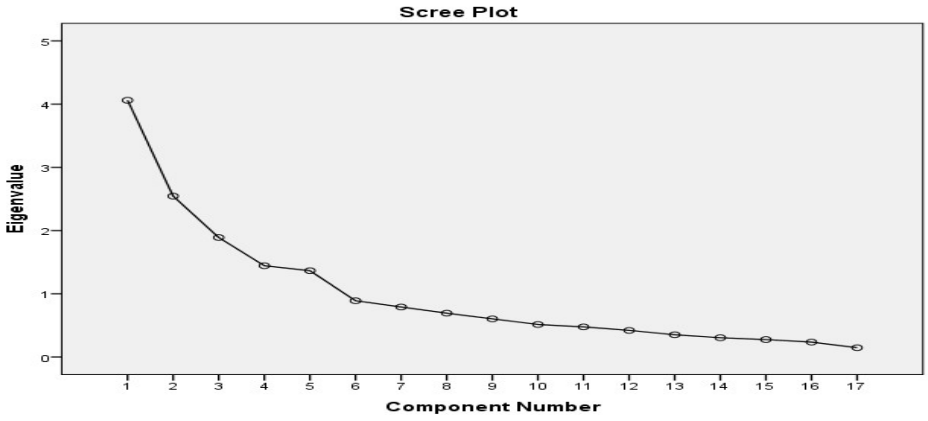
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.321	21.607	21.607	4.321	21.607	21.607	2.858	14.288	14.288
2	2.615	13.074	34.681	2.615	13.074	34.681	2.405	12.025	26.314
3	1.960	9.799	44.480	1.960	9.799	44.480	2.050	10.250	36.564
4	1.639	8.193	52.673	1.639	8.193	52.673	2.007	10.033	46.597
5	1.491	7.455	60.128	1.491	7.455	60.128	1.970	9.851	56.448
6	1.179	5.896	66.024	1.179	5.896	66.024	1.915	9.577	66.024
7	.992	4.961	70.986						
8	.913	4.564	75.550						
9	.712	3.562	79.112						
10	.649	3.243	82.356						
11	.531	2.653	85.009						

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
12	.474	2.372	87.381						
13	.458	2.292	89.673						
14	.439	2.197	91.870						
15	.366	1.830	93.700						
16	.337	1.684	95.385						
17	.146	.729	100.000						

Note: Extraction Method: Principal Component Analysis.

Table 2 gives the Eigen values associated with each linear component before extraction and after rotation are presented. The data set contained six factors and 17 items. The Eigen values associated with each factor represent the variance explained by that particular linear component and also the Eigen values displayed in terms of percentage of variance explained (factor 1 explains 21.607 per cent of the total variance and so on). It is clear that the first four factors explain a relatively large amount of total variance, particularly factor 1, whereas the subsequent factors after factor 4 explain only a small amount of variance (<10 per cent only). The factors with Eigen Values greater than one are extracted which results in six factors. The cumulative sum of six dominant factors extracted was found to be 66.024 per cent. The Scree plot (Fig1) gives a clear interruption after the fourth factor. After the sixth component, variances between the eigenvalues have declined and its curve gets flattened (see the figure 1). This declining level of the remaining factor variables indicates that they have a very small proportion of the variability of the factor variables and are insignificant. Hence the first four factors are taken as the significant factors responsible for more than 50 per cent cumulative variations.

Figure 1: Scree Plot



Source: Primary Survey data.

Eliciting Component Correlates of Factors

Factor Rotation Method was employed to identify the underlying correlates that influence the factors of skill development as per their relationship among the variables (*see* Table 3). All retained factors in factor analysis must have at least three items with a loading greater than 0.4, according to the criterion of minimum loaded values factors (Peter Samuel 2016). In this way, at least two factors with less than minimum criterion value, had to be eliminated from the rotated component matrix (*see* Table 3)

Table 3: Factor Structure of the Skill Development among the Labourers

Rotated Component Matrix					
Factors of skill development	Determinants	Components			
		1	2	3	4
Business Acumen Skills (BAS)	Ability to evaluate market demand and trend.	**.730**	.168	.045	.049
	Improved risk-taking ability	**.641**	-.370	-.011	.288
	Better team work and performance	**.660**	.306	.030	.183
	Improved quality of work	**.570**	-.001	.424	.239
	Competitiveness in product management	**.568**	-.173	.187	-.155
Technological Competency (ICT Skill)	Able to communicate online using internet	.200	**.801**	.181	.152
	Capacity to use digital communication devices skills	.117	**.781**	-.024	.180
	Capacity to use online business networking skills	.081	**.833**	-.063	.012
	Capacity to use digital marketing like social media marketing, digital advertising etc.	.094	**.806**	-.068	.080
Job Specific Skills (JSS)	Proficiency in identify product raw materials	.091	-.128	**.859**	.084
	Proficiency in production techniques, cloth, sweets, etc.	.124	.044	**.803**	.022
	Proficiency in identify combinations of ingredients.	.086	-.060	**.808**	-.019
	Proficient in operating production machines and tools.	-.079	.033	**.769**	.057
	Creativity and artistic flair to create unique product	.098	-.154	**.533**	.046
Career Advancement Skill (CAS)	Income and employment could increase significantly	.141	.099	-.060	**.784**
	Improved work autonomy	.297	-.281	-.072	**.571**
	My Job security has been enhanced	.409	.253	-.043	**.539**

Notes: Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization.

Source: Primary Survey data.

The Rotated Component Matrix delineates the interrelationships among various factors, and its corresponding determinants. Each factor represents a distinct domain skill or set of skills, while determinants pertain to specific job skill aspects within each factor. These findings shed light on the qualitative characteristics as well of the identified factors like Business Acumen skills, Information Communication Technology Skills, Job-Specific Skills, and Career Advancement skills. An analysis of the variables corresponding to the identified factors clarifies how they contribute as a determinant to that particular factor (*see* Table 3).

Factor 1, Business Acumen Skills (BAS), represents different skills related to business acumen. The determinants or items of skills included in this factor are the ability to evaluate market demand and trends, improved risk-taking ability, better teamwork and performance, improved quality of work, and competitiveness in product management. The component loadings reveal that the ability to evaluate market demand and trends has the highest positive loading of 0.730, indicating a significant association with BAS (i.e., Factor 1). It implies that labourers who possess the skill to assess market demand and trends are more likely to demonstrate strong business acumen skills. Similarly, improved risk-taking ability, better teamwork and performance, and improved quality of work also exhibit positive loadings, ranging from 0.570 to 0.660. These results advocate that the labourers who show enhanced risk-taking abilities, perform well in teamwork settings, and deliver high-quality work are more likely to hold strong business acumen skills. However, the determinant of competitiveness in product management shows to some extent, lower positive loading of 0.568, suggesting relatively weaker correlation with business acumen skills compared to other determinants.

Factor 2, Information communication Technology skills, pertains to skills correlated to Technological Competency, i.e., ICT Skills. The determinants of ICT skills included in this factor are the ability to communicate online using the internet, capacity to use digital communication devise skills, capacity to use online business networking skills, and capacity to use digital marketing like social media marketing, digital advertising, etc. The factor loading value of the determinants, ranging from 0.152 to 0.801, indicate the significance of each determinant in contributing to Information Communication Technology (ICT) skills. Further, the loadings reveal that the ability to communicate online using the internet networking exhibits the highest positive loading value of 0.801, indicating a significant association with Factor 2. It implies that labourers in MSEs who are proficient in effectively communicating online using internet are more likely to hold strong technological competency in ICT. Similarly, the capacity to use online business networking skills also show positive loadings, ranging from 0.781 to 0.833. These results have indicated that labourers who have the ability to utilize digital communication skills and engage in online business networking are more likely to possess higher levels of technological competency in selected micro and small enterprises in the study area. However, the factor capacity to use information

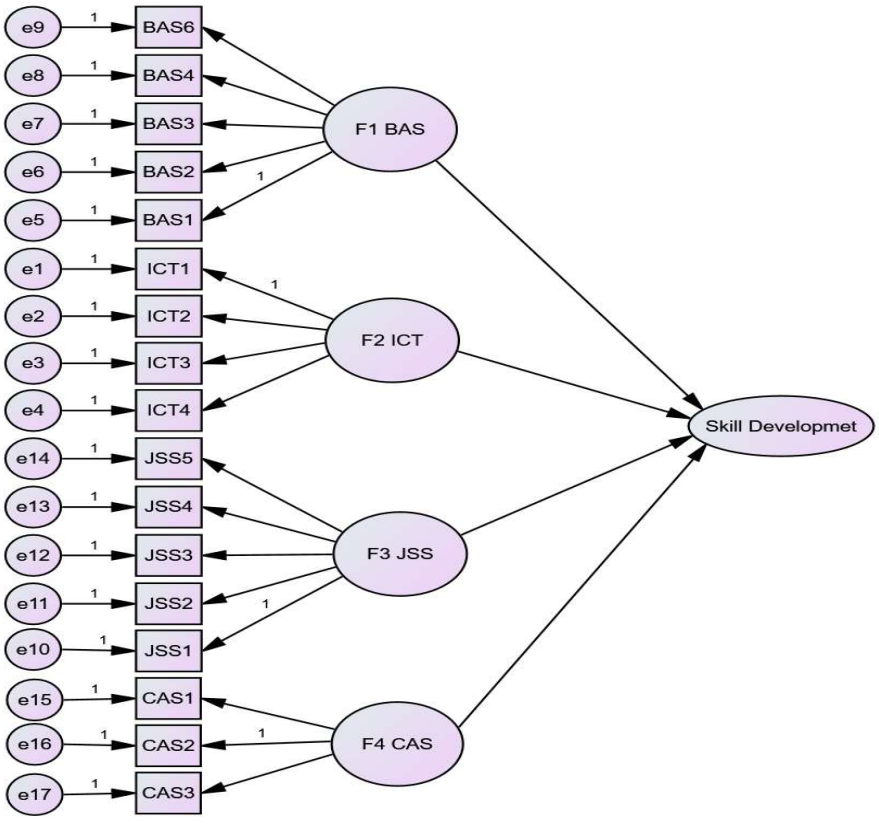
communication technology shows relatively better positive loadings, ranging from 0.,781 to 0.833. It indicates a positive relationship with Factor 2, the magnitude of the loadings recommends a slightly stronger association compared to the other determinants. In summary, the results suggest that labourers in MSEs who possess the ability to communicate online, utilize digital communication skills, and engage in online business networking are more likely to have strong technological competency in ICT. These skills are essential in the modern business environment, enabling labourers to effectively utilize information and digital communication technology tools, collaborate with others online networking, and leverage technology for improved productivity and competitiveness in MSEs.

Factor 3, Job Specific Skills (JSS), represents the skills that are specific to particular occupations or industries. The determining factors included in this factor are proficiency in identifying product raw materials, proficiency in production techniques (e.g., Cloth, baking), proficiency in identifying combinations of ingredients, proficiency in operating production machines and tools, creativity and artistic flair to create unique products. The factor loadings reveal that proficiency in identifying product raw materials exhibits a strong positive loading of 0.859, suggesting a significant association with Factor 3. This indicates that labourers in selected MSEs who possess the skill to identify raw materials required for their specific products are more likely to demonstrate strong job-specific skills. Similarly, proficiency in production techniques, proficiency in identifying combinations of ingredients, and proficiency in operating production machines and tools also exhibit positive loadings, ranging from 0.769 to 0.803. These findings suggest that labourers who are proficient in these specific job-related skills are more likely to possess higher levels of job-specific skills in MSEs. On the other hand, the determinant of creativity and artistic flair to create unique products shows a positive loading of 0.533, indicating a somewhat weaker association compared to the other determinants. The overall results in this factor suggest that labourers in MSEs who have proficiency in identifying product raw materials, production techniques, combinations of ingredients, and operating production machines and tools are more likely to possess strong job-specific skills. These specific skills are vital for their respective industries, allowing labourers to effectively perform tasks, produce high-quality products, and contribute to the overall success of MSEs.

Factor 4, Career Advancement Skill (CAS), refer to skills correlated to the progress and success in their careers and specific goal of labourers; these skills are varying depending on the industry and specific job roles. In the study, determining factors included in factor 4 are income and employment potential, improved work autonomy, and enhanced job security. Further, the factor loadings in Table 3 reveal that income and employment potentials exhibit a positive loading of 0.784, indicating a significant association with Factor 4. It suggests that labourers in MSEs who anticipate significant increases in income and employment opportunities are more likely to possess strong career growth and development skills. Similarly, improved work autonomy and enhanced job security exhibit

positive loadings, ranging from 0.571 to 0.539. These findings indicate that labourers who enjoy increased work autonomy and perceive enhanced job security are more likely to have higher levels of career growth and development skills in the MSE context. In summary, the results indicate that labourers in MSEs who have positive expectations regarding income and employment growth, experience enhanced improved work autonomy, and perceive increased job security are more likely to hold strong career growth and development skills. These skills are crucial for their career advancement, job stability, and overall well-being within the MSE sector. By examining the Rotated Component Matrix presented in Table 3, workers gain significant insights into the relationships between different determinants and their respective factors. Its analysis has offered a more reflective comprehension of the factors that influence the skill development and career growth of labourers in MSEs (*See* Table 3). Further, from Table 3, the association between identified skill development factors and its determinants can be conceptualised as in (Figure 2.)

Figure 2: Conceptualisation of Inter Relationship between Determinants of Skill Development



(Source: primary data)

Inter Relationship between Determinants of Skill Development

Even though the foregoing analysis delineated the different factors and their association with respective correlates, a correlation analysis was done to find out whether any of latent variable have some sort of relationship with any of the identified factors by analysing their interrelationship. The Pearson's R among the determinants of skill development among the labourers was analysed and presented in Table 4.

Table 4: Correlation between determinants of skill development

Determinants	1	2	3	4	5	6	7	8
Machine skill	1							
Job techniques	.212**	1						
Raw Materials	.108**	.602**	1					
Artistic flair	.337**	.294**	.435**	1				
Digital devices	-.023	-.029	.018	-.034	1			
ICT skill.	.108**	-.056	-.077	.122**	.479**	1		
Online trade	-.022	.080*	.194**	.082*	.783**	.284**	1	
Networking	-.071	-.054	.143**	-.101*	.524**	.648**	.467**	1
Market trend	.088*	.192**	.133**	.117**	.134**	.095*	.151**	.186**
Risk-taking	.117**	.036	.190**	.187**	.268**	-.079*	.279**	.152**
Work quality	.230**	.239**	.289**	.078*	.170**	.107**	.010	.067
Team work	.065	.104**	.090*	.100*	.404**	.326**	.354**	.365**
Work autonomy	.124**	.007	.085*	.117**	.411**	-.015	.376**	.004
Career growth	.233**	.092*	.133**	.232**	.206**	.172**	.209**	.258**
Income growth	.022	-.041	.019	.081*	.495**	.241**	.457**	.316**
Job security	-.016	.007	.054	.077	.183**	.262**	.171**	.271**

Determinants	9	10	11	12	13	14	15
Machine skill							
Job techniques							
Raw Materials							
Artistic flair							
Digital devices							
ICT skill.							
Online trade							
Networking							
Market trend	1						
Risk-taking	.218**	1					
Work quality	.370**	.360**	1				
Team work	.522**	.294**	.312**	1			
Work autonomy	.184**	.614**	.303**	.333**	1		
Career growth	.216**	.090*	.079*	.262**	.193**	1	
Income growth	.121**	.123**	.090*	.311**	.272**	.403**	1
Job security	.334**	.372**	.255**	.395**	.437**	.196**	.134**

Source: Primary Survey data.

The determining factors involved include machine skills, job techniques, raw materials, artistic ability, digital devices, ICT skills, online trade, networking, market trend, risk-taking, work quality, teamwork, work autonomy, career growth, income growth, and job security. The determinant Job technique (0.212) indicating labourers with greater machine skills have higher job techniques to a certain extent. Further, the relationship between Job skills and Raw Materials is moderately positive (0.602). It indicates that the labourers use better work methods with better resources, especially with quality raw materials. Subsequently, Raw Materials and artistic talent have a moderate positive relationship (0.435). It can be argued that the use of quality raw materials may bring out the sense of artistic flare in the labourers. At the same time, it is seen that there is a very weak positive relationship between skill in using digital devices and raw materials (0.018). It indicates that proficiency in using digital devices have little to do with the usage of quality raw materials. The link between artistic flare and information communication technology (ICT) skills also show only slight positive correlation (0.122). It implies that labourers with weaker creative/artistic talent may also have better ICT proficiency.

Online trading and use of digital devices indicate a high positive relationship (0.783). Hence, using digital devices promotes labourers to effectively engage in online trade. ICT skill and networking also show high positive relationship (0.648) supporting the argument that workers who actively participate in online networking activities have good ICT skills. Subsequently, Networking and market demand trend have a weak positive relationship (0.186) showing labourers participating in online networking activities and have less interest in market demand trends, as they are more motivated to networking. Networking and Risk-taking have a mild positive relationship (0.279). It reveals that labourers who take chances and get involved with networking activities, are more driven to take risks. Work quality and teamwork have a moderately positive relationship (0.370). It implies that workers who produce high-quality work prefer to work in teams.

Estimating the Loaded Value of Determinants and Correlates of the Outcome Variable Skill Development Leading to Economic Gain

The high loaded values of the factors influencing skill development among labourers, particularly Micro and Small Enterprises, indicate that the loaded factors have a strong relationship with the outcome variable skill development resulting in income and employment generation. The correlation analysis found that job and raw materials, ICT skills, and Networking, as well as online trading and use of digital devices, show moderate to high interrelationships. The factor components with the greatest loaded values, ranging from 0.539 to 0.859, strongly correlate with labourers' technological competency, business acumen, job-specific skills, and Career advancement skills. These high-loading extracted skill development elements promote economic growth and job creation in the selected Micro and Small Enterprises sectors. These determining factors have been

recognised as the main motivators supporting labourers in the selected MSEs sector with a higher potential for skill development towards economic gain and employment creation. The findings of the study could be further strengthened by a large sample size representing diversified production techniques and products along with scope for analysing determinants of intra and inter-skill sets.

VIII Conclusions and Suggestions

The foregoing discussion elicits the fact that among four factors along with 17 items in determining skill development, factor 2, technological competency among the labourers is found positive and has a set standard barring the digital skills over the other three factors. The labourers are well-versed in ICT Skill sets, while a moderate skill set is observed in handling digital devices. The business acumen factor exhibits moderate values within its determinants, explaining the larger attention required to strengthen the determinants like quality of work and competitiveness in product management. The determinants like creativity and artistic flair among the labourers are to be instilled further as they appeared to be weak. The labourers in the MSEs also exhibit weak work autonomy and job security in their enterprises having larger implications for their career advancement and future prospectus on their income and employment. The observations and findings of the study emphasises the need for comprehensive digital literacy programmes, including online digital document, trade on digital platform through hands-on training, role-play, exposure, and target group-specific policy interventions. Vocational training programme on production techniques, viz., creativity and artistic development are also framed in accordance with the changing technology and market needs. The MSEs have to develop an organisational culture encompassing product diversification, quality circles, and career-oriented job skills within the enterprises, as well as motivate the same among its stakeholders. This will instil competency, innovation, and efficiency within the MSEs helping them to grow within the larger ambit of the Nation, Aatma Nirbhar Bharat.

References

Annual Report, (2020), Ministry of Labour and Employment*,* Employment Exchange Statistics Government of India, www.ncs.gov.in.

---------- *(2018-19), Ministry of Skill Development and Entrepreneurship,* Government of India.

Anup, Kumar (2015), Skills Development for SMEs: Mapping of Key Initiatives in India, *Institutions and Economies,* 7(2): 120-143

Baiju, K.C. (2023), Nexus of Multidimensional Poverty and Educational Deprivation among the Social Groups: Evidence from a Developing Country, *Journal of Governance and Regulation,* 12(1): 147-158, https://doi.org/10.22495/jgrv12i1art14

Baiju, K.C., J.V. Asha and Narendra Kumar (2022), Role of Education on Entrepreneurial Motivation, Skills and Success of Women Entrepreneurs in Kerala, India, *Education India: A Quarterly Refereed Journal of Dialogues on Education,* 11(2): 1-13.

Barro, Robert J. (2001), Human Capital and Growth, *American Economic Review*, *Papers and Proceedings,* 91(2): 12–17.

Becker, G.S. (1975), *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, 2nd Edition, National Bureau of Economic Research, Columbia University Press, New York.

Blundell, R., L. Dearden, C. Meghir and B. Sianesi (1999), Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy, *Fiscal Studies*, 20(1): 1-23, https://www.jstor.org/stable/24437656

CMIE (2023), *Youth Employment Shockingly High*, Centre for Monitoring Indian Economy Pvt Ltd, 26 September 2023, https:// cmie.com

Das, Anup (2015), Skills Development for SMEs: Mapping of Key Initiatives in India, *Institutions and Economies*, 7(2): 120-143, http://dx.doi.org/10.2139/ssrn.2499207

Dickens, W.T., I. Sawhill and J. Tebbs (2006), The Effects of Investing in Early Education on Economic Growth, *Policy Brief*, 153: 1-8.

Economic Survey (2020-21), Ministry of Finance, Department of Economic Affairs, Government of India.

Economic Survey of India (2018-19), Ministry of Finance, Department of Economic Affairs, Government of India.

Fabrigar, L.R., D.T. Wegener, R.C. MacCallum and E.J. Strahan (1999), Evaluating the Use of Exploratory Factor Analysis in Psychological Research, *Psychological Methods,* 4(3): 272-299.

Golda, Godly and K.C. Baiju (2022), Gender Digital Divide in Kerala, India- An Exploratory Analysis at Micro-Level, *The Online Journal of Distance Education and e-Learning*, 10(3): 370-375.

Government of India, (2014), *Report on Employment in Informal Sector and Conditions of Informal Employment*, Ministry of Labour and Employment Labour Bureau Chandigarh, Government of India.

Gracia, Santoso (2016), Technology as a Driver of Skills Obsolescence and Skills Mismatch: Implications for the Labour Market, Society and the Economy, *The ANU Undergraduate Research Journal*, 7: 49-58. DOI:10.22459/AURJ.07.2015.06

Gregory, N. and P. Mark (2008), Seventh Edition: *Macroeconomics*, *Worth Publishers* Avenue, New York, pp. 181–182, www.worthpublishers.com

Hanushek, Eric, A. Dennis and D. Kimko (2000), Schooling, Labour Force Quality, and the Growth of Nations, *American Economic Review,* 90(5): 1184–1208.

International Labour Organisation (ILO) (1993), Resolution concerning statistics of employment in the informal sector, adopted by the *Fifteenth International Conference of Labour Statisticians*. Geneva, International Labour Organisation.

ILO (2002), Decent work and the informal economy, *International Labour Conference 90th Session*, Geneva, ILO

---------- (2003), *Guidelines Concerning a Statistical Definition of Informal Employment*, ILO Seventeenth International Conference of Labour Statisticians*,* Geneva

---------- (2013), *Defining Informal Employment,* Bureau of Statistics International Labour Office, CH-1211, Geneva -22, Switzerland.

---------- (2014), *Minimum Wage Systems: General Survey of the Reports on the Minimum Wage Fixing Convention, 1970 (No. 131), and the Minimum Wage Fixing Recommendation*, 1970 (No.135), International Labour Conference, 103rd Session, Geneva,

India Skills Report (2019), *Wheebox*, retrieved fromhttps://wheebox.com/assets/ pdf/ ISR_Report_2019.pdf.

Kaiser, H.F. (1974), An Index of Factorial Simplicity, *Psychometrika*, 39(1): 31-36, https://doi.org/ 10.1007/ BF02291575.

King, Palmer (2010), Planning of Technical and Vocational Skills Development, Fundamentals of Educational Planning Series*, International Review of Education; Dordrecht*, 59(4): 539-540, DOI:10.1007/s11159-013-9345-5

Krejcie, R.V. and D.W. Morgan (1970), Determining Sample Size for Research Activities, *Educational and Psychological Measurement*, 30(3): 607-610, https://doi.org/10.1177/00131644700300030

Krüeger, A.B. and M. Lindahl (2001), Education for Growth, Why and for Whom? *Journal of Economic Literature,* 39(4): 1101-1136.

Lawrence, Arul and A.S. Thiyagarajan (2021), *Nation Building through Skill Development*, Tamil Nadu Open University.

Leitch, A. (2006), *Prosperity for all in the Global Economy: Work Class Skills*, Final Report, *HMSO*. Norwich.

Machin, Vignoles (2001), *The Economic Benefits of Training to the Individual the Firm and the Economy, The Key Issues*, Centre for the Economics of Education, London School of Economics.

Majumdar, Shyamal (2008), *Workforce Development in India Policies and Practices*, Asian Development Bank Institute, Tokyo. www.adbi.org

Malhotra, Naresh and Birks, David (2007), *Marketing Research: An Applied Approach*: 3rd European Edition, Harlow, UK. Pearson Education, 835.

Meijer, Robin (2022), *Public Participation and the Economic Gain in Real Estate and Urban Development for Project Developers*, Thesis Report 10-01-2022, Delft University of Technology, New York, 19.

Mini, Tejaswi (2019), Making a Skilling from Skilling Raw Grads, *The Hindu*, Chennai, July 14 2019.

National Commission on Enterprises in the Unorganized Sector (NCEUS) (2006), Report on Social Security for Unorganised Workers, *National Commission for Enterprises in the Unorganised Sector*, Government of India.

NCEUS (2007), *Report on Conditions of Work and Promotion of Livelihoods in the Unorganised Sector*, Government of India: NCEUS.

National Council of Applied Economic Research (NCAER) (2021), India's Employment Challenges and the Demand for Skills, National Council of Applied Economic Research Skilling India Working Paper No.: WP 121, pp. 1-63.

Peter, Samuels (2016), Advice on Exploratory Factor Analysis, Birmingham City University, 1-9, DOI:10.13140/RG.2.1.5013.9766

Power, H. (1958), The Economic Framework of a Theory of Growth, Oxford University Press. The Royal Economic Society, *The Economic Journal*, 68 (269): 34-50, URL: https://www.jstor.org/stable/2227243.

Sunita, S. and A. Srija (2015), *Skill Development and Productivity of the Workforce*, CII-NITI Aayog, Delhi. 1-16.

Sunita, S. and K. Sensarma, (2014), Skill Challenges of Informal Sector in India, Focus of the Month-March 2014, Confederation of Indian Industry (CII), pp. 33-41.

Schumpeter, J.A. (1934), The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle, *Harvard University Press*, Cambridge, MA.

Taherdoost, H., S. Shamsul and N. Jalaliyoon (2014), Exploratory Factor Analysis; Concepts and Theory. Jerzy Balicki, *Advances in Applied and Pure Mathematics*, WSEAS, 27: 375-382.

Skill India Report (2018), Ministry of Skill Development, and Entrepreneurship, Government of India, http://www.skilldevelopment.gov.in/

Sushil, Kumar and Rajesh Tripathi (2022), Challenges of MSMEs in India, *Journal of Positive School Psychology*, 6(6): 10519–10541.

Vyas, Mahesh (2021), *An IT & ITES Labour Conundrum*, Centre for Monitoring Indian Economy, 25 October 2021.

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Beating The Market with Volatility Harvesting: Rebalancing as a Dynamic Portfolio Management Strategy Using Algorithmic Trading Systems

Vishvajeet Upadhyay and Porinita Swarnendu Banerjee

Various studies have shown that more than 80 per cent of Mutual Funds fail to surpass their benchmark indices in terms of returns. Hence, the popularity of passive investing in index-based Funds has increased exponentially. But these indices can be very volatile and the drawdown periods can be long (S&P 500 dropped by about -57 per cent during the Subprime crisis of 2008 and took more than 4 years to recover to the original value) and, at best, we can expect only market returns. This study shows how by actively rebalancing a portfolio on monthly and smaller time scales, returns can be enhanced while retaining all the advantages of passive index investing. This study, using stock indices of the US and emerging markets of India, Brazil, and China, found that by using rebalancing, the risk-return profile of a portfolio can be substantially improved. Till now rebalancing at frequencies greater than monthly intervals have not been studied citing execution difficulties and transaction costs, but with the advent of discount brokers and Algorithmic Trading Systems, it will be easy for any investor to establish an automated rebalancing strategy for a portfolio as suggested in this paper.

Keywords: Passive investment strategy, Active portfolio management, Portfolio rebalancing, Dynamic asset allocation, Algorithmic trading systems, Volatility harvesting

I Introduction

Beating the market is extremely difficult. Many studies have shown that 80 per cent of actively managed mutual funds fail to beat their benchmark indices in the long run. As per SPIVA U.S. Scorecard Mid-Year-2022, 87.53 per cent of all mutual funds in the U.S.A. failed to beat their benchmark (S&P composite 1500) over a five-year period and the underperformance became worse at 91.79 per cent, and 93.10 per cent over 10 and 20-years period respectively (SPIVA 2022). In a

Vishvajeet Upadhyay, Doctoral Research Scholar, Suryadatta Research Center, SIMMC Bavdhan, Pune 411021, Maharashtra, Email: vishvajeet.pro@gmail.com

Porinita Swarnendu Banerjee, Associate Professor, Y and M AKI's Poona Institute of Management Sciences and Entrepreneurship, Camp, Pune 411001, Maharashtra,
Email: porinita.pimse@gmail.com

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study, it was found that strategic asset allocation accounts for most (93 per cent) of the time series variation in the portfolio returns while stock selection and timing have a minimal role (Brinson, Hood, Beebower, 1986, in US market and Blake, Lehmann, Timmermann, 1999, in UK markets). Investors have realized the folly of investing in actively managed funds that charge hefty fees yet can't beat their benchmark index. Hence, passive Index Funds are one of the most popular investment choices. But these indices can be very volatile and the drawdown periods can be long (S&P 500 dropped by -57 per cent during the Subprime crisis of 2008 and took more than 4 years to recover back to the original value). At best, we can expect only market returns if there are no tracking errors. In this study, we claim that it is possible to beat the market while retaining all the advantages of an index-based portfolio by using rebalancing as a dynamic portfolio management strategy.

Traditionally portfolio rebalancing has been used as a powerful risk-control strategy and to ensure that the assets in the portfolio adhere to the allocation objective. Different assets in the portfolio produce different returns over the passage of time; thus there is a drift in the value of the constituent assets which may skew the risk profile of the portfolio. Rebalancing is the process of keeping the relative portfolio weights of different asset classes stable by using calendar-based and/or threshold-based strategies (Donohue and Yip, 2003). A rebalancing strategy minimizes the risk due to portfolio drift by formalizing guidelines about how frequently the portfolio should be monitored, and how far an asset allocation can deviate from its target before it is rebalanced. Rebalancing is associated with both locking in a portfolio's risk exposure at an intended level (*see*, e.g., Tsai 2001) and the ability to buy assets at low and sell them at high prices (*see*, e.g., Bouchey, Vassilii, Paulsen, Stein 2012). Periodic rebalancing may be used to restore a portfolio to its target or to some other intermediate or new asset allocation ratio.

Nevertheless, only a minority of investors actually rebalance their portfolios (*see*, e.g., Bonaparte and Cooper 2009). Possible reasons for them not using rebalancing are that these strategies cause transaction and monitoring costs which make a simple buy-and-hold strategy more appealing. Rebalancing as a dynamic strategy in itself is rarely used in practice.

ATS are ideally suited for the routine task of portfolio rebalancing with minimum execution errors. ATS have become very complex and are now using Artificial Intelligence-based strategies, these are being called 'smart' in comparison to the 'dumb' ATS which use traditional strategies based on fundamental or technical analysis. However, this labeling of ATS is debatable as there is no correlation between the complexity of a strategy and stock market returns. This study uses rebalancing as an investment strategy for which the algorithm is very simple and almost trivial; so, it is easy to implement and robust.

II Literature Review

Previous studies on rebalancing frequency for relatively long periods conclude that it does provide advantages in terms of returns enhancement and risk minimization, apart from a few detractors. However, almost none of the studies have examined the effect of rebalancing at weekly and daily frequencies. Ferguson (1986) demonstrates theoretically and empirically that investors can manage risk effectively by using a DAA program that alters the exposure between risk-free and risky assets. Using long-term data, he concludes that the DAA strategy results in the capture of market upside along with market downside protection. Perold and Sharpe (1988) examine dynamic strategies for rebalancing portfolios in response to the tendency of risky assets to increase in value relative to less risky assets, over time. They find that a constant-mix strategy would outperform a buy-and-hold strategy in a volatile market, without sustained moves either up or down. A constant-mix strategy has the most advantage when the volatility is high. Using market data from 1963 through 1988, Dennis, Perfect, Snow, and Wiles, (1995) examine the effects of rebalancing on portfolios that conform to rigid quantitative criteria. They found that the rebalancing interval producing the highest return was two years. Horvitz (2002) suggests that rebalancing costs are substantial due to trading costs (including execution inefficiencies) and tax costs. He concludes that the drift of assets from their thresholds is less frequent than many investors realize. Therefore, rebalancing in taxable portfolios can safely be avoided over short time periods. Lynch and Balduzzi (2000) find that the predictability of returns has an effect on the rebalancing behavior of investors. When returns are predictable, investors rebalance more often and bear higher transaction costs. Tsai (2001) examines the effect of various rebalancing strategies on five model portfolios, each representing a range of risk profiles. A buy-and-hold strategy (never rebalancing) produces the lowest risk-adjusted returns, as measured by the Sharpe ratio, for all five portfolios tested. For the other four active rebalancing strategies tested Tsai found small (insignificant) variations in performance and risk. Tsai concludes that portfolios should be rebalanced because the small additional return associated with not rebalancing fails to compensate for the significantly increased risk. Tokat (2006) studies the various factors that may influence a rebalancing strategy. A conceptual framework is presented to formulate a rebalancing strategy that takes into account an institution's risk appetite and investment horizon while also considering the market environment and specific asset characteristics. Bouchey, *et. al.* (2012) used market data to evaluate the rebalancing strategy for equal-weighted portfolios comprising 100 stocks in the U.S. developed, and emerging markets. The stock selection was done at random to show that the excess return is independent of an active stock selection process. It was found that about half of the excess return from volatility harvesting comes from a diversification benefit and the other half from the rebalancing effect. They concluded that diversifying and rebalancing not only reduces risk but also enhances returns. Witte (2016)

shows how volatility can be traded to generate profits using binomial and Gaussian return dynamics in discrete time and confirms the model on real-world data.

Horn and Ohler (2020) analysed portfolios of German households (which also included real estate funds and other articles of great value) to study whether they would have benefited from automatically rebalancing their portfolios and empirically found that they would not have derived any benefit from using an automated rebalancing service in comparison to a buy-and-hold strategy.

Pedersen (2021) generated a large number of random portfolios of varying sizes and time period by using daily price data of about 900 U.S. stocks from 2007 and 2021, to compare the Rebalanced with Buy-and-Hold strategies on different performance metrics and found that the outperformance of the Rebalanced portfolios in comparison to the Buy-and-Hold portfolios depended on the time period under consideration and cannot be generalized.

III Algorithmic Trading Systems

The explosion of algorithmic trading, or automated trading systems, has been one of the most prominent trends in the financial industry over the recent decade. The simplest and most general definition of Algorithmic Trading Systems (ATS) is that it is a computer program that follows a defined set of instructions (an algorithm) to generate and place a trade in the Stock Exchange. It is naively thought that ATS are just the automation of conventional investing processes that use fundamental, technical analysis, or quantitative methods and the automatic placement of trade orders generated using these strategies. They are not just the automation of classical trading methods but offer some unique advantages of their own. Their efficient and high-speed execution of complex repetitive processes brings a new perspective to the trading process. Many of the continuous time processes like rebalancing (as shown in this study) and portfolio optimization can now be used as investment strategies and can only be efficiently implemented at higher frequencies using ATS.

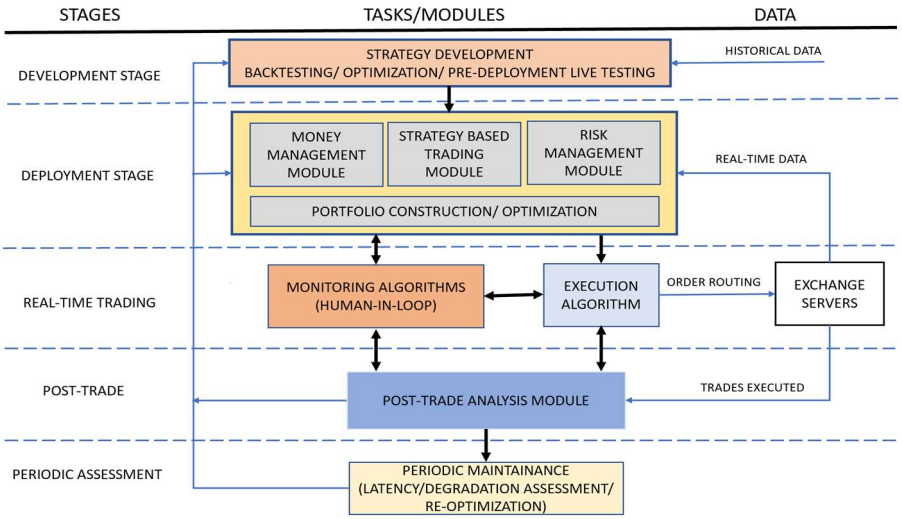
ATS generate more than 60-75 per cent of total trading volumes in the US and other developed markets (ReportLinker 2022). India is not far behind with ATS accounting for more than 50 per cent of trades on NSE and BSE (DEA-NIF, 2017). Till now ATS were mostly being used by Institutional Investors but now ATS are increasingly being used for trading by retail investors due to:

- Online discount brokers offering proprietary trading platforms requiring very little programming skills.
- Ready-made Algos available for hire.
- ATS hosted in the cloud bypasses the need for costly hardware.
- The lure of easy money.
- The premise that using ATS is unemotional, objective, and convenient.
- High-quality real-time/ historical data available at low cost/free.

There are many kinds of ATS based on the time period in which they operate and the task they perform. High-Frequency Trading Systems (HFT) operate in the range of nanoseconds to a few minutes. In such a short time period there is hardly any volatility so any strategy that uses volatility for profitability is not suited for such short time periods. The HFTs are best suited for arbitrage. Another popular strategy for the HFT is to search for big incoming orders and to take positions before these orders in anticipation of price movement due to the impact of these big orders. There are specialized Execution ATS that break up big orders into small chunks in an endeavour to get the best execution price and prevent HFTs from taking advantage of the price move. Trading ATS uses strategies that may be purely based on (or a mix of) fundamental, technical analysis, or other advanced quantitative methods. The use of Machine Learning based strategies is becoming more and more popular.

The figure below shows the steps involved in developing and deploying an ATS. The modules shown may be built into a single program but to emphasize their importance they are shown as different modules. In the development stage, creative ideas to be used as trading strategies are developed and tested on historical data. Out of these strategies the best-performing one based on the required risk-return profile is chosen for optimization and live testing prior to deployment. This strategy module is then integrated with other modules for deciding the position size of individual assets in the portfolio and for using other risk management methods like trailing stop loss, etc. Other metrics for rebalancing and optimization of the portfolio are designed and tested prior to real-time deployment. There is an execution module that places and monitors the order generated by the trading module with the Exchange Servers (maybe through intermediary brokers). The ATS is not a static system, it needs to adapt to the changing market environment and the post-trade analysis and maintenance modules help in this process by analyzing and giving the required input for the upgradation of system parameters. The monitoring algorithm (preferably with humans-in-loop) is one of the most important tasks to prevent any malfunction that may lead to large losses.

Figure 1: Stages of Developing and Deploying an ATS and Its Conceptual Architecture



IV Methodology

Portfolio Design: In most of the previous papers, the study has been done on widely diversified stock portfolios which led to the discussion about how much excess return was due to the volatility harvesting effect and how much due to the diversification effect. So, to focus only on volatility harvesting and to show that it is possible to perform better than a balanced portfolio of the benchmark index, we construct a passive balanced portfolio with three assets: An Index to represent the market return, bonds to represent risk-free return (here we take it as five per cent fixed interest rate with daily compounding), and gold which has been a traditional hedge against inflation. The assets are weighted as Index: Bond: Gold: :45:45:10. This portfolio is our benchmark against which the performance of other portfolios with varying rebalancing periods are compared. To generalize the result, four different portfolios were constructed with indices from different global markets, viz., S&P 500 (USA), Nifty 50 (India), Shanghai Composite (China), and Bovespa (Brazil).

Rebalancing Procedure: In the rebalancing algorithm, we calculate the portfolio value using the previous day's closing price of assets and we assume that the ATS is deployed in the market at the ending half hour of the trading day so that most of the daily volatility is captured and for the purpose of stimulation we take the closing prices of assets to do the rebalancing for that day. In the long run, we assume that the last half-hour prices will be nearly the same as the closing price and the simulation will very nearly mimic actual trading. Weekly rebalancing was

done on the last trading day of the week (Friday) and monthly rebalancing was done on the last trading day of the month.

V Theoretical Explanation

Intuitively volatility pumping uses the well-known investing maxim: "Buy low and sell high", if we are able to use this process consistently then this will lead to portfolio growth. To theoretically explain the process, we follow the treatment for continuous-time portfolio growth as in standard literature (Luenberger 1997). We assume that prices are governed by a geometric Brownian motion equation:

$$dS = \mu.S.dt + \sigma.S.dz \quad \ldots(1)$$

Where S is asset price, μ is expected return, σ is volatility, z is a normalized Wiener process and dt is the time increment. Using Ito's lemma, the above stochastic differential equation has the solution:

$$dF = \left(\frac{\partial F}{\partial S}\mu S + \frac{\partial F}{\partial t} + \frac{1}{2}\frac{\partial^2 F}{\partial S^2}\sigma^2 S^2\right)dt + \frac{\partial F}{\partial S}\sigma S dz \quad \ldots(2)$$

Assuming the prices follow the lognormal process F=ln(S) we get:

$$\frac{\partial F}{\partial S} = \frac{1}{S};\ \frac{\partial^2 F}{\partial S^2} = \frac{1}{S^2};\ \frac{\partial F}{\partial t} = 0 \quad \ldots(3)$$

Substituting in equation (2) we get:

$$dF = \left(\mu - \frac{\sigma^2}{2}\right)dt + \sigma dz \quad \ldots(4)$$

We assumed F to be a lognormal process, so the continuously compounded return dF=d ln(S) =dS/S and at time t has the drift parameter:

$$\vartheta.t = \left(\mu - \frac{\sigma^2}{2}\right)t \quad \ldots(5)$$

Now let us construct a portfolio of n assets using the weights w_i, where i= 1,2,…,n and Let V be the value of the portfolio. The instantaneous rate of return of the portfolio is the weighted sum of the instantaneous returns of the n assets and we have:

$$\frac{dV}{V} = \sum_{i=1}^{n} w_i \frac{dp_i}{p_i} \quad \ldots(6)$$

Where p_i is the price of the i^{th} asset, if we take μ_i to be its expected return and substitute for the instantaneous prices of the asset using equation (1) for multiple assets we have:

$$\frac{dV}{V} = \sum_{i=1}^{n}(w_i\mu_i\, dt + w_i dz_i\,) \quad \ldots(7)$$

The variance of the stochastic term is

$$E(\sum_{i=1}^{n} w_i dz_i\,)^2 = E(\sum_{i=1}^{n} w_i dz_i\,)\big(\sum_{j=1}^{n} w_j dz_j\,\big) = \sum_{i,j=1}^{n} w_i\, \sigma_{ij}\, w_j dt \quad \ldots(8)$$

Where σ_{ij} is the covariance between assets i and j. The value V(t) is lognormal with

$$E\,\left[ln\left(\frac{V(t)}{V(0)}\right)\right] = \vartheta t = \sum_{i=1}^{n} w_i\mu_i\, t\, - \frac{1}{2}\sum_{i,j=1}^{n} w_i\, \sigma_{ij}\, w_j dt \quad \ldots(9)$$

Equation (9) explains how volatility can be pumped to increase portfolio growth. To see this in a simplified way, suppose that the n assets are uncorrelated to each other and all of them have the same mean and variance; then, for this case equation (1) becomes:

$$\frac{dp_i}{p_i} = \mu dt + dz_i \quad \ldots(10)$$

Since variance is same for all assets, each dz_i has variance $\sigma^2 dt$. The expected growth rate of each individual stock is

$$\vartheta = \mu - \frac{1}{2n}\sigma^2 \quad \ldots(11)$$

If we assume equal weights of 1/n for all the assets in the portfolio, then the expected growth rate of the portfolio is:

$$\vartheta_{port} = \mu - \frac{1}{2n}\sigma^2 \quad \ldots(12)$$

The volatility harvesting process reduces the magnitude of $\frac{1}{2}\sigma^2$ correcting term resulting in the increase of portfolio growth rate. In the above case the growth rate of the portfolio has increased over that of a single asset by a factor:

$$\vartheta_{port} - \vartheta = \frac{1}{2}\left(1 - \frac{1}{n}\right)\sigma^2 = \frac{1}{2}\left(\frac{n-1}{n}\right)\sigma^2\,. \quad \ldots(13)$$

VI Findings

Improved Performance: The performance of portfolios with various frequencies of rebalancing is as shown in Figures 2 to 5 (the Authors). It may be noted that in all four portfolios, monthly rebalancing doesn't make much of a difference in the returns or the Sharpe ratio; however, with weekly and daily rebalancing, the performance improves and the returns are more than double the benchmark return for daily rebalancing and more than 1.5 per cent excess return for weekly rebalancing (Table 1) with marked improvement in Sharpe ratio in all cases (*see* Table 2).

The increase in returns by using daily rebalancing is substantial; however, it comes at the cost of increased volatility. The annualized Sharpe ratio does not give the full picture of the portfolio parameters so a detailed look in terms of drawdown and volatility for the portfolio with S&P 500 (USA) is shown in Figure 8. For daily rebalancing, the returns have more than doubled, but the drawdowns have also doubled and the volatility of the portfolio has also increased when compared to the benchmark portfolio.

Figure 2: Performance of portfolio with S&P 500 (USA)

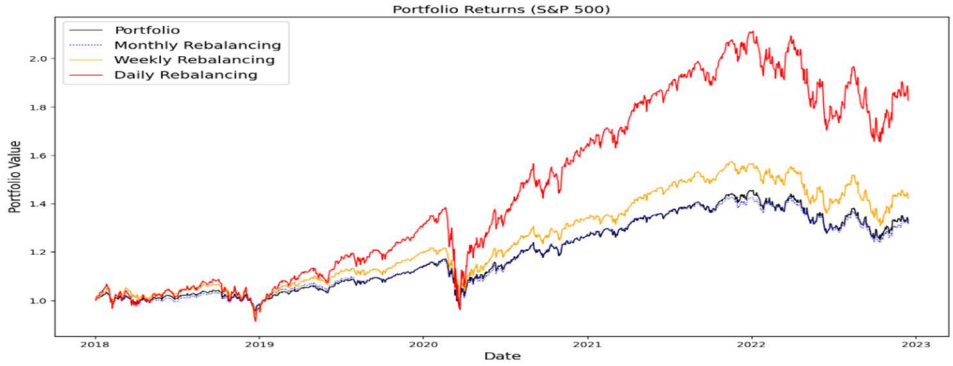


Figure 3: Performance of portfolio with Nifty (India)

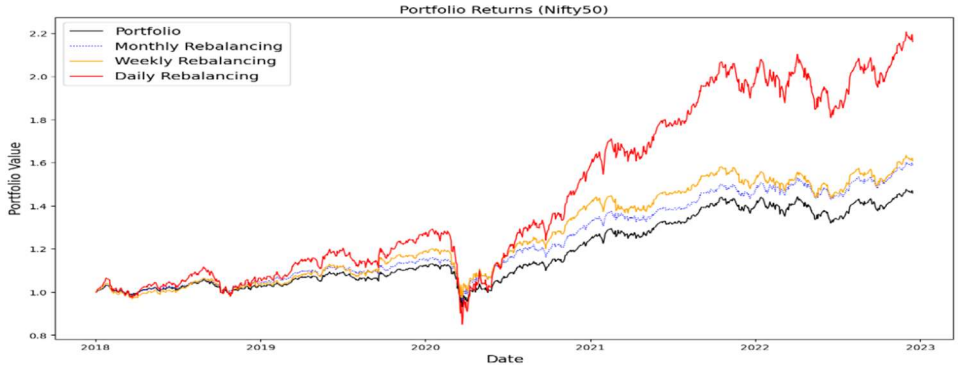


Figure 4: Performance of portfolio with Shanghai Composite (China)

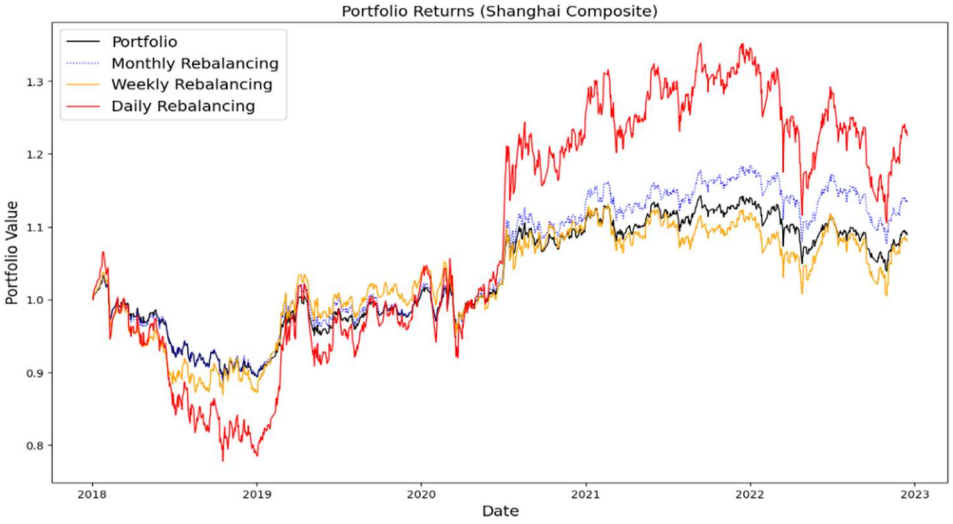
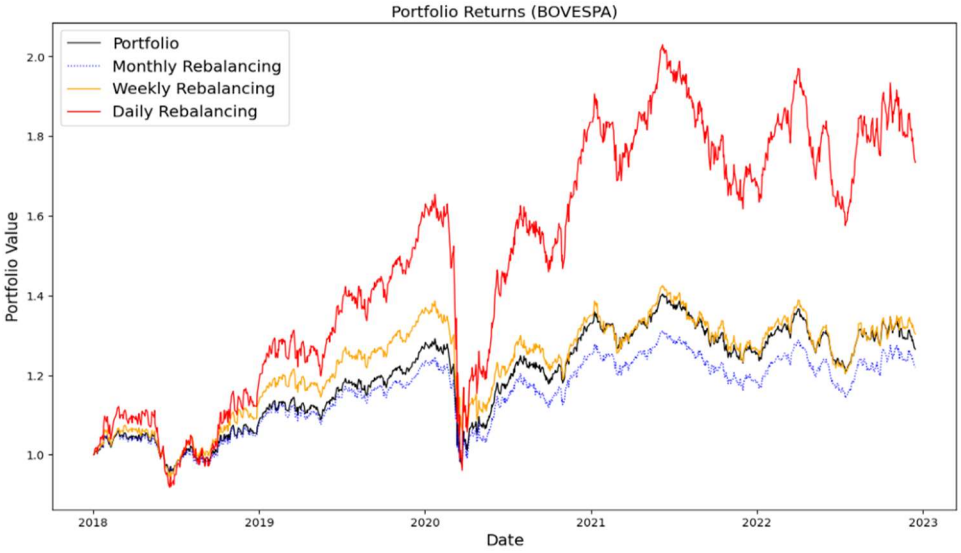


Figure 5: Performance of portfolio with Bovespa (Brazil)



When we look at the distribution of returns, we notice that the distribution of the benchmark portfolio has most of the returns bunched tightly toward the center, thus having positive excess kurtosis compared to that of daily rebalancing where the returns are more widely distributed.

Figure 6: Distribution of Returns

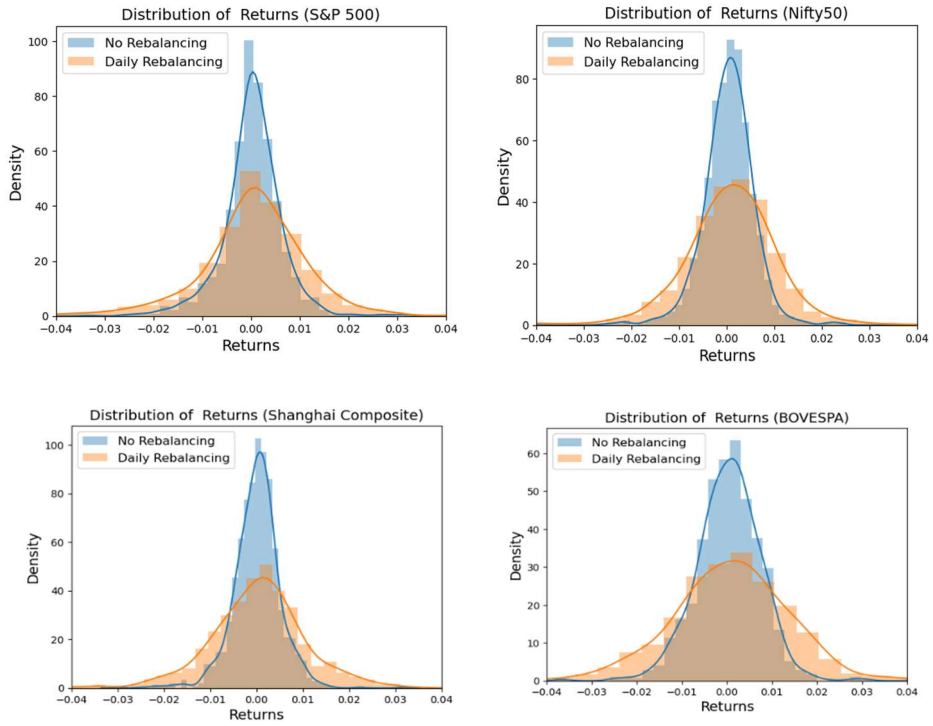


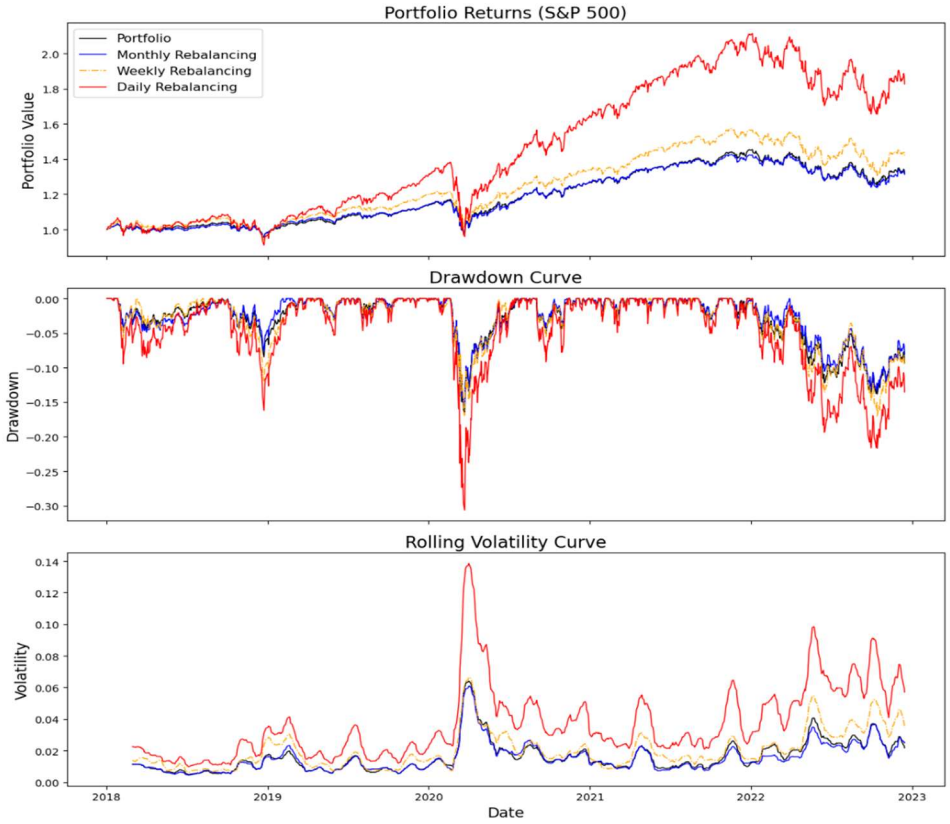
Table 1: Comparative Performance of Returns

Index in Portfolio	Performance (per cent CAGR)			
	No Rebalancing	Monthly Rebalancing	Weekly Rebalancing	Daily Rebalancing
S&P 500 (USA)	5.75	5.66	7.35	12.93
Nifty (India)	7.91	9.75	10.08	16.83
Shanghai Composite (China)	1.73	2.56	1.46	4.18
Bovespa (Brazil)	4.86	4.10	5.49	11.75

Table 2: Comparative Performance of Risk

Index in Portfolio	Performance (Sharpe Ratio)			
	No Rebalancing	Monthly Rebalancing	Weekly Rebalancing	Daily Rebalancing
S&P 500 (USA)	0.59	0.60	0.63	0.70
Nifty (India)	0.93	1.12	0.96	1.00
Shanghai Composite(China)	0.27	0.35	0.21	0.34
Bovespa (Brazil)	0.45	0.41	0.44	0.59

Figure 7: Drawdown and Volatility of Portfolio with S&P 500 (USA)



Drawback of Daily Rebalancing and Its Mitigation: The biggest drawback of the rebalancing strategy is that we are increasing our position in an asset which decreases in value and vice versa. This strategy may lead to huge losses in a continuously down-trending market. To overcome this drawback, one simple suggestion is that we modify our daily rebalancing algorithm to temporarily stop the rebalancing process whenever the (say) 40-day rolling volatility of the returns of the daily rebalanced portfolio increases beyond a specified threshold and restart the rebalancing process again when the rolling volatility comes down below this threshold. To check the effectiveness of this procedure we take the portfolio with the S&P 500 as the index component and set the volatility threshold to a specified limit which can be obtained from historical data and can be updated as required based on market conditions (for this case we take the threshold as 0.04). With this simple modification in the algorithm, we find a big improvement in the risk profile of the portfolio. It can be seen in the drawdown curve (Figure 8) that the maximum drawdown has reduced from -30.64 per cent for the daily rebalanced portfolio to -19.56 per cent for the daily rebalanced portfolio with a threshold. Table 3 shows

that the portfolio with a volatility threshold is better than the daily rebalanced portfolio on all performance and risk parameters.

Figure 8: Drawdown with Volatility Threshold for Portfolio with S&P 500

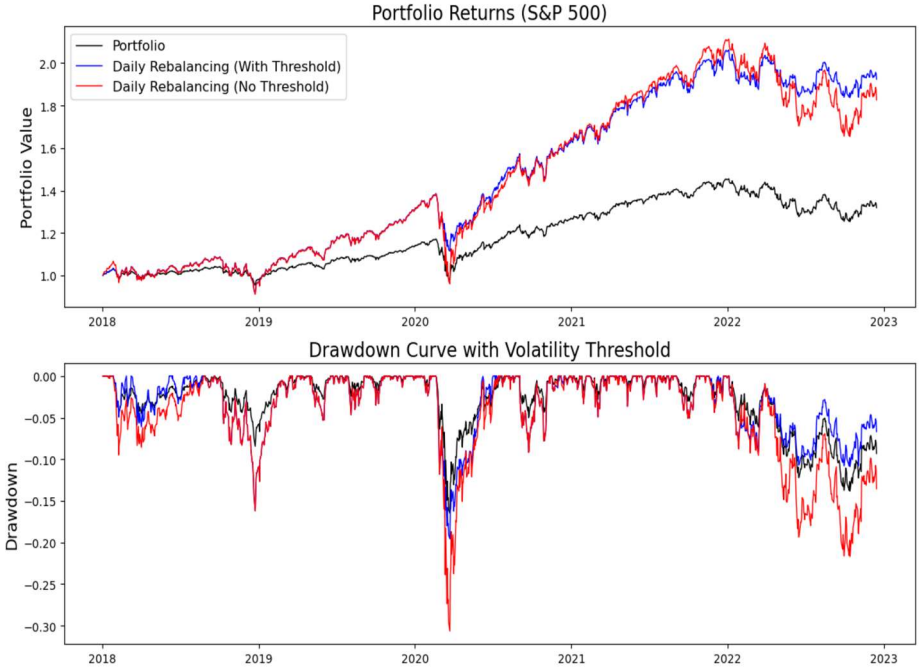


Table 3: Comparative Performance with Volatility Threshold for Portfolio with S&P 500

Performance Metric	Daily Rebalancing	Daily Rebalancing with Volatility Threshold	Benchmark Portfolio
Cumulative Return	82.66 per cent	92.44 per cent	31.93 per cent
CAGR per cent	12.93 per cent	14.13 per cent	5.75 per cent
Sharpe Ratio	0.70	0.99	0.59
Sortino Ratio	0.99	1.40	0.82
Max Drawdown	-30.64 per cent	-19.56 per cent	-16.50 per cent
Volatility (annualized)	20.18 per cent	14.45 per cent	10.36 per cent

VII Effect of Transaction Costs and Execution Errors

Transaction costs and errors in the execution of the algorithmic strategy can have a big impact on the profitability of the strategy. The transaction cost is low, since the average daily price fluctuation is 0.2 per cent and if we take a high transaction cost of 0.5 per cent (the transaction cost is usually below 0.2 per cent), even then the annual transaction cost comes out to be 0.25 per cent of the portfolio value

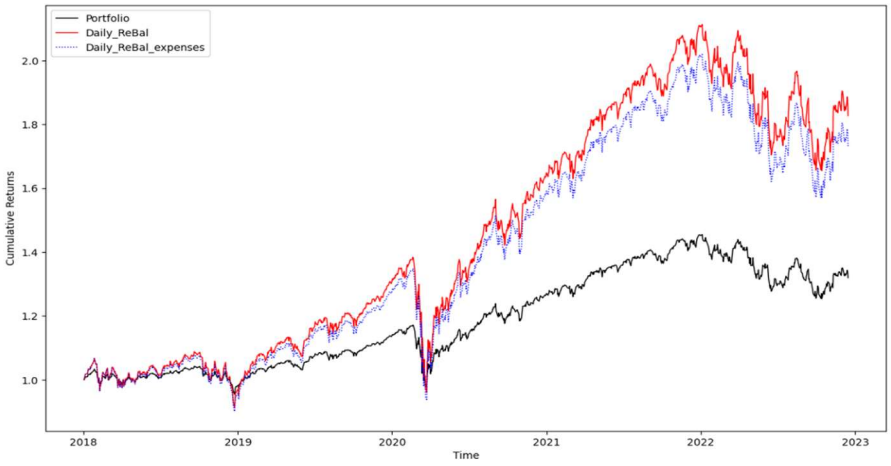
(taking 255 trading days in a year). This is very low compared to the 0.8 per cent of the annual management fee being charged even by passive Index Funds.

Improper rebalancing will have a more serious effect. This can occur for example, if the contract size of the futures contract for the index is too large and the overall value of the portfolio is small so that we are unable to rebalance properly and are unable to capture the volatility. To avoid this, the total portfolio value should be at least 10000 times the value of the largest tradable lot of an asset (preferably it should be 40000 times). For example, if the cost of a gold mini futures contract is $ 50 and the cost of a S&P 500 mini futures contract is $ 100 then the minimum portfolio size should be $ 1000000.

Another serious factor that can impact profitability is slippage in order execution. Slippages are exacerbated during low liquidity periods or when volatility is high. Avoiding rebalancing during high volatility, as suggested in section 6.2, will help in minimizing the effect of slippages.

A simulation was done on the portfolio with S&P 500 to incorporate all these factors in the algorithmic trading process (transaction cost was taken as 0.5 per cent and improper rebalancing and slippages were simulated) and the effect is shown in Figure 9. The blue dotted line shows the effect of the factors on the cumulative return of the portfolio for daily rebalancing. The CAGR dropped from 12.93 per cent to 11.58 per cent, which is a substantial drop in performance.

Figure 9: Effect of Transaction Costs and Execution Errors



VIII Discussion

1. The performance of daily rebalancing is excellent on all parameters. The returns generated are more than double that of the benchmark portfolios and the Sharpe ratio is also better; thus, we are generating substantially more returns with lesser risk.

2. Weekly rebalancing also generates returns greater than 1.5 per cent annually when compared to the respective benchmark portfolio with improvement in the Sharpe ratio in most cases.
3. The results for monthly rebalancing are mixed and the gains in performance are not substantial.
4. The rebalancing will be effective only if the size of the portfolio is at least 10000 times the cost of one unit of the highest prized asset. With a high transaction cost of 0.5 per cent and catering for slippages in execution and improper rebalancing, the deterioration in the result is around 1.5 per cent annually, of the overall result achieved. However, the results will be seriously impacted if the portfolio value is too small to do the rebalancing properly.
5. We found that the biggest drawback of this rebalancing strategy is that we are increasing our position in an asset which decreases in value and vice versa. This strategy may lead to huge losses in a continuously down-trending market. To minimize the risk of ruin, a kind of anti-martingale position sizing strategy i.e., increasing the position size of the winning asset and vice versa is always recommended. To overcome this drawback, further experimentation is recommended in which we stop the rebalancing process temporarily when the rolling volatility or Sortino ratio (which is excess return by negative standard deviation) goes above/falls below a threshold, and restart the process when it is again within the required limit. In this study experiments using a volatility threshold gave very good results.

IX Summary

This study shows how, by actively rebalancing a portfolio on monthly and smaller time scales, which can easily be implemented using ATS, returns can be enhanced and risk can be reduced, while retaining all the advantages of passive index investing. This study found that by using weekly rebalancing on four portfolios (composed of risk-free bonds, Gold, and an Index as the equity component in the ratio 45:10:45) based on S&P 500, Nifty 50, Shanghai Composite, and Bovespa respectively, the returns were enhanced by at least 1.5 per cent annually over a five-year period with better Sharpe ratio. The returns were substantially more (at least double the benchmark portfolio returns) when daily rebalancing was used. Hence, rebalancing can be used as an excellent dynamic strategy when used in conjunction with index investing.

References

Blake, D., B.N. Lehmann and A. Timmermann (1999), Asset Allocation Dynamics and Pension Fund Performance, *The Journal of Business*, 72(4): 429-461.

Bonaparte, Yosef and Russell Cooper (2009), *Costly Portfolio Adjustment,* NBER: Working Paper 15227, https://www.nber.org/paper s/w15227.ack, Accessed 12 May 2019.

Bouchey, Paul, Vassilii Nemtchinov, Alex Paulsen and David M. Stein (2012), Volatility Harvesting: Why Does Diversifying and Rebalancing Create Portfolio Growth?, *Journal of Wealth Management,* 15(2): 26–35.

Brinson, G.P., L.R. Hood and G.L. Beebower (1986), Determinants of Portfolio Performance, *Financial Analysts Journal*, 42(4): 39-44.

DEA-NIFM (2017), *A Study of Algorithm Trading/HFT in Indian Capital Markets*, https://dea.gov.in/sites/default/files/NIFM-Report-on-Algo-trading.pdf

Dennis, P., S.B. Perfect, K.N. Snow and K.W. Wiles (1995), The Effects of Rebalancing on Size and Book-to-Market Ratio Portfolio Returns, *Financial Analysts Journal*, 51(3): 47-57.

Donohue, Christopher, and Kenneth Yip (2003), Optimal Portfolio Rebalancing with Transaction Costs, *Journal of Portfolio Management*, 29(4): 49–63, https://doi.org/10.3905/jpm.2003.319894.

Ferguson, R. (1986), How to Beat the S&P 500 (without losing sleep), *Financial Analysts Journal*, 42(2): 37-46.

Horn, M. and A. Oehler (2020), Automated Portfolio Rebalancing: Automatic Erosion of Investment Performance?, *Journal of Asset Management*, 21(6): 489-505.

Horvitz, J.E. (2002), The Implications of Rebalancing the Investment Portfolio for the Taxable Investor, *The Journal of Wealth Management*, 5(2): 49-53.

Luenberger, D.G. (1997), *Investment Science,* Oxford University Press:422-425

Lynch, A.W. and P. Balduzzi (2000), Predictability and Transaction Costs: The Impact on Rebalancing Rules and Behavior, *The Journal of Finance*, 55(5): 2285-2309.

Pedersen, M. (2021), *Does Volatility Harvesting Really Work?*, Available at SSRN 3847692.

Perold, Andre F. and William F. Sharpe (1988), Dynamic Strategies for Asset Allocation, *Financial Analysts Journal,* 44(1): 16–27, https:// doi.org/10.2469/faj.v44.n1.16.

ReportLinker (2022, March), *Algorithmic Trading Market - Growth, Trends, COVID-19 Impact, and Forecasts (2022 - 2027),* https://www.reportlinker.com/p06246232/Algorithmic-Trading-Market-Growth-Trends-COVID-19-Impact-and-Forecasts.html?utm_source=GNW

SPIVA U.S. Scorecard (Mid-Year-2022), https://www.spglobal.com/spdji/en/documents/spiva/spiva-us-mid-year-2022.pdf

Tokat, Y. (2006), Portfolio Rebalancing in Theory and Practice, Vanguard Investment Counseling and Research, Number 31.

Tsai, C.S.Y. (2001), Rebalancing Diversified Portfolios of Various Risk Profiles, *Journal of Financial Planning*, 14(10): 104.

Witte, J.H. (2016), Volatility Harvesting: Extracting Return from Randomness, *Wilmott*, 2016(83): 60-67.

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Learning Poverty in a Matrilineal Society: An Empirical Study

Kenny R. Shullai and Bhagirathi Panda

Learning poverty has negative implications for human capital formation and progress of human development. A case study in two urban areas of Meghalaya—Shillong and Jowai found that learning poverty is prevalent among the sample data of female students. 15 schools were randomly selected and three tests were administered to classes nine and 10 students focusing on Mathematics, English reading and basic scientific and technological concepts. The study found that students coming from low-income households scored lesser marks by -9.65, -3.73 and -1.87 in Mathematics, English reading and Picture Vocabulary tests respectively, in relation to students from the relatively higher incomes households, keeping other things constant. Other family related variables are also significantly related to learning outcomes. Human development of a society can be improved foremost if the young generation are learning effectively and efficiently, thereby, policy-makers should address the factors that affect learning whether in school or at home.

Keywords: Learning poverty, household-income, family characteristics, human development.

I Introduction

The female is one of the main pillars in a typical household of the Khasi-Jantia tribe in Northeast India. They enjoy equal rights as the men do or even more when it comes to land and property. The youngest daughter (or in some cases, all the daughters) inherits her parental land and property. Khasi-Jantia women have culturally instilled positions and roles concerning different spheres of the socio-economic spectrum of society. Authority, inheritance, title, succession and residency after marriage follow the female line (De and Ghosh 2007). In most patriarchal societies around the world, especially in rural India, daughters do not have many rights or priorities as the sons, especially in education and property rights. In India, patriarchy has played a part to impede women progress (Singh, Chokhandre, Singh, Barker, Kumar, McDougal and Raj 2021). The Annual Status of Education Report conveyed that in education there was widespread gender

Kenny R. Shullai, Assistant Professor of Economics, Department of Economics, MLCU, Shillong 793006, Meghalaya, Email: kennyrichieshullai@gmail.com, Mobile No.: 9863151919

Bhagirathi Panda, Professor of Economics, Department of Economics, NEHU, Shillong 793022, Meghalaya, Email: bhagirathi2@yahoo.co.in

disparity (Pratham 2022). In matrilineal Meghalaya though, females' education and their over-all welfare is well taken note of in a typical household, except when poverty hampers the ability to do so. Females' education is related to economic growth and human development and women empowerment is not just a gender issue but a development issue (Tembon and Fort 2008). This is especially relevant in the context of a matrilineal society because the female is the important pillar that builds onto the next generation with her children bearing her surname and her daughters inheriting whatever she has accumulated and saved with her husband. Her education, capabilities and knowledge are significant variables that will influence her children's wellbeing with subsequent links to the prospects of human development of the particular society.

Learning poverty has increased significantly in low- and middle-income countries and household-income shocks had the highest impact on learning poverty in Latin America and the Caribbean with a predicted 80 per cent of children at the end-of-primary-school-age unable to understand simple written texts. For South Asia, the increase in learning poverty is also dire with 78 per cent of the share of children lacking minimum literacy proficiency, up from 60 per cent pre-pandemic level (The State of Global Learning Poverty: 2022 Update). Poverty and its effects have no particular exception for any social system. One of its effects manifests in learning poverty, that is, household poverty mediates learning poverty. For a female in a matrilineal society with the culturally implied role as the main component of the household and the clan, the dynamics of learning, skills development and knowledge acquisition in the early years of childhood, play a crucial part in the progress, stability and development of the clan. Learning poverty will be something that will not facilitate the progress of human development in this society especially when it concerns female students.

Human development is a broad concept and has many factors that go into it but the main components are education and health. Education can be measured by many proxies to gauge the progress of this dimension in relation to human development. Aggregates like gross enrolment ratio does not inform us much about skills development and knowledge acquisition of the students enrolled, thus presenting us with only partial information about human development. Learning outcomes, instead, will present us with the information that matters because the role of education is to equip the learner with skills and knowledge that will facilitate even higher learning and subsequently be useful later in life. What determines learning outcomes to a great extent are the family variables *inter alia* school environment and teachers' talents. The family is the source of security and identity for children (Croll 2004). In this study, learning outcomes of female students are examined and the association with the student's household characteristics is analysed to bring into focus the micro-variables that are related to learning. Further, learning outcomes have implications for human capital formation and knowledge, influencing the ability to make informed decisions about health and education with subsequent ramifications for human development.

The rest of the paper is organised as follows: Section II brings out the objectives of the study, Section III briefly discusses the literature on learning outcomes and the factors affecting it, Section IV discusses the data and methodology of the study, Section V discusses the findings of the study and Sections VI and VII bring the conclusion, some policy recommendations and limitation of the study.

II Objectives of the Study

The study's main objectives are to examine the extent of learning poverty among a sample of female students in urban Meghalaya and analyse the relationship with family related variables. This will inform policy makers about the ground realities, the dynamics of the learning process and the inequality that exists in the students' community, and how to address the issue as this has cultural, economic and human development significance on the particular society.

III Literature Review

Education is *sine quo non* to human development. It is the basis in which the foundation of a society or nation is built. The literature is replete with studies tracing how education is positively related to the progress of human development. An educated, well-nourished and healthy labour force is the most important productive asset and human development strategies involving educating girls have better pay-off for smaller families (Streeten 1994). Nussbaum (2000) conveyed that females are "less well nourished" than men, less literate than men and are less likely to have more of technical education. They are also more likely to have less political rights. The author noted that all these inequalities in the social and political domains resulted in unequal development of human capabilities in women. Young (2009) noted that positive learning outcomes is an enhancement to human capabilities and that learning is a fundamental aspect of living through which an individual can improve one's welfare. His study on 14-years old students equated functional learning to be essential to improve one's condition. Azevedo (2020) observed that learning poverty has increased drastically in middle-income countries especially in East and South Asia, Latin America and Africa. This stands to increase inequality among the learning poor with girls disproportionately affected. Crouch, Rolleston and Gustafsson (2021) explored learning achievements across several countries, the distribution of achievement and the proportion of students learning below or at the required minimum and found that gender, wealth and other "system-related" inequalities impacted learning outcomes. The authors noted that countries can progress by reducing the percentages of students with low scores than by increasing the percentages of high scoring students. Rose, Sabates, Alcott, and Illie (2017) conveyed that gender, income and location compounded with one another and this exacerbated inequalities in many dimensions, especially in education. The authors identified

the extent of learning inequalities globally, using the World Inequality Database in Education and found that low and middle-income countries were the ones with the highest inequality in learning. The authors stressed on the challenge to raise learning outcomes in order to ensure inclusive education for all children by 2030. Ro and Loya (2015) investigated learning outcomes in engineering undergraduates and observed that women, Asian and other ethnics groups tended to report lower learning outcomes and tended to rate their skills to be lower than their male-white counterparts. von Stumm, Cave and Wakeling (2022) using regression, correlation and other methods found that students from more privileged households performed better throughout the compulsory schooling years. The authors noted that students from low socio-economic households have been persistently disadvantaged in education arguably because students from such households cannot make use of the learning opportunities that compulsory education offers because of income constraints. Khanam and Nghiem (2017) found significant association between household income and student's Peabody Picture Vocabulary Test (PPVT), Matrix Reasoning (MR), literacy score and mathematics scores. The authors used regression analysis and found that a 10 per cent increase in household income is associated with an increase in PPVT, MR, literacy and mathematics score by one per cent of a standard deviation. Atemnkeng (2010) noted that parents' education and income strongly influenced parental decision towards children's education and schooling. There appears to be an intergenerational transmission of school levels with gender of household head, level of income, education of the parents and size of household influencing schooling outcomes. Tovar (2014) found that the condition of family resources is significantly related to children's educational achievements and plans about education trajectory. The author's econometric results showed that girls have better educational outcomes than boys and those from families with higher resources showed higher probabilities of continuing higher studies. Sahoo (2016) observed that in India, girls' education is an opportunity that needs to be realized. Girls' education has positive impacts that can yield dividends socially and economically. Educated girls make significant contribution at home, professionally and contribute to the overall development of the society. The author noted though that there were challenges galore in India with girls' education being "poor" and enrolment rates being low at the elementary and secondary levels.

Indubitably, education is an important aspect that cannot be overlooked if one ponders on the prospect of human development in a society. Girls' education is especially important as they will most of the time, be an important component of the most fundamental unit of the society—the family. The mother of the house as opposed to the man of the house, is a significant variable that determines the wellbeing of the children that are the future of the society. But first, it all starts with learning by the girl child and the factors that affect learning whether in school or at home, or in reading or reasoning. Data from this region of India is scarce; thereby the story is not complete when talking about education, given the diversity of the country. Therefore, this study is a small contribution to the story.

IV Data and Methodology

The study is based on primary data that was collected from 15 randomly selected schools in Shillong and Jowai, two urban centres of Meghalaya. The experiment on learning outcomes was conducted from September to December of 2021 on students of classes nine and ten studying in schools affiliated to Meghalaya Board of School Education (MBoSE). The field experiment involved administering a mathematics test that was mostly based on class seven syllabus of MBoSE, an English reading test based on a poem by William Shakespeare titled *Sonnet 60,* evaluating the students' punctuations, pronunciation and comprehension and finally, a Picture Vocabulary Test (PVT) focusing on basic STEM (science, technology, engineering and mathematics) concepts. A total of 240 female students makes up the sample data. Further, data on their family collected by interviewing the parents on such variables like, annual household-income, educational level of the parents, number of children, whether staying in own house or rented house, number of rooms, etc.

The data is analysed using descriptive statistics examining the learning outcomes of the students. To test the association between learning outcomes and household-characteristics, regression analysis is used with the scores of the students being the dependent variables and the predictor or independents variables are the family characteristics taken for the purpose of the study. Therefore, we have the following:

$$Y_i = a_i + b_1X_{i1} + b_2X_{i2} + \ldots + b_nX_{in}$$

Where, i=1, 2… 240 and Y is the total of scores in Mathematics, English reading and PVT tests while Xs are the independent variables used for the study (Appendix 1). The regression analysis is used to test the difference and the statistical significance of the relationship between students' learning outcomes and their family characteristics. Variance Inflating Factor (VIF) and Tolerance Level are used to test for collinearity and no serious collinearity problems were detected for the independent variables chosen (Appendix 2).

V Findings and Discussions

Learning poverty is defined as deficiency in reading and mathematical skills of students in age-appropriate learning materials. It is designed to track the progress of learning or the lack of it in relation to reading comprehension and numeracy skills of students. The report by the World Bank and UNESCO highlighted that 53 per cent of children in low- and middle-income countries could not read a text with comprehension appropriate for their age (World Bank 2019). Learning poverty has negative implications for the development of human capital and the progress of human development overall. Skills and knowledge deficiency is a great threat to the socio-economic fabric of a nation. The nature and outcome of children in

development spheres in a household is associated to a great degree with income and the mother's education (Harding, Pamela and Hughes 2015). In a matrilineal society of Meghalaya, skill development and knowledge acquisition of the female student is ever more important as she will one day become one of the main components in a typical Khasi household.

From the field data, it was observed that on average, students were able to score only 11 per cent of the total in the mathematics test that was based on earlier syllabus, indicating severe learning poverty in this subject domain. The Co-efficient of Variation (CoV), a measure of dispersion of the data points (student's score) around the mean, showed that even though the average score is somewhat lower, there is wide variations in the scores secured by the students with some scoring higher than and many scoring below the average in mathematics. No doubt, mathematics is considered to be a difficult subject; but for students of classes 9 and 10 to be unable to solve most of the questions of class 7conveyed that their foundational knowledge is not established. This will severely hamper comprehension during their current mathematics lessons and in higher studies especially when it comes to STEM subjects. In English reading test, the result is relatively better with students on average scoring more than 50 per cent of the total marks and the CoV is also relatively smaller, meaning that female students on average performed consistently better in reading than in mathematics. When it comes to scientific concepts, students on average scored less than 35 per cent of the total marks (Table 1).

Table 1: Average score of students

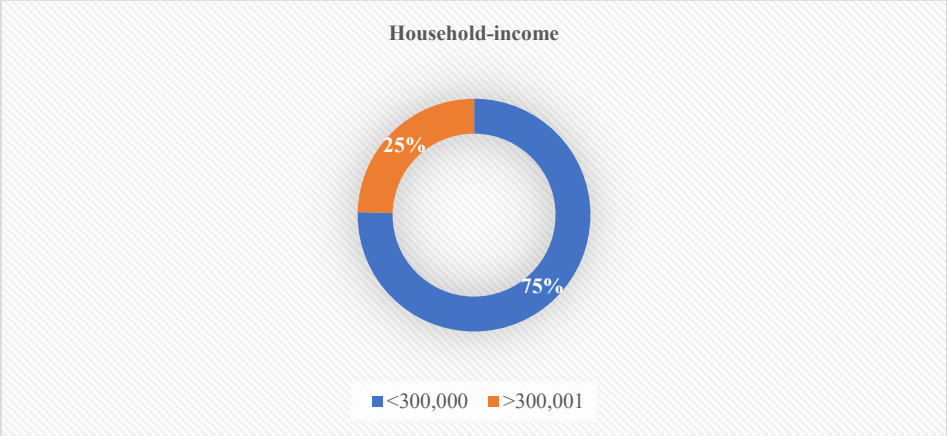
	Average Score (%)		
	Mathematics	English Reading	PVT
	10.97	51.02	34.64
CoV	113.17	29.98	59.41

Source: Authors' calculation from field data.

Science and mathematics seem to be subjects that the students in the sample data are facing difficulty with. A similar finding was arrived at, in a paper examining the mathematical proficiency of students in the East Khasi Hills districts of Meghalaya (Singh, Choudhury and Nongrum 2019). Logical and reasoning skills that mathematics entail is a beneficial skill to acquire, aiding in making informed decisions that can improve one's socio-economic conditions. It also helps in making sense of the complex world and how Nature works that invariably facilitates higher learning and knowledge formation. Looking at the family background of the students, it was observed that most of them come from low-income households. Meghalaya in terms of per capita income is one of the states in India that ranked in the bottom half of the list. It's GDP per capita ranking at current prices that stood at 29th position among the states and union territories of India in 2019-2020 (Reserve Bank of India 2022). It is listed as the fifth-poorest

state in India according to NITI Aayog's Multidimensional Poverty Index (NITI Aayog 2021). From the sample data, more than 70 per cent of the students come from households with annual income less than 300,000 Indian Rupees per annum (Figure 1).

Figure 1: Household-Income Levels (INR per annum)



Source: Authors' calculation from field data.

Household income is one of the most important determinants of children's welfare in a family. Without adequate purchasing power, parents can do little to invest in goods and services that are necessary for human development. Academic and health outcomes of the children will be affected if a household is trapped in poverty, leading to intergenerational transmission of poor human development. Inequality in learning outcomes because of the prevalence of poverty in the society will lead to further inequality in other dimensions like, higher education, human capital formation and the access to economic opportunities. From the field data, arranging the total scores according to household-income level, it was observed that students from low-income households scored lesser marks on average, compared to students who come from relatively higher income households. Students coming from household-income level of lesser than 300,000 INR per annum scored almost 18 percentage points lower in mathematics than students from the relatively higher household-income level. In English reading, students from household-income level of more than 300,001 INR per annum scored 13.1 and 28.7 more percentage points in English and PVT respectively, than students from the lower household-income level. The CoV between the tests shows that students from the lower income households have wide variation in the scores with some performing better than the average of that particular group and many scoring less. But the CoV, especially in mathematics is lower, i.e., lower as compared to students from the low income households (indicating lower deviations from the mean as compared to students from low household income).

for the students coming from the higher income households indicating that on average, the latter students performed consistently better. Testing the significance of the difference in the means of the three tests between the two household-income levels, the t-scores indicated that the difference is statistically significant, meaning income is associated with the difference in the scores of the students (Table 2).

Table 2: Students' Average Scores According to Household-Income Levels

Household income (INR/annum)	Average Score (%)		
	Mathematics	English reading	PVT
<300,000	6.5	47.6	27.5
CoV	*(110.9)*	*(29.7)*	*(27.5)*
>300,001	24.6	61.4	56.2
CoV	*(60.4)*	*(23)*	*(30.5)*
t-score	*(12.6)* ***	*(7.4)* ***	*(13.1)* ***

Notes: *** signifies statistical significance at one per cent, ** signifies statistical significance at five per cent.
Source: Authors' calculation from field data.

Socio-economic and gender gaps mediate gaps in educational attainment (Jones and Ramchand 2016). Absence of a conducive learning environment and household poverty has collateral effects on cognitive development of the children leading to poor academic outcomes. Despite the importance of household income, parental educational level is equally important when it comes to children's academic outcomes. Parents' education is positively related to children's educational outcomes in school and economic achievements later on in life (Erola, Jalonen and Lehti 2016). From the field data, it was found that 28.3 and 18.3 per cents of the students have a father and mother respectively, who had never attended school. Less than three per cent of the students have parents who are post graduates and a little over 12 per cent have parents who are graduates. A greater proportion of the students have a mother and father who have at least completed secondary education (class 8 and above) with 30.8 and 24.1 per cents respectively (Table 3).

Table 3: Parent's Educational Levels

	Educational Level (%)					
	Never attended	Primary	Secondary	Higher Secondary	Graduate	Post Graduate
Father	28.3	21.2	24.1	12	11.2	2.9
Mother	18.3	23.3	30.8	14.1	12	1.2

Source: Authors' calculation from field data.

Breaking down the sample data into low-income and high-income households, we observed that the greater proportion of parents from the low-income households also have low educational level. 36 per cent and 23.2 per cent of fathers and mothers respectively from the low-income households had never attended school. A little over three per cent of parents are graduates and none of

the mothers from the low-income households is a post-graduate and only one father has completed post-graduation. Parents from the higher income households though are mostly educated with 33.89 per cent of fathers and 38.98 per cents of mothers being graduates and only 3.38 per cent of them had never attended school (Table 4).

Table 4: Parents' Educational Level according to Household-Income

Household income (INR/annum)	Educational level (%)					
	Never attended	Primary	Secondary	Higher secondary	Graduate	Post Graduate
<300,000						
Father	36.46	23.75	24.3	11.04	3.86	0.56
Mother	23.2	27.07	33.14	13.25	3.31	0
>300,001						
Father	3.38	13.55	23.72	15.25	33.89	10.16
Mother	3.38	11.86	23.72	16.94	38.98	5.08

Source: Authors' calculation from field data.

The positive externalities of education can be enjoyed by the society and especially the children by simply having educated and knowledgeable parents. The parents' educational level, belief and behaviour towards their children's education is positively related to children's motivation and academic achievements by way of language and communication competencies shared between parent and child (Eccles 2005). But for most students coming from low-income households, with parents having low education level, the reality is an intellectually unstimulating family environment. Chores often consume most of their times with many siblings to look after and communication with their parents would hardly consist of anything academic. From the sample data, it was observed that students from the low-income households have on average more siblings and living in a rented house with fewer rooms. 53.5 per cent of the students from the lower income households stayed in a rented house with their parents as compared to 37.2 per cent for students from the higher income households. Students from the higher income households also stayed in a house with more rooms on average, with two more rooms as compared to students from the lower income households. They also have fewer siblings on average, with one less as compared to students coming from the lower income households. Further, almost 90 per cent of the students from the lower income households do not have access to a personal computer (Table 5).

Table 5: Residence, Number of Rooms and Siblings According to Household-Income

(in %)

Household-income ('000 INR)	Own House	Rented house	Personal computer	Having all books	Number of rooms	Number of siblings
<300,000	46.	53.5	10.5	95.5	4 (1)	4 (2)
>300,001	62.7	37.2	38.9	98.3	6 (3)	3 (2)

Note: Figures in (…) indicate the standard deviation.

Source: Authors' calculation from field data.

Household's characteristics are known to be associated with students' academic outcomes. Students' cognitive development is not a given but something that is affected by family related variables. Stress, anxiety and poor nutrition arising from household poverty, negatively affects the cognitive health of the young members of the family. Household's income shocks affect the mental health of the children with the affects being recognizable in the area of the brain which is related to reading, language, executive functions and spatial skills (Noble, Houston, Brito, Bartsch, Kan, Kuperman and Sowell 2015). Analysing the association between students' learning outcomes and family characteristics, regression analysis is used and the results indicated that household-income is statistically significant in its association with learning outcomes with students coming from the lower household-income level scoring lesser marks by -16.2, -5.03 and -2.84 in mathematics, English and PVT tests respectively, in relation to students coming from the higher household-income level, keeping other things constant. Students whose father's education is below secondary level are negatively affected in English reading test securing lesser marks by -1.13 in the sample data whereas students whose mothers have not completed secondary education scored lesser marks by -1.13 in PVT tests, keeping other things constant. Staying in parents' own house is positively related to reading and PVT tests with such students scoring more marks by 3.38 and 0.71 respectively in relation to students who stayed in a rented house, keeping other things constant. Having more rooms in a house is positively related to mathematics' score with students living in a house with more rooms, scoring more marks by a multiple of 0.53, keeping other things constant. Whereas having more siblings translates to lesser marks in English reading with one more sibling equalling a loss of marks by -0.18, keeping other things constant (Table 6).

The association between household characteristics and learning outcomes is a well-researched domain in other parts of the world and this study in the matrilineal society of Meghalaya further reiterates the fact that income inequality permeates every society and perpetuates inequality in other domains of life as well. Inequality in the dimension of learning, in acquiring knowledge and skills between the young members of the society mediated by inequality in household-income distribution, affects the progress of human capital formation and development of a society. Particularly in a matrilineal society, women empowerment would be

incomplete if most of the female students are suffering from learning poverty with probable ramifications affecting their ability to make informed decisions regarding health, relationships, higher education, career, finance, family, etc.

Table 6: Regression Results

Independent Variable	*Co-efficient*		
	Mathematics	English	PVT
Constant	7.26	8.67	10.3
	(2.92) ***	(7.93) ***	(8.59) ***
Household-income			
Low income	-9.65	-3.73	-1.87
	(-9.37) ***	(-8.26) ***	(-3.77) ***
Education			
Father (<class 8)	0.35	-1.13	0.39
	(0.34)	(-2.51) **	(0.80)
Mother (<class 8)	0.64	-0.24	-1.13
	(0.65)	(-0.57)	(-2.23) **
Own house	-0.2	3.38	0.71
	(0.24)	(9.0) ***	(1.72) *
Number of rooms	0.53	0.10	0.83
	(2.77) ***	(1.23)	(0.89)
Number of siblings	-0.16	-0.18	-0.78
	(-1.04)	(-2.67) ***	(-1.04)
Own computer	0.72	1.41	0.46
	(0.63)	(2.81) ***	(0.84)
Have all books	3.9	0.34	1.33
	(1.99) *	(0.39)	(1.40)
R-squared:	0.43	0.64	0.22
Adjusted R-squared:	0.42	0.63	0.20
F-score:	22.61 ***	52.73 ***	8.51 ***

Notes: Figures in (…) indicate the t-score, *** signifies statistical significance at one per; ** signifies statistical significance at five per cent; * signifies statistical significance at 10 per cent

VI Policy Recommendation

A society aspiring to achieve ever increasing human development in the dimension of health, education and standard of living, policies that address learning poverty among the student community is a wise one to consider. Policy-makers should address the inequity in the learning process originating from household poverty. Income transfer to poor families with children studying in school is a time-tested policy despite its failures and successes. Nevertheless, it can be improved upon,

say, focusing on the mother as the prime beneficiary. Cash transfers to poor families with school-age going children has shown to increase human capital investments as parents' believe that education is a worthwhile investment (Benhassine, Devoto, Duflo, Dupas and Pouliquen 2015). Children from poor families suffer from deprivation and their experiences of poverty and vulnerability have cumulative and long-term negative consequences. Cash transfer of various designs have proven to be an effective way to reduce deprivations and reduce family poverty (Barrientos and DeJong 2006). The findings also showed that accommodation is a significant factor with students staying with their parents in rented houses with fewer rooms being negatively affected in learning. Therefore, policy-makers should focus on providing subsidized hostel accommodation for students coming from poor families who stay with their parents in a rented house to ameliorate the negative effects of a cramped, unconducive and unstimulating living environment.

VII Conclusion

Improving the learning outcomes of students have long-term positive effects for human development of the society. Even with the dichotomous characterisation of society into patrilineal and matrilineal, learning is fundamental to improve upon an individual character, worldview, decision-making regarding health and economics and in other aspects of human existence whether social, political or personal. The common method to gauge the progress of human development is in through the Human Development Index (HDI), but aggregates in the HDI especially in the education dimension, does not convey the dynamics of learning. The student is just a statistic in the computation of HDI. In the matrilineal society of Meghalaya, the female is an important component in the social, economic and cultural dimensions. Her future is the future of the family as well as the clan and her education is important for that future. Girls' education is an important consideration in a typical Khasi-Jantia household. But enrolment in school is hardly a guarantee for effective and efficient learning to acquire knowledge and develop skills. Learning poverty will derail the progress of human capital formation and development, affecting the ability to make informed decisions in health, relationships and economics. For a female student in a matrilineal society, learning poverty mediated by household poverty as indicated by the results of this study will have ramifications to the access of higher education and economic opportunities with subsequent effects on her own family later on in life. In a way, this perpetuates the intergenerational transmission of poor human development and poverty.

Limitation of the Study

The findings of the study are limited to the urban areas of Shillong and Jowai and may not be representative of the whole student community in Meghalaya. Further,

the caveat of the study is that it considers household effects on learning outcomes of the students, but the impact of school also influences learning outcomes.

References

Atemnkeng, J.T. (2010), Household-level Social Capital in Cameroon and Children's Schooling: A Gender Analysis, *Africa Development*, 35(4): 211-236, https://doi.org/10.4314/ad.v35i4.70224

Azevedo, J.P. (2020), *Learning Poverty: Measures and Simulations,* The World Bank, Washington, DC, https://doi.org/10.1596/1813-9450-9446

Barrientos, A. and J. DeJong (2006), Reducing Child Poverty with Cash Transfers: A Sure Thing? *Development Policy Review,* 24(5): 537-552, https://doi.org/10.1111/j.1467-7679.2006.00346.x

Benhassine, N., F. Devoto, E. Duflo, P. Dupas and V. Pouliquen (2015), Turning a Shove onto a Nudge? A "Labelled Cash Transfer" for Education, *American Economic Journal: Economic Policy,* 7(3): 86-125, https://doi.org/10.1257/pol.20130225

Croll, P. (2004), Families, Social Capital and Educational Outcomes, *British Journal of Educational Studies,* 52(4): 390-416, https://doi.org/10.1111/j.1467-8527.2004.00275.x

Crouch, L., C. Rolleston and M. Gustafsson (2021), Eliminating Global Learning Poverty: The Importance of Equalities and Equity, *International Journal of Educational Development,* 82: 102250, https://doi.org/10.1016/j.ijedudev.2020.102250

De, U.K. and B. Ghose (2007), *Status of Women in the Rural Khasi Society of Meghalaya*, https://mpra.ub.uni-muenchen.de/6168/

Eccles, J.S. (2005), Influence of Parents' Education on Their Children's Educational Attainments: The Role of Parent and Child Perceptions, *London Review of Education,* 3(3): 191-204.

Erola, J., S. Jalonen and H. Lehti (2016), Parental Education, Class and Income Over Early Life Course and Children's Achievement, *Research in Social Stratification and Mobility,* 44: 33-43, https://doi.org/10.1016/j.rssm.2016.01.003

Harding, J.F., A. Pamela and D. Hughes (2015), The Relationship between Maternal Education and Children's Academic Outcomes: A Theoretical Framework, *Journal of Marriage and Family,* 77(1): 60-76, https://doi.org/10.1111/jomf.12156

Jones, G.W. and D.S. Ramchand (2016), Closing the Gender and Socio-economic Gaps in Educational Attainment: A Need to Refocus, *Journal of International Development,* 28(6): 953-973, https://doi.org/10.1002/jid.3051

Khanam, R. and S. Nghiem (2016), Family Income and Child Cognitive and Noncognitive Development in Australia: Does Money Matter? *Demography*, 53(3): 597–621, https://doi.org/10.1007/s13524-016-0466x

Niti Aayog (2021), Multidimensional Poverty Index, *Press Bureau of India,* https://www.niti.gov.in/sites/default/files/2021-11/National_MPI_India-11242021.pdf

Noble, K.G., S.M. Houston, N.H. Brito, H. Bartsch, E. Kan, J.M. Kuperman, … and E.R. Sowell (2015), Family Income, Parental Education and Brain Structure in Children and Adolescents, *Nature Neuroscience,* 18(5): 773-778. https://doi.org/10.1038/nn.3983

Nussbaum, M.C. (2000), *Women and Human Development: The Capabilities Approach,* 3, Cambridge University Press.

Pratham (2022), *Annual Status of Education Report 2022,* Mumbai, Pratham Resource Centre.

Reserve Bank of India (2022), *Publications* https://m.rbi.org.in//Scripts/PublicationsView.aspx?id=20675

Ro, H.K. and K.I. Loya (2015), The Effect of Gender and Race Intersectionality on Student Learning Outcomes in Engineering, *The Review of Higher Education,* 38(3): 359-396, https://doi.org/10.1353/rhe.2015.0014

Rose, P., R. Sabates, B. Alcott and S. Illie (2017), *Overcoming Inequalities within Countries to Achieve Global Convergence in Learning, Research for Equitable Access and Learning (REAL) Centre.* University of Cambridge.

Sahoo, S. (2016), Girl's Education in India: Status and Challenges, *International Journal of Research in Economics and Social Sciences (IJRESS),* 6(7): 130-141.

Singh, A., P. Chokhandre, A.K. Singh, K.M. Barker, K. Kumar, L. McDougal, … and A. Raj (2021), Development of the India Patriarchy Index: Validation and Testing of Temporal and Spatial Patterning, *Social Indicators Research,* 159(1). 351-377, https://doi.org/10.1007/s11205-021-02752-1

Singh, S.K., S. Choudhury, and B.D. Nongrum (2019), Low Achievement in Mathematics: A Case Study of Schools of East Khasi Hills, Meghalaya: A survey, *International Journal of Mathematical Education,* 9(1): 45-56, https://www.ripublication.com/ijome19/ijomev9n1_06.pdf

Streeten, P. (1994), Human Development: Means and Ends, *The American Economic Review*, 84(2): 232-237, https://www.jstor.org/stable/2117835

Tembon, M. and L. Fort (2008), *Girls' Education in the 21st Century: Gender Equality, Empowerment, and Economic Growth,* Washington, DC: World Bank, https://openknowledge.worldbanl.org/handle/10986/6554

Tovar Garcia, E.D. (2014), Determinants of Educational Outcomes: Analysis of the Republic of Tatarstan, *Communist Studies and Post-Communist Studies,* 47(1)L 39-47, https://doi.org/10.1016/j.postcomstud.2014.01.001

UNICEF (2022), The State of Global Learning Poverty, https://policycommons.net/artifacts/2476935/the-state-of-global-learning-poverty

Von Stumm, S., S.N. Cave and P. Wakeling (2022), Persistent Association between Family Socioeconomic Status and Primary School Performance in Britain over 95 Years, *npj Science of Learning,* 7(1): 1-8, https://doi.org/10.1038/s41539-022-00120-3

World Bank (2019), *Ending Learning Poverty: What will It Take?* World Bank, Washington D.C., https://hdl.handle.net/10986/32553

Young, M. (2009), Basic Capabilities, Basic Learning Outcomes and Thresholds of Learning, *Journal of Human Development and Capabilities*, 10(2): 259-277, https://doi.org/10.1080/19452820902941206

Appendix 1

Dummy Variable	Category	Value
Low Income	<300,000 INR	1, 0 otherwise
Medium Income	>300,001 INR	1, 0 otherwise
Low Education	< Class 8	1, 0 otherwise
Residence	Own house	1, 0 otherwise
	Own room	1, 0 otherwise
Own computer/Laptop	Students having own computer/laptop	1, 0 otherwise
Having all books	Students having all books	1, 0 otherwise

Appendix 2

Independent Variable	VIF	Tolerance level
Low-income	1.4	0.68
Father below class 8	1.5	0.66
Mother below class 8	1.5	0.70
Own house	1.3	0.73
Number of rooms	1.7	0.57
Number of siblings	1.1	0.87
Own computer	1.4	0.70
Having all books	1.0	0.97

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Promoting Women's Financial Inclusion: Understanding Usage and Constraints in Savings and Mobile Banking

Noopur and Sujatha Susanna Kumari D.

The gender gap in account ownership is zero per cent in India, but still India has not achieved complete financial inclusion because of high rate of inactive accounts. World Bank suggests for countries like India that the next step towards financial inclusion is usage and quality of financial products. The present study depends both on primary and secondary data. The researcher has used survey method to identify enablers and constraints of saving bank account usage by women and has extracted secondary data from all banks' websites to study the quality of savings products in India. Simple Design, Easy Access, Safety and Trust are the factors which encourage women to use savings accounts. 'Doesn't suit my needs' and lack of money are the constraints in saving account usage by women. Digital illiteracy and non-ownership of mobile phones act as constraints for mobile banking usage by women. Designing need based products is essential for women's financial inclusion; hence an in-detail analysis of the factors that encourage/enable women to use savings accounts and similarly factors acting as constraints in saving account usage, would guide banking institutions to cater better to their existing female consumers and also attract new female ones.

Keywords: Women's financial inclusion, Mobile banking, Enablers in savings, Constraints in savings.

I Introduction

Financial inclusion refers to the timely delivery of financial services to unbanked and underserved population. Ample evidence from past research suggests that a well-functioning and inclusive financial system is linked to faster and equitable growth (Singh, *et. al.* 2021). A strong financial system encourages expansion in the market and provides options to the people to choose financial products depending on their needs, price perception, and paying capacity. This increases competition among existing firms and acts as an incentive for the new firms to

Noopur, Assistant Professor, School of Business, GITAM (deemed to be university) Hyderabad 500081, Telangana, Email: nraghoji@gitam.edu

Sujatha Susanna Kumari D., Assistant Professor, Department of Commerce, Central University of Karnataka, Kadaganchi, Kalaburgi District 585367, Karnataka, Email: sujathask@cuk.ac.in

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capture the untapped market. It ensures that poor households and small entrepreneurs get the sufficient funds for emergency and working capital requirements. On the other hand, an underdeveloped financial system acts as ahurdle in the nation's growth by making it inaccessible for the marginalized section of the society and making the market uncompetitive and unattractive.

A well-developed financial system brings in efficiency by providing regular information about risk, risk diversification and mobilizing of resources as productive investments for the growth of the nation. Although the relationship between a well-functioning financial system and growth is well-established, the fact that access to financial services does not necessarily lead to usage needs to be acknowledged (RBI, 2008). Mobilizing savings, objectively allocating capital, monitoring the use of credit funds by entrepreneurs, and changing risk by pooling and repackaging it are the four core activities of finance. These tasks must be supported by legal, regulatory, and informational structures that improve the financial system's quality, which cannot be judged solely by looking at its breath. Hence financial inclusion is a holistic concept which can be achieved when all the dimensions such as a well-functioning financial market supported by innovative banking institutions, a broad range of financial services and its usage by each segment of the society.

II Dimensions of Financial Inclusion

Financial inclusion is defined as "universal access to a wide range of financial services at a reasonable cost. These include not only banking products but also other financial services such as insurance and equity products" (RBI, 2013).According to Dr. C. Rangarajan, "Financial inclusion may be defined as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at an affordable cost" (India and India 2009). According to Financial Inclusion Index Report 2021, (Anil Kumar Sharma, *et. al.* 2021) The three metrics of financial inclusion are Access, Usage and Quality.

Access highlights availability of digital and physical infrastructure and initiatives to make basic banking products and services available to underbanked/unbanked populations. Usage is demand side measure, which measures the extent to which financial infrastructure is actively used through savings, credit, insurance, investment, and remittance among other things. Quality dimension reflect the efforts made by stakeholders for financial literacy and financial awareness. In simple terms, financial inclusion is a state which is achieved by a country when its 6 'A's are taken in to consideration in policy framing and implementation, namely, Accessibility, Availability, Affordability, Awareness, Assurance and Appropriateness. Availability and Accessibility reflect the supply side of financial products and its reach to each segment, where as Affordability reflects the ability and perception of the customer to purchase financial products. Awareness measures the financial literacy and financial

behavior of people towards financial products (Sujlanaand Kiran 2018). Appropriateness emphasizes the importance of variety of financial products available for each section of the society according to it needs and Assurance reflects the trust of people in the financial product and its genuineness (Arisha Salman and Nowacka Keiko 2020).

A combination of Access, Usage and Quality determines the extent of financial inclusion, and according to Financial Inclusion Index Report 2021,year on year India is witnessing growth in all the three elements of financial inclusion; hence the financial inclusion index 43.4 in the year 2017 has increased to 53.9 in the year 2021(Anil Kumar Sharma, *et. al.* 2021).

According to Global Findex Report 2021, 742 million women around the world are financially excluded and another $1/4^{th}$ of a billion women are with financial products and services that are not useful for them (Women's World Banking, 2022). In India, women make up 48.8 per cent of the population, but only 77 percent participate in the formal sector. India has the highest percentage of inactive accounts around the world. The percentage of women's inactive accounts in India for the year 2021 is 32.32 per cent(Demirgüç-Kunt, *et. al.* 2021).The full and active engagement of women is required to convert India into a developed country. The first step in this direction is to promote women's economic involvement through expanding economic opportunities and empowering women to make their own financial and strategic life decisions. Gender specific financial products are essential to improve women's economic self-reliance and may help raise women's financial risk-taking ability. Hence a gender specific approach to financial inclusion is the most effective intervention for women's economic involvement (World Bank Group, 2014).Banking penetration enables socio-economic development of the country. Banking services facilitate the flow of financial resources, allocation of capital and revenue generation. In India, the penetration of banking services has grown greatly, with a branch network of 97,149 in rural areas and 61,949 in urban areas as on June 2022.

Despite mounting evidence that women manage to save a percentage of their wages despite low and often unpredictable incomes, banks still continue to ignore women (Women's World Banking, 2014).There is a dearth of knowledge of women's unique financial requirements. Women's financial independence and educated decision-making are critical for them to contribute to the nation's economy, therefore India's efficient banking system and digital infrastructure should now turn its attention to make it women friendly.

III Objectives

1. To identify the factors that act as enablers and constraints in saving and mobile banking usage by women.
2. Aligning saving bank account with life-cycle financial needs of women.

IV *Research Methodology*

The present research is an exploratory and evaluative study. It explores the factors that act as enablers and constraints in saving account usage and it evaluates the existing products with life-cycle financial needs of women. The study depends both on primary data and secondary data. Primary data is collected using the survey method through a structured interview schedule. Secondary data is collected from all private and public banks official websites, to find the existing features and types of saving bank accounts in India.

Sample Size and Sampling Method

Yamen's formula is used to find the sample size; accordingly, the researcher has collected data from 400 sample units from Kalaburagi district. Purposive sampling method was used to select each unit of the sample. The entire sample size is divided into three groups viz., Single, Married and Older. The sample is further sub divided into six groups on the basis of their financial status, viz., Single Financially Independent (SFI), Single Financially Dependent (SFD), Married Financially Independent (MFI), Married Financially Dependent (MFD), Older Financial Independent (OFI) and Older Financially Dependent (OFD).

Table 1: Distribution of Sample Size

Taluks	Female Voters	Percentage share of female voters in each village (%)	Sample Size (s=400* per cent of female voters in each taluk)	In each sub group (Sample Size for each village/ Total No. of sub groups)
Afzalpur	108380	10.34	41	7
Aland	111360	10.62	43	7
Chincholi	94772	9.04	36	6
Chittapur	114772	10.95	44	7
Kalaburagi	392013	37.41	150	25
Jewargi	117398	11.20	44	7
Sedam	109140	10.41	42	7
TOTAL	1047835	100.00	400	

V Findings and Discussion

1. The respondents across each life-cycle stage namely Single, Married and Older groups were interviewed to understand their life-cycle financial needs. The researcher found the following financial needs across life-cycle stages- furniture, house, marriage, health, house site, skill development, capital, car, self-education, children's education, books, laptop, electronic gadgets, harvesting, agriculture, small savings, jewelry, old age, bike, travel, pocket money, emergency fund and function expenses. Each group has different

financial needs, which implies that a customized approach is required in designing financial products for women. Financial status also plays an important role in determining the financial goals of women, hence a generalized women financial product would not suffice and a tailor made product should be designed for each target group of women. For Single Financially Independent financing their 'self-education' and having a 'small saving' are the top financially priority, whereas for Single Financially Dependent, it is 'self-education' and 'car'. For Married Financially Independent 'children's education' and 'house' are the top financial goals whereas for Married Financially Dependent, it is 'house', 'children's education' and 'small savings'. A married woman irrespective of her financial status prioritizes her children and family, accordingly an independent women save money for children's education and house. Similarly a dependent woman too saves for family and children, but as they are dependent on others, women in this group want to create saving fund for themselves. It further implies that women in this group give importance to children's education rather than children's marriage; they are interested to save and plan for children's education first, and not for marriage. For Older Financially Independent 'small savings', 'children's marriage' and 'house' are their financial priorities whereas for Older Financially Dependent it is 'children's education', 'small savings' and 'health'. It is to be noted that only 7.7 per cent of Older Financially Dependent group want to save for old age, no other group considers financially planning for old age is important**.**

2. It is observed that women access and operate bank accounts by either of the following ways namely, visiting, internet banking, SHG, family members, ATM and mobile banking. Mobile Banking is only popular among Single Financially Independent and Single Financially Dependent groups. Other groups still prefer visiting banks personally, mainly for two reasons; firstly they feel transaction done in person is safe and secondly because women are not familiar with digital banking. It's difficult for middle aged and older women to manage time to visit banks; hence if bank is located near to her house/place of work, chances of her visiting and using financial products also increases. Hence proximity is still an important factor to bring women to banks. Women across all age group are familiar and comfortable in using ATM machine for cash withdrawals. Majority of the women are not familiar with other ATM services such as balance enquiry, depositing cash, setting ATM card password, etc. Efforts should be directed by the policyholders and banking institutions in making women aware about other ATM machine features and encourage them to use it. This initiative would make them experience branchless banking closely. This initiative can act as a stepping stone for convincing women that banking transactions can be done safely without visiting the banks**.**

3. Out of the total sample only 11.75 per cent of women in Kalaburagi are not savers and 88.25 per cent of the women in the sample have the saving habit. It is observed that the financially independent are goal based and commitment savers, unlike financially dependent women who save as and when they have money. About 28 per cent of the women from the sample save, as and when they have money. The data also makes it visible that women are inherent savers, irrespective of their financial status. The fact that women believe in saving and save regularly should be capitalized by banking institutions and design saving products based on their financial needs. Women, if convinced that their saving would enable them to achieve their financial need/goal, would not hesitate to commit and save regularly.
4. The field survey data illustrates that out of a total sample of 400, out of which 77.25%women had an active saving account (either held individually or jointly) and 91 had an inactive saving account. It was observed that irrespective of life-cycle stage and financial status, majority of the women in the sample responded to questions related to enablers rather than constraints, which implies that women across all age group perceive saving as a quality financial product which helps them to fulfill their financial needs.
5. The literature indicates the following as the enablers or the reasons which encourage women to use bank accounts, namely Proximity, Simple to use, Have quick access, Money free from theft, Trust, Earn good interest, Resist me from spending. Majority of the women in the Single Financially Independent group who have an active savings account, use it because it is "Simple to use" and "Easy to access" "Proximity" and "Money free from threat" are other two major reasons which encourage women to save money in a saving account. Although women in this group are familiar with digital banking, proximity is still an important factor for them, because for important financial transaction they prefer physical mode. The features such as simplicity and having easy access to the saving account are the reasons for this group to use savings accounts. The researcher found that apart from the quality of the saving product, women in this group prefer saving accounts even if they have small cash amounts, because it resists them from spending. Feature of easy accessibility coupled with not being able to spend it on unimportant things, act as enablers for them to use saving account. The table shows that apart from simple design and easy access, what attracts women in Married Financially Independent group to use a saving account, is that, their money is free from theft and they trust banking institutions. It can be implied from the data that 'trust' is of utmost importance for women in this group to invest in any financial product. Similar to Married Financially Independent group, it is observed that women in Married Financially Dependent group use the saving account because it is simple to use, can be accessed anytime and is safe in the bank. Hence trust and safety are the important factors and influences women's decision to use a saving or any other financial product in this group. The factor

that encourages most women in Older Financially Independent group to save in a bank account is 'money free from theft'. Proximity is not an issue for women in this group, mainly because the saving accounts transaction such as deposits/withdrawals are done by their family members. Women in this group trust banks and the simple design of savings account have encouraged them to use savings accounts. Similar to Older Financially Independent group, the women in Older Financially Dependent group use saving account because it is simple to use and makes them believe that money is safe in the bank. Hence trust and safety are the important factors and influence a woman's decision to use a saving account or any other financial product in this group.

6. The researcher has observed that majority of the women from financially dependent group and few from financially independent group did not know that money in savings account also earns interest, which implies that women's financial literacy programme has to be basic and in detail. If women get to know that interest is earned in a saving bank account, it may encourage them to deposit only in banks and not save money at home, even if it is a small amount.
7. It is evident from the literature that following are the constraints or the reasons which restrain women from using bank accounts namely Didn't need it, Doesn't suit my needs, Proximity, Expensive, Staff not friendly, Don't trust, Didn't have money. Women in Single Financially Independent group do not actively use saving account because they think it does not suit their needs and hence feel they don't need it. The other reason being lack of money, although women in this group are financially independent, women responded that, at the end of the month, they are not left with any money to save. The researcher has observed that women do not understand the power of saving money in small amounts. The Table displays that similar to Single Financially Independent group, women in this group stated the same reasons for not saving in a bank account, viz., 'didn't need it', 'does not suit my needs' and 'lack of money'. The highest marked response as a constraint by women in Married Financially Independent group is that it 'doesn't suit their needs'. The researcher has observed the reason being saving account is either used as a salary account/withdrawing account. Salaried employees use it to encash their salary and women from informal sector use bank accounts to withdraw government subsidies/direct benefit transfers. They do not consider saving account as a place to "save money". The researcher was told that it is difficult to use saving account as a 'salary account' and 'saving account'. Hence they prefer it to save it at home, which most of the time they end up spending it, before achieving their financial goals. Similar to Married Financially Independent group, the women in Married Financially Dependent group responded that the biggest constraint for using saving account is that 'it doesn't suit their needs'. The researcher observed that women in this group save in small amounts and also are not familiar with mobile banking; hence it difficult

for them to reach the bank to deposit money. The other reason being sometimes women do not wish the husband to know about the amount of money she has; hence to avoid this, they prefer to save money at home or with friends. The data analysis exhibits that saving account design doesn't suit Older Financially Independent women's financial needs. The researcher has observed that most of the women ask their children/husband to handle all the transactions in their bank account. The saving account is used as a salary account and not as a saving account. Similar to all other groups, women in Older Financially Dependent group also responded 'didn't need it' and 'doesn't suit my needs' as reasons for not using saving account.

8. The data reveal that almost all women from each group think that the saving product doesn't suit their needs. Banks have to take note of this and improve saving product design along with doorstep banking. Women think they do not need it, because they do not know the benefit of having a savings account; which implies lack of awareness about basic financial product.
9. The field survey data showed that out of the total sample of 400, only 55 per cent women are using mobile banking and 180 women are not using mobile banking. The table shows that more women from Single Financial Independent and Single Financial Dependent group are using mobile banking compared to the other groups. Higher number of women from the older group do not use mobile banking app.
10. The literature indicates the following as the enablers or the reasons which encourage women to use mobile banking, namely, Send money to other person, Receive money from others, Advertisement, My friends recommended it, Easy access, Win Rewards. Pandemic. From the field survey it was observed majority of the women in this group has started using mobile banking apps because they either wanted to send money or receive money from another person. It shows that majority of the women in this group has started using mobile banking apps because it is easy to send money to another person. The researcher has observed that women in Single Financial Independent and Single Financial Dependent group are mobile savvy and mainly use it for making online purchases. Hence mobile banking app is used in this group because firstly it has provided them a better and safe alternative for 'cash-on-delivery' purchases. Online payments make it easy for them to track their return orders. This group is using banking apps because they are digitally literate. The majority of the women in Married Financially Independent group has started using mobile banking apps because it is easy to send money to another person. Similar to Married Financially Independent, the majority of the women in Married Financially Dependent group has started using mobile banking apps because it is easy to send money to another person. The researcher has observed that women in Married Financially Independent group are using mobile banking apps for all activities such as online and offline shopping, tuition fees, making deposits, utility bills and all other transactions.

Contrary to women in Married Financially Dependent group are using mobile banking apps to usually to do watsapp shopping. This shows lack of digital literacy in Married Financially Dependent group. The women in Older Financially Independent group have started using mobile banking apps because it is easy to send money to another person. The other reason which pushed women to use banking app is the pandemic. Older Financially Dependent women also started using mobile banking apps because of the pandemic.

11. It can be implied from the data that if women are pushed and mandatorily required to do something, they do it. Pandemic situation left women with no choice, other than digital banking, hence they started using it. The researcher has observed that women do not get much opportunity to do financial transactions; hence they lack experience of managing money, which eventually develops into a strong belief that they are not good at it.
12. It is evident from the literature that following are the constraints or the reasons which restrain women from using mobile banking, namely Don't know what it is, Don't know how to use, Do not need it, Using it is difficult, Do not have a smart phone, Do not trust, None of my friends use it. A major reason for women in Single Financial Independent group to not use mobile banking is that they 'do not have a smart phone'. Similar to Single Financial Independent group, the highest stated reason by women in Single Financial Dependent group is that they "do not have a smart phone" and "do not know how to use mobile banking apps". Owning a smart phone is a necessary requirement for digital banking. The researcher has observed that women in this group are digitally literate, but as this group doesn't own a smart phone, they are not using it. Women in Married Financially Independent group think that they do not need it, and hence avoid using mobile banking apps. Women in this group consists of both rural and urban women, and hence the researcher has observed that rural women hesitate to use mobile banking on their own whereas urban women are somewhat comfortable in using mobile banking. After the pandemic, the use of QR codes has increased dramatically from vegetable vendors to big shops, everyone has QR codes; hence women are familiar with how to make payment using apps such as PhonePay. However, women are not aware about internet banking and are not comfortable using digital bank apps. Women in Marriage Financially Dependent group do not know how to use mobile banking apps. The researcher has observed that although women in this group have a smart phone of their own, they do not use mobile banking apps for mainly two reasons. Firstly, majority of the time, all banking transactions are handled by male members of the family; women do not see any good in learning how to use mobile/digital banking apps. The other reason being lack of digital literacy, which restricts them from using mobile banking apps; as there is no human touch involved they do not trust digital sources to do any type of financial transaction unless urgently required. Older Financially

Independent group thinks that they do not know what it is and how to use mobile banking apps. Women in this group think they do not need it. Older Financially Dependent group does not use banking apps because they do not know how to use it and also feel they don't need banking apps to do financial transactions. The researcher has observed that the biggest constraint for mobile banking usage for women in this group is their résistance to learn. The researcher has observed women in group resist adapting to new things and hence avoid them by giving reasons that they do not require independence. For digital financial inclusion of women of this group, it very important to change this attitude of women.

Aligning Savings Bank Account with Life-Cycle Financial Needs of Women

1. Create a dedicated commitment savings account tailored for each group of women: Example for financially independent single women commitment savings account allows women to set specific goals and save consistently until they achieve them. Encouraging savings for self-education, books, skill development, seed money, laptops, and improving job prospects is essential.
2. To incentivize adoption, banks can offer a higher interest rate rather than regular savings accounts for the first three years.
3. Allow women customers to customize the goal achieving period, paying intervals, and paying amount according to their individual preferences. To ensure the product's inclusivity and usability for all women, it is important that these factors are not predetermined by the bank, as income levels and stability vary among individuals.
4. Banks often overlook older women customers due to factors such as a shorter working life and reduced risk tolerance as age increases. Consequently, financial products tend to become more expensive for women starting financial planning at age 50 and beyond. In the light of this, women in this age group generally prefer saving products over credit, insurance, and pension plans. Therefore, there is a need for innovative savings products tailored to their specific needs.
5. Ladder Saving Account that features predetermined saving slabs for both Older Financially Independent and Older Financially Dependent groups. As women customers achieve each saving slab, they become eligible for various financial products specific to that slab. The saving amount slabs will differ for each group. This approach ensures that women have access to different financial products based on their saving milestones.
6. Ladder Time Saving Account, which operates similarly to the Ladder Saving Account but with the inclusion of time slabs. This account serves two purposes for women: helping them save for their financial goals and cultivating a savings habit. As each level is crossed, the account rewards the consistency of

saving. Rewards may include shopping coupons, home décor gifts, appreciation certificates, and discounted entertainment coupons.

Conclusions

Women of all life-cycle stages exhibit comfort in accessing savings accounts through bank visits or ATM transactions. Among a total sample of 400 women in Kalaburagi, only 11.75 per cent are classified as 'non-savers,' while the remaining 88.25 per cent demonstrate a savings habit. Approximately 28 per cent of women save whenever they have money available, while around 16 per cent save on a monthly basis. Married Financially Independent and Older Financially Independent women show the highest percentages of monthly savers. These findings indicate that women possess an inherent inclination to save, and with proper guidance, they can become active users of savings accounts. Despite their familiarity with savings accounts, women currently underutilize them due to a lack of awareness and suitable account designs. It is crucial to promote the attitude and behavior of commitment towards both short-term and long-term financial goals among women, regardless of their financial status.

References

Anil Kumar Sharma, Sonali Sengupta, Indrajit Roy, and Sushmita Phukan (2021), Financial Inclusion Index for India, *RBI Monthly Bulletin*, *September*, 8.

Arisha Salman and Nowacka Keiko (2020), *Innovative Financial Products and Services for Women in Asia and the Pacific,* Working Paper 67, Asian Development Bank. https://www.adb.org/sites/default/files/publication/576086/sdwp-67-financial-products-services-women-asia-pacific.pdf

Demirgüç-Kunt, A., L. Klapper, D. Singer and S. Ansar (2021), *The Global Findex Database 2021: Financial Inclusion, Digital Payments and Resilience in the Age of COVID -19* (English), Washington D.C: World Bank Group.

India and India (Eds.) (2009), *A Hundred Small Steps: Report of the Committee on Financial Sector Reforms,* Planning Commission, Government of India; SAGE Publications.

RBI (2008), *Financial Inclusion,* RBI, https://www.rbi.org.in/scripts/PublicationsView.aspx?id=10494

---------- (2013), *Financial Inclusion in India—An Assessment,* https://rbidocs.rbi.org.in/rdocs/Speeches/ PDFs/MFI101213FS.pdf

Singh, B.P., A. Kumari, T. Sharma and A. Malhotra (2021), Financial Inclusion, Pradhan Mantri Jan Dhan Yojna Scheme and Economic Growth: Evidence from Indian States, *Economic Notes*, 50(3), https://doi.org/10.1111/ecno.12186

Women's World Banking (2014), *Three Reasons Low-Income Women Doesn't Save in a Bank Account*, https://www.womensworldbanking.org/insights-and-impact/three-reasons-lowincome-women-save-banks/

---------- (2022), *Women's Financial Inclusion Through Moving Collateral,* https://www.womensworldbanking.org/insights-and-impact/womens-financial-inclusion-through-movable-collateral-three-case-studies/

World Bank Group (2014), *Expanding Women's Access to Financial Services*, https://www.worldbank.org/en/results/2013/04/01/banking-on-women-extending-womens-access-to-financial-services.print

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Book Review

Dr. Sunita Singh, *Educational Philosophy of Madan Mohan Malaviya,* Atlantic Publishers and Distributors (P) Ltd., New Delhi, ISBN:978-81-269-3431-7, 2022, pp. 341, Price ₹895/-

"Educational philosophy of Madan Mohan Malaviya" authored by Dr. Sunita Singh, an esteemed Assistant Professor at Banaras Hindu University, provides a comprehensive exploration into the educational philosophy of one of India's visionary leaders, Madan Mohan Malaviya. He was a pivotal figure in pre-independence politics, social reform, and education. His educational ideas, focusing on integrating advanced science with strong values, remain relevant today. Malaviya's vision for a progressive, value-driven education system aligns with the goals of the New Educational Policy 2020, aimed at transforming India into a knowledge economy.

Malaviya and his Time

Madan Mohan Malaviya was a prominent figure in Indian history, born in 1861 in Allahabad during British colonial rule. Raised in an orthodox Brahmin family, he valued education and traditional Indian values. Nicknamed 'Masta' in childhood, he initially studied in Sanskrit Pathshalas before moving to an English medium school. Malaviya earned a B.A. and later became vice-chancellor of Banaras Hindu University (1919-1938). He actively contributed to education and social reforms throughout his life, passing away in 1946.

Philosophical Thoughts of Madan Mohan Malaviya

This chapter explores Madan Mohan Malaviya's philosophical views on social, economic, political, religious, moral, and spiritual matters. A staunch believer in Sanatan Dharma, Malaviya emphasized truth, altruism, and scholarly conduct, and promoted humanitarianism grounded in democratic principles. He advocated for respect across all religions, saying, "Never do to others what you don't want to be done to yourself." Malaviya addressed social issues like dowry, animal sacrifices, women's education, the parda system, sati, widow remarriage, and child marriage. He believed social reform should originate from within rather than through legislation. Malaviya opposed British attempts to divide Hindu and Muslim communities, focusing on economic and agricultural aspects of cow protection, a cause that saw participation from Muslims, including Syed Nazir Ahmad. He founded organizations like Seva Samiti and Akhil Bharatiya Seva Samiti to alleviate societal suffering and support marginalized groups. Malaviya also stressed the importance of a sound economy and government, advocating for the

development of indigenous industries, industrial and commercial education, and financial self-reliance. Politically, he criticized British policies as oppressive and urged Indians to strive for independence. Malaviya envisioned India as a common homeland for all religions, promoting secularism and a unified national identity.

Educational Philosophy of Malaviya

Madan Mohan Malaviya was a visionary educationist, known for his contributions to educational theory and practice. He combined realism, idealism, pragmatism, and eclecticism in his philosophy, emphasizing values, curriculum, and human nature. Malaviya believed in education's role in spiritual and character development, advocating for a balanced approach that integrates cultural heritage, arts, sciences, and ethics for national prosperity.

His first contribution in field of education was by setting "Bharati Bhavan Library" at Prayag in (1889) and the establishment of the "Hindu Boarding House" at Allahabad in (1899), where students from rural and distant places stay to pursue education. In 1916, he founded the famous "Banaras Hindu University" with the cooperation of many other great persons like Dr. Annie Besant.

Foundation of Banaras Hindu University itself shows the Malaviya's significance towards higher education. He argued that the strength of nation increases with the increase in well-educated scholars who spread knowledge everywhere. The sole purpose of education is not only the distribution of degrees but complete development of personality. He argued that the success of university depends upon quality research and faculty.

Malaviya championed universal education, opposing discrimination based on class, caste, religion, region, or gender. He financially supported disadvantaged students, including Harijans, highlighting his dedication to accessible education. Malaviya criticized patriarchal norms that hindered women's education and advocated for educating women to promote character development, social reconstruction, and economic progress.

Malaviya proposed an educational system that bridged ancient culture with western science and technology, promoting indigenous industry and technical education. His opinion on vocational development reflects in these words, "*Ann Chinta Chamtkar Kateray Kavita Kuth*", means hungry man can't achieve anything good and great in his life. He advocated that education should have vocational base. The main cause of growing poverty in country is decline in indigenous arts and industry.

Malaviya promoted a diverse and integrated curriculum that emphasized Indian culture, history, and self-reliance. He focused on physical, mental, and spiritual development, economic improvement, and preserving Hindu culture. Malaviya valued logical reasoning, observation, and practical learning, advocating for idealistic and pragmatic teaching methods. He criticized the lack of vernacular language instruction and supported experiential activities.

Malaviya emphasized that teachers should be leaders with strong character, integrity, and morals, serving as unbiased guides and mentors. He highlighted the importance of respecting teachers as architects of society. Malaviya advised students to focus on their studies, maintain discipline, and cultivate spiritual practices for success.

Malaviya believed in cultivating student discipline through self-control rather than external enforcement or punishment. Malaviya refused Gandhi's call to shut down Banaras Hindu University during the non-cooperation movement, valuing effective administration and the promotion of citizenship, nationalism, and accountability. He envisioned a blend of the ancient Gurukul system with Western education, emphasizing infrastructure, natural settings, and dedicated teaching staff, believing that true educational value comes from spirit and devotion, not just physical buildings.

An Evaluation of Malaviya's Education Philosophy in Contemporary Comparative Setting

This chapter compares the educational thoughts of Madan Mohan Malaviya in comparison to Tagore, Gandhi and sir syed Ahmad khan.

Known as 'Mahamana' and 'Gurudev,' Malaviya and Tagore shared a deep love for ancient Indian culture and aimed for freedom from political oppression and societal upliftment through education. While Tagore emphasized freedom, experiential learning, and the Soviet education model, Malaviya's model focused on Sanatan Dharma, science, and creating self-reliant citizens. Both valued education as a path to liberation.

Gandhi and Malaviya shared similar views on removing untouchability, promoting communal unity, indigenous industrial development, economic equality, women's education, and political freedom. Gandhi emphasized the development of the body, heart, mind, and spirit, advocating for education in the mother tongue and craft-based learning. Malaviya focused on modern science, religion, English language, and industrial and scientific progress to achieve economic independence for India.

Malaviya and Sir Syed Ahmad Khan significantly contributed to higher education in India by founding Banaras Hindu University and Aligarh Muslim University, respectively. Both shared a love for the nation and aimed to uplift society, integrating Oriental and Occidental learning to preserve culture, tradition, and religion. While both valued scientific and technological advancement, Sir Syed focused on the Muslim community, whereas Malaviya concentrated on the Hindu community.

Limitations of Malaviya's philosophy

Malaviya lacked systematic and originality in education. He wanted to establish morality through religious lines which is difficult in secular and multicultural country. He didn't write any book on educational philosophy for the students. Therefore, Malaviya appeared as educational leader rather than educationist.

References

Chaturvedi (1988), *Builders of Modern India*, New Delhi: Publication Division Ministry of Information and Broadcasting, Government of India, Patiala House.

Parmananda (1985), *Mahamana Madan Mohan Malaviya: An Historical Biography*, Varanasi: *Malaviya Adhyayan Sansthan Banaras Hindu University.*

Sahu, B. (2002), *The New Educational Philosophy*, New Delhi: Sarup & Sons.

Singh, R. and R. Shukla (2012), *150 years of Mahamana's Service to Humanity*, New Delhi: Bharti Publication.

Tiwari, U. (1988), *Bharat Bhusan Mahamana Pt. Madan Mohan Malaviya Jivan Evam Viyaktitva*, Varanasi: Banaras Hindu University Press.

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