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Manufacturing in India and Other BRICS Countries: A Stuttering Performance

Introduction

There is a feeling among many analysts that the manufacturing sector in India has not done well as in other countries, particularly China. The sector accounts for a relatively small share of GDP in India, and, furthermore, this share has been relatively stagnant over the past four decades or more. It is believed that growth in India has been based on growth of the services sector. The Indian government is making considerable efforts to raise the growth rate of the manufacturing sector and raise its share in GDP. A more dynamic manufacturing sector is seen to be particularly necessary to provide jobs for the emerging bulge in the youth population. Assessing the performance of India's manufacturing sector is difficult because it depends on the perspective from which it is viewed. This brief assesses the performance of the manufacturing sector in India in the context of the world economy. We first examine the overall performance of developing economies. We then analyse the behaviour of the manufacturing sector in other developing countries, particularly the BRICS countries. We thus analyse the performance of the manufacturing sector in India in the context of overall macro trends in the world economy and the particular behaviour of the manufacturing sector. We then seek measures that might improve the performance of the sector.

Performance of the Developing World

The very encouraging performance by developing countries in this century has by and large continued despite some slowdown after the financial crisis of 2008. After an immediate sharp drop in the growth rate there was a recovery so that the growth rate for the period 2011-15 was only slightly lower than in the boom of 2001-07 and much higher than for the almost two decades of 1983-2000 (Table 1).

The integration with the world economy has been proceeding apace with a large increase in the share of exports of goods and services in GDP (Table 1). However again there was a setback with the 2008 crisis and after the recovery the share is again slightly lower than in the boom years but considerably higher than in the twenty year period 1983-2000. The share of gross fixed capital formation (GFCF)

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in GDP shows a slightly different picture. It is continues to increase after the crisis. The high investment rates augur well for a recovery in growth of GDP in the coming years.

Manufacturing in the Developing World

Share of Manufacturing in GDP

While the overall macroeconomic growth situation in developing countries remains satisfactory, even after the slowdown following the financial crisis of 2008, the sector composition of growth is worrying. The performance of the manufacturing sector has been poor. The share of manufacturing in GDP had stagnated in the low income countries in the years from 1974 to 2000 (Table 2). After increasing in the boom years of 2001-07 it has slid back and in the period 2011-15 it is lower than in the period 1983-90.

Manufacturing's share in the GDP of middle income countries after increasing till the 1974-82 period, has fallen to 20.4 per cent from its peak of 27.1 (Table 2). The same phenomenon of initially increasing and then falling is observed in most developing country regions. The exact timing of the reversal from an increasing share to decreasing share varies between the regions. In EAP and SSA, it started decreasing after the 1974-82 period whereas in LAC the decline has been particularly sharp since the 1983-90 period. There is a further difference in the performance of the sector in more recent years. Its share has declined continuously in LAC and SSA whereas in EAP it is almost constant and in SA there is an overall increase though with fluctuations.

The Manufacturing Sector in BRICS

The BRICS countries exhibit a pattern similar to that of their regions (Table 3). The share of manufacturing in GDP which was rising in Brazil and South Africa till the period 1983-90 has since fallen precipitously to about a half. The share in Russia also has been declining over the more limited period for which data is available. In China it increased till the 1974-82 period and since then has declined slowly and

Table 1: Some Macro Indicators

	Growth of per capita GDP			XG&S (% of GDP		
	(annual average %)					
	1983-2000	2001-07	2011-15	1983-2000	2001-07	2011-15
World	1.5	2.2	1.5	20.6	27.7	30.3
Low and Middle Income	1.5	3.8	3.4	18.9	29.9	26.7
Low Income	-0.6	2.8	2.3	18.1	21.5	22.3
Lower Middle Income	1.5	4.1	3.5	19.0	22.4	26.3
Upper Middle Income	1.7	4.3	3.7	18.9	30.8	26.9
EAP	6.5	7.8	6.5	20.3	35.2	29.1
LAC	0.6	1.5	0.9	15.4	21.2	20.2
MNA	0.6	2.3	-0.7	21.2	35.5	30.2
SA	3.2	5.3	5.0	9.6	17.3	21.5
SSA	-0.9	1.7	1.3	28.5	34.5	29.3

Source: World Bank, World Development Indicators.

Note: EAP is East Asia and Pacific, LAC is Latin America and the Caribbean, MNA is Middle East and North Africa, SA is South Asia and SSA is Sub-Saharan Africa. These regions correspond to the classification used by the World Bank.

steadily. In India the share while fluctuating overall increased particularly since the financial crisis.

Exports

Value of exports as a share of GDP has been increasing in developing country regions in contrast to happenings in the developed world. The same phenomenon can be seen in the manufacturing sector. Value of exports as a share of value added in manufacturing has increased in developing regions in contrast to the world (Table 4). It must be remembered that exports are gross value of exports, whereas GDP is value added. Phenomenon such as outsourcing would affect this ratio. Outsourcing would reduce the share of value added as the value added in an imported input would count as value added in the country of production and in the country of use it would be included in input use and so reduce value added.[1] If the production of some components used in goods exported is outsourced, then while the value of exports would not be affected domestic value added (VA) would decline so that the ratio would rise.

The share of value of exports to VA falling for the world could mean that the share of value added in total value of output has been rising, namely the share of raw materials in value of output has been declining. This could be an indication of the increasing share of design, property rights payments and marketing costs in value of output. The trend in developing regions would imply that share of inputs in value of output is rising either because more

[1] The use of imported inputs has been increasing in all these four countries. [Agarwal, Manmohan and Aritri Chakravarty (2017), "Growth of the manufacturing Sector: Future Constraints" in Manmohan Agarwal, Jing Wand and John Whalley (eds.) *China and India: The International Context and Economic Growth, Manufacturing Performance and Rural Development*, World Scientific, Singapore].

Table 2: Share of Manufacturing (% of GDP)

	1965-73	1974-82	1983-90	1991-2000	2001-07	2008-10	2011-15
Low & Middle Income	24.0	27.0	25.6	23.5	22.2	21.4	20.3
Low Income			9.9	9.6	10.9	9.7	8.7
Middle Income	24.1	27.1	25.8	23.6	22.3	21.5	20.6
Lower Middle	13.4	15.2	16.5	17.6	17.5	17.5	16.6
Upper Middle	26.7	30.3	28.5	25.5	23.7	22.7	21.7
EAP	28.4	34.0	31.5	30.8	30.7	30.1	29.1
LAC	25.5	26.7	27.1	19.1	17.3	16.0	14.5
MNA		12.1	13.7	15.9	14.6	13.7	13.7
SA	13.3	15.5	15.8	15.6	15.6	17.3	16.4
SSA		14.9	14.1	12.2	11.3	10.1	10.5

Source: World Bank, World Development Indicators.

Table 3: Share of Manufacturing in GDP (%) for BRICS Countries

	1965-73	1974-82	1983-90	1991-2000	2001-07	2008-10	2011-15
Brazil	28.3	31.5	32.3	19.3	18.4	18.6	12.4
China	31.7	38.1	34.3	32.6	32.0	31.7	31.0
India	13.7	16.0	16.0	15.7	15.7	17.8	16.7
Russia	17.4	15.7	13.6				
S. Africa	22.2	22.2	22.8	20.6	18.1	15.1	13.3

Source: World Bank, World Development Indicators.

expensive raw materials are being used or more imported inputs are being used. This issue is discussed further in the next section in the context of the BRICS countries.

BRICS and Exports of Manufactures

We would expect the increasing splintering of production to reduce the share of value added and so increase the ratio exports to value added. But obviously this would not operate for the world as a whole. Therefore, it is difficult to separate out how much of increase in this ratio in Table 5 is due to splintering and how much is because of increased exports as such.

The point whether more of the output is actually being exported is shown by using the world input-output data set. This shows that the share of gross output exported by three of the BRICS increased between 1995 and 2011, while that for Russia was constant (Figure 1).[2] The share of the manufacturing sector that has been exported initially increased for all the countries. But then it started declining. However, it shows some tendency to increase since the 2008 crisis.[3]

For Russia the peak occurred very early in 1999 and it has been declining from that peak though it increased in 2011 (Figure 1). Furthermore, for two more of the BRICS the share has decreased since the peak. The peak export share for China was in 2005 and for Brazil in 2004.[4] Though for both there is a tendency for the share to increase after the 2008 crisis, for India the share has increased over the period 1995 to 2011 period though with some fluctuations. Among the four countries India is exporting the highest share of its manufacturing output in 2011. Brazil which exported the lowest share of its output in 1995 had become the country exporting the largest share of its output in 2002. However, by 2010 it was again the country that was exporting the smallest share of its manufacturing output. In 2011 it exported a marginally higher share than Russia. Brazil, China and Russia were all

[2] The data set is only available for this period and for only four of the five BRICS members, and not for S. Africa.

[3] Since the WIOD data set is only till 2011 it is not possible to check whether the uptick has persisted after 2011.

[4] The behavior of China is very different in the WIOD data than in the World Bank data because of the difference in what is calculated. The WIOD data shows that the share of manufacturing gross output exported decline since 2005. The World Bank data shows share of manufacturing exports to manufacturing value added continued to grow. This can only imply that share of value added in gross output has been declining because of outsourcing.

Table 4: Value of Exports of Manufactures as a Share of Value Added in Manufacturing

	1991-2000	2001-07	2008-10	2011-15
World	83.0	56.5	46.1	42.2
EAP	60.8	82.3	79.3	75.5
LAC	34.4	63.2	56.4	64.9
SA	46.7	59.7	58.6	66.0
SSA	48.7	68.1	78.8	63.2

Source: Author's calculations from data in the World Bank World Development Indicators.

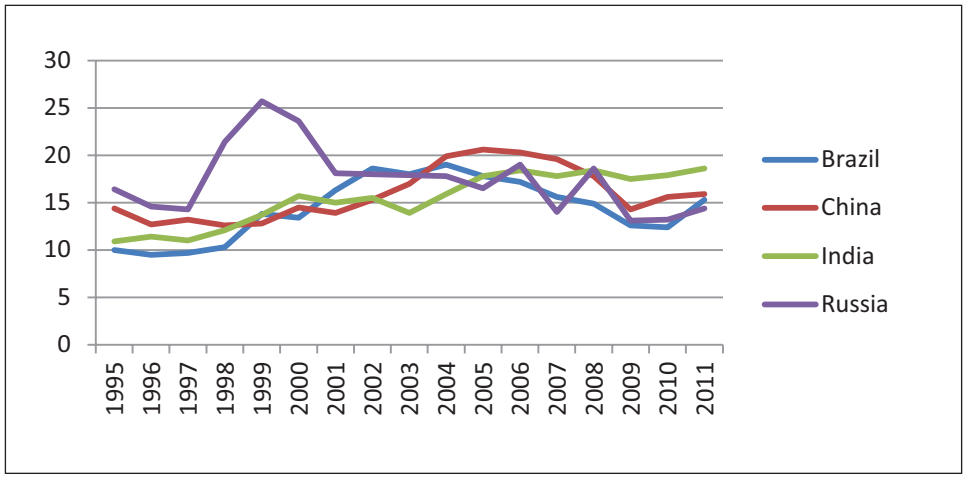
Table 5: BRICS Exports as a Share of Value Added in Manufacturing

(Per cent)

	1991-2000	2001-07	2008-10	2011-15
Brazil	24.7	46.1	30.6	33.7
China	34.1	66.7	74.2	70.8
India	41.3	54.8	55.7	66.7
Russia			30.7	34.9
S. Africa	52.7	68.0	78.8	104.4

Source: Author's calculations from data in the World Bank World Development Indicators.

Figure 1: Share of Manufactures Exported, 1995-2011



Source: Author's calculations from the WIOD data base.

exporting about 15 per cent of the gross output of manufactures.

Employment

The World Bank development indicators provide employment in industry but not in manufacturing. According to this data, the share of employment in industry in developing countries more than doubled from 18.7 per cent of total employment in 1991-2000 to 41.2 per cent in 2011-14. The share in LAC remained constant at about 22 per cent. In South Asia, on the other hand, industry's share in employment increased from 15.7 per cent in 1991-2000 to 24.8 per cent in 2011-14, an increase of more than 50 per cent. The fastest increase was in EAP.

Employment in BRICS

In Brazil, India and S. Africa there is a tendency for employment in industry to grow slowly (Table 6). But In China, there was a big leap in the share of industry in employment between 1991-2000 and 2008-10. Even in the period 2011-14 there was a substantial increase in industry's share in employment, more than in the other countries. In Russia the share has been steadily decreasing.

The Behaviour of the 300 Largest Indian Firms

The Indian manufacturing sector has not performed badly in comparison to the sector's performance in other developing countries, including the BRICS countries. However, overall the sector shows a declining growth rate for many years during the period 2005 to 2014, particularly, the

Table 6: BRICS Employment in Industry

(Per cent of Total Employment)

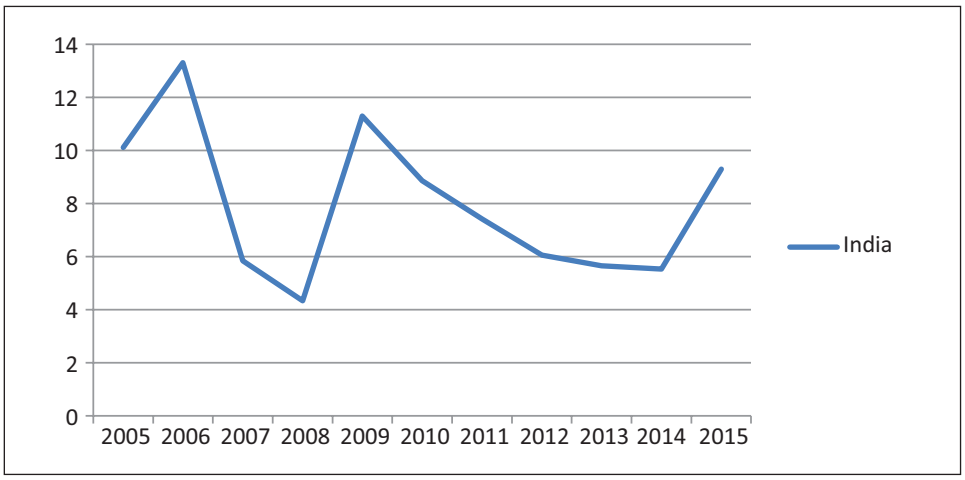
	1991-2000	2001-07	2008-10	2011-14
Brazil	20.2	21.2	22.9	22.4
China	19.5	35.9	44.1	46.3
India	15.8	19.0	22.4	24.8
Russia	33.5	29.6	28.0	27.6
S. Africa	23.7	25.4	25.2	23.8

Source: World Bank, World Development Indicators.

[5] The time series is too short to apply a statistical test to identify a break point.

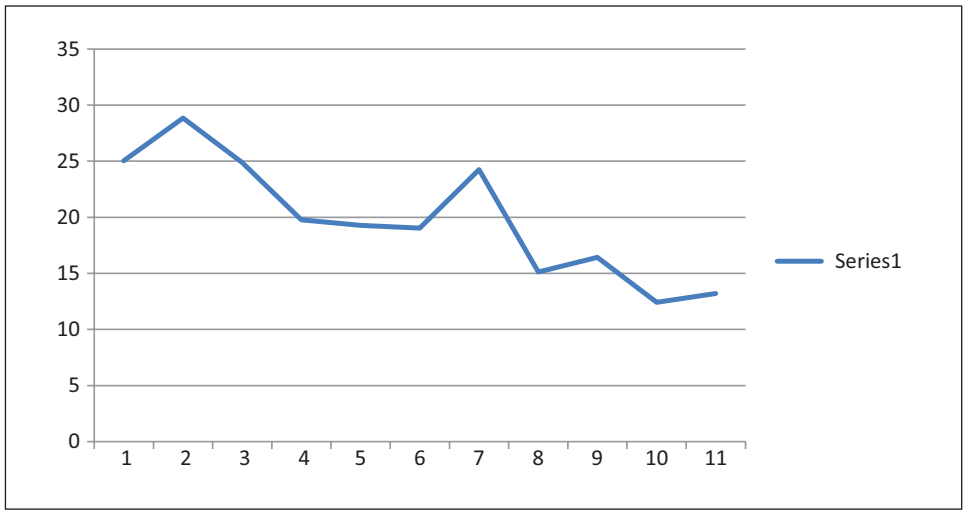
[6] We calculated the RNW for the banking and financial services sectors also though these are not industrial sectors. But it shows the same pattern. For the banking sector the decline in RNW between the two periods is even more stark.

Figure 2: Manufacturing Annual Growth Rate, 2005-2015



Source: Based on data from the World Bank Development Indicators.

Figure 3: Rate of Return on Net Worth of Large Manufacturing Firms



Source: Author's calculations from data in prowess.

years from 2006 to 2008 and from 2009 to 2014 (Figure 2).

Within this overall growth rate of the manufacturing sector we look at the performance of the largest 300 companies. Out of these 300 firms we took mainly industrial firms and did not take those in the banking, financial services and media sectors. We also did not take firms for which data was available only for a few years in the sample. As a result, we had a sample of 164 firms. We calculated the simple annual unweighted average of the return on net worth (RNW) for these 164 firms for the period 2005-2015.

The return on net worth (RNW) shows a distinct downward trend during the period 2005-15 (Figure 3). But there is an uptick in 2011 and before that for three years 2008 to 2010 the RNW is steady at about 19 per cent. Therefore, there seems to be a break in 2011.[5] Between 2005 and 2011 the average RNW is 22.7 and for the period 2012-15 it is 14.4. Similar results hold if we use return on capital employed instead of RNW.

We find a similar break in 2011for

Table 7: Rate of Return on Net Worth by Sector

	2005-11	2012-15	Number of Companies	
			lower return in 2012-15	higher return 2012-15
Automobiles	21.4	21.6	10	8
Chemicals	20.2	19.1	8	4
Construction	23.5	6.6	24	2
Consumer goods	41.3	27.8	16	3
Industrial Equipment	19.8	1.9	17	4
Gases and Fuels	30.8	29.5	4	1
IT Software	28.5	23.0	9	6
Mining metals ports	21.4	12.5	14	3
Power generation	10.0	8.3	8	6
Oil exploration and refining	14.4	7.4	7	3
Telecommunications	12.2	6.4	3	2
Textiles	21.2	16.1	59	4

Source: Author's calculations from data in prowess.

many of the sub-sectors. We calculated the average RNW for the period 2005 to 2011 and for 2011 to 2015.

We find that for all the sectors rates of return were lower in the second period (Table 7).[6] The same result holds if we take the purely manufacturing sectors, leaving out construction and reality, IT software and telecommunications. What is perhaps even more significant is that even when the rates of return are not so different, companies showing a decline are considerably more than those showing an increase.

We next analysed the growth of large companies. We took the manufacturing companies among the largest 200 companies and there were 111 of these. We divided these companies into three groups. The first group was of companies whose increase in capital stock between December 2005 and December 2014 was less than the increase in the deflator for gross fixed capital formation. Broadly speaking, these would be the companies whose real capital stock declined during this period. Real GDP had had just more than doubled during this period. The second group of companies was that where the increase in the nominal value of the capital stock was less than the product of the rate of inflation of GFCF and of the real growth of GDP. These companies would be those whose importance relative to GDP declined during this period. The third group of companies was that whose capital stock increased faster than the product of real GDP growth and the deflator for GFCF. We found that of the total of 111 manufacturing companies 62 were in the first group, namely whose real capital stock seems to have declined during this period, and 31 companies were in the second group. Only 18 companies, about 16 per cent of the total number of companies were in the fast growing third group.

In brief, most of the biggest companies were growing very slowly. They were growing very slowly as the rate of return on capital was declining.

We next analysed the relation between sales and the return on capital. We formed a dynamic panel of 164 of the largest 300 companies, those that were in the

manufacturing sector, the dependent variable was the return on net worth. The regressors were the return lagged, current sales and lagged sales. The sales variable was defined as the share of the company's sales in total sales of the group of large companies in that sub-sector of the manufacturing sector. The estimated regression equation was:

profit = .935 profit (-1) +.990 sales -1.241 sales (-1)
(10.56) (.78) (.96)

The overall regression equation was significant. However, among the regressors only lagged profit was significant. Current sales were positively related to current profit but lagged sales were negatively related. This negative relation suggests that a company with a large sales share might face more competition and see its profit margins being eroded. However, none of the sales terms were significant.

When we regressed sales against profit the estimated equation was:

sales = .921 sales (-1) -.020 profit +.001 profit (-1)
(51.32) (3.8) (.32)

Lagged sales are very significant. Lagged profits are also significant and have a negative sign. Raising a compay's share of sector sales has a negative effect on profits, more selling expenditures or price discounts might be needed to raise sales share.

The negative relation between profits and sales share and the coefficient for the lagged variable being less than 1 in both the equations suggest that there is mean reversion. A leader finds it difficult to maintain its position.

Conclusion

The manufacturing sector has grown slowly in India raising concerns about its capacity to provide sufficient jobs for the youth bulge. But we find that the manufacturing sector over the whole world has been facing difficult prospects but it has done better in India than in many other developing countries. However, we did find that the rate of growth of value added in manufacturing has been slowing over the period 2005-14. During this period, the rate of return of the largest manufacturing companies has been declining in all sub-sectors. Intense competition seems to be one of the factors responsible for the decline in returns. Another factor that seems to be affecting profitability is the slow pace of productivity increase because of the slow rate of investment in new more productive equipment. Rates of investment have been declining. The entire nexus between the availability of long term funds, the incentive to invest because of competition and actual investment will further explain and provide the basis for policy intervention to raise the growth rate of manufacturing.