

Towards a location-sensitive policy for manufacturing in Karnataka

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Abstract As states have moved to attract investments in the post-liberalisation era, two distinct patterns have emerged. Some states have focused on their largest city, while others have adopted a more dispersed strategy of attracting investment. Taking the experience of Karnataka, this paper looks at the consequences of concentrating on a single centre to boost industrialisation. Using insights from Krugman’s new economic geography, it first isolates the factors contributing to agglomeration to argue that Karnataka’s industrialisation has been Bengaluru centric. It goes on to identify the adverse consequences of concentrating industrial activity in a single city, and points to some of the challenges to moving towards a policy that is more sensitive to issues of location.

Keywords Manufacturing · Location · Karnataka · Bangalore · Industry

Introduction

Among the less debated changes brought in by the process of liberalisation in India is transformation in the policy towards industrial location. In the years before liberalisation, government policy, at both the Centre and the states, focused on large industry as an instrument to remove backwardness (Mohan 1997). The implementation of this policy may have been affected by extraneous, including political considerations, but removing backwardness remained one of the considerations in the stated policy on industrial location. In the post-liberalisation era, this consideration has received much less attention (Saikia 2011). States have competed with each other to attract investment (Venkatesan and Varma 2000). In doing so, states have tended to follow quite different strategies. Some states have concentrated to a very high degree on promoting the attractions of their most important

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city, while others have tended to seek investments in a wider range of cities within their state. The neighbouring states of Karnataka and Tamil Nadu are examples of this divergence with the former focusing largely on promoting Bengaluru even as the other has tried to develop more industrial centres.

Comparing the effectiveness of these two strategies will require a comprehensive understanding of the process of industrialisation in these two, or other similarly contrasting states. This is a task that is well beyond the scope of this paper. The focus of this paper is on the dynamics of the process of industrialisation which is concentrated in a single city in a state, using the example of Karnataka. As the dynamics of this process involves varied relationships between multiple elements, a comprehensive analysis will capture both the interconnections between the different elements as well as the working of each of these elements in detail. For reasons of space, this paper will focus on the former, that is the interactions between the multiple elements that constitute the process of a single-city-dominated industrialisation. This broad-brush approach begins by first briefly outlining a framework drawn from the literature on new economic geography to understand how and why centres of industrial growth emerge. It then uses that framework to explain the tendency for Karnataka's industrialisation to gravitate excessively towards Bengaluru. It goes on to argue that this Bengaluru-centricity has contributed to the industrial crisis in the state. The paper finally outlines some of the challenges that have to be met in shifting from a Bengaluru-centric growth pattern to a more diversified pattern of industrialisation.

Dynamics of economic agglomeration

The emergence of new economic geography has brought issues of location into the centre stage of our understanding of the development process. The work of Paul Krugman and others has helped understand why some cities emerge as economic centres while others do not (Fujita et al. 2001). In grasping the dynamics of this process, it is useful to adopt a model of agglomeration that draws on this body of work.

In this adapted model, a city grows through a series of backward and forward linkages. As is depicted in the dark boxes of Fig. 1, the dynamics of the growth of an economic centre can be depicted as a self-reinforcing cycle. The first step towards the emergence of an economic centre could be at any point in the cycle, typically one where the city has already established an advantage. If we were to begin with a city that has a well-established labour force with particular skills, it would be attractive to those seeking to set up units requiring those workers. This contributes to firms with the same worker profile being set up in the city. This in turn leads to an increase in job options for individual workers, enabling them to raise their nominal wages. At the same time, the availability of the products of these firms improves the capabilities of the worker as a consumer. The increase in the nominal wage together with a greater availability of products at closer-to-cost prices leads to a significant increase in the real wages of the workers. This encourages more workers to move to the city, attracting more firms, and the cycle continues.

The working of this cycle is not independent of the conditions around it. The significance of each stage in the cycle would depend on the extent to which it is supported by the larger environment in which the cycle is operating. The light boxes in Fig. 1 identify the external factors influencing each stage of the cycle.

We began our exploration of the cycle at the point where there is a large number of workers with the skills a particular industry requires. The existence of this labour force would, however, itself depend on the larger economic environment created by historical and social circumstances. These circumstances would determine not just the size of the

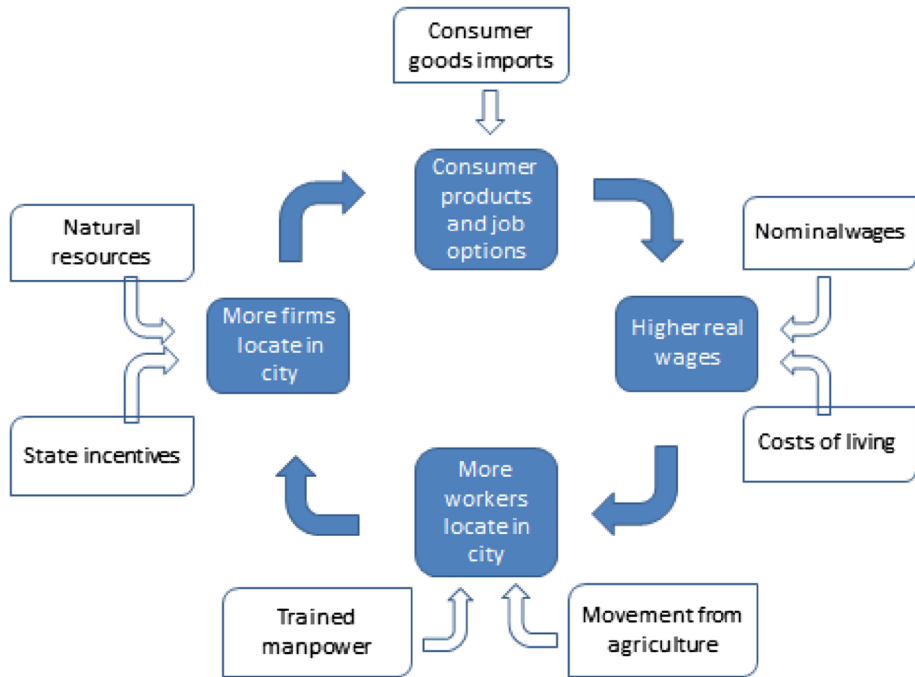


Fig. 1 Process of industrial agglomeration

labour force that would be available, but also the kind of industry it would support. A larger economic environment characterised by a rural economy that can no longer absorb its entire labour force would encourage these workers to migrate to urban centres. The labour force generated by such migration from agriculture would be of interest to industries that need skills that are relatively less time consuming to develop. In contrast, a larger economic environment characterised by institutions of technical education would throw up a workforce rich in technical manpower. This would attract industries seeking technically qualified manpower.

External influences can play a significant role in all the other stages of the cycle as well. At the next stage, there is also a role for the extent to which a particular location allows industry access to resources. Indeed, in some industries that are heavily based on natural resources, this can be at least as significant a factor as the availability of labour. It would appear obvious that natural factors would play a critical role in the availability of resources. But it is possible for the natural availability to be enhanced or curtailed by state policies. A state government offering highly subsidised prices for a particular natural resource could attract companies if the benefit of lower prices more than makes up for the transportation of the resource from other areas. It must be noted, though, that the role of the state need not always work in favour of growth. It is possible for an effective and desirable state policy to raise the cost of a resource and hence act as a disincentive for growth. This is particularly true of situations where increased availability of a resource can be damaging to the environment.

The availability of products that serve to enhance real wages is also dependent on the larger economic environment. The specific products that attract workers would depend on the profile of the workers. Workers would be attracted to products they can relate to. Those

migrating from villages have been known to prefer investing in televisions that allow them to keep in touch with the culture of the rural setting from where they have come. Employees of more high-technology industries on the other hand would prefer more products with more advanced technologies and a closer link to fashions in the developed world. In the latter case, they would be influenced by whether the larger policy environment encourages the availability of imported products and lifestyles.

The improvement in the real wages of workers too could be influenced by other external factors. In an environment with significant inflationary pressures, it would require a very substantial increase in nominal wages for real wages to grow. Cities that can manage the cost of living better would then have a greater advantage. This factor can be critical as an increase in nominal wages could lead firms to consider setting up shop elsewhere. In an era of globalisation, the alternative locations need not be in the same country, let alone the same state.

The growth of a state's industrial sector would then depend on the success of its economic centres. In an accounting sense, it would not matter if the overall growth came from the massive growth of a single metropolis or from the growth of multiple economic centres. But these patterns can affect the process of agglomeration. For instance, an excessive concentration in a single city can raise the costs of land and infrastructure in that city. The higher costs may not have too adverse effect on cities that compete on the basis of quality and cutting edge technological change, but it could be a debilitating weakness for industries competing primarily on the basis of low costs.

The Karnataka experience

Karnataka has been among the worst hit by the slowdown in Indian industrial growth that followed the global economic crisis of 2008. In the 4 years leading up to 2008–2009, the state had an industrial growth rate at constant prices of 10.35 % which was a little above the average national growth rate of manufacturing over the same period of 9.6 %. Over the next 4 years, the state slipped well below the national average. While the average national growth rate of manufacturing in the 4 years following 2008–2009 dropped to 6.7 %, the average industrial growth rate in Karnataka over the same period fell much more sharply to 3.14 %.¹ Given Karnataka's long record as one of the country's more industrialised states, going back to the pre-independence era, it is tempting to treat this as no more than a short-term aberration. But if we look beyond these growth rates at the economic processes underlying these trends there is greater cause for concern. The industrial slowdown in the state may well be the early signs of a deeper malaise, where Karnataka's strategy of industrial growth as if location does not matter is beginning to unravel.

When using the framework of agglomeration outlined above to understand the nature of industrialisation in Karnataka's cities, there is little doubt about the effectiveness of the process in Bengaluru. The economic growth of Bengaluru in the years after independence can be seen in terms of the working of the cycle of agglomeration in at least three different phases. The first phase was led by the public sector. Bengaluru's focus on public sector investments began even before independence. The city's experience with public sector units in princely Mysuru helped build its case to be considered a natural destination for some of the major public sector investments made by the Central government after

¹ The average growth rates are tabulated from data provided by the Economic Survey 2013–2014 of Government of India and the Economic Survey 2013–2014 of the Government of Karnataka.

independence. The inflow of central public sector investments on a large scale saw the emergence of a number of townships on the periphery of the then Bengaluru (Nair 2005). These well-designed townships, together with the higher wages and better labour conditions ensured by trade unions, made Bengaluru a sought-after destination for workers. The availability of a skilled workforce may well have influenced the decision of the Central government to expand public sector investment in the city.

The second and third phases of Bengaluru's economic growth grew out of the first. As the public sector grew with a unionised labour force, it ensured that the nominal wages paid to its workers as well as the facilities available were noticeably above those of the rest of the working class, particularly workers in the unorganised sector. This created a situation where it was attractive for the public sector to outsource the manufacture of some of its components to small scale private units who relied extensively on unorganised labour. This process was enabled by the creation of large industrial estates in Bengaluru (Sudhira et al. 2007). This created the infrastructure needed for a rapid growth in the small scale sector in the city. This process received a further boost in the 1970s from global trends. In this decade, it became fashionable to celebrate the clothes of the working class in the developed world, particularly those made from denim. The making of these clothes no longer needed the high degree of skill and technology that was available in the developed world. The manufacturing process thus moved out of the developed world, seeking manufacturers in alternative sites that could provide both the physical infrastructure as well as low-cost labour. Bengaluru, with its large industrial estates and unorganised workforce, met this demand (Pani and Singh 2012). This export-garment-led growth provided the second phase of industrial agglomeration in the city.

The third phase too was a combination of the by-products of the public sector boom and global change. Workers in the public sector, who were relatively better off than their counterparts elsewhere, were in a position to tap the educational opportunities Bengaluru offered their children. The townships themselves had well-developed health and schooling infrastructure. Once out of school, the children of public sector employees had the opportunity to access the well-developed and heavily subsidised engineering education system developed since the days of princely Mysuru. This created a large body of technical manpower that the state could not initially absorb. Many of these engineers sought to migrate out of the country. With the coming of the communication revolution in the mid-1980s, however, it became possible for global players to tap this manpower even as the workers remained located in Bengaluru. The resultant widely recognised information technology boom led the third phase of agglomeration in Bengaluru (Heitzman 2004).

These three phases of Bengaluru's economic growth were not matched by similar processes of agglomeration elsewhere in the state. There were examples of processes of agglomeration being initiated in other cities in the state, but they did not turn out to be sustainable. The mining boom in Ballari could have begun a sustained process of agglomeration. But the environmental degradation and subsequent health hazards it brought with it limited its potential to attract other industries. The mining boom itself came up against a moral and legal barrier.² Other potential centres on the coast, particularly Mangaluru, were not able to get the full benefit of agglomeration because of inadequate access to the rest of the state.³ As a result, Karnataka's growth has tended to become Bengaluru centric.

² See for instance the news report, "SC clamps mining ban on Bellary" *The Telegraph*, 30 July 2011.

³ The Ghat section of the highway connecting Mangaluru–Bangalore has been very vulnerable to monsoons, and it is not unknown for train services too to be interrupted during the monsoons.

The Bengaluru-centricity of Karnataka's economic growth is perhaps best reflected in the patterns of urbanisation, particularly the increase in urban population between 2001 and 2011. During this decade, Bengaluru accounted for more than half of the increase in urban population in Karnataka. There was no other district that was even close. As can be seen in Table 1, Bengaluru's contribution of 52.7 % of the increase in urban population in the state was more than 10 times greater than the district with the next highest contribution, Dakshina Kannada. It is also interesting to note that the other major point of urban attention in the state, at least in terms of JNNURM recognition, Mysuru, contributed less than Dakshina Kannada. The other district that has often been suggested as a focus of Karnataka's urbanisation, Dharwad, ranks even lower at seventh.

Consequences of Bengaluru-centricity

In exploring the consequences of the Bengaluru-centricity of Karnataka's recent industrialisation, there has been a tendency in both official and popular discourse to treat this process as an unqualified advantage. As the only major successful industrial centre in the state, it has been convenient to treat the economic growth of Bengaluru as being the core of the growth of Karnataka as a whole. The idea of Bangalore was sold in international fora, drawing both investment and academic interest in the city. The term 'Bangalored' was used in some advanced countries to refer to the process in the advanced countries of workers' jobs being outsourced to the developing world. As a part of this process, it was believed that Bengaluru must be transformed into a world class city. The idea of what exactly constituted 'world class' was to be in line with the perceptions of industry. Advisory bodies led by successful industrialists, such as the Bangalore Agenda Task Force and Agenda for Bengaluru Infrastructure Development, were set up to work out the direction of the growth of Bengaluru. This drive to make Bengaluru a 'world class city' demanded greater resources from the state government. There were subsidies offered for the construction of a new international airport. There was also substantial investment in infrastructure in the city, though this did not always lead to a reduction in complaints about the quality of infrastructure. As a result, the process of Bengaluru-centricity was further consolidated by the policy of successive Governments of Karnataka.

The emergence of a popular conventional wisdom that the development of Bengaluru was at the core of the economic growth of Karnataka contributed to an underestimation of some of the less desirable consequences of this process. The costs of Bengaluru-centricity have varied dimensions ranging from those emanating from geography to those that are a consequence of the policy framework.

Regional disparity

The effects of single-city led industrialisation have to be seen in the context of the regional disparity within a state. The emergence of a major industrial centre affects the region around it. A major city that grows horizontally absorbs villages around it, bringing with it economic change including a boost in real estate. It also becomes a source of employment and a market that can be tapped by those residing in villages around it. This often results in increasing wages and other incomes in the surrounding region. The effect of this urban impulse on the regional disparity in the state as a whole depends on the nature of the region within the state where the city is located. When a city that is the major, if not sole, engine of growth in a state is located in the backward regions of the state, its growth will lift the

Table 1 Share of districts in increase in urban population between 2001 and 2011

States/districts	Percentage share in new urban population
Karnataka	100.00
Bengaluru	52.70
Dakshina Kannada	4.67
Mysuru	4.56
Ballari	3.78
Kalaburgi	3.57
Belagavi	3.53
Dharwad	2.98
Kolar	2.44
Udupi	2.27
Bengaluru Rural	2.27
Bagalkot	2.14
Vijapura	1.86
Tumakuru	1.70
Davanagere	1.53
Bidar	1.40
Hassan	1.29
Raichur	1.19
Haveri	1.02
Chitradurga	0.96
Shivamogga	0.93
Gadag	0.67
Koppal	0.63
Uttara Kannada	0.55
Chamarajanagar	0.48
Mandya	0.47
Chikkamagaluru	0.30
Kodagu	0.10

The population data have been calculated as per 2001 districts

Source calculated from Census of India, GoI (2001, 2011)

economic well-being of the region and reduce regional disparity in the state. If on the other hand, the city is located in the historically better developed region of the state, and its further growth can contribute to a widening of regional disparity within the state. The growth of Bengaluru has, when seen in the context of regional disparities, tended to widen the gap between the developed and backward regions of Karnataka. It is widely recognised that the north-eastern districts of the state constitute the most backward region of the state. Six districts in this region—Kalaburgi, Yadgir, Raichur, Bidar, Koppal and Ballari—have now been officially granted special status. As can be seen in the map (Fig. 2), Bengaluru (formerly Bangalore Urban district) is geographically placed in the south of Karnataka, a considerable distance away from the backward north-eastern region. The closest of the districts in the north east recognised as backward, Ballari, is well over 250 km away. Add the cultural differences and there is very little scope, if any, for the economic benefits of the growth of Bengaluru to spill over into the most backward regions of the state.

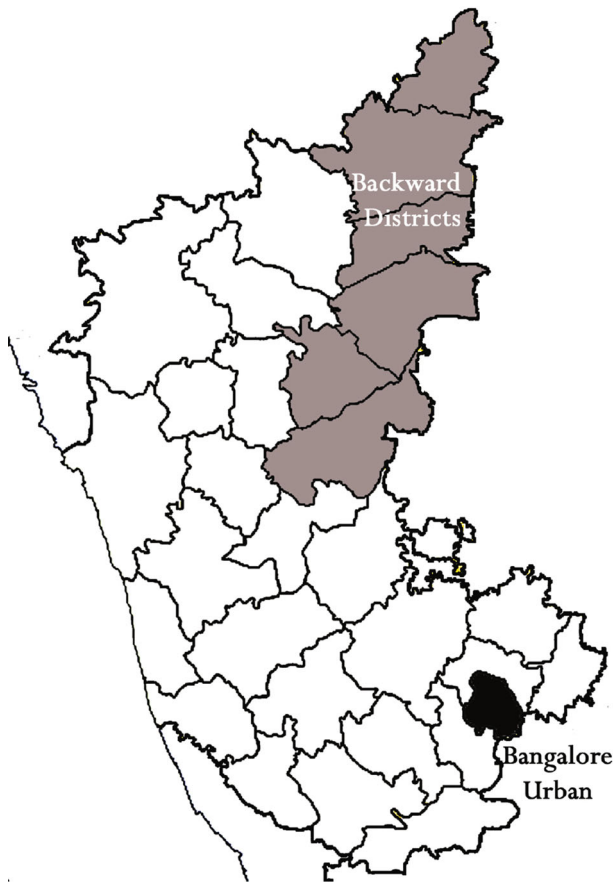


Fig. 2 Map of Karnataka indicating officially recognised backward districts

Infrastructure

There is little doubt that an improved infrastructure is essential for a more rapid pace of industrial growth. The deficits in infrastructure in Karnataka, especially in power and transportation, are well documented (Sharma et al. 2005). Addressing these deficits efficiently would ideally involve initiatives on both the supply and demand sides. While managing infrastructure demand, particularly for power, formed at least a small part of the policy discourse in earlier years, more recently, the focus has been almost entirely on the supply side. By ignoring the potential to manage demand in a way that does not restrict growth, and could even enhance it, policy makers have tended to discard, unused, an important instrument.

The limitations of a focus on supply alone have been compounded by the approach to the task of improving infrastructure. First, as has been noted, the emphasis has been on world class infrastructure rather than cost-effective infrastructure. It is not unknown when deciding on individual infrastructure projects, such as airports, to keep in mind images of similar projects in the developed world. Indeed, Bengaluru's new international airport was developed within a larger discourse of the city being transformed into a Singapore. When specific infrastructure projects are designed to be comparable to the best in the world, it has

an impact on their costs, even sometimes making them comparable to that of similar projects in the developed world. Foreign investors seeking to escape the costs of the developed world would have little incentive to invest in Karnataka if the costs are not substantially lower than that in the developed world. It is then not entirely surprising that the initial promise of investing in Karnataka that can be seen in the signing of MOUs in global investors' meets does not always translate into real investments once the foreign investors are confronted with the real costs of investing in the state. Second, official efforts to get investors to overcome their hesitation by offering greater concessions can also, in some cases, be counterproductive. This is particularly true when infrastructure projects are offered more land than they, strictly speaking, require. Using the promise of real estate profits to woo investors may appear an attractive option, but it is in fact counterproductive. It increases the resistance to projects from those whose land is being taken away and, equally important in terms of the effect on growth, it contributes to even foreign capital being diverted into the real estate market and away from manufacturing.

Real estate spiral

Another major consequence of resources being concentrated in Bengaluru was that it set off what can be termed a real estate spiral. The concentration of resources into Bengaluru increased the demand for land in the city, with the consequent effect on land prices. The term "speculators' heavens" was soon being used in official circles (Ravindra et al. 1997). The sharpness of this spurt in land prices set up the possibility of land being an avenue for speculative investment. This investment, sometimes by investors who had no intention of living in Bengaluru, provided a further impetus to land prices. The higher land prices had, and continue to have, at least two important consequences for the growth of manufacturing.

First, higher land prices affect the composition of investment in Bengaluru. It forces investors to get more conscious of the land element in their investments. This generates a clear preference for less land-intensive economic activities. Since manufacturing typically requires more land than services, high real estate prices contribute to a preference for services over manufacturing. This preference is strengthened by the tendency for smaller information technology firms to be set up in residential areas, an option that is typically not open to manufacturing.

Second, sky-rocketing land prices also make it very difficult for micro-businesses to expand into medium and then large units. The problem is not just one of land becoming unaffordable. The booming real estate market also opens up an investment opportunity for micro-businesses. Rather than going through the effort for the relatively limited profit margins of manufacturing, they now have the opportunity to generate much greater speculative profit through real estate investments. This trend may well be immune to government initiatives to offer land for manufacturing. Indeed, there is a risk of misuse of state incentives. Those who do receive land at subsidised rates from the government to set up a manufacturing unit have an incentive to allow their industry to turn sick and book the profits available on converting the land to various forms of real estate. This preference for real estate over manufacturing has contributed to the employment in Karnataka being concentrated in micro-businesses and large businesses. The inability of micro-enterprises to grow into small and medium enterprises is reflected in the patterns of investment, number of units and levels of employment in micro-, small and medium industries.⁴

⁴ The categories of micro-, small and medium industries are defined differently for manufacturing and services. According to a presentation of the Commissioner of Industries, Government of Karnataka, made on

As can be seen in Fig. 3, the decline from micro to small and then to medium is consistent and sharp in the case of both the number of units and employment. The total investment does show a sharp increase as we move from micro to small, only to drop even more dramatically when we come to medium industries. None of this is to suggest that the relative profitability of real estate over manufacturing is the sole factor contributing to the limited growth of medium-scale industries. There has been literature on the missing middle from across the country pointing to the concentration in the micro- and small enterprises at one extreme and large industries on the other with little space for medium industries (Ramaswamy 2013; Krueger 2009). Much of this literature focuses on the regulatory framework for small industries that prevents them from growing to the next stage. While the case for regulatory reform for small scale industries is undoubtedly a strong one, the contribution of other factors cannot be ignored. The relative profitability of real estate *vis a vis* manufacturing is a factor that has had considerable significance in Bengaluru and possibly other Indian cities.

Cost of living

Higher land prices also contribute to a more widespread increase in the cost of living of labour. The city economy is an arena where the larger inflationary pressures play out. And these pressures are not helped by the emphasis on world class infrastructure at any cost, particularly when policy is based on the principle that the user must pay. The higher cost is then sooner or later transferred to the consumer. This can be done by charging higher rates as in the case of toll roads or higher priced tickets for buses or it can be done indirectly as when the government bears the cost, thereby reducing the resources available for other instruments to improve infrastructure, ranging from filling potholes on roads to subsidising housing for the poor.

The extent of the higher costs of living in Bengaluru and other cities in Karnataka, and hence their potential impact on industrialisation, is best seen when we compare the consumer price index for industrial workers in the cities of the state with that of cities in the neighbouring Tamil Nadu. Since the latest index has a base year of 2001, the index for select cities in the month of October 2014 provides us a picture of the rates of inflation in each of them. If we go by the data for select cities in Karnataka and Tamil Nadu for which the Labour Bureau of the Government of India⁵ provides data, we get a set of 11 cities. A comparison between the indices for the cities in the two states shows that the selected cities in Tamil Nadu have a lower rate of inflation than the cities in Karnataka. The fact that the two states have distinct patterns of inflation can be seen from the results of an ANOVA using the October 2014 consumer price index for industrial workers in these cities. This analysis finds, as can be seen in Table 2, that the variation between the states of Karnataka and Tamil Nadu is significantly greater than within them. The mean index for the two states shows that Tamil Nadu has a lower CPI for industrial workers in October 2014 than Karnataka. It may also be worth noting that all the selected cities in Tamil Nadu have a lower index than the city with the lowest index in Karnataka.

Footnote 4 continued

manufacturing units with an investment in plant and machinery, up to Rs. 25 lakhs are classified as micro, Rs. 25 lakhs–500 lakhs as small, and between Rs. 500 lakhs and Rs. 1,000 lakhs as medium. In services, the limits are Rs. 10 lakhs, Rs. 10 lakhs–Rs. 200 lakhs and Rs. 200 lakhs–Rs. 500 lakhs, respectively.

⁵ Data from Labour Bureau, Government of India downloaded from <http://labourbureau.nic.in/indnum.htm>. Data accessed on 2 December 2014.

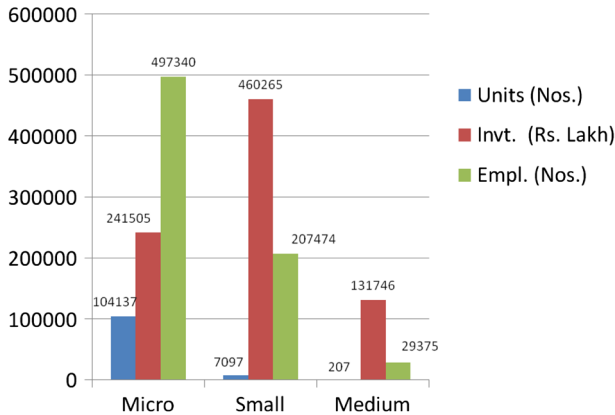


Fig. 3 Distribution of micro-, small and medium units in Karnataka. *Source* presentation to the first meeting of the Manufacturing Task Force by the Commissioner of Industries, Government of Karnataka, at Bangalore on 12th July 2013

Table 2 Consumer price index numbers for industrial workers with base 2001 = 100 for select cities in Karnataka and Tamil Nadu

Districts	States	CPI for industrial workers in October 2014
Belagavi	Karnataka	259
Bengaluru	Karnataka	259
Hubballi-Dharwad	Karnataka	271
Madikeri	Karnataka	262
Mysuru	Karnataka	259
Chennai	Tamil Nadu	230
Coimbatore	Tamil Nadu	235
Coonoor	Tamil Nadu	248
Madurai	Tamil Nadu	245
Salem	Tamil Nadu	242
Tiruchirapally	Tamil Nadu	258
Mean for above cities from Karnataka		262
Mean for above cities from Tamil Nadu		243
ANOVA <i>F</i> value		14.867
Significance		0.004

Source Labour Bureau, Government of India, downloaded from <http://labourbureau.nic.in/indtab.html>. Accessed on 10th February 2014

The policy challenges

At the heart of Karnataka's recent slowdown in manufacturing is the Bengaluru-centricity of its development experience. The excessive emphasis on Bengaluru has accentuated two other trends that have had a serious negative effect on manufacturing. First, the tendency for real estate to draw capital away from manufacturing has severely restricted the flow of capital into the industrial sector. Second, the higher costs of living both because of the real estate boom as well as the high-cost infrastructure force Bengaluru into a labour trap. If the nominal wages are increased to cover these costs, the city runs the risk of becoming less competitive in the global race of cost-effective manufacturing centres. If the costs are not

covered, workers prefer to shift back to the relatively low personal cost economy in rural areas, even if the earning capacity there is substantially lower.

Meaningful prescriptions for a revival of manufacturing in Karnataka must then be consistent with our diagnosis of the disease. The diagnosis that emerged from the discussion in the earlier sections demanded measures to deal with three main issues: reducing Bengaluru-centricity; encouraging capital to move from real estate to manufacturing and providing labour accessibility to training and jobs.

Reducing Bengaluru-centricity

The need to develop manufacturing centres outside Bengaluru has been recognised by the Karnataka Government. There has been a concerted effort to tap the Government of India's efforts to set up national investment and manufacturing zones (NIMZs) in Karnataka. Three NIMZs have been approved in Tumakuru, Gulbarga and Bidar. The Central Government has also decided to provide the proposed Information Technology Investment Region (ITIR) near the Kempegowda International Airport in Bengaluru, the facilities available to NIMZ. While these initiatives indicate a welcome effort to develop multiple growth centres in Karnataka, it is not yet clear whether the economic environment in these regions will lead to the individual units taking off.

For the investment in NIMZ to become the starting points for a self-sustaining manufacturing boom in these regions, at least two broad principles will have to determine the course of implementation of these projects. First, there must be a broad compatibility between the type of labour available in these regions and the economic character of the NIMZ. Gulbarga and Bidar belong to the north-east region of the state that is now officially recognised as being much more backward than other parts of the state. The labour force that is available in these regions is relatively less educated. Tumakuru may be in the relatively less backward southern Karnataka, but Census data tell us that that there is a major movement of labour in this district away from agriculture.⁶ For the NIMZs to be able to make the best use of the labour available in their vicinity, they would need to focus on industries which use relatively less educated labour with limited training. For such industries, the backwardness of the region will provide advantages in terms of the availability of cost-effective trainable labour in adequate quantities. This labour advantage can, however, be quickly and dramatically lost if the NIMZs focus on industries that have no place for labour that is locally available. In that case, the industries would have to import not just their capital equipment into the region, but also their technical labour. While such technical labour may be willing to move into cities that have already established themselves as economic powerhouses, they are less likely to move into areas they perceive to be backward. To make these backward areas attractive to technical manpower, the industries would have to offer higher wages. This would dramatically reverse the cost-advantage of a NIMZ in a backward region.

Second, the infrastructure that is provided must be cost-effective. The infrastructure must be provided at a cost that does not make it difficult for the industries located in the NIMZ to compete with manufacturers located elsewhere. This would require a number of factors to be kept in mind when making infrastructure decisions. While the infrastructure would have to enable effective manufacturing as well as provide the education, health and social facilities needed to attract workers, it will be necessary to be sensitive to the overall

⁶ For a detailed analysis of the shift away from agriculture in the districts of Karnataka, see Pani and Iyer (2013).

cost that is passed on to the price of the final product. This sensitivity could be addressed by looking at low cost options, including alternative technologies. It is also possible not to transfer the entire infrastructure cost on to the final consumer, by maintaining a general infrastructure subsidy.

This is not to suggest that the economic revival must be confined to industries that make use primarily of labour that is relatively less educated. The proposed ITIR near Bengaluru is recognition of the scope for industries requiring high-technology manpower. There is scope for industries using technical manpower in manufacturing as well. Since such initiatives will be competing in a relatively higher cost market and need to attract technical manpower, the social infrastructure requirements may be different. In particular, the recreational and cultural infrastructure the technical manpower demand may be different from what workers from other social backgrounds in the NIMZs would like. While these industries may be able to absorb higher infrastructure costs, there would be a need to be sensitive to these costs too in a competitive global market. There would then be an advantage in locating these initiatives too in areas where high-technology manpower is easily available. The coastal Karnataka districts of Dakshina Kannada and Udupi have consistently demonstrated their potential in terms of the availability of educated manpower. Locating a high-technology township in that region is likely to prove more rewarding.

In short, reducing the state's dependence on Bengaluru for its growth requires at least three urgent steps. First, the government must launch a series of townships with a strong manufacturing centre that also provides all other facilities for those working in them. This effort can be built around the strategy based on NIMZs but need not be confined to them. Second, policy makers should ensure that the focus of the townships is consistent with the type of labour available in the region. This will help the township grow in the initial stages, and once it takes off, it will be able to attract labour from elsewhere. Third, the infrastructure that is provided in each township must be sensitive to the effects it has on the prices of the products produced in them. Care must be taken to ensure that the cost of infrastructure does not contribute to the products being priced out of the global market.

Encouraging real estate capital to move to manufacturing

The challenge of getting capital, especially small local capital, to move from real estate to manufacturing is a particularly difficult one. It involves reversing a trend that has taken root for two decades if not more. Real estate also has the ability to attract capital in very wide scale of investment, from investment in single sites to larger integrated townships. As a first step, it would be useful to at least plug the loopholes that allow land allotted for manufacturing to be diverted to real estate by changing the land use classifications. Allowing such a transfer implies the diversion of concessions offered by the government for manufacturing into activities that the government has no reason to support. Strict administrative measures to prevent a change in land use should help limit such a diversion even if it cannot be stopped altogether.

A more meaningful push to capital to move from real estate to manufacturing would, however, require more than administrative measures. There would have to be economic opportunities to be gained by shifting at least a part of the capital into manufacturing. One way of achieving this would be to develop a close link between the real estate opportunities of the new townships to their manufacturing cores. It could be a condition for real estate investors that a part of the investment in the township must be directed to the manufacturing centres that are at the core of the townships. The real estate investor could invest in a

manufacturing centre of his/her own or contribute a specified amount of capital to a larger investment. Such a process would also create a mechanism through which the capital of multiple local investors could contribute to a single large project. In the process, it would help those investing in micro-enterprises grow into investing small and then medium enterprises.

In short, the process of encouraging capital to move from real estate to manufacturing would involve at least two steps. First, there would have to be administrative measures to ensure that land meant for manufacturing is not diverted to real estate. This would include ensuring there is no change in land use legislation. It would also be necessary to ensure that large investors in infrastructure are not given vast amounts of extra land that can later be used, directly or indirectly, as real estate. Second, the real estate opportunities of the new townships should be linked to their manufacturing activities, so that at least a part of real estate capital can be diverted to manufacturing.

Improving availability of labour

There are at least three challenges to improving the availability of labour for manufacturing: constraints on the mobility of workers; inadequate cost-effective training and the deficit in the availability of appropriate housing for the poor.

Mobility constraints

Mobility can play a critical role in determining the availability of labour for manufacturing. In the effort to ensure public transport networks are profitable, there has been a tendency to raise the cost of public transport in Bengaluru and some other cities. This adversely affects the ability of the poor to tap job opportunities that exist at a distance from their place of residence. This limits their employment opportunities even as it reduces the availability of labour in other parts of the city. There is thus a need for an effective low-cost transportation for workers within cities. It is possible to also ensure that the facilities offered are such that those who can afford the higher fares would not take these forms of transport. For instance, buses with only standing room at very low prices may be acceptable to lower-end workers seeking employment in other parts of the city but are unlikely to be attractive to others.

Effective mobility can also be used to extend the economic frontiers of the city at a relatively low cost. An effective local transport network could be used to allow the workers to continue to live in nearby villages and commute to the city for work every day. As the costs of continuing to live in the village are likely to be well below that of migrating to the city, this arrangement could help raise the real wages of labour without an increase in the nominal wage.

Cost-effective training

With a workforce that is moving from agriculture to non-agricultural occupations, the availability of appropriate labour can depend on skill development. When considering the challenge of generating a skilled workforce, it is important to focus not only on issues related to the size of such a potential workforce and their training but also on the effective cost of training to the workers. These effective costs include not just the amounts paid out for the training but also the costs of getting to the point of training and what is given up in order to spend time training. Locating training centres close to the place of residence of those who are

to be trained can make a substantial difference to the costs the trainee has to bear. A dispersed network of skill development catering to remote rural areas can serve this purpose. It is also possible to develop industry-specific training programmes that are developed in regions where labour is available. The trained workers are then taken to the location of the industries that need them. Such centres have been developed in Odisha to cater to the garment industry in Kerala. There should be no reason why they cannot be developed in the backward regions of north-east Karnataka to meet labour shortages in other parts of the state.

Housing for the poor

The current strategy of building houses for the poor focuses primarily on providing houses that the poor can own. This strategy typically ensures that only a limited part of the demand is met. This is not only because of the limited financial resources available but also because the nature of employment in a globalised economic environment is built around flexibility. Workers need the flexibility to change jobs and also the place of residence. They might also want to shift the cities in which they work. The major demand for housing is then for rented rather than owned accommodation. There is thus a need for an increase in the availability of rented accommodation. An effective intervention must then be made in the housing market for workers so as to increase the availability of housing. This investment must take place at the level where the poorest live. In order to expand the effect of state resources, this initiative could include state financial support for those building houses of a type that only the poor will occupy.

In short, an effective policy to increase the availability of labour would involve three steps. First, it would develop low-cost-low-facilities public transportation both within the city and from villages to urban centres. Second, it would develop a network of effective skill training centres located at places which minimise the costs to those who are being trained. Third, it would invest in the lower end of the rental market for accommodation that is used by the poor.

Conclusion

The Bengaluru-centric strategy that has dominated Karnataka's industrialisation has become self-defeating. It has resulted in a high-cost economic environment that makes the city less competitive both within the country and globally. There is thus a clear need to switch to a more dispersed strategy of industrialisation in the state. Such a shift in policy is not without its challenges, but these hurdles can be crossed with a broad-based strategy that explores the specific cost and other advantages of cities other than Bengaluru in Karnataka.

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