



Choosing a Growth Pattern that Suits the Present **Development Stage**

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Since the late 1990s, the growth of heavy industry in China has speeded up considerably, with a corresponding rise in its share in the national industrial output value. This trend has made some scholars believe that China has entered a stage of booming heavy and chemical industries, and for good reason. Many localities regard accelerating

the heavy and chemical industries as the key to economic growth, and have written this into local development strategies and industrial policies. Because a correct reading of the current development stage of the economy has a close bearing on the nation's development strategy, and also because the choice of such a strategy determines the mode of eco-

nomical growth and affects the solution of problems concerning farmers, rural areas and agriculture, urban and rural employment, and the income gap, we must make a sensible judgement upon whether or not present-day China has advanced to the stage of heavy and chemical industries. Only by means of a scientific judgement can we reach a consensus upon

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national development strategy.

I. China's conditions for heavy and chemical industrialization are immature

It is nothing new for heavy industry to lead economic growth and assume a large proportion of a country's economic set-up. Priority development of heavy industry did take place in China during the era of central planning; it was regarded by the government as a strategic goal and implemented through a series of policies. According to the constant price, heavy industry and light industry grew by 2780% and 905% respectively between 1952 and 1978, the former being 3.07 times greater than the latter. This excessive growth of heavy industry over light industry was rectified with the adoption of the policy of reform and opening up to the outside world. Between 1978 and 1997, China was able to balance the two industries which grew by 1196% and 1349% respectively, with heavy industry leading by 0.89 times. However, heavy industry resumed its runaway growth in the late 1990s. It registered a 98.13% increase from 1999 to 2003, and was 1.61 times ahead of light industry, which grew by 61.11%. In some provinces in eastern, central and western China, heavy industry returned to its pre-reform level of development, outstripping light industry by 3.00 times. (See Table 1.)

Nevertheless, it is questionable whether this new trend signifies the advent of a new stage in China's industrialization, or, in other words, whether the conditions are ripe for success. Economic literature abounds with expositions of heavy industry taking centre stage in the industrialization process. A widely quoted theory is the Law of Hoffmann (Hoffmann, 1958) which, on the basis of the early European experience, regards the dominance of heavy industry as an inevitable higher stage in industrialization. In addition to theories that attribute the transition of the industrial structure to the substitution of one industry by another, however, even more academic voices point out that a rise in the level of economic development catalyzes changes not only in public demand but also in the endowment of production factors and relative

prices, with the subsequent changes in comparative resource advantages giving rise to a new industrial structure (Kuznetz, 1971; Chenery et al., 1975). This being the case, we need to observe the changes in production factor endowment and the comparative strength of the economy when judging whether the transition of an industrial structure is caused by the advent of a new development stage or by certain irregular factors.

In comparison with light industry, heavy industry is characterized by high capital intensity, big investments, long periods of construction and recovering funds, heavy consumption of energy and raw materials, and exclusion of labour. Only when the following conditions become available can industrialization in China enter a stage that calls for a higher share of heavy industry in the nation's industrial set-up. If these conditions are unavailable, this

Table 1: increases in heavy industry over light industry in China, 1999-2003

Locality	Lead index	Locality	Lead index
Beijing	3.87	Hubei	1.89
Tianjin	2.37	Hunan	1.70
Hebei	1.45	Guangdong	1.80
Shanxi	2.89	Guangxi	1.23
Inner Mongolia	1.26	Hainan	1.19
Liaoning	2.02	Chongqing	1.39
Jilin	3.06	Sichuan	1.04
Heilongjiang	1.76	Guizhou	1.49
Shanghai	3.00	Yunnan	1.31
Jiangsu	1.68	Tibet	1.25
Zhejiang	1.31	Shaanxi	2.21
Anhui	1.73	Gansu	3.01
Fujian	1.82	Qinghai	5.94
Jiangxi	2.10	Liaoning	2.36
Shandong	1.27	Xinjiang	3.14
Henan	1.53	National level	1.61

Sources: State Statistical Bureau: China Statistical Yearbook 2004, China Statistics Publishing House.

means the age of heavy and chemical industry has not yet arrived. If the heavy and chemical industries start to boom in the absence of the following conditions, this means the market signals for industrial development have been deliberately misread.

Condition One: fundamental changes have taken place in the nation's production factor endowment, i.e., a substantial labour shortage has caused an increase in wages while surplus capital has brought down the interest rate. However, the wages in non-governmental departments, which are major providers of jobs in this country, have shown no substantial increase, while the trend of wage increases among governmental departments is nothing more than a distorted occurrence. The wage level in an open economy can be observed by comparing it with the international level. A study of relative wage levels in the manufacturing industry in several countries and regions indicates that, if the level of the United States stands at 100, then it is 11.2 for Mexico, 12.0 for Brazil, 42.9 for the Republic of Korea, 25.4 for Taiwan, 27.3 for the Hong Kong Special Administrative Region and 34.1 for Singapore. By contrast, it is a meagre 2.9 for governmental departments in China, and 1.9 for farmer-workers in China's urban areas (Cai Fang, 2005).

Condition Two: With condition

one as the prerequisite, heavy and chemical industries have gained relative superiority and have shown better investment efficiency than the industries to be substituted. Deriving from this situation, heavy and chemical industrial products are enjoying a competitive edge on the global market and expanding their market shares. However, in our observation of the indicators for the efficiency of light industry and heavy industry, we discover that light industry exceeds heavy industry in industrial added value created by either per-unit current assets or per-unit fixed assets, and both the current and long-term debts of the per-unit added value of light industry are lower than those of heavy industry. (See Table 2.) Given these factors, speeding up the development of

Fang, 2004), the rate of economic returns for listed Chinese companies rose to 12.6% in 1992, but it was followed by a decline, reaching 3.6% in 2003. During that period, the interest rate on one-year loans stood at 5.3%, meaning that capital returns were lower than capital costs. Moreover, the incremental capital output rate, i.e., the input needed for every yuan of GDP increase, had risen from 2 yuan in 1992 to 5 yuan today.

Condition Three: The other input resources needed by the heavy and chemical industries are obtainable, and at relatively low prices. Economic growth backed by the heavy and chemical industries calls for colossal consumption of energy and raw materials. This, plus the fact that the Chinese have not yet transformed their mode of exten-



China's modernization drive is being gravely hindered by the global scramble for energy resources and price controls and by the price hikes resulting from it



heavy industry and raising its share in the nation's industrial set-up can only hurt the efficiency of overall industrial investment. According to the studies of some scholars (Liu

sive economic growth, can only push China further down the road to becoming a country of high energy and mineral consumption. Sources indicate that the nation spent a whop-

Table 2: A comparison of the relationship between capital and output in light and heavy industries

	Average annual increase rate for surplus of current assets(%)	Average annual increase rate for surplus of fixed assets(%)	Volume of current debt incurred by per-yuan GDP increase(yuan)	Volume of long-term debt incurred by per-yuan GDP increase(yuan)
Light Industry	60.39	88.89	1.66	0.29
Heavy industry	57.91	55.36	1.80	0.75

Sources: State Statistical Bureau: China Statistical Yearbook, China Statistics Publishing House.

ping 1250 billion yuan, or 13.5% of the GDP, on energy consumption in 2001, whereas the figure for the United States was only 7%. In China, 33 products of 11 high energy-consuming industries have a level of energy consumption which is higher than the advanced world level by as much as 46%. Every year, these industries consume approximately 230 million tons of coal more than the international level (Chen Qingtai, 2003). Moreover, with its steadily rising dependency upon the outside world for energy and raw materials, China's modernization drive is being gravely hindered by the global scramble for energy resources and price controls and by the price hikes resulting from it.¹ Obviously, priority development of heavy industry at China's current stage of development is up against resource constraints and high costs.

II. Why heavy industry is leading economic growth

Considering that China is yet to reach a stage of industrialization led by the heavy and chemical industries, why is it that heavy industry is actually leading the nation's economic growth? To answer this

question, let us look into the conditions in place when other countries started and proceeded with development of the heavy and chemical industries. History reveals only two circumstances under which heavy industry could lead a country's economic growth. The first condition occurs when a country's per-capita income has risen to a high enough level for the structures of production factor endowment and prices to shift from the unlimited labour supply and capital shortages of the past, which kept labour costs at a low level, to the current labour shortages and abundant capital, which keep the capital price at a low level and thereby precipitate a boom in the heavy and chemical industries. Because of the role of the market, this transition has occurred typically or atypically in most developed countries during a certain stage of development, thereby providing an experiential basis for the Hoffmann law. Under the second condition, in which the production factor endowment structure is characterized by an abundant labour supply and capital shortage has shown no sign of change, the government may arbitrarily distort the constant prices of

production factors and, despite the capital shortage, keep capital at an excessively low price, in order to give priority to development of heavy industry. This arbitrary strategy in favour of heavy industry obviously violates the role of the market, but it was adopted in China, India, the Soviet Union and many Latin American countries in the 1950s. It is thus clear that when production factor endowment remains unchanged, priority development of the heavy and chemical industries can occur only if production factor prices are wilfully distorted.

Our study of China at present sheds light upon government intentions to promote heavy industry and distort prices of production factors. The self-glorifying obsession of local governments with higher GDP, and a value-added tax system that invites local officials to increase tax revenue by boosting the share of heavy industry, are motivational forces behind the unrealistic development of heavy industry. Local governments hoping to speed up local economic growth can achieve this aim in two ways. Firstly, they can encourage economic activity by fostering a good investment environment and furnishing favourable conditions for development. However, given the fact that the economic functions of local governments in China are not yet well-defined and that their outdated management

philosophy has not been changed, local governments tend to exceed their bounds and embrace another way of doing things. That is, they tend to intervene directly in enterprises' investment goals and activities and turn state-owned enterprises into tools for undertaking their economic growth strategies. In the reform of state-owned enterprises, the guideline of "controlling the large and liberating the small" serves to drive more and more state-owned enterprises into monopoly-oriented industries. In addition, direct government intervention in investment seems to encourage unrealistic priority development of heavy industry. Furthermore, under the tax distribution system based upon value added tax for productive fields, the larger the scale of investment in fixed assets, the greater the increase in financial revenue. This has exacerbated the tendency among local governments to direct investment into heavy industry.

With the motivation to boost investment in the heavy and chemical industries and with their economic functions unchanged, local governments in China are inclined to encourage investment in heavy industry. This is particularly the case when government policies have led to distorted production factor prices by bringing down the relative prices of capital and land and raising the relative costs of labour in some areas.



Large state-owned enterprises, which are instrumental in the government's heavy industrialization strategy, find it easy to obtain loans and reduce financing costs, but the opposite is true for comparatively strong medium-sized and small enterprises



Firstly, the investment structure will go awry if the monetary policy's periodic nature is mistaken for changes in the long-term production factor endowment structure. Since 1998, both the financial policy and the monetary policy of China have been expansion-oriented, with the interest rate going down steadily in order to stimulate consumption by residents and corporate investment. However, the steady drop in the interest rate does not mean that capital has become a plentiful production factor in this country. As China's per-capita GDP has just passed the 1,000 US dollar mark, it is unrealistic to talk about a development stage that can overcome both capital and foreign exchange shortages. A high savings deposit rate and a large-scale influx of foreign direct investment help obtain investment sources in times of capital shortage, but they can by no

means alter the nation's resource endowment situation. A World Bank (2005) study indicates that in the 1990s, non-agricultural industries in China's rural areas registered a marginal capital income rate that was much higher than that of urban industry, and the gap has continued to widen steadily. From 1990-2001, the growth of rural non-agricultural industries' marginal capital income rate outstripped that of the urban industry by 4.3 times. This testifies to the fact that scarcity of capital remains a particular problem for China's production factor endowment, and that reduction in the relative price of capital, which is precipitated by interest rate readjustments, is merely a periodic phenomenon.

Secondly, apart from keeping the interest rate at a low level for a long time, the joint effect of capital supply and demand could also turn

periodic macroeconomic phenomena into signals that continue to influence long-term economic growth and structural changes. This will not only arbitrarily bring down the price of capital as a production factor when it is in short demand, but also give rise to conflicts owing to the need of state-owned commercial banks to find loan outlets for their huge savings deposits and the serious lack of investment demand, and conflicts arising from monetary organizations' motivation in granting loans and their cautious responsibility for such grants, thereby forcing banks to follow the investment direction of national debt. In this way, state-owned enterprises - large enterprises and projects in particular - that are both under the government's soft budgetary protection and subject to government intervention, were naturally at the top of the state-owned commercial banks' list of prospective loan recipients, while medium-sized and small enterprises - private ones in particular - find it hard to obtain loans and their demand for capital is often overlooked. To put it another way, large state-owned enterprises, which are instrumental in the government's heavy industrialization strategy, find it easy to obtain loans and reduce financing costs, but the opposite is true for comparatively strong medium-sized and small enterprises.

Thirdly, the tendency towards price distortion is also evident in other production factors. Driven by their motivation for higher GDP growth, local governments offer low land use prices to attract construction projects and foreign investment, which helps further reduce capital formation costs. Meanwhile, in the presence of a dual labour market, the wage formation mechanism represented by state-owned enterprises remains a system in its own right; even when unemployment becomes a harsh reality, wages continue to rise quickly under the traditional system represented mainly by state-owned enterprises. Thus, in large state-owned enterprises that have little trouble obtaining loans, capital becomes less expensive and labour becomes relatively expensive which gives rise to an industrial structure based upon heavy industry.

III. The development strategy determines the mode of economic growth

It is important to ascertain the current stage of growth in an economy because this can provide the basis on which the government devises the strategic goals and measures that guide economic growth. Furthermore, the governmental strategy for economic growth determines the mode of growth, and, consequently, the gains of economic growth and the results of social

development. In China, this logical link can affect whether a satisfactory solution can be achieved regarding the series of problems affecting economic and social development.

The term "development strategy" refers to the government's goals and philosophy for economic development, and the series of policies designed to implement them. In some cases, economic development strategies are devised by the government beforehand. For example, the strategy of India and China to give priority to developing heavy industry, and the strategy of some Latin American countries to substitute import for development were deliberate choices compelled by a series of policies and measures. In other cases, the development strategy is no more than somebody's summary of what has happened. When the four "small dragons" of Asia decided to develop their economies by relying heavily upon international trade and making good use of market forces, they did not clearly define this as a type of development strategy. Some economists later summarized these economies' practices as being different types of development strategy. Ordinarily, what is behind an economic development strategy is primarily an understanding of which is more important: market forces or government functions. This understanding facilitates the formation of policies for speeding up

economic development. Firstly, should the prices of production factors be set with government intervention in order to push forward a certain development strategy (that often goes against the market trend), or should they be left to the market to determine so as to reflect the relative scarcity of these production factors and their supply and demand relationship? Secondly, should the industrial structure be shaped to manifest dominance in the world market or should there be intervention by means of government policies in accordance with a certain strategic intention? Thirdly, should investment decisions be made by entrepreneurs according to the rule of the market or by the government in order to meet certain strategic demands? Fourthly, should products and production factors be circulated through market mechanisms or utilizing government distribution measures?

The mode of economic growth refers to a method for allocating production factors and other input at both macroeconomic and microeconomic levels during the course of economic growth and industrial restructuring; it is ultimately reflected in the degree to which the resulting growth is dependent upon different sources of economic return. If, in addition to all of the conventional production factors (i.e., capital, land, simple labour and labour capital) which help to in-

crease output, there is an unseen factor that has gone unmentioned, or, to put it another way, if a residual value remains unexplained after all the conventional factors that can raise output have been listed, then this extra factor is just technical progress or improved efficiency, known usually as TFP (total factor productivity). The degree of this factor's contribution to economic growth is a criterion by which economists appraise the mode of such growth (Krugman, 1994).

Specifically speaking, production factors and other inputs are allocated in two steps. First, selecting an appropriate group of production factors in light of the industrial structure; second, choosing a technological structure that can meet production needs. This sort of resource allocation calls for different mechanisms, which in turn bring forth different modes of growth. As the modes of growth differ, so do the results of growth. When resources for economic growth are allocated mainly through the market, and when the relative prices of production factors can reflect the relative scarcity of resources, investors and producers economize on production factors for which there is a shortage and make use of factors that are available in abundance in order to make these choices. In a mode of growth based upon advantageous industrial and technical structures, technical

progress and improved efficiency contribute greatly to economic growth, while input of the same materials and human resources can yield higher output. This is what is known as the intensive mode of economic growth. Industrial and technical structures may render an economy's relative strength useless if a development strategy is arbitrarily pushed forward by transcending the current stage of development, or the production factor market is malfunctioning. If the investment structure and the industrial structure are estranged from an economy's relative strength, that is, if economic growth has gone beyond the economy's relative strength, then the development strategy falls into the "overtaking" category. To be specific, if capital-intensive and labour-economizing investment and industrial structures are chosen at a development stage in which labour is still abundant but capital is in short demand, then the economy inevitably falls into the conventional pattern of growth. This traditional mode of growth depends solely upon material and human input, with improvements in efficiency contributing a tiny proportion to growth. This is what is usually known as the extensive mode of economic growth.

In terms of the connotations of development strategies, the global experience in economic development offers two typical models of

development strategy.

The first is the “overtaking” strategy embraced by the former Soviet Union, India, pre-reform China, and some Latin American countries. This strategy seems destined for arbitrary distortion of production factor prices. Apart from causing development problems such as low efficiency and poor growth results, this

strategy is embraced by most developed countries and the four “small dragons” of Asia.ⁱⁱ Under this strategy, economies make use of market forces and are highly open to the outside world, thereby fostering a mode of economic growth that is contingent upon technical progress and improved efficiency as well as upon achieving fine growth and socioeco-

ences indicate that different development strategies and modes of growth lead to different employment and other socioeconomic results. The countries and regions that had been anxious to overtake developed economies made the mistake of prematurely boosting heavy industry or so-called “high-tech and new industries”; the development strategies and modes of growth they adopted were detached from their relative strengths and they were intent upon cultivating capital-intensive industrial structures while their actual strength lay in their rich endowment of labour resources. Thus the capacity of their economies to absorb employment was impaired. This type of growth may be able to gather impressive momentum in a given period, but it cannot maximize employment opportunities. The lack of job opportunities eventually hindered the labour force’s shift from farming to non-agricultural fields and from villages to cities and towns, thereby protecting the outdated dual structure in labour distribution and making it difficult to redress fundamental problems concerning farmers, rural areas and agriculture. In contrast, a development strategy which adheres to the Chinese economy’s relative strengths and is in accordance with the salient features of her resource endowment situation will enable China’s labour-intensive industries to grow further and offer a constant stream of opportunities to

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“overtaking” strategy is also the hotbed for the extensive mode of growth characterized by single-handed reliance on the input of visible factors and extremely low AFP. Just as Krugman pointed out in 1994, the once high growth enjoyed by the former Soviet Union may be entirely attributed to a fast growth in input; that is to say, this type of growth depended upon increased employment and education level, but even more so, upon large-scale input of material capital. This type of economic growth, achieved in the absence of a per-unit increase in input, could not last long.

The second development strat-

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IV. Scientific development cannot span historical stages

To regard human beings as the fundamental resource is essential to our scientific outlook for development. Whether or not this requirement can be met hinges upon adopting the correct development strategy and fostering a fine mode of growth.

Firstly, the development strategy and the mode of growth have a close bearing upon the employment results of the entire economy. Both the Chinese and the international experi-

shift the surplus rural labour force into other fields of endeavour.

Secondly, to boost the heavy and chemical industries by skipping historical stages is detrimental to efforts to improve income distribution, because this only gives rise to a mode of growth that provides inadequate and narrow employment opportunities. Income distribution is closely associated with the mode of economic growth. A growth mode and industrial structure which are in keeping with the economy's relative strengths can bridge the income gap fundamentally and effectively by expanding employment and increasing the share of labour remunerations in income distribution. The mode of economic growth determines the pattern of income distribution. Income derives from rewards from production factors such as capital and labour, and from resources such as land. The mode of economic growth decides the proportion or share of contribution of each factor in production, and the composition of rewards from these factors. A country rich in labour resources adopting a highly capital-intensive mode of industrial development obtains high rewards from capital, while income and wealth gravitate towards a small number of owners of capital factors, thereby enlarging the income gap. Under the labour-intensive mode of industrial development, labourers can gain a large share of the rewards, income distribution is relatively

balanced, and the income gap is narrow. It is thus clear that to expand employment is conducive to fostering a mode of development that not only is in keeping with China's relative strength in abundant labour resources but also can effectively bridge the income gap, achieve fairness in income distribution, and lay a solid foundation for China to become a congenial society.

Finally, if the development strategy and corresponding mode of growth are out of line with the country's relative strengths, they can place excessive pressure upon resources and the environment, with the supply of resources and the capacity of the environment falling short of the demand for heavy resource-consuming economic growth. Having outshined other economies in the world for so many years, the Chinese economy should not only continue to grow faster than others but should also surpass the world's developed economies. However, the Chinese economy can maintain its high growth only when its mode of growth is tailored to the country's relative strengths. China is still at a development stage whereby labour resources are abundant but there are shortages in capital and resources are extremely scarce. To push heavy industry beyond reasonable bounds during this stage of development would be very costly as it runs counter to China's relative strengths. Because of China's absolute

shortage in developmental resources, her development is circumscribed by resource-associated international politics. This is why we can only choose a mode of development that can be sustained with our own resources at the present stage of development. Sustainable development is out of the question if we transcend our current development stage and count on costly and uncertain supplies of resources, energy and raw materials. Only by adopting a mode of growth that accords with her relative strengths can China free herself from resource constraints. If this development strategy is adhered to, it is entirely possible for China to blaze a new road of development even if she has to experience a boom in the heavy and chemical industries somewhere along the way. ■

i For instance, three transnational corporations control 80% of the world's iron ore supply and manipulate the international iron ore price. Apart from refinery capacities and market demand, OPEC's monopoly is another major cause behind skyrocketing oil prices.

ii A relative consensus is that the development strategy chosen by "the four Asian tigers" is categorically different from the "overtaking" strategy adopted by the Latin American and other countries. However, how to judge their modes of economic growth is a highly controversial issue. Krugman (1994) put them into the category of growth in the absence of improved productivity, but most other economists believe that their economic growth is based upon improved productivity and technical progress.