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THE THREE WAVES OF THE FORDIST MODEL OF GROWTH AND THE CASE OF CHINA

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The three waves of the fordist model of growth and the case of China

by Vittorio Valli¹

Abstract

The main thesis of the paper is that, while the US economy has widely adopted a fordist model of growth since 1908, and this has largely contributed to the building and consolidation of its economic pre-eminence, Japan and most Western European countries have adopted it mainly in the 1950-1973 period, the golden age of European and Japanese growth, and China has adopted important aspects of fordist and post-fordist models in the 1980-2008 period.. The Chinese case shows that the crucial elements of the fordist model of growth - the economies of scale or of network, the rise of productivity, the increase in wages and in total wage bill, the increase in consumption, in total profits, in investment and in GDP - can give a great boost to industrial and economic growth and then to exports in certain phases of the economic history of a country, although contributing to determine also some socially undesirable consequences, such as rapidly growing economic and social imbalances and income inequalities.

JEL Classification: N60, O1, O57, P10.

Keywords: fordism, fordist model of growth, China's development.

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1. Introduction

Since the beginning of the XX th Century the world economy has experienced very large changes.

Mighty colonial empires have collapsed. The great dream of communist countries has bloomed and vanished. Western European countries have steadily declined. They have bitterly fought each other in two world wars in the first half of the century, trying a gradual and difficult path towards union in the second half. An economic super-power (the US) has emerged. Another (the Soviet Union) has grown and collapsed. A third one (China) is rapidly emerging, while India has begun its catching-up. Most African countries have freed themselves from colonial domination, but have registered a poor economic performance. Japan, the four Asian tigers and then other Eastern Asian countries have had a mighty, although partial, economic catching up during the second half of the century, while Latin America has had a much weaker and mixed economic performance. Inequality has been growing among countries and within countries, and two waves of globalisation have swept the world economy in the first and the final quarter of the Century.

In this paper we will try to outline some of the main economic changes in the XX century and in the beginning of the XXI century², concentrating the attention on the adoption, first in the Unites States, then in Western Europe and Japan and finally in China and other emerging countries, of the *fordist model of growth*. We will then analyze the third wave of the fordist growth model with particular reference to the case of China since the deep economic reforms of 1978.

2. Relative economic ascent and relative economic decline

In order to analyse the main transformations of the world economy it is useful to introduce the concepts of *relative economic ascent* and of *relative economic decline*. There is a *relative economic ascent* if in a prolonged period (a couple of decades or longer) the rate of growth of an economy, measured by the average rate of change of real per capita GDP, is consistently higher than the rate of growth of the world economy, and a *relative economic decline* if the rate of growth of an economy is consistently lower than the rate of growth of the world economy.

As **table 1** shows, in the years 1870-1950 there has been a rapid relative economic ascent of the USA, whose GDP per capita has increased much faster than in Western Europe and in the world economy, although the US economy passed through the devastating years of the great depression and of two world wars. Actually, the whole period has seen the upcoming and then the consolidation of the US to the status of top world economic power.

² See, for a more detailed analysis of these changes Maddison (2001), (2007a), Valli (2002).

Table 1: Real GDP per capita in selected countries or areas: 1870-1950
(annual average rates of change on PPP data)

Countries or Areas	1870-1913	1913-50	1950-73	1973-2008
USA	1.8	1.6	2.5	1.8
Japan	1.5	0.9	8.1	2.0
Germany	1.6	0.2	5.0	1.6
France	1.5	1.1	4.0	1.6
Italy	1.3	0.9	5.0	1.7
World	1.3	0.9	2.9	1.6
Total Western Europe	1.3	0.8	4.1	1.7
United Kingdom	1.0	0.9	2.4	1.6
Russia- USSR - Russia	1.0	1.8	3.4	0.9
China	0.1	- 0.6	2.9	6.7
India	0.5	- 0.2	1.4	3.7
Africa	0.6	1.0	2.1	0.4
Brazil	0.3	1.9	3.7	1.5

Sources: Maddison (2003), pp. 265 for the years 1870-1973; Maddison (2008) and GGDC (2009) and our elaborations for the years 1973-2008.

According to Maddison's and GGDC estimates³, the level of total GDP in PPPs of the US had surpassed the levels of the United Kingdom and of two much more populated countries such as China and India in the late decades of the XIX century, largely distancing them in the succeeding years (see **Table 2**).

In 1913 the total GDP of the US was already more than double than each other major country in the world.

The relative rise in total GDP of the US was particularly strong in the 1870-1913 years, since both per capita GDP and population rose very rapidly, much faster than in Europe. This was partially due to the American “*frontier*”, the existence in the West of the country of a large amount of untapped natural resources. New fertile arable land or pastures, gold and iron mines, large forests, oil fields, and other natural resources were available in the West. The frontier made possible a large increase in population, a massive immigration flow, a rapid increase in the size of the internal market and a strong industrialization and innovation process.⁴ While in 1870 the total GDP of the US and of the United Kingdom were very close, in 1913 the GDP of the UK had relatively decreased to about 43% of the US GDP, while Germany went down to 46% of the US level and France to 28%.

³ See Maddison (2001) and (2003), GGDC (2009)

⁴ For a more detailed analysis of this period see Habakkuk (1962), Kuznets (1966), Valli (1978).

Table 2: Levels of GDP in PPPs in selected countries: 1870-2008 (USA=100)

Country	1870	1913	1950	1973	1990	2008
China	192.9	46.6	13.0	16.2	36.6	83.6
India	137.1	39.0	15.3	14.0	18.9	35.4
United Kingdom	101.8	43.4	23.9	19.1	16.3	15.2
USA	100.0	100.0	100.0	100.0	100.0	100.0
Russia- USSR	85.0	44.9	35.0	42,8	34.3	13.5
France	73.3	27.9	15.1	19.3	17.7	14.9
Germany	72.6	45.9	17.4	25.8	21.8	18.0
Italy	42.5	18.5	11.3	16.5	16.0	12.2
Japan	25.8	13.8	11.1	35.1	40.0	30.9
Brazil	7.1	3.7	6.1	11.4	12.8	13.1

Sources: Maddison (2003, pp 195, 261 and GGDC (2009): our elaboration. The data are based on purchasing power parities (PPPs) and refer to 2003 frontiers, with the exception of Russia- USSR. The data on Russia-USSR refer to Russia until 1913, to USSR until 1990 and to Russian federation in 2008.

However, at the beginning of the XX^o century the US economy registered a gradual weakening of the positive impact of the “frontier”. Several natural resources in the West of the country had already been exploited, a large part of the land had been distributed to private or public owners, some mines had been exhausted, and so on. But since 1908, as we will see in paragraph 3, the US devised another powerful “engine of growth”, and gradually substituted the frontier with the *fordist model of growth*.

In the 1870-1913 period, while the US rapidly grew, China and India had a sharp relative economic decline with almost no growth. And in the 1913-50 years they even worsened their economic performance. Instead in the whole period Western European countries had a modest performance only slightly declining in comparison with the world economy, but greatly declining if compared to the US.

In that period some of the Western European countries were the masters of powerful colonial empires, so that their global economic strength was greater than the economic power of the centres of their empires. However, in the long-run these mighty empires were doomed. There were profound ethnic and religious differences within the colonial empires, a lower status of the citizens of colonies with respect to the citizen of the centres of the empire and the myopic centre- periphery economic logic prevailing in colonial empires. All these factors strongly contributed to the rapid dissolution of the proud European empires in the second post –war period.

In the second half of the XX century the main changes were the rise and decline of the Soviet Union and of Eastern Europe; the rapid economic ascent of Japan, of most other East Asian countries, and in more recent years of India; the severe economic decline of most African countries; the uneven growth pattern of Brazil and of other Latin American countries; the deepening of economic inequalities within countries

and among countries in the last quarter of the century, although some very populous emerging countries, like China, India and Indonesia registered a remarkable economic catching up.

3.The first two waves of the fordist model of growth

One of the factors which powerfully contributed to some of these changes in industrialised and emerging countries, is the different *timing* and the different *intensity and diffusion* of the *fordist model of growth* in various countries.

Several authors have treated of fordism and post-fordism as historical phases. According to their analyses there is a phase of fordism, then the crisis of the model and the beginning of post-fordism. However, this approach is too rigid (some fordist elements have remained also in the countries in which there has been a crisis of fordism) and it is mainly centred on Western industrialized countries and Japan. Looking at what happened and is still happening in the whole world, it would be better to speak of fordist *waves*, appearing in different periods of times in different zones, and not of precisely set historical *phases*.

Moreover, we will use the term of *fordist model of growth* in a somewhat different and much more limited sense than the one utilised for the concept of *fordism* by Gramsci⁵ and by the French regulation school⁶

The important connections of fordism to changes in labour and production organisation, to the industrial relations system, to labour division and alienation and to the whole structure of society have not been here considered, since our attention is focused on the macroeconomic core of the variables which contribute to determine the growth process, which we have named the *fordist model of growth*.

The fordist model of growth, has passed through three different waves, which are illustrated in **Table 3**.

The first wave started in the US economy in 1908. The fordist model of growth was in fact introduced into the US economy by Henry Ford through the opening of the line of production of the Ford T model in 1908⁷.

As we can see in **Chart 1**, the fordist model of growth led to a rapid increase in GDP and in the size of the market. It thus implied strong economies of scale or of network

⁵ See Gramsci (1978), who in 1934 introduced the term with reference to the case of Ford's model T and the use of mass-production, assembly lines and taylorist organization of production in the automobile industry.

⁶ See, for example, for the regulation school, Aglietta (1979), Boyer (1987), (2007). The attempt of the regulation school to give a general interpretation of economic, political and social-institutional changes is fascinating, but perhaps too ambitious, because we lack a fully integrated social science.

⁷ Aldous Huxley in his famous science fiction novel "Brave New World" (1932) measured time from 1908, considered Ford as a deity and T as a religious symbol. However, one of the essential aspects of the fordist model, a substantial increase in unit wages (from 2.34 up to 5 dollars a day), was introduced by Henry Ford only five years later, under the pressure of the loss of several workers, passed to other firms, and severe social tensions with labor unions (see Sward, 1948 and Braverman, 1974).

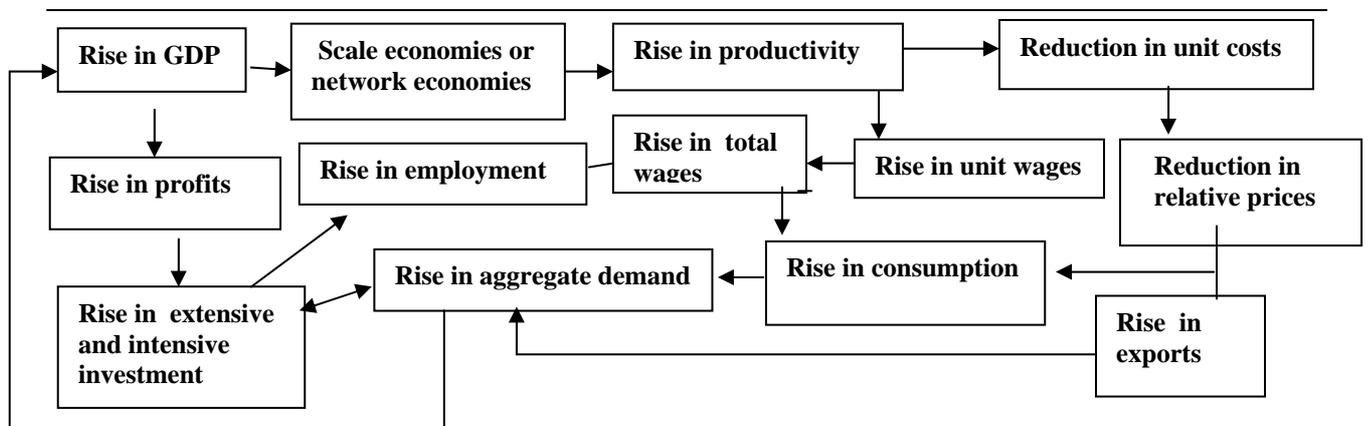
in several sectors, such as the automobile industry, the tyre industry, the steel industry, the oil industry, the car repair services, etc. There was, therefore, a sharp reduction in unit production costs and a rapid increase in labour productivity. Moreover, in those years there were strong network economies in the distribution of oil products and in the electricity sectors. Until the great depression and after the mid-30s, this gave the possibility to the big US corporations of the sectors with relevant economies of scale or of network to increase unit wages and to reduce relative prices without cutting profit margins. Their total profits could in fact rise thanks to the rapidly increasing volume of sales, fostered by massive intensive and extensive investment, made possible, in their turn, by the large and increasing profits and by the fast rise of aggregate demand. The sales could grow because of the reduction in the relative prices of several products and services, but, above all, because more workers could afford to buy cheaper mass- production goods, such as the automobiles, or domestic electric appliances, thanks to the increase in unit wages and of total employment, and so in total wages. The rise of exports played a significant role for the US economy before the first world war and after the second world war, but had a more limited importance in a great part of the interwar period. because of the spreading of protectionist policies.

Table 3: The three waves of the fordist model of growth

Waves	Countries or areas involved	Periods	Main trends
First	USA	1908-1929, 1939-1950	Strong relative economic ascent. 1908-50*: US + 1.7; World + 1.0
Second	Several Western European countries, Japan, Four Asian Tiger.	1950-1973	Partial catching-up and strong relative economic ascent. 1950-73*: Japan* +8.1; West Europe* + 4.0; World * +2.9.
Third	China since 1978 India since 1992 Eastern Europe, Russia, Brazil, etc. since the late 1990s.	1978-2008	Rapid partial catching up and strong relative economic ascent China*: + 7.1 (1978-2008) India*: + 4.8 (1992-2008) World* + 1.7 (1978- 2008)

* Annual average rates of change of per capita GDP in PPPs. Our elaborations. Sources: Maddison (2003), GGDC (2009).

Chart 1: A stylized representation of the fordist model of growth in the US economy



The chart is derived from Valli (2002)

While in the US the fordist model of growth was fully operating in the 1910s and in the 1920s and was mainly due to the rapid growth of the already huge US internal market, in Western Europe in those decades it was hindered by the relatively limited size of each European economy, by the destructions caused by the first world war, by the protectionist policies of most countries in the interwar period and by the corporative policies of some governments (Germany, Italy and Spain under Franco). After the 1929 Wall Street crash and during the great depression in the 1930s the economy of the US did not exploit the macro-economic advantages of the fordist model of growth. On the contrary in those years the mechanisms of the model operated at the reverse. The fall in aggregate demand led to less economies of scale or of network, to a fall in productivity, in profits, in investment, in unit wages and in employment, therefore in total wages and in consumption, while the protectionist policies led to similar protectionist measures of other countries and then to a fall in exports.

The Second wave of the fordist model of growth began in Western Europe and in Japan more than forty years later than in the US, in the 1950s and in the 1960s, and was greatly helped by the rise of external trade, the gradual suppression of restrictions to trade and the beginning of the integration process in Western Europe.

We can therefore say that, in a great part of the golden-age period (1950-73) Western Europe and Japan registered a complex combination of elements of the fordist model of growth and of the export-led growth with additional ingredients for late-comer countries,⁸ such as Italy, Finland and Japan, which could also benefit from the advantages of relative economic backwardness. At the beginning of the 1910s, before the break of first world war, the size of Western European countries and Japan and the level of per capita GDP in several countries had been too low to fully exploit the benefits from economies of scale and mass-production methods. The

⁸ See Gerschenkron (1962), Fuà (1980)

production of automobiles had remained, for example, limited and only a small and wealthy segment of the population could afford to buy the relatively expensive European automobiles. In the inter-wars period in Italy and Germany the authoritarian fascist and nazi regimes had established a corporative model of growth in which free labour unions were banned or persecuted and the real unit wage of most workers were maintained more or less constant.

Therefore, the total amount of wages rose only marginally and mainly because of the increase in employment, and the total demand for consumption goods rose at a comparatively slow rate. The size of the market in the two countries remained limited, and protectionist policies made it difficult to expand the sales into other countries. In the United Kingdom and in France the economic policy was more liberal as regards labour unions and wage increases, but the size of the two national markets was insufficient to fully benefit from the economies of scale. Moreover in the 1930s the consequences of the great Depression and of prevailing protectionist policies did not allow to rapidly increase exports to other industrialised countries.

After the Second World War and the reconstruction phase, in Western European countries, in Japan and then in other Eastern Asian countries, such as South Korea and Taiwan, the fordist model of growth could gradually take-off as long as the economic growth led to an increase in the size of domestic markets and the liberalization of trade led to growing exports. In Western Europe, both the growing liberalisation of foreign trade and the institution of EEC and EFTA contributed to rapidly enlarge the markets beyond the national frontiers⁹, while for Japan, South Korea and Taiwan the Korean war led to a substantial increase in exports. Moreover, the continuing presence or the reconstitution of free labour unions contributed to stimulate innovation and the rise of unit wages and thus the growth of consumption, investment and aggregate demand. Several countries could apply Keynesian expansive policies without encountering the risk of a high inflation thanks to the great productivity gains obtained in the sectors on which mass-production techniques and economies of scale allowed a rapid increase in productivity and cuts in production costs. Moreover, latecomer countries, such as in Europe Italy, Finland, Greece, Ireland, and in East Asia Japan, Taiwan, Singapore, Hong Kong and South Korea could benefit from the advantages of economic backwardness, while in the 50s and in the 60s Portugal, Spain, and, temporarily, Greece remained partially frozen under the conservative policies of their authoritarian regimes. The only large Western European industrialised country which did not share in the rapid economic growth of the “golden age” (1950-1973) was the United Kingdom, which greatly suffered in those years because of the gradual loss of the empire and thus of the increasing difficulty in exporting to the former colonies, which before the war had been to some extent “captive markets” for the British manufactured goods. Moreover, the United Kingdom did not benefit, until 1973, from the advantage of being a member of the

⁹ For a more detailed analysis of European growth, see, for example, Boltho (1982), Maddison (2001), Valli (2002).

EEC, but only of the smaller club of EFTA countries, and until the late 1970s it could not profit from its North-Sea oil revenues.

In USSR and Eastern Europe, in the era of central planning, the policy of containment of wage increases and of civilian consumption and the rigidity of planning sterilised a substantial part of the possible advantages of the economies of scale. In the 1990s, the great transformation crisis of the transition period did not allow to introduce fordist or post-fordist models of growth, which have only begun to operate since the end of the decade in several Eastern European and former USSR countries

4. The crises of the first two waves of the fordist model of growth

The United States experienced a temporary, interruption of the fordist model of growth in the 1930s, after the 1929 Wall Street crash. As we have already remembered, in those years the fordist model of growth *functioned at the reverse*, worsening the consequences of the economic depression. With the new deal and the economic recovery, there was a partial return to the fordist model of growth, which to some extent went on also during the 1940s, although there was the difficult passage to military production and then the re-conversion to civil production of several firms.

In the 1950s in the US part of the advantages of the fordist models were already exhausted because economies of scale had become less important and several industrial sectors were close to maturity. In the meantime in Japan and Western Europe those advantages began instead to fully operate, continuing until the 1960s. However, in the 1970s in Western Europe and Japan there was a rapid deterioration of the fordist model of growth, while several signs of the crisis of the model were already present at the end of the 1960s.

First of all, there was the increasing difficulty in several sectors of mass-consumption goods and in their furnishers to obtain further economies of scale and productivity gains within the fordist model. In fact in most industrialized countries several sectors, such as the automobile industry, household electric appliances, the steel industry, some basic chemical industries, etc. had already reached the maximum optimal size of their plants or factories, so that any further advancement in productivity required a different and costly new organisation of the production process.

Secondly, some of these markets had become mature markets, where the demand could no longer increase very rapidly because almost every family already possessed an item of the goods and there were saturation problems, while for the means of transportation there were also great congestion and pollution problems.

Thirdly, in the 1969-73 period, sweeping social and labour conflicts reduced in all Western European countries profit margins and contributed to increase real wages more than productivity and to raise the prices of the goods produced by the fordist sectors.

Moreover, an increased use of computer- aided machines and telecommunication, flexibilization of production and the labour market, greater recourse to subcontracting and firm networks, lean production, continuous process and product innovations, a series of restructuring and de-localization processes and other important changes in the productive process were used to try to maintain sustained rates of increase in productivity in a context where in several sectors traditional forms of economies of scale were less important and the growth of sales was slackening.¹⁰

Finally, the continuous expansion of the service sector and the relative reduction of the industrial sector heavily contributed to reduce the average size of the firms, to favour outsourcing practices in the big industrial firms and to reduce the overall trends of productivity, since some service sectors have a lower productivity dynamics than most industrial sectors.

Since the 1980s economies of scale and of network returned to be important in some new sectors such as micro-electronics and then internet and mobile phones, but only a few countries could fully exploit their benefits, namely Japan mainly in the 1980s, and the US mainly in the '90s; South Korea, Taiwan, Singapore, and then China for hardware, India and Ireland for software, Finland and Sweden for mobile phones, United Kingdom with Vodafone, etc. Most Western European countries, and in particular Italy, Spain, Greece and Portugal, were unable to enter or remain competitive in these sectors, partly because of poor industrial policies and their very low effort in R& D and in tertiary education, while Germany with Siemens and Sap, the Netherlands with Phillips and France with Cap Gemini and the Italian – French ST Microelectronics, only partially benefited from these trends.

The two great energy crises (1973-4, 1979-80) powerfully contributed to terminate the “golden age” in Western Europe, since most European countries were largely dependent on oil and natural gas imports. After the two energy crises, the rate of inflation was for a couple of decades much higher, and economic policies were often restrictive in order to reduce inflation and imbalances in the external current account and in public accounts. In the 1990s also the attempt at reaching and respecting the severe Maastricht parameters strongly contributed to reduce growth in EU countries.

Finally, growing globalization put an increasing pressure on industrialised countries which tried to converge towards the US level of productivity, and pushed them to attempt at reducing hourly labour costs, at decentralizing production or at de-localising phases or parts of the productive cycle in cheaper countries. Moreover, until 2001, in most Western Europe the rate of unemployment grew substantially because of the slowing- down of extensive investment, so that the rate of growth of real wages per employee declined during the Eighties and the Nineties and was in most EU countries lower than the rate of growth of real productivity.

¹⁰ In the automobile industry, for example, it was necessary to radically change production techniques and labour organization, introducing Japanese organisational forms (see Bonazzi, 1993) and exploiting the economies of scale on various components of the vehicle rather than on the vehicle as such.

So, in Western Europe, Japan and the US different forms of post-fordism increasingly took the place of fordist elements or mixed up with them¹¹. However, the fordist growth model is still present, although partly modified and less important in scope, in several sectors of most industrialised economies.

Moreover, in the last two decades of the XX^o century and in the beginning of the XXI^o century in several emerging countries, such as China, Indonesia, Malaysia, Thailand, Turkey, Mexico, Brazil and, then India and, since the end of the 1990s, in several Eastern European countries, there has been a third wave of the fordist model of growth, although mixed with post-fordist elements and with some features of the traditional economy, or, in the case of Eastern Europe, of the residual elements of the former planned economies.

5. The third wave of the fordist model of growth: the case of China.

In 1978 the Chinese government began a series of sweeping economic reforms which at first in depth changed the agricultural sector, then the industrial and the services sectors, the relations between public and private ownership and between the state and the market, the foreign economic relations, the monetary and financial system, etc¹². There was a gradual passage from a centrally planned economy to a sort of *economy of the double mix*: a complex mix between public (central and local) and private ownership of the means of production and between the plan and the market as the main mechanisms of regulation and coordination of the economy.

Since 1978 China has experienced an extraordinary growth performance. **Table 4** summarizes some of the main indicators of this process.

From the table we can see that in the years 1978-2008 the performance in terms of real GDP in PPPs (+ 8.2 per year), real per capita GDP (7.1) and real labor productivity (+ 6.5) was indeed extraordinary, even larger and more durable than the one exhibited by Japan in the 1950-1973 period. However, in the same years the distribution of income among the families became markedly unequal (the Gini coefficient overtook the US's level), and territorial inequalities were exploding.

The economic reforms of the agricultural sector led to a rapid increase in agricultural value added and productivity. However, the system of relative prices devised by the Chinese planners gave a great advantage to the industrial and service sectors vis-à-vis agriculture, so that on the average it was more profitable to invest in industrial or tertiary activities than in agriculture, as long as the government allowed a gradual liberalization of prices and of the markets. In the 1980s and in the 1990s in several rural areas there was therefore a strong tendency to create TVE (township and village enterprises) operating in various industrial and tertiary sectors with growing profits, which, when re-invested, could determine a new expansion of employment and production. Further reforms made it possible to create private enterprises or joint-

¹¹ On post-fordist elements see, for example, Bell (1976), Piore, Sabel (1984).

¹² See, for example, Chiarlone, Amighini (2007), Feswith (1994), Friedman, Gilly (2005), Maddison (2007 b), Valli (2002), pp. 187-97, Weber (2001).

ventures with foreign corporations and therefore to accelerate the industrialization of the economy. The growth of agricultural and industrial production raised the demand for services to the families and to the firms, so that also the tertiary sector grew very rapidly.

Table 4. Selected indicators of the Chinese economy.

Indicators	Years	Source	Values
Population (a)	1978-2008	GGDC	1.1
Real GDP in PPPs (a)	1978-2008	GGDC	8,2
Real per capita GDP in PPPs (a)	1978-2008	GGDC	7.1
Real labour productivity (a) (b)	1978-2008	GGDC	6.5
Gini index (distribution of consumption)	2004	World Bank	46.9
Interdecilic ratio (c)	2004	World Bank	21.8
Percentage of the US total GDP	2008	GGDC	83.6
Percentage of the US per capita GDP	2008	GGDC	19.1
Percentage of the US Total GDP (d)	2007	World Bank	51,1
Percentage of the US per capita GDP (d)	2007	World Bank	11.7
% of agriculture on total GDP	2007	NBS China	11.1
% of industry on total GDP	2007	NBS China	48.5
% of services on total GDP	2007	NBS China	40.4
Trade surplus (billion US \$)	2008	NBS China	295.5
International reserves (trillion US \$)	End 2008	NBS China	1.95
Expenditure in R.& D. in % of GDP	2007	NBS China	1.49

(a) average annual compound rates of change; (b) GDP/ employment; (c) ratio between the income of the richest 10% of the population and the poorest 10%.

(d) The revised World Bank estimates give a lower estimate of GDP and per capita GDP than previous World Bank's data and Maddison's and GGDC estimates. On the measurement problem see also Maddison, Wu (2008).

Sources GGDC (2009), World Bank (2008), NBS of China (various years)

In the 1980s China began to experience some aspects of the *fordist model of growth*. There was, however, an important difference with the US and the Western European cases. In the 1980s in China the fordist model was not centred on the automobile industry, but mainly on other means of transportation (bicycles, buses, vans, trucks, ships, railways, etc), but above all on the household electrical appliances and their associated sectors (electricity, steel, plastics,). In the 1990s there was the extension of the fordist model to ICT, and in particular to the production of PCs, faxes, printers and then mobile phones, software and internet networks. Finally, in the years 2000-2008 there was, the rapid growth of the car industry and of its associated sectors, such as tyres or the distribution of gasoline, as well as a large expansion of the fast railways network, airlines, air conditioners, electricity, business consultancy, banking and financial services, and so on.

Tables 5-9 provide some figures about the trends of GDP in the main branches and sectors of the Chinese economy. While for the great branches of the Chinese economy (agriculture, industry and services) we have used Chinese official statistical figures for the years 1978-2007, for the disaggregated data of manufacturing industry we have used the estimates by Szirmai, Ren, Bai¹³ which make possible an

Table 5 Employment in the main branches of the Chinese economy: 1978-2007

A) Employment (in millions)

Sectors	1978	1989	1997	2005	2007
Agriculture	283.1	332,3	348.4	339.6	314.4
Industry	69.5	119.5	165.5	180.6	206.3
Services	49.0	101.6	184.3	238.0	249.2
Total economy	401.6	553.4	698.2	758.2	769.9

B) Percentages on total employment

Sectors	1978	1989	1997	2005	2007
Agriculture	70.5	60.1	49.9	44.8	40.8
Industry	17.3	21.6	23.7	23.8	26.8
Services	12.2	18.3	26.4	31.4	32.4
Total economy	100,0	100,0	100,0	100,0	100,0

Sources: NBS (2007), pp. 27, 34 for 1978- 2005 and NBS (2008), p. 109 for 2007.

Table 6. GDP in the main branches of the Chinese economy: 1978- 2007
(% on total GDP at current prices)

Sectors	1978	1989	1997	2005	2007
Agriculture	28.2	25.1	18.3	12.2	11.3
Industry	47.9.	42.8	47.5	47.7	48.6
Services	23.9	32.1	34.2	40.1	40.1

Source: NBS (2008), p.38.

inter-temporal comparison of sectoral growth rates for the years 1980-2002.

These data show a rapid structural transformation of the whole productive system.¹⁴

¹³ See Szirmai, Ren, Bai (2005). However the data-set reconstructed by these authors probably slightly underestimates employment and overestimates productivity growth in the 1995-2002 period because they use a corrective factor based on the 1995 industrial census data, whose effectiveness declines as long as we move away from 1995.

¹⁴ For a more detailed analysis of structural changes in the Chinese economy see Valli, Saccone (2009)

In the years 1980-2007 there was a large rise in the percentage in employment and GDP of industry and services and a gradual decline of agriculture. Since in China productivity in agriculture is much lower than productivity in industry and in services, the decline in the share of agriculture was much larger and faster for GDP than for employment. In the 1980s industry became the largest sector for GDP, and continued to increase its share over time, while for employment it gradually rose to 26.8% at the end of 2007, but was overtaken by the service share since the mid 1990s. So, as regards employment even the country which has been called “the

Table 7: Growth rates of real GDP in the main sectors of the manufacturing industry in China: 1980-2002

Sectors	1980-2002	1980-92	1992-2002
Manufacturing industry	9.1	7.6	10.9
Electronics and telecom	17.1	12.1	23.3
Transport equipment	14.5	12.2	17.4
Leather and fur products	11.3	6.8	17.0
Electrical machinery	11.2	9.0	14.0
Clothing	11.1	10.3	12.1
Beverages	11.0	12.4	9.4
Chemical industry	10.2	9.7	10.8
Tobacco processing	10.1	11.0	9.1
Other manufacturing	10.0	9.1	11.1
Food manufacturing	9.9	8.5	11.6
Wood products	8.3	1.9	16.6
Rubber and plastics	8.2	7.0	9.8
Machinery and equipment	8.1	7.6	8.6
Paper and printing products	8.0	6.0	10.4
Instruments	7.6	4.4	11.6
Basic metals	7.3	6.0	8.7
Fabricated metals	7.2	3.6	11.7
Furniture	7.2	1.3	14.8
Non- metallic minerals	6.8	7.8	5.7
Textile industry	5.7	4.2	7.6
Oil refining, coal, coking	0.3	3.0	2.9

Source: Szirmai A, Ren R., Bai M. (2005), p. 65.

factory of the world” has probably begun a process of relative de-industrialization with an increasing importance of services and a fall in employment in some traditional or mature sectors of the manufacturing industry, which, however, have been recently revitalized by the exports made possible by the Chinese entrance in WTO in 2001.

In particular, in manufacturing industry the textile sector began to lose employment in 1991, some other sectors began to reduce employment in 1994-1995, while modern sectors such as “electronics and telecom equipment” continued to raise employment.

However, while dynamic and modern sectors, such as electronics and transport equipment, were the main engines of the acceleration in growth in the 1992-2002 period, the stagnation in employment in traditional sectors of the economy as textiles, clothing, leather, wood products, etc. did not lead to a slowing down of the growth of value added of these sectors, but to a significant increase in the rate of growth of their labour productivity (see **Table 8**). This was in part due to the rapid opening of the

Table 8. Labour productivity in manufacturing industry in China. 1980-2002.
Level: manufacturing industry = 100; indexes: 1980 = 100 on data at constant prices 1980.

Sectors	Level 1992	Index 1992	Index 2002
Tobacco processing	1251.8	148	449
Oil refining, coal, coking	309.8	61	58
Chemical industry	155.7	171	631
Beverages	148.6	157	451
Transport equipment	133.6	289	1555
Electronics and telecom	118.3	245	1636
Basic metals	120.0	128	369
Food manufacturing	103.4	154	669
Electrical machinery	100.4	167	788
Manufacturing industry	100.0	149	593
Rubber and plastics	99.7	121	450
Machinery and equipment	86.2	190	839
Paper and printing products	77.6	120	514
Instruments	77.2	140	483
Textile industry	75.4	83	318
Clothing	71.4	178	554
Other manufacturing	71.0	138	479
Non- metallic minerals	61.7	156	391
Leather and fur products	49.7	117	564
Fabricated metals	49.0	115	584
Furniture	33.7	116	734
Wood products	28.9	74	504

Source: Szirmai A, Ren R., Bai M. (2005), p. 37. Our elaboration.

Table 9. Growth of some industrial and service sectors in China: 1980-2007

A) Volumes

Sectors	1980	1990	2004	2007
Refrigerators, millions	0.05	4.60	30.30	43.97
TV sets, millions	2.50	26.80	73.30	84.33
Crude steel, mlns. tons	37.00	66.00	272.00	489.66
Chemical fibers, million tons.	0.45	1.65	14.20	23.90
Pcs, millions			45.1	120.73
Mobile phones, millions			233.0	548.58
Motor vehicles, millions	0.22	0.50	5.10	8.88
of which automobiles	0.10	0.30	2.3	4.80
Electricity, billion Kwh	300.60	621.20	2187.0	3277.72
Telephones, millions	2.14	6.84	312.6	

B) Indexes (1980=100)

Sectors	1980x	1990	2004	2007
Refrigerators, millions	100.0	920.0	6060.0	8794.0
TV sets, millions	100.0	1072.0	2932.0	3373.2
Steel, million tons	100.0	178.40	735.1	1323.4
Chemical fibers, million tns.	100.0	366.7	3155.6	5311.1
Motor vehicles, millions	100.0	227.3	2318.2	4036.4
of which automobiles	100.0	300.0	2300.0	4800.0
Electricity, billion Kwh	100.0	206.7	727.5	1090.4
Telephones, millions	100.0	319.6	14609.3	

Sources: China National Bureau of Statistics, *Statistical Yearbooks* (various years)

Chinese economy since the mid-nineties. The increasing openness of the Chinese economy, further accelerated in 2001 by the entrance in WTO, gave the possibility to several Chinese firms to rapidly increase the exports and to attract foreign capital, thus obtaining the foreign currency necessary to import more modern capital goods and technology from advanced countries or to learn new techniques through joint-ventures with experienced foreign companies. There was, in this way, a vast improvement both in labour productivity and in the quality of goods, and an acceleration in the growth of demand and of profitability, since foreign importers could often pay more than internal consumers.

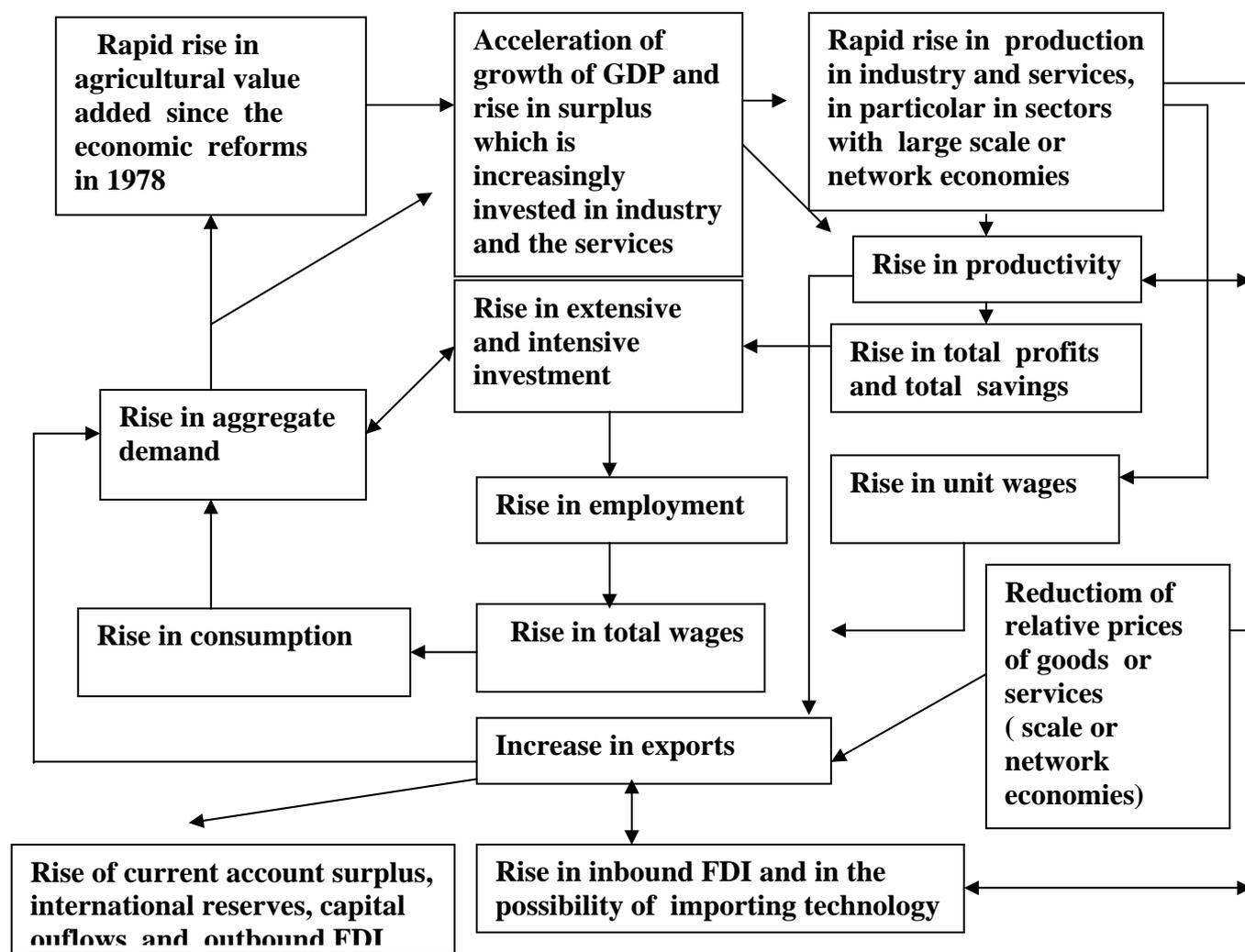
The growth process activated various forms of fordist and non-fordist feedbacks in China, which are described in **Chart 2**.

The core of growth passed from agriculture to industry and from traditional industrial sectors, such as textiles, to more modern and technologically complex ones, such as ICT and transport equipment. These sectors needed more recourse to tertiary support

than traditional ones and the rapid increase of per capita GDP implied a rise in the demand of public and private services, so that the tertiary sector rose very rapidly both in employment and in value added in the last two decades.

The growth of more modern industrial and service sectors, as well as the rapid increase in productivity of traditional sectors since the mid 1990s, led to important increases in total profits and in investment and in the possibility of raising real wages, so that consumption could increase very rapidly although the propensity to save of the households remained very high.

Chart 2. Some fordist and non-fordist feedbacks in the case of China.



Several western observers complain that the propensity to consume of Chinese households remains particularly low if compared to most industrialised countries and this accounts for lower imports and a growing surplus in the Chinese trade balance; but it must be observed that in a dynamic long run context no other country in the world has registered in the last thirty years such a rapid growth in internal consumption and that this impressive result is partly due to the very high rate of investment and saving of the country.

An important determinant of growth was also the capacity of the Chinese productive system, to gradually, but progressively upgrade the technological content of its production. This result was achieved mainly through five policies: a) a steady improvement of the average level of education, although there was an increase in inequalities in higher education; b) a rapid rise, especially in recent years, of expenditure in R.& D. up to almost 1.5% of GDP in 2007; c) a strong attraction of foreign direct investment which could channel capital, new techniques and know how in Chinese joint- ventures; d) a rapid expansion, in recent years, of outbound direct investment which could bring new markets and new knowledge to Chinese firms; e) an important improvement in infrastructures and services in several areas.

6. The dark side of Chinese rapid growth

The phase of very rapid, and partly fordist, growth of the Chinese economy (1978-2008) has been accompanied by serious economic and social problems.

The first problem is the other side of the extraordinary success in industrial growth and in the exports of manufactured goods. The Chinese economy has expanded the production of several industrial goods very fast and has rapidly penetrated foreign markets which has created a series of problems. There have been an excessive dependence of Chinese industry on exports, an over production of some goods in the world market and a series of severe re-adjustment problems of entire industrial sectors in most industrialized and emerging countries. This has led to increasing reactions from other countries, which, in the present context of a severe world economic crisis, might originate strong protectionist pressures in the US and other foreign countries. Internally, the extraordinarily rapid rise in investment in the Chinese industry has contributed to determine such a rapid rise in labour productivity that a 6-7% rate of growth of GDP, as is foreseen for 2009, would not be enough to ensure a rise in total employment and therefore would lead to a vast and socially disruptive expansion in unemployment. It would be therefore important to reduce for a while the rate of growth of labour productivity, in order to increase employment even in presence of a reduced rate of growth of GDP. This might be accomplished through the reduction in the rate of growth of investment in industry and the channelling of more resources to agriculture and to services, and especially to social security, the health system, education, banking and financial services in rural areas and environmental policies¹⁵.

Secondly, there has been a strong increase in the inequality of income distribution. In 1978 in China inequality among families or individuals were very low in comparison with most other countries. In 2004 they had become rather high. According to the

¹⁵ These ideas have been stimulated by a seminar given in Turin by professor Kent Deng of LSE and by the succeeding discussion. Prof. Deng has emphasized the limits of the input-based Chinese growth model and its weaknesses as regards social security, health, environmental policy and banking services in rural areas.

World Bank, in China the Gini index had become 46.9 in that year, and was much higher than in several industrialized countries such as Sweden, Japan, Germany, France, Italy and even the US¹⁶. In 1978 in China there were already consistent inequalities among different provinces, but they greatly increased in the period of rapid growth.

Even if it is too early to interpret these trends as persistent and irreversible, or, on the contrary, as the first ascending phase of a Kuznets' inverted u-shaped curve¹⁷, it is likely that these trends have increased social discontent, although the improvement of economic conditions of several low-income people, due to the rapid growth, has dampened social tensions.

The large increase in income inequalities among families has contributed to raise the inequality in the access to higher education although inequality in basic education has decreased¹⁸. Since, especially in the urban industrializing areas, better job opportunities and better wages are offered to people with university or post-graduate education, who generally have also a higher social capital, there is the danger that current inequalities in income and higher education will determine further larger income and wealth inequalities in the future.

Moreover, the rapid industrialization and urbanization process, the increase in the use of private means of transportation (cars, motorcycles, etc.) in recent years and the growing diffusion of PCs, domestic electric appliances and air conditioning units have very rapidly increased energy consumption, energy dependence from abroad¹⁹ and air and water pollution. The reaction of the Chinese government to the rapidly increasing energy dependence has been the attempt at establishing solid relations with oil producing Middle East, African and Latin American countries; the attempt at increasing renewable energy sources and energy saving policies, and to boost the research on cleaner usage of coal and renewable sources. The reaction of Chinese government to severe environmental problems had at first been inadequate and delayed, although in recent years several environmental measures have been introduced, both because of the 2008 Olympic games in Peking and of the growing perception of the negative consequences of pollution and global warming.

Finally, the rapid economic growth has strongly contributed to greatly expand the Chinese banking and financial system, but the four main Chinese banks remain structurally weak because they have to finance several ailing state firms, while the Chinese stock exchange markets (Shanghai, Shenzhen and in part Hong Kong) have registered phases of dangerous speculative bubbles, which have been controlled by the government and the Central bank with increasing difficulty²⁰.

¹⁶ See World Bank (2008).

¹⁷ See Kuznets (1955).

¹⁸ See Saccone (2008). On inequality in China see also, for example, Chen, Zhou (2005), Galbraith, Krytynskaia, Wang (2004).

¹⁹ See Ma, Oxley, Gibson (2009).

²⁰ See Chiarlone, Ferri (2007), Sau (2009).

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