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Ricardo Molero Simarro

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Ricardo Molero Simarro

Visiting Research Student, Department of Economics,
School of Oriental and African Studies, University of London, United Kingdom.

Researcher, Departamento de Economía Aplicada I,
Universidad Complutense de Madrid, Spain.

Email: ricardomolerosimarro@ccee.ucm.es

Abstract This paper seeks to analyse the relationship between functional distribution of income, aggregate demand and growth in Chinese reform economy. For this purpose the Bhaduri-Marglin Model is used, stating the theoretical possibility of both profit-led and wage-led growth regimes. Subsequently, the principal literature on the evolution of factor's shares in China is reviewed. The statistical series for the period 1978-2007 are reconstructed in order to carry out our analysis of the relations between capital's share and investment, on one hand; and labour's share and consumption, on the other. Supported by the Model's preliminary estimations, it is argued that Chinese growth has been largely profit-driven. Finally, the implications are presented vis-a-vis concerning Chinese economic prospects.

Introduction:

The spectacular expansion of the Chinese economy since the beginning of the reform process has been accompanied by a high increase of distributional inequality. During the Maoist era (1949-1978), marked egalitarianism in income distribution, achieved through a complex of policies, ultimately impeded capital accumulation. This situation hobbled economic growth. A change in development strategy was consequently necessary to avoid China's falling behind in the world economy (Riskin, 1987). The economic reforms implemented since 1978, allowed the Chinese economy to reach an average growth rate of 9.9 per cent until 2007 (own calculations based on NBSCh (various years(a) data). However, the Gini index also rose from 0.28 before the death of Mao to 0.47 in 2004 (WIDER, 2008). This paper's analysis attempts to link these two last processes and demonstrate why one cannot be understood without the other.

To date, most economists have linked Chinese economic expansion to the liberalization and opening of the economy, highlighting the keys to China's successful entry into the world market (viz. Chai, 1997; Chow, 2002; Lardy, 2002; Lin, Cai, and Li, 2003; Wu, 2005). These economists have praised for the high sustained growth rates, arguing that they have enabled poverty to fall dramatically (World Bank, 1997; Ravaillon and Chen, 1998 & 2008). Other economists, however, have qualified their argument by analysing the evolution of personal income distribution (Khan and Riskin, 2001 & 2005). Nevertheless, most of the research community has interpreted this marked rise in inequality as "collateral damage" incurred in an extraordinary economic trajectory. This trend to greater inequality could be palliated, it is claimed, by a mix of redistributive policies, which would then inflect the Chinese Kuznets Curve upward (World Bank, 2003; UNDP, 2005 & 2008; Riskin, 2007; Wong, 2007).

If the issue is analysed in the light of the nature of accumulation process, however, a different conclusion may emerge. In this framework, economic growth is organically linked with the functional distribution of national income, i.e. with its distribution between wages, profits and production taxes. As the first section demonstrates, in general terms the evolution of profits explains the trend in saving and investment, the latter being the key to economic growth. China's capital accumulation has been financed through internal savings, primarily business and government, rather than household (Kuijs, 2005; He and Cao, 2007; Li and Yin, 2009). At the same time, the most relevant component of aggregate demand during last three decades has been investment, accounting, in average, for more than 35 per cent of the GDP

and reaching 43 per cent level between 2004 and 2006 (NBSCh (various years(a)). Indeed, although most analysts assert that growth has been externally driven by external sector, net exports have only been significant in the last five years, accounting for less than 5 per cent of GDP until 2005.

Analysis could also aid in understanding personal distribution and, then, poverty. Household incomes contain different sources of income, from both labour and capital. State redistributive policies are also relevant to their development. However, ultimately, the link between wages and household incomes plays the most relevant role in explaining their evolution (Daude and García-Peñalosa, 2007; Atkinson, 2009). In China the household sector's loss of share in national disposable income is the reason behind the increase in inequality. According to various authors, this loss in favour of corporate and government shares, has been caused principally by the decline of labour share in national income, at least from 1996 to 2005 (Bai and Qian, 2009a). In 2008 two thirds of Chinese urban household income was explained by wage share (OECD, 2010).

An overall analysis of the pattern in Chinese primary distribution of income helps both to understand economic growth and income inequality statistics, and to shed light on their relationship. This paper, however, focuses on linking the evolution of labour and capital shares in GDP with Chinese economy's growth rates. The **hypothesis** is: China's annual 10% growth rate over 30 years has required an annual decline in labour's share of national income in order to feed the accumulation process. Bhaduri and Marglin's theoretical framework (1990) will be applied to this analysis with a view to evaluating its plausibility to our analysis. The goal is to determine if China's economy can be properly characterised as a "profit-led" growth regime.

The paper is organized in five main sections. First, is a presentation of the above-mentioned theoretical background to clarify the relationship between functional distribution and growth. Second, is a review of current literature on the evolution of factors' share in the Chinese economy. Third, this paper attempts to recalculate available statistical data to obtain comparable and consistent series of the variables to be analysed. Fourth, the topic of the evolution of factorial distribution is revisited, focussing on its role in pushing the different aggregate demand components and, consequently, determining the pace of economic growth. Fifth, in support of the argument, and following previous works, is an estimation of different equations that specify mathematically the Bhaduri-Marglin model. The conclusion refers to the implications of our results vis-a-vis the Chinese government's efforts to construct a

"harmonious society" in order to maintain economic growth rates in the context of the current Global economic crisis.

1. Theoretical Background:

The relevance of distribution of income was already stated by classical political economist even before Adam Smith. However, the most broadly known statement on the topic is that of David Ricardo, who declared in the Introduction of his *On the Principles of Political Economy and Taxation* that "to determine the laws which regulate distribution is the principal problem in Political Economy". Indeed, insofar as profits constitute the main source for investment funding, the distribution of income (between classes) is the last determinant of the accumulation process (and, consequently, the engine of economic growth). Ricardo focused on the decreasing yields of new cultivated land to explain the tendency of capitalist growth to achieve a stationary state. In contrast, Karl Marx's "law of the falling tendency of profit rate" was grounded in the evolution of the ratio among constant (means of production) and variable (labor power) capitals. At the same time, the "counteracting factors" he exposed that could interfere in the law were mainly related to the increase of the surplus value, absolute or relative. Overall, Marx's account of capitalism's inner contradictions and of the ways capitalist class tries to avoid them, were rooted on the conflictive nature of income distribution between it and working class.

The role of income distribution as a factor explaining growth began to be neglected with the emergence of neoclassical economics. Indeed, in a supposed framework of perfect market competition, distribution became to be explained as an outcome of growth, determined only by the marginal productivities of the factors of production (capital and labor). Nevertheless, the realization that perfect competition was rarely found in actual capitalism caused other economists like Michal Kalecki, to reintroduce the topic. Two main statements distinguish his theory from the neoclassic: first, workers spend what they get and capitalists get what they spend; second, a certain degree of monopoly exists in every economy. From the first statement is deduced that the absolute level of profits and subsequent the profit rate are determined by investment (and not the reverse). From the second it is deduced that the share of profits in national income is determined by that degree of monopoly. In addition, Kalecki linked income distribution with effective demand theory by taking into account the different propensity to consume out of wages and profits. This tendency implies ultimately that

redistribution of national income between workers and capitalists can influence the level of output.

That last idea, which would inspire Postkeynesian economists like Nicholas Kaldor and Joan Robinson is also the basis for the model constructed by Amit Bhaduri and Stephen Marglin. Their seminal paper (Bhaduri and Marglin, 1990) considers the dual role of wages as the most important element of production cost and the most important determinant of aggregate demand. The paper argues for the indefinite effect of a rise or fall of real wages on the level of output and employment. Indeed, they reformulate Hicks' IS-curve to allow exogenous variations of real wages (unlike Kalecki) in order to measure the outcome of a distribution change over demand components and subsequent economic growth. In contrast with Kalecki, they state that investment can also be determined by the level and share of profits.

Their starting point is the definition of a savings function totally dependent on profits assuming that a constant portion (s) of which is not saved:

$$S = sR$$

If the function is expressed in terms of capacity utilization of the economy, then:

$$S = s(R/Y)\ (Y/Y^*)\ Y^* => S = shz\ ;\ Y^*=1$$

Where R = total profits; Y = national income; Y^* = full capacity utilization income; $h = R/Y$ = profit's share; and, finally, $z = Y/Y^*$ = capacity utilization degree.

They also define an investment function dependent on profit's share and capacity utilization, treating each as independent:

$$I = I(h,z)\ ;\ Y^* = 1\ ;\ I_h > 0\ ;\ I_z > 0$$

Where I = investment.

At equilibrium condition they equal savings and investment, implying for the above equations that:

$$shz = I(h,z)$$

Being the curve's slope:

$$dz/dh = (I_h - sz)/(sh - I_z) \; ; \; I_h = (dI/dh) > 0$$

They take as a standard assumption that savings are more reactive than investment to variations in capacity utilization, that is to say:

$$sh - I_z > 0$$

Thus, the final effect of a change in profit share on capacity utilisation and, therefore, on output, depends on whether investment is more or less responsive than savings to the positive effect that capital's share on GDP has on both.

On one hand, if the response of investment to a change in profit's share is stronger than that of savings, then:

$$sh - I_z < 0$$

This implies, mathematically, that the slope of the curve is positive and, economically, that investment is the dominant component of aggregate demand, being growth driven by profits. In this "profit-led" pattern of growth, also called "exhilarationist regime" the positive effect of a higher profit's share on investment is more important than the one it has on savings. Considering the assumed higher propensity to save out of profits than out of wages, the other face of that result is that the positive effect of capital's share on investment is also higher than the negative effect a lower wage's share has on private consumption.

On the other hand, if the response of investment is weaker, then:

$$sh - I_z > 0$$

This implies, mathematically, that the slope of the curve is negative and, economically, that consumption leads demand, being allowed a "wage-led" growth. In this "stagnationist regime", a lower profit's share and, consequently, a higher wage's share let aggregate demand and capacity utilization to grow as long as the positive effect on total consumption is more important than the negative effect on capital formation.

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Although the model has been advanced only in a context of a closed economy, basic relationships between functional distribution of income, aggregate demand and growth are already defined. Following its theoretical outcomes, it can be stated that, at least in the short term, a variation of factor's share either in favor of profits or in favor of wages could have a positive effect on growth. In the first case, that variation affects growth through increased investment and in the second through larger consumption. At the same time, either growth regime could face limits: the first would be an upper limit to the share of wages in national income (and, consequently, a lower limit to the share of profits); beyond this, the accumulation and growth processes decline because of insufficient savings to finance new investment; the second one would be a lower limit to the share of wages (and, consequently, an upper limit to the share of profits) beyond which appears a problem of underconsumption (or overproduction) that prevent profits to be fulfilled.

This paper analyzes the regime that has driven China's growth during the first three decades of the reform. The conclusion reflects on limits that it could have faced during the last three years of World economic crisis.

2. Literature Review:

Research on functional distribution of income in China is very recent. To our knowledge, the only works in English that dealt with this issue before 2009 were those of Aziz (2006) and Aziz and Cui (2008)[3]. In these papers, factors' shares are taken as an explanatory variable for the neglect of private consumption in the Chinese pre-crisis growth model. Although they present graphically the statistical series they obtained from different sources, they do not give detailed accounting on how they calculated it for the series missed period (1980-1992); neither do they show the exact figures they worked with.

The first published papers in English[4] that have provided such accounting have also attempted to explain functional distribution evolution (Li, Liu, and Wang, 2009; Luo and Zhang, 2009b). These were released in a special issue of *Social Sciences in China* review on "Distribution of National Income in a Transitional Economy".

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[3] Two previous papers, one in Chinese, and other in English (Dai and Li, 1988; Minami and Hondai, 1995) also did it. Nevertheless, they focused on the evolution of factors' share only in the industrial sector and during the initial years of the reform process. Zhou, Xiao and Yao (2010) also quoted the work of Liyang (1992). Unfortunately, we could not review and, then, evaluate its exact scope.

[4] To our knowledge, all existing works in Chinese (except the above quoted of Dai and Li, 1988; and Liyang, 1992) are also 2008 onwards (Bai, Qian and Wu, 2008; Luo, 2008; Huang and Xu, 2009; Luo and Zhang, 2009a). Bai and Qian; Li, Liu and Wang; and Lou and Zhang also wrote previous respective Chinese versions of the English papers to be quoted.

Li, Liu, and Wang characterized the general evolution of labour's share, in economic development process by a U-shaped curve, as Kuznets Curve. While they find that wage share is lower in the Chinese economy than in developed economies, they argue that China's functional distribution evolution between 1990 and 2006 is consistent with that pattern. Moreover, they maintain that labour's share will enter an upward trajectory after the traditional transfer of workers among agricultural and industrial sectors is complete. Other of their findings are: first, an inverse relationship between wage's share and gross product, at a regional level; second, the relevance of higher returns to capital inside different industries (either in state-owned (SOE), and non-state-owned (non-SOE) enterprises) to explain the decline of wages' participation in primary distribution during those years.

In accordance with this first explanation, Luo and Zhang claim that labour income share is mainly correlated with the economy's sectoral structural change. The authors take into account "between" and "within" sector effects, but concentrating on the earlier factor. They notice three main trends in national income distribution between 1993 and 2004: an upward one until 1995 due to an increase of the importance of primary and tertiary sectors on GDP; second, a downward one between 1996 and 2003 caused by the predominance of industrialization and the decline of wage share inside the three sectors; third, an abnormal drop in 2004, attributable to a change in statistical accounting method, implying that incomes of self-employed came to be counted in profit share. Finally, they analyse regional disparities in wage share, discovering that they would have been reduced during the period considered.

One limitation is that their analysis is limited to the last two decades. However, Bai and Qian (2010) extend the period of study from 1978 to 2007, focussing on the 1995-2007 sub-period. Their results tally with those of earlier papers, as they maintain that the two most important factors explaining evolution of functional distribution are structural transformation and variations in the labour's share within each sector of the economy. This concerns mainly the secondary sector where the restructuring of SOEs would have had an important role. Nevertheless, they argue that the drop of wage's share is overstated since up to 42.16 per cent of the total decrease of its participation between 1995 and 2007 would have been caused by the accounting methodological change carried out by NBSCh in 2004. They adjust that year's data by counting mixed income of self-employed as part of labour compensation and operating surplus of state-owned and collective-owned farms as part of operating surplus. After their recalculation, the 5.25 per cent points decline in labour's share between 2003-2004 turns into a 1.04 per cent points ´recovery. Nevertheless, the inability to apply that adjustment

to subsequent years prevents presentation of a completely consistent series for the whole period.

To avoid this problem, Zhou, Xiao and Yao (2010) recalculate the series for those years with two alternative methods: first, measuring average labour compensation of self-employed workers; alternatively, measuring their average operating surplus. The authors adjust labour's share for 2004 to 2007 period through summing it up the self-employed compensation obtained. After choosing an average data of the two methods, they obtain a consistent series in which the whole self-employed income is included in the compensation of employees for the three decade period (which is not the standard accounting practice). Then, they investigate the evolution of raw labour, human capital, and physical capital to find that the decline in labour share from 1998 to 2006 would have been caused by the negative growth of the former, the deceleration in the growth of the second, and the high growth of the third. In addition, they argue that the main cause of the fall in raw labour would have been the stagnant income of rural surplus workers migrating to urban areas, who would have been paid below their contributions. They argue finally in favour of raising minimum wages to alter that trend and achieve "harmonious" distributional relations.

Zhou, Xiao and Yao exclude net taxes on production from their series of functional distribution of income, as do Bai and Qian. The next section of this paper, however, will seek to obtain a new series, which takes into account the evolution of the whole functional distribution series.

3. Statistical Series Comparison and Recalculation:

As it can be deduced from the above, sources for Chinese functional income distribution are limited. Prior to 1992, the only existing data are those of Hsueh and Li (1999) who collected "Gross Domestic Product by Primary Distribution of Income" for the thirty provinces of China. Their series run from 1978 to 1995, and gross regional product is divided between labour remuneration, fixed assets depreciation, net production tax and operating surplus. From 1992 to 2007, the National Bureau of Statistics of China provides three different factor's shares series in its Statistical Yearbook: the "Flow of Funds Accounts (Physical Transactions)", the "Intermediate Use Part of Input-Output Table", and the "Income Approach Components of Gross Regional Product" (NBSCh, various years(a)). The first runs from the whole referred sub period; the second presents only 1992, 1995, 1997, 2000, 2002 and 2005 data; finally, the cited regional statistics must be completed with the data supplied

by NBSCh (2007) to obtain a third series until 1993. While these two last series share national and regional incomes between the four same variables than Hsueh and Li, the former does not take into account the depreciation of fixed assets. Figure 1 compares the three series of the period 1992-2007.

Figure 1: Comparison between China's "Compensation of Employees" series, 1992-2007
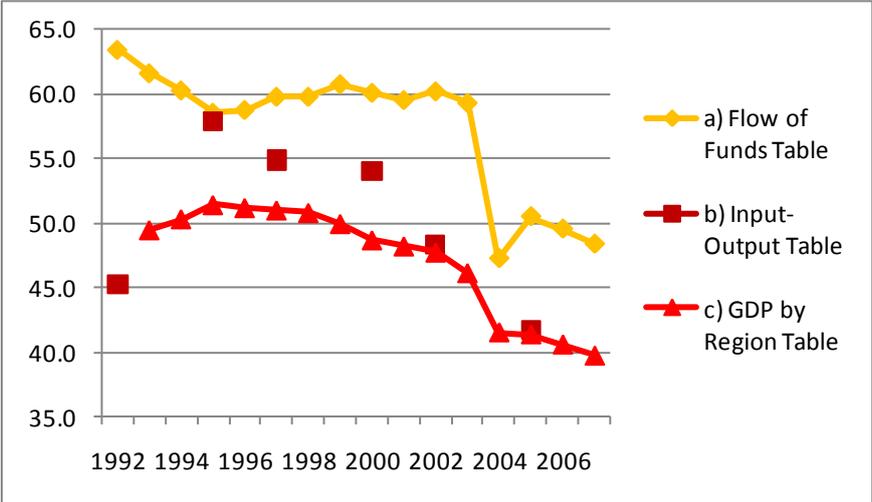
(percentage of GDP)

<u>Sources</u>: Own calculations based on data from: NBSCh (various years(a)): *China Statistical Yearbook* ("Flow of Funds Accounts (Physical Transactions)", "Intermediate Use of Input-Output Table", and "Income Approach Components of Gross Regional Product"); NBSCh: Department of National Accounts (2007): *Data of Gross Domestic Product of China, 1952-2004* ("Components of GDP by Income Approach by Region").

There are marked differences between the values given by each series, even among Input-Output and Regional ones (at least, until 2002), although both take depreciation of fixed assets into account during the whole fifteen-year period. Although there are no apparent criteria to choose among, the last series has been retained for two reasons: first, because it is the only way to obtain a homogeneous series for the entire thirty year period under study, since regional product by income approach is calculated following the same criteria than Hsueh and Li for their 1978-1992 data[5]; second, it allows this paper's outcomes to be compared with those of the earlier studies of Bai and Qian (2010), and Zhou, Xiao and Yao (2010), who have also chosen this series.

However, there is an obstacle to that comparison to be possible. As noted, all these authors exclude net taxes on production from the factor's distribution series they utilise in

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[5] Comparing Hsueh and Li data for 1993-1995 with that from NBSCh (2007) could show that although they differ by some extent for these three years, the trend shown by both is similar. In the case of "Compensation of Employees" its values are 50.6, 51.1, and 50.8 in the former; and 49.5, 50.3, and 51.4 in the latter.

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their analysis. They implicitly[6] exclude depreciation of fixed assets as well. Including the latter in the operating surplus would actually make it comparable in international terms[7]; not including the first, however, could distort understanding of labour's share progression insofar as it would neglect significant changes experienced by net taxes. Indeed the difference between its lowest (11.6 per cent in 1982 and 1983) and highest (15.8 per cent in 2003) values reaches 4.2 percentage points, equivalent to more than 30 per cent of its average level (Figure 2). Zhou, Xiao and Yao claim that to maintain them overestimates the extent of the decrease in labour's share. However, it should be noted that it is impossible to assign an *a priori* pro-labour or pro-capital effect to taxes. Accordingly, to avoid that neglect of net taxes on production level movements, in this work they are retained within functional distribution of income series.

Figure 2: China's Net Taxes on Production, 1978-2007
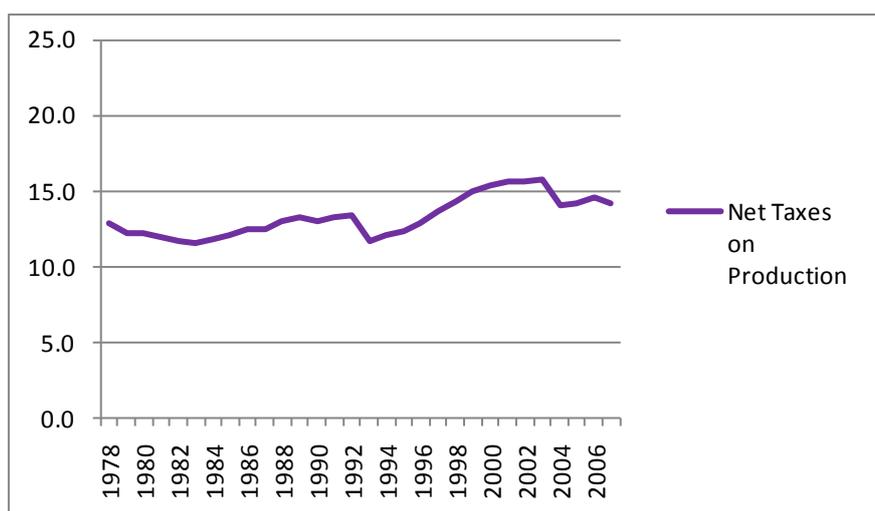
(percentage of GDP)

Sources: Own calculations based on data from: Between 1978 and 1992: Hsueh, T. and Li, Q. (1999): *China's National Income, 1952-1995* ("Gross Domestic Product by Primary Distribution of Income (by the distribution approach)". Between 1993 and 2004: NBSCh: Department of National Accounts (2007): *Data of Gross Domestic Product of China, 1952-2004* ("Components of GDP by Income Approach by Region"). Between 2005 and 2007: NBSCh (various years(a)): *China Statistical Yearbook* ("Income Approach Components of Gross Regional Product").

Finally, this forces us to recalculate 2004 to 2007 data of the series with taxes incorporated in order to avoid the effects of NBSCh's 2004 accounting change. To present comparable data, the method developed by Zhou, Xiao and Yao is used. First total

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[6] As they focus only in the evolution of wage share this is not specified.
[7] However, the possibility of taking into account the net gain of share obtained by profits would be lost. This is why this paper maintains the distinction between depreciation of fixed assets and (net) operating surplus.

compensation of both employees and self-employed workers has been calculated, by obtaining average labour compensation of employees and multiplying it for the total workforce[8]. Alternatively, average operating surplus for employees has been obtained and the equivalent sum calculated for total self-employed workers in order to add it to NBSCh's original data for compensation of employees. Next wage's share has been weighed up by the two methods and the average value chosen. Table 1 compares this paper's adjusted labour's share data for 2004 to 2007 (which take into account net taxes on production) and those of Bai and Qian (2010) and Zhou, Xiao and Yao (2010) (calculated by their respective methods, after subtracting the cited variable).

Table 1: Comparison between Adjusted China Labour's Share Series, 2004-2007

|	**2004**	**2005**	**2006**	**2007**
Bai and Qian	54.7	54.5	53.6	52.9
Zhou, Xiao and Yao	54.0	54.2	53.8	52.9
Own calculations	46.4	46.5	46.0	45.4

(percentage of GDP)

Sources: Bai and Qian (2010): "The Factor Income Distribution in China, 1978-2007"; Zhou, Xiao and Yao (2010): "Unbalanced Economic Growth and Uneven National Income Distribution: Evidence from China"; and own calculations based on data from: For 2004: NBSCh: Department of National Accounts (2007): *Data of Gross Domestic Product of China, 1952-2004* ("Components of GDP by Income Approach by Region"). Between 2005 and 2007: NBSCh (various years(a)): *China Statistical Yearbook* ("Income Approach Components of Gross Regional Product"). Since 2004 series adjusted following the method presented by the same Zhou, M., Xiao, W. and Yao, X. (See Annex 1 for compare the entire series data)

Although, the evolution described by the three series is similar, estimates to be presented suggest that other adjustment method for those years´ data would be required. However, the series illustrated in Figure 3 has retained provisionally current method's data (series data are displayed in Annex 2). If depreciation of fixed assets were added to operating surplus (presented here in net terms), the gross gains of capital's share in the whole period would be significant (almost three percentage points) and would account for more than two thirds of the more than four point decrease in labour's share. However, as was done by maintaining net taxes on production inside the series, the distinction between the two variables is maintained. Our final purpose is to evaluate gross and net variations of the share of profits on GDP separately.

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[8] Data on employees and self-employed workers, needed to do all these calculations, are also those given by Zhou, Xiao and Yao (2010).

Figure 3: China's Functional Distribution of Income series, 1978-2007

(percentage of GDP)

4. China, 1978-2007: Functional Distribution, Aggregate Demand and Growth:

From the series presented, it can be argued that the evolution of functional distribution of income in China during the last thirty years has gone through four main periods, which coincide somewhat with the different stages of the reform process. From 1978 to 1984 compensation of employees reached its peak (53.6 per cent), while net taxes on production and depreciation of fixed assets drop to their nadirs (11.6 and 9.6 per cent, respectively). At the same time, (net) operating surplus began by losing three percentage points. Until 1993, this last fluctuate to finally maintain its 1984 level (28.4 per cent), as long as depreciation gained four points in total share to the detriment of labour's share. Meanwhile, net taxes started to increase its participation in national income. This rise continued until 1999 at expenses of profit's share, which fell to its nadir (21.7 per cent); meanwhile the participation of wages in national income dropped again while depreciation first descended and then rose. Since then, labour's share continued to decrease reaching its lowest point of 45.4 per cent the final year 2007. The amount lost by wages during that last eight years went on the side of capital's share and depreciation of assets. Indeed, the latter reached its zenith (14.9 per cent)

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in 2005; two years later than taxes on production achieved a 15.8 per cent level. Overall, the net gains of this last were of less than two points. Then, even though net operating surplus never recovered its initial level, compensation of employees' losses went to depreciation of fixed assets, essentially becoming part of the amount of gross surplus behind the funding of investment.

In any event, it will be seen that even by only taking into account net aggregate profits it is possible to explain the evolution of gross capital formation and growth. In this sense, it is necessary to highlight a paradox regarding the evolution of aggregate demand in the Chinese economy. As noted, most post-reform China analyses focus on the external sector to explain economic growth. Indeed, there are many reasons to argue for its significance to explain Chinese economic growth during the reform period. However, at the macro level of analysis, it could be claimed that the component of the demand which has played the most important role for the growth process has been investment (Figure 4). Since reaching its lowest point during the first years (31.9 per cent in 1982) its share in GDP grew up to 43.2 per cent in 2004 at the expense of consumption's share, achieving a thirty year average of 37.5 per cent, virtually unequalled internationally. Meanwhile, net exports begun to stand out only after 2005, recording an average level of only 1.9 per cent during the whole period. This reason would justify focusing on the evolution of capital formation, if Chinese economic growth process is to be explained.

**Figure 4: China's Aggregate Demand Components of GDP, 1978-2007**
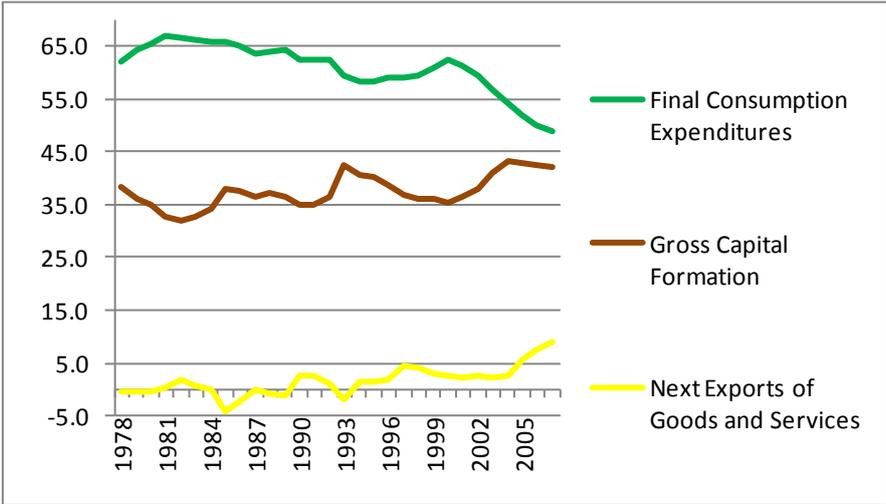
(percentage of GDP)

Source: calculations based on: NBSCh (various years(a)): *China Statistical Yearbook* ("Gross Domestic Product by Expenditure Approach"). (See Annex 3 for the entire series data).

In that sense, investment movements have followed those of the profit's share during most of the three decades under analysis, as illustrated in Figure 5. Indeed, the trend of the two variables fit very well: Both fell from 1978 to 1982, coincident with the improvement of agricultural incomes enabled by the introduction of the household responsibility system, which allowed labour's share to obtain initial gains. In succeeding years, while labour's share started to decline, surplus and capital formation fluctuated together, partially recovering, though the later more significantly. Although they achieved two years of important growth when the economic reform was again advanced in 1992, both from 1986 to 1991 and from 1994 to 1999 surplus and capital formation dropped, firstly because of the measures taken to control inflation and avoid overheating the economy; later because of the intensification of market-oriented reforms. However, during all those years investment hardly fell below the significant 35% level. Moreover, since then, i.e. even before China's 2001 entry into the World Trade Organization, the two variables resumed an upward tendency thanks to the countercyclical measures taken by the Chinese government to fight against East Asian Crisis. This trend continued until 2007, despite the fact that investment reached its peak in 2004, falling by one percentage point then on, while profits fluctuate a bit around that year data.

**Figure 5: Capital's Share and Investment Evolutions, 1978-2007**
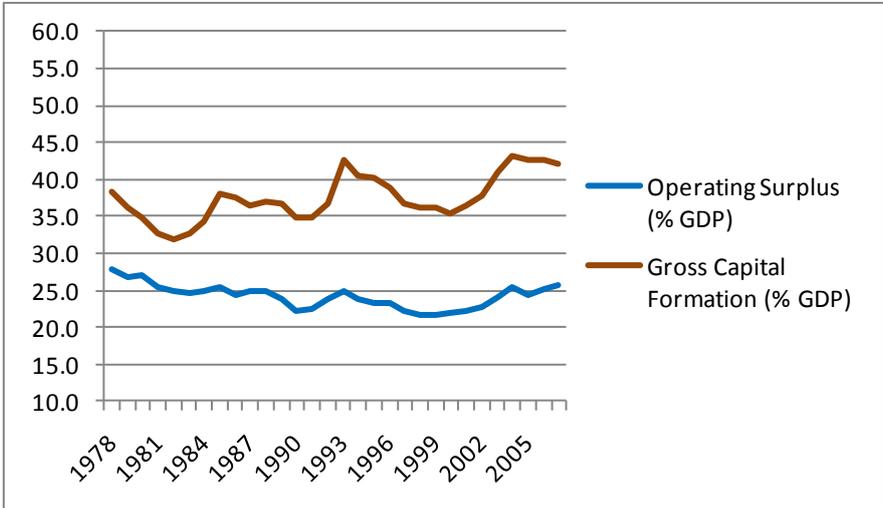
(percentage of GDP)

Source: Same as in Figures 3 and 4.

The same parallel evolution is found between the shares of compensation of employees and final consumption expenditures (Figure 6). The former reached its height in 1982, as we have already seen; the latter did so one year earlier. Since that date, the drop in

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labour's share has been accompanied by a fall in aggregate consumption. Only from 1998 to 2000 were total consumption movements independent of aggregate wages, because of an increase in Government consumption (which in 2001 achieved its highest level, 16.2 per cent) in response to the Asian Crisis. Still, after recovery in growth because of that stimulus, consumption again decreased its share of GDP following the slump in labour's share. Both moved towards their lowest values in 2007.

Figure 6: Labour's Share and Consumption Evolutions, 1978-2007
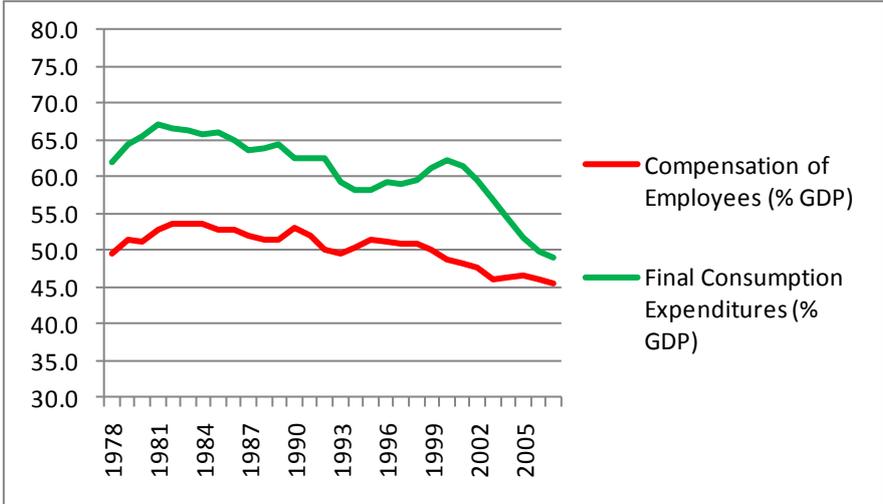
(percentage of GDP)

Source: Same as in Figures 3 and 4.

After analysing the main determinants of the evolution of aggregate investment and consumption, the second step is to study the influence of the components of aggregate demand on growth. Once again a parallel relationship is observable, this time between capital formation and rates of growth (Figure 7). Gains and losses of share of the former coincide, respectively, with accelerations and decelerations of the latter. This relation is maintained for the four main periods this study has delimited: fall in economic growth during the first years of the reform; rise until 1993 (in fact, fluctuation from its peak rate in 1984 to its lowest level at 3.8 per cent in 1990, but recovering during the next three years); a new decrease until 2000 because of the East Asian Crisis; and, finally, a continued intensification of growth until 2007. Although GDP growth seems to move one year earlier than investment, if fixed capital formation (rather than total) is taken into account, i.e. if changes in inventories (highly determined by growth) are removed, the parallelism of the relationship becomes clearer: fixed investment and growth trends match for all the years, except 1998 and 1999, when capital

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formation pushed growth; and for 2006 and 2007, when growth continues after gross fixed investment achieves its net highest point of 41 per cent of GDP in 2005[9].

Figure 7: Investment and Growth Evolutions, 1978-2007
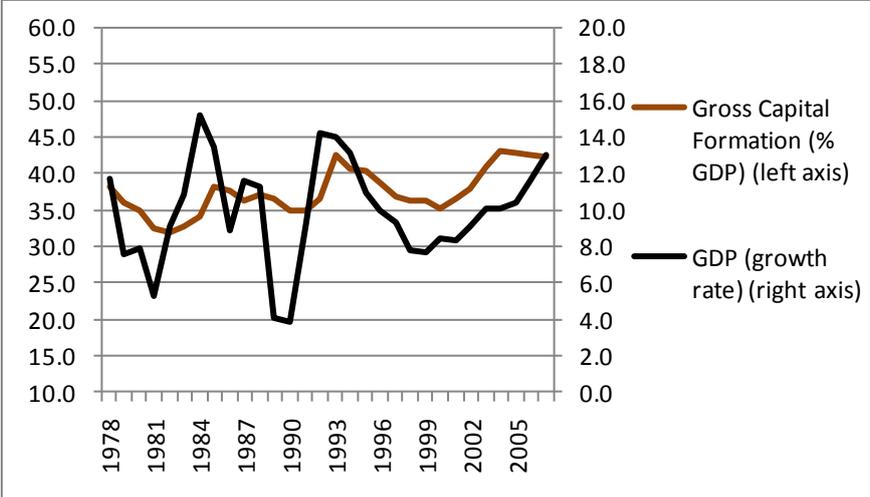
(percentage of GDP)

Source: Same as in Figures 3 and 4.

On the other hand, the subsequent opposite evolution of final consumption relative to economic growth can be principally observed during the years of increasing share of consumption, given that it was declining for most of the period of analysis (Figure 8). Both from 1978 to 1981 and from 1996 to 2000, when total consumption participation rises, GDP growth rates descend significantly. This trend is partly due to the Chinese government's countercyclical policies taking during those periods. However, average household spending accounted for 46.5 of domestic product, i.e. for most of total consumption during the three decades under study (Annex 3). Then, the inverse evolution of total consumption relative to growth during the whole period is mainly explained by private consumption expenditures, rather than by government consumption.

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[9] The complete series of aggregate demand can be found in Annex 3, in which gross fixed capital formation and change in inventories are displayed separately, as well as household and government consumptions.

Figure 8: Consumption and Growth Evolutions, 1978-2007
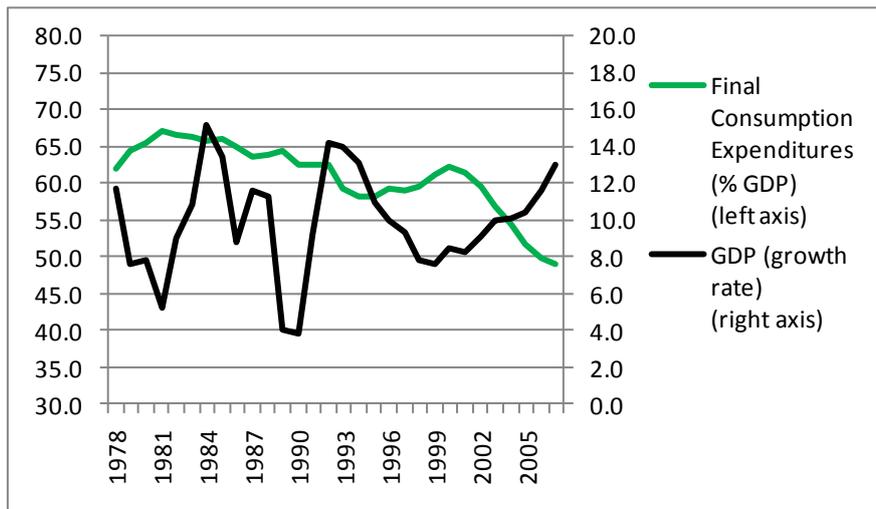
(percentage of GDP)

<u>Source:</u> Same as in Figures 3 and 4.

Lastly, once the effects of functional distribution on aggregate demand and aggregate demand on growth are analysed, it is possible to elucidate the relationship between the evolution of factors' shares and the pace of growth. To this end, the variation rates of both wage and profit shares have been calculated and compared with the economy's rates of growth. In accordance with the relationship noted between operating surplus and capital formation, as well as the relationship between this and GDP expansion, Figure 9 illustrates a close relationship between the variation rates of profit's share and growth rates. Not only do their upward and downward trends fit for twenty two out of the twenty nine years of the sample, but the acceleration and deceleration of their variation rates also coincide. Indeed, both reach their lowest point in 1990. Moreover, just as losses of capital's share preceded growth's drop during the late 1980s and the end of the 1990s, recovery of the participation of profits anticipated the final increase of the rates of economic expansion. Thus, at least in broad terms, this pattern confirms a profit-led growth regime in reform China. The only significant data outliers from the trend are occur in 1985, when the deceleration of growth came before the decrease of surplus participation; and in 2005, when growth continued to gather speed while capital's share declined. To anticipate this paper's next section, this last phenomenon may well indicate the need for another method of recalculating 2004-2007 numbers.

Figure 9: Capital's Share and Growth Evolutions, 1978-2007
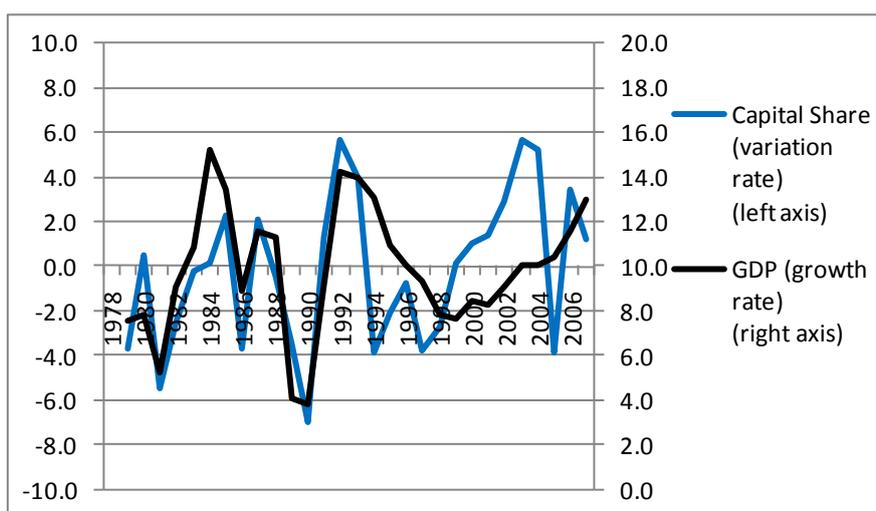
(percentage of GDP)

<u>Source:</u> Same as in Figures 3 and 4.

The mentioned pattern of growth appears to be confirmed on analysis of the relationship between labour's share and economic growth (Figure 10). Again, 1985 and 2005 (and also 2004) are the main outlier years, in this case, in the tendency of growth to move opposite to aggregate wages. This tendency is unsurprising insofar as it indicates an almost completely contrary evolution between labour and capital shares. However, between 1996 and 1999 a movement of the participation of wages in accordance with growth is observable, caused not by profits, but by net taxes on production's gains of share. In any event, above the six years mentioned, the negative relationship between labour's share and growth is maintained for the rest of the period, arguing as well in favour of the presence of a profit-led growth regime in China from 1978 to 2007. The range of variation of wage's share is lower than that of profit's share, but this situation is still expected, not only because labour's share absolute value is higher, but also because of the movements of the two other components of functional distribution.

Figure 10: Labour's Share and Growth Evolutions, 1978-2007
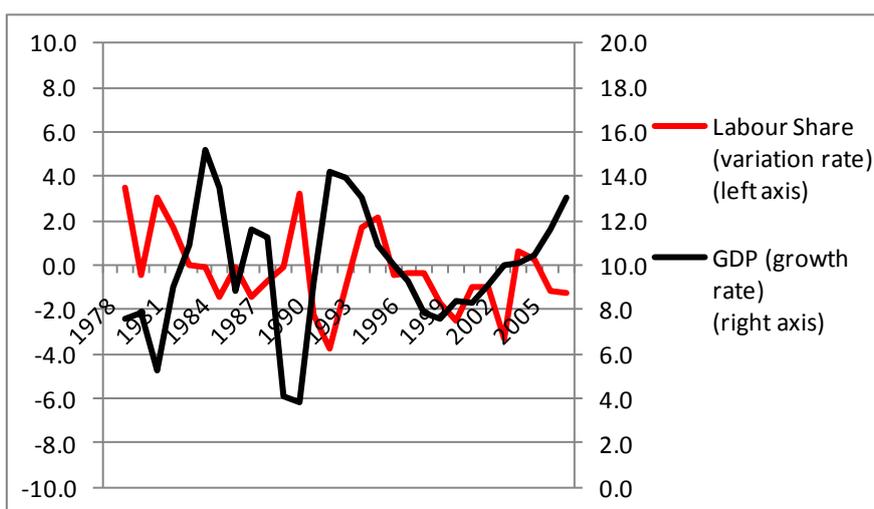
(percentage of GDP)

<u>Source:</u> Same as in Figures 3 and 4.

5. Preliminary Estimation Results:

In support of the stated pattern, preliminary results are presented of Bhaduri-Marglin Model's estimation for reform China. To date, the only estimation of the Model for developing countries has been made by Onaran and Stockhammer (2005). They apply a structural vector auto-regression model to investigate the relationship between accumulation and distribution in Turkish and South Korean economies. The rest of the papers which have estimated the Model elaborated by Bhaduri and Marglin have focused on other OECD countries or the Euro Area[10]. Moreover, unlike Onaran and Stockhammer first paper, most of them present a different specification, directly developed from the original Model. Following this trend, this paper is largely based on one of that specifications (Onaran, Stockhammer and Ederer, 2009), albeit in respect of a closed-economy analysis only.

First, the estimation results are presented for a consumption function defining the relations between compensation and operating surplus as independent variables and final consumption as a dependent variable (Equation 1). The variables are in logarithmic form (including their one year lags) in order to avoid problems derived from their exponential growth tendency. At the same time, differences between the respective logarithms have been calculated in order to capture the relationship among the respective variation rates.

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[10] It can be seen Naastepad and Storm (2006); Hein and Vogel (2008); Stockhammer, Onaran and Ederer (2009); or Onaran, Stockhammer and Grafl (2010).

Equation 1: Consumption Function Estimation

	c	dlnce	dlnos	lncons (-1)	Adj.R^2
dlncons	0.184 (0.063)***	0.410 (0.179)**	0.305 (0.102)***	-0.019 (0.007)**	0.604

Notes: cons = final consumption; c = constant; ce = compensation of employees; os = operating surplus. ln"
denotes the Neperian logarithm of the constant renminbi value of the variable. "d" the calculus of their
differences. "(-1)" is the one year lag.
*** and ** are significant at 5% and 10% confidence levels, respectively. Figures in parentheses are standard
errors.

Estimating this specification, a significant positive relation (at the 5 and 1 per cent level, respectively) can be found for both compensation of employees and operating surplus with final consumption. However, from the values of their coefficients it can be inferred a higher elasticity of compensation of employees than of operating surplus. Thus, it can be stated a propensity of consume out of wages above that of profits, as expected.

Second, an investment function has been estimated, relating the behaviour of gross capital formation to that of gross domestic product and operating surplus. The first of the independent variables can be considered a proxy of demand when taken in logarithm, (i.e., in level) form; it may also be considered a proxy of capacity utilization (when taken in differences of logarithm form). This is needed because there are no official data on capacity utilization later than 2002 (NBSCh, various years(b)). Operating surplus can be considered a proxy of business confidence insofar as it is directly related to the expectation of future returns; it may also be expected to explain the evolution of investment because of its central role as a main financial source in the Chinese economy. Logarithms of the variables have again been taken, including their one year lags. Differences of logarithms have been calculated too. The results of the regression can be found in Equation 2:

Equation 2: Investment Function Estimation

	c	dlngdp	dlngdp (-1)	dlnos	dlngos (-1)	lngdp (-1)	lnos (-1)	lninv (-1)	Adj.R2
dlninv	-0.412 (0.236)**	1.072 (0.307)***	0.220 (0.285)	0.446 (0.191)**	0.263 (0.177)	0.344 (0.131)**	-0.124 (0.085)	-0.229 (0.119)*	0.895

Notes: inv = gross capital formation; c = constant; gdp= gross domestic product; os = operating surplus. "ln"
denotes the Neperian logarithm of the constant renminbi value of the variable. "d" is the difference of the
respective logarithms. "(-1)" is the one year lag.
***, ** and * are significant at 1%, 5% and 10% confidence levels, respectively. Figures in parentheses are
standard errors.

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The outcomes of the regression are also close to those anticipated: the sign and statistics of the contemporary variables show a strong short run relationship of investment with both capacity utilization (represented by GDP as proxy) and operating surplus, despite the fact that the lack of significance of the lags of the level variables would indicate a weak long run relation.

Thus, although in-depth econometric work is still to be done, preliminary results seem to support the relationship between the different components of functional distribution of income and aggregate demand derived from this study's accounting of Chinese economic growth. Moreover, if total net effects of a one per cent positive change in profit share over consumption and over investment are taken into consideration, a profit-led regime also seems to characterize Chinese economic growth, as defined by Bhaduri-Marglin Model. Indeed, a direct regression between the differences of the logarithms of total gross regional product and capital share present a significant relation between the two variables at a 1% level (Equation 3).

Equation 3: Profit Led Growth Estimation

	c	dlncs	Adj.R^2
dlngrp	0.098	0.788	0.407
	(0.005)*	(0.175)*	

Notes: grp= gross regional product; c = constant; cs = capital share (% GRP)."d" denotes the difference of Neperian logarithms of the variables.
* are significant at 1% confidence level. Figures in parentheses are standard errors.

Moreover, the adjusted R^2 of the regression increases if it is estimated only until 2003. This could be explained by two factors: the rise of net exports as a relevant component of aggregate demand since 2005, or the effect of the change in accounting methods in 2004. Insofar as the increase of net exports may be expected to strengthen the relationships defined by a profit-led growth regime, the higher R^2 of the regression may be better explicated by the possible problems in adjustment method used for the 2004-2007 period. That would make necessary a review of that method used to obtain a consistent series for the whole period.

Conclusions:

Although further work is needed to confirm an inconsistency in the adjustment method as well as this paper's other findings, some preliminary conclusions may be advanced:

Unlike most accounts of Chinese reform process which present the evolution of personal income distribution as unconnected with economic growth, or explain functional distribution of income as a simple consequence of sectoral transformation, this study develops an alternative approach in an effort to highlight the existing link between functional distribution and growth through aggregate demand. In this sense, the main trends found are:

- On one hand, a robust relationship between the evolution of operating surplus and that of gross capital formation, as well as between capital formation and GDP growth; both together explaining capital's share and growth rates' parallel movements.

- On the other hand, a strong but declining relationship between compensation of employees and total final consumption, as well as a negative correlation between consumption and GDP growth, explaining the opposite movements of labour's share and the growth rate.

All these relationships are typical of a profit-led growth regime, as defined by Badhuri and Marglin. Indeed, that regime's expected regression coefficients seem to be confirmed by this study's estimations. The results generally support the hypothesis concerning the negative relationship between growth and wage's share. As quoted in the Introduction, works on the link between factorial and personal income distribution, both in general and for China, show that labour's share ultimately determines the pace of household incomes evolution, thus explaining that of personal income inequality. Hence it could be argued that the rise of Gini coefficient is internally and negatively linked with the spectacular rates of growth through the related evolution of factor's shares under study. Specific research on this aspect, however, would be needed to corroborate the exact impact of functional distribution on Gini in the Chinese economy.

Some other tasks would also be necessary to accomplish, including: first, finding an alternative method to recalculate 2004 to 2007 functional distribution data; second, repeating the above analysis, while adding depreciation fixed assets to operating surplus, in order to obtain a gross series. Accounting aggregate investment in a gross series of operating surplus could strengthen the study's findings. Once these tasks are completed, it would be also be necessary to investigate the implications of the mutual causality existing between distribution and growth and, following Kalecki's statement, between profits and investment. This may shed light on what a profit-led growth regime exactly means. Indeed, it could help to understand the implications of applying Bhaduri-Marglin Model to a mixed economy. In this context, however, it can be claimed that the main financial source of investment are

reinvested profits in both SOE and non-SOES. In any event, the role of the particular Chinese financial system should not be neglected in the explanation. Most importantly, neither should the crucial role of agricultural income and rural-urban relations in China. Finally, to support the soundness of the study's findings, the analysis could be very usefully applied at sectoral and regional levels.

Overall, it is possible to posit some implications of this research to Chinese economic prospects. It has been generally claimed that the Chinese growth model would eventually face constraints because of an imbalance between external and internal demand, a situation which would have become more evident since the onset of the global economic crisis in 2007-2008. That situation would have forced the Chinese government to improve income distribution by developing a range of social policies to reorient the economy toward internal markets, trying to maintain the high rates of economic growth. That reorientation may already have been framed during the 17th Congress of the Communist Party of China with the call to build a "harmonious society". However, external proposals to achieve that goal, like reducing private savings and fostering consumption have focussed not only on increased public services, but also, and more importantly, on a reforming banking sector and liberalizing financial markets (Blanchard and Giavazzi, 2005; Aziz, 2006; Guo and N Diaye, 2009). This study's findings, however, indicate a need to focus on distributive, not redistributive policies, even less in financial liberalization, if Chinese growth model is wanted to be reoriented. Still if this is, sooner or later, achieved, it can also be argued that growth would face further limits.

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Annex 1: Comparison between Adjusted China Labour's Share Series, 1978-2007

	Bai and Qian (2010)	Zhou, Xiao and Yao (2010)	Own Calculations
1978	57.0	57.0	49.7
1979	59.0	59.0	51.4
1980	58.2	58.2	51.1
1981	59.8	59.8	52.7
1982	60.6	60.6	53.6
1983	60.6	60.6	53.5
1984	60.9	60.9	53.5
1985	60.2	60.2	52.7
1986	60.4	60.4	52.7
1987	60.1	59.5	51.9
1988	59.5	59.5	51.6
1989	59.4	59.4	51.5
1990	61.4	61.4	53.1
1991	57.7	60.1	52.0
1992	57.8	57.8	50.0
1993	57.6	56.0	49.5
1994	58.4	57.2	50.3
1995	59.1	58.6	51.4
1996	58.7	58.8	51.2
1997	58.7	59.1	51.0
1998	58.6	59.3	50.8
1999	57.7	58.7	50.0
2000	56.7	57.5	48.7
2001	56.0	57.2	48.2
2002	55.4	56.6	47.8
2003	53.6	54.8	46.2
2004	54.7	54.0	46.4
2005	54.5	54.2	46.5
2006	53.6	53.8	46.0
2007	52.9	52.9	45.4

Annex 2: Functional Distribution of Income Final Series, 1978-2007

	Compensation of Employees	Depreciation of Fixed Assets	Net Taxes on Production	Operating Surplus (Net)
1978	49.7	9.7	12.8	27.8
1979	51.4	9.6	12.2	26.8
1980	51.1	9.8	12.1	26.9
1981	52.7	10.0	11.9	25.4
1982	53.6	10.0	11.6	24.8
1983	53.5	10.1	11.6	24.7
1984	53.5	10.0	11.8	24.8
1985	52.7	9.9	12.0	25.3
1986	52.7	10.5	12.5	24.4
1987	51.9	10.7	12.5	24.9
1988	51.6	10.6	13.0	24.8
1989	51.5	11.3	13.3	23.9
1990	53.1	11.6	13.0	22.3
1991	52.0	12.3	13.2	22.6
1992	50.0	12.8	13.3	23.8
1993	49.5	14.0	11.7	24.8
1994	50.3	13.8	12.0	23.8
1995	51.4	13.0	12.3	23.3
1996	51.2	12.7	12.9	23.2
1997	51.0	13.0	13.6	22.3
1998	50.8	13.2	14.3	21.7
1999	50.0	13.4	14.9	21.7
2000	48.7	14.1	15.3	21.9
2001	48.2	13.9	15.6	22.2
2002	47.8	13.8	15.6	22.9
2003	46.2	13.9	15.8	24.2
2004	46.4	14.1	14.1	25.4
2005	46.5	14.9	14.1	24.4
2006	46.0	14.2	14.6	25.3
2007	45.4	14.8	14.2	25.6

Annex 3: China's Aggregate Demand Components of GDP, 1978-2007

	Household Consumption Expenditures	Government Consumption Expenditures	Fixed Capital Formation	Change in Inventories	Exports of Goods and Serv.
1978	48.8	13.3	29.8	8.4	-0.3
1979	49.1	15.2	28.2	8.0	-0.5
1980	50.8	14.7	28.8	6.0	-0.3
1981	52.5	14.6	26.7	5.8	0.3
1982	51.9	14.5	26.9	5.0	1.6
1983	52.0	14.4	27.7	5.1	0.8
1984	50.8	15.0	29.2	5.0	0.0
1985	51.6	14.3	29.4	8.7	-4.0
1986	50.5	14.5	29.9	7.6	-2.4
1987	49.9	13.7	30.9	5.4	0.1
1988	51.1	12.8	30.6	6.5	-1.0
1989	50.9	13.6	25.5	11.1	-1.1
1990	48.8	13.6	25.0	9.9	2.6
1991	47.5	13.6	26.9	8.0	2.7
1992	47.2	14.9	30.9	5.7	1.0
1993	44.4	15.2	36.0	6.5	-1.8
1994	43.5	14.9	34.5	6.0	1.3
1995	44.9	14.7	33.0	7.3	1.6
1996	45.8	13.3	32.4	6.4	2.0
1997	45.2	13.4	31.8	4.9	4.3
1998	45.3	13.7	33.0	3.2	4.2
1999	46.0	14.3	33.5	2.7	2.8
2000	46.4	15.1	34.3	1.0	2.4
2001	45.2	16.2	34.6	1.8	2.1
2002	43.7	15.9	36.3	1.6	2.6
2003	41.7	15.1	39.2	1.8	2.2
2004	39.8	14.5	40.6	2.5	2.5
2005	37.7	14.1	41.0	1.8	5.4
2006	36.3	13.6	40.7	1.9	7.5
2007	35.6	13.4	40.1	2.1	8.9