Factor Income Distribution: The Story behind The Statistics

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Abstract

This paper investigates changes in aggregate labor share in China since 1978 with a particular focus on the 1995 -2007 period during which official statistics report a drop of 12.45 percentage points in labor's share of national income. Our main findings are: (1) The reported fall in labor's share of income (the labor share) is overstated. According to the official statistic released by the NBS (2007a), the labor share fell 5.25 percentage points from 2003 to 2004. However this dramatic decline, 42.16% of the total reported decline of the labor share from 1995 to 2007, is due to changes in the way NBS break down the income of the self-employed and state-owned and collective-owned farms; (2) For the last three decades, two main forces have been driving shifts in the labor share: (i) structural transformations between the agriculture and non-agriculture sectors (ii) shifts in the labor share within the industry sector; (3) From 1995 to 2003, these two effects are both negative and together drive down labor's share of income by 5.48 percentage points. The structural change explains 61.31 percent of the decline and the remaining 38.69 percent of the decline is due to changes in the labor share within sectors, primarily in the industry sector; (4) Labor's share of income in agriculture is lower than labor's share in services. Therefore, when the service sector grows relative to the agriculture sector in the economy, the aggregate labor share of income declines; (5) Restructuring of the SOEs and expanded monopoly power are the main reasons for the decline in the labor share after 1998 in the industry sector. Relative price shifts, the factor input ratio, and biased technological progress are all insignificant forces in this decline because the substitution between factors in the industry sector is nearly unit elastic.

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1. Introduction

During the last one and half decades, labor's share of China's national income has declined over 12.48 percentage points according to the official data released by the National Bureau of Statistics of China (NBS). This precipitous decline in China's labor share has attracted wide attention. Although many economies have observed a drop in the labor share in recent years, no other economy in the world has experienced a factor income distribution shift comparable to that of China (Economist, Oct 11th 2007).

Changes in factor income distribution are significant for two main reasons. First, a shift in factor income distribution impacts the flow of income to groups of different wealth levels in a population (Atkinson, 2000). Because labor ability is more equally distributed across a population than capital is, a decline in the labor share exacerbates income inequality across a population. Since the *Reform and Openness*, China has experienced a steady increase in its GINI coefficient, nearly reaching 0.5 in recent years. China's capital market is less developed and therefore capital distribution is even more concentrated than it is in developed economies. For this reason, it has been proposed that the significant decline in the labor share may explain the steady increase in income inequality in China (Cai, Oct 17th 2005), which in turn might hinder China's future development (Subramanian, 2008).

Second, studying changes in factor income shares improves our understanding of the investment ratio, which has been rising in China since the mid-1990s. According to NBS, today, China has the highest investment ratio in the world, exceeding 40% since 2003. Bai, Hsieh and Qian (2006) find that aggregate capital return does not show a clear decline after 1978 even though both the investment ratio and the capital-output ratio have been increasing since the mid-1990s. They cite the increase of the capital share of national income (i.e. decrease in the labor share) since 1995 as an explanation for these findings. In turn, Kuijs (2006) argues that the consumption ratio has declined because the share of China's household income has fallen. Since labor compensation is the main source of household income, the decline in the labor share is, of course, a key contributor to the drop in household income as a share of national income. The Bai, Hsieh and Qian (2006) and Kuijs (2006) conclusions are supported by Nicholas Kaldor's theory that economies with a high capital share of income tend to have a high ratio of investment to output (Solow, 2000). These sources suggest that the increase in the investment ratio in China might be related to the increase in the capital share (and parallel decline in the labor share) since the mid-1990s.

In the present paper, we first analyze data sources and accounting methods for factor income shares in China. Using GDP by income approach at the provincial level we calculated the aggregate labor share since 1978. We find that the labor share fluctuates before 1995 after which it has been declining, most dramatically between 2003 and 2004. We then investigate the large drop in the labor share between 2003 and 2004 and find that this abrupt decline is mainly caused by a change in

categorization of the income of state-owned and collective-owned farms and the self-employed. Using 2004 National Census data, we obtain estimates of income of the self-employment and state-owned and collective-owned farms in 2004, which reduces the decline of the labor share between 1995 and 2004 from over 10 to around 5 percentage points. Following a decomposition method advanced by Solow (1958), we analyze the movement in the aggregate labor share during 1978-2007. The decomposition allows us to highlight the relative importance of each of the two forces driving the movement in the labor share: sectoral transformations and changes in labor share within sectors. We find that structural transformation from agriculture to non-agriculture sectors since the mid-1980 has shown negative impact on aggregate labor share. The main reason for the accelerated decline of the aggregate labor share since the mid-1990s is that the labor share in the industry sector, which had been rising, began declining from its 1995 peak after 1998. To understand why the labor share in the industry sector began to decline in 1998, we design an econometric model to analyze the determinants of the labor share in this sector. By applying industrial survey data to our model, we determine that the decline of the SOEs and increase in monopoly power are the main reasons for the shift in factor income shares within the industry sector. This conclusion contradicts the commonly held belief that the decline of labor share after 1995 is caused by biased technological improvement and change in the relative prices of factors and factor input ratios.

The paper is organized as follows. Section 2 is devoted to the presentation of factor income distribution in China since 1978. We compare labor share computed with all available data in the National Accounting System and discuss the trends of the labor share. In section 3, we explain how changes in GDP accounting led to a precipitous decline of labor share in 2004. To make the labor shares before and after 2004 comparable, we adjust labor compensation from 2004 to 2007 using data on the income of the self-employed and state-owned and collective-owned farms estimated based on data reported in the China Economic Census Yearbook 2004. In section 4, we analyze the relative importance of the two driving factors of the labor share: structural transformation and factor income share changes within sectors. We find that from 1995-2003 structural change has accounted around two-thirds of decline in the aggregate labor share and the within-sector effects, most notably in the industry sector, account for the remaining third. In section 5, we show that the structural change effect is overestimated as a result of inaccurate inflated NBS statistics on the labor share in agriculture. In section 6, we present an econometric estimation of the determinants of the labor share in the industry sector and calculate the contribution of each factor to the decline of the labor share in this sector since 1998. Section 7 concludes.

2. The Official Estimates

To compute the labor share, we must first select an appropriate denominator. Although GNI, by definition, is the most natural choice, GDP has several

advantages. First, GDP data are readily obtainable. The generation of income account is an elementary table of the National Account System in most countries. Second, the GDP by income approach data reflect the factor income distribution of domestic production, which is most relevant in analyzing the factor income distribution in an economy. For these reasons, we, along with many other researchers, use GDP as the denominator in our calculation of the labor share.

Next we considered whether or not to subtract "indirect tax" from the GDP denominator. Economists have computed the labor share using total GDP as the denominator (e.g. Hansen, 1985; Harrison, 2002; Krueger, 1999; Kydland and Prescott, 1982; Poterba, 1997) and also using GDP net of indirect tax (also known as value-added at factor cost) as the denominator (e.g. Bentolila and Saint-Paul, 2003; Bernanke and Gürkaynak, 2002; Cooley and Prescott, 1995; Gollin, 2002). The choice depends on two considerations: whether or not the government sector is treated as competing sector to the household and corporate sectors; and whether or not indirect tax is significant in the taxation system of an economy. Indirect taxes are a significant category of taxes in China's taxation system so we computed the labor share using both definitions.

In China's National Account System, GDP by income approach for the aggregate economy are available in the Input-Output Table (I-O table) and Flow of Funds Accounts (FFA). NBS does not update the I-O table annually so a continuous time-series for factor income shares cannot be constructed using GDP by income approach with this source alone. In 2007, NBS published *Data of Flow of Funds of China: 1992-2004*(NBS, 2007b). According to this publication, the NBS has adjusted FFA between 1992 and 2003 published in China Statistical Yearbook, employing data from the China Economic Census 2004. Because NBS does not provide GDP by income approach for the aggregate economy for the earlier period of 1978-1991, we cannot calculate changes of the labor share before 1991 with the FFA or the I-O table. Nevertheless, NBS released GDP by income approach at provincial level in Hsueh and Li (1999) for the 1978-1995 period, each volume of China Statistical Yearbook (CSY) after 1993, and NBS (2007a) for the 1993-2004 period. With provincial GDP by income approach (hereafter provincial GDP), one can use the weighted average of the labor share across provinces as proxy variable for the aggregate labor income share.

In Table 1 and Table 2, we report five different measures of the labor share annually from 1978 to 2007 calculated using the three types of data sources described above. Column (1) represents the labor share calculated using the I-O table; column (2) represent the labor share calculated using FFA; and columns (3)-(5) each represent the labor share calculated using provincial GDP data from three different sources. Table 1 and Table 2 report measurements of the labor share using "total GDP" and "GDP net of indirect tax" as the denominator respectively.

Data in columns (3)-(5) of Table 1 suggest that the labor share in 1993 and 1994 varies little using the three different data sources. This is because the accounting methods of provincial GDP by income approach are consistent in Hsueh and Li (1999), CSY (vol1995-vol2008), and NBS (2007a). However, the estimates of the

labor share during 1996 and 2003 are significantly different in columns (4) and (5), since the provincial GDP data have been updated using the 2004-National Census data in NBS (2007a). To obtain a continuous estimate with provincial GDP, we combine the labor share calculated with Hsueh and Li (1999), CSY, and NBS (2007a) into a series displayed in column (6), where the 1978 to 1992 data are obtained from column (3), the 1993-2004 data from column (4), and the post-2004 numbers from CSY (vol2006-vol2008).

To compare the labor share calculated with the I-O Table and the FFA to the series obtained using the provincial GDP data, we plot the estimates from column (1), (2) and (6) in Figure 1. As Figure 1 illustrates, the labor shares in column (1) and (2) move in tandem with those reported in column (6) for most years. Nevertheless, the estimates calculated with the I-O table are more volatile than those calculated using the other two sources. One possible explanation is that there are measurement errors in the I-O table, since the data in I-O table are calculated industry-by-industry and should be balanced with input-output data from each industry. Furthermore, the labor share has decreased significantly since the mid-1990s according to estimates computed using the I-O table and provincial GDP. The FFA estimates follow a similar trend to those of the I-O and provincial GDP estimates between 1995 and 2003, but fluctuate from 2003 to 2007. According to Bai and Qian (2009a), the NBS estimates labor compensation in FFA by assuming that its growth rate equals the growth rate of household income (for details see NBS, 2007b). These two facts imply that the labor share calculated using the I-O table or FFA cannot illustrate the true change in the aggregate labor share. Therefore, the following discussion focuses on explaining the movement of the labor share calculated using the provincial GDP by income approach reported in column (6).

In Table 2, the labor shares are defined as the ratio of labor compensation to GDP net of indirect tax, where indirect tax is net production tax in GDP by income approach. Comparing Table 2 with Table 1, we can reach similar conclusions for the movement in the labor share since 1978. In Figure 2, we plot the labor share calculated using the provincial GDP data defined by the above-mentioned two definitions (see column (6) of Table 1 and Table 2 for the underlying data). From 1978-2007, the two series have been moving together exactly with an almost constant gap between the plots, implying that indirect tax is not an important factor affecting the movement of the income share. Therefore, for simplicity, unless otherwise specified, the analysis in the remainder of this paper focuses on the movement of the labor share defined by the ratio of labor compensation to GDP net of indirect tax[1] .

Based on trends observed in the plot of the labor share over time (Figure 2), we divide the 1978-2007 period into three sub-periods for analysis. From 1978 to 1984 the labor share increases slightly, then fluctuates and decreases slightly from 1984 to 1995 and then decreases dramatically from 1995-2007. As depicted in Table 2, the labor share of GDP net of indirect tax declined 12.45 percentage points from 1995 to 2007. The labor share dropped 10.73 percentage points between 1995 and 2004, and

[1] Most results with the labor income share defined by the ratio of labor compensation to GDP are similar to those reported in this paper. We can provide the results upon request.

a dramatic 5.25 percentage points from 2003 to 2004 (see Figure 2 and Column (6) of Table 2). After 2004, the labor share continues to decline through 2007.

3. The Impact of Change in GDP Accounting Method

3.1 The changes in GDP accounting method since 2004

The dramatic drop of the labor share between 2003 and 2004 is suspect, since the labor share shifts were relatively smooth over the past two decades and also during the post-2004 period. Therefore, before conducting further analysis of factors explaining the decline between 1995 and 2004, we attempted to explain this abrupt change. We first explored whether there were changes in statistical methods affecting the estimates of factor income distribution in 2004

In 2004, China performed the first National Economic Census. In this Census, there were many changes in the statistical methods and scope. Most of these modifications have remained in later data reports. According to the NBS, there have been two changes relevant to GDP by income approach since 2004. First, the income of the self-employed in the non-agricultural sector began to be classified as "operating surplus" after 2004. In the case of self-employed individuals (hereafter *the individual economy*), the self-employed owners earn "mixed-income" and the employees hired by them earn "wages." Prior to 2004, the income of both owners and employees in the individual economy was counted as labor compensation according to China's National Accounts 2002 (NBS, 2003). Since 2004, the income of the employees remains included in "labor compensation" but the income of owners is considered as "operating surplus" (NBS, 2006a; NBS, 2008).

The second change pertains to the agriculture sector. Before 2004, operating surplus in agriculture included only profits from the state-owned and collective-owned farms. The income of the rural households engaging in the agriculture sector was counted as "labor compensation." Because it is difficult to obtain the financial statements of state-owned and collective-owned farms (NBS, 2006a; NBS, 2008), the NBS decided to count all the income excluding depreciation and net production tax in those farms as "labor compensation." As a result of this change, over half of provinces in China reported zero or close to zero operating surplus in agriculture in 2004, according to the NBS (2007a).

These two changes in GDP accounting methods should affect data on both the non-agriculture sectors and the agriculture sector. We suspected the first change would cause an abrupt decline in the labor share in non-agricultural sectors, while the second change would result in a sudden increase in the labor share in agriculture. To verify these hypotheses, we used the GDP by income approach data by province and sector (NBS, 2007a) to calculate the labor share for agriculture, industry, construction and service sectors in 2003 and 2004 (reported in Table 3[2]). As Table 3 shows, as expected, the labor share in all non-agriculture sectors declined significantly from 2003 to 2004 and the labor share in agriculture sector increased

[2] The aggregate labor income shares in Table 3 are weighted average of sectoral labor income share using labor value-added at factor cost as weights. Please refer to section 4 for the calculation of sectoral labor income share.

significantly from 2003 to 2004.[3] Because the non-agriculture sector is much larger than the agriculture sector, the aggregate labor share, which is the weighted average of each sector's labor share, appears to be much lower in 2004 than in 2003. Therefore, the change in the accounting methods in GDP by income approach overestimates the decline of the labor share between 2003 and 2004.

3.2 Eliminating the effect of changes in accounting method

To calculate the actual decline of the labor share from 1995 to 2004, one must eliminate the influence of changes in GDP accounting methods to obtain an estimate of the 2004-labor share that is comparable with the pre-2004 estimates. We began this process by obtaining estimates of operating surplus from the individual economy in 2004 for the construction, industry and service sectors, which would have been counted as labor compensation if there were no changes in GDP accounting method in 2004. We subtracted each of these estimates from the sectoral operating surplus and then added them back to the sectoral labor compensation statistic reported in 2004. By this method we reclassified the income of the self-employed owners from "operating surplus" to "labor compensation" in GDP by income approach. To adjust the data for the agriculture sector using this technique, we obtained estimates of the operating surplus of all state-owned and collective-owned farms that had been counted as labor compensation in 2004. In Figure 3, we represent how the adjustments were performed using estimates for the income of the owners in the individual economy and the operating surplus in the state-owned and collective-owned farms.

From China Economic Census Yearbook 2004 (NBS, 2006b), we obtained data on employment, the labor compensation of employees, book-value of fixed assets, operating revenue and operating expenses for the individual economy by sector. With these data we calculate each term of GDP by income approach in 2004 for the individual economy as follows. The operating surplus of the individual economy is the operating revenue net of operating expenses; the depreciation of fixed assets is five percent of the book value of fixed assets; labor compensation is the employees' compensation; and net production tax is the tax and fee paid to the government[4] . We report these estimates in Table 4.

Since we use provincial GDP by income approach to proxy the aggregate labor share, the operating surplus of the individual economy should also be measured at the provincial level. However one shortage with the above estimate is its caliber is inconsistent to the provincial GDP. Because the National Economic Census has given special effort to collect information of the individual economy, the individual economy is more completely covered in the National Economic Census than provincial data. As shown in the first two columns of Table 4, employment in the individual economy reported in Economic Census Yearbook 2004 is 94 million,

[3] Unless otherwise specified, agriculture sector refers to the whole primary sector, including agriculture, forestry, animal husbandry and fishery and all relevant service activities. The service sector in this paper means the tertiary sector.

[4] We calculate each term of the GDP by income approach for the individual economy following the formula published by NBS (2007a).

which is more than double the estimate of 46 million for this same figure calculated by summing the statistics on employment for the individual economy across provinces using China Statistical Yearbook 2005. This significant difference implies that the operating surplus in the individual economy estimated with the 2004 National Economic Census data might be larger than that actually counted in provincial GDP by income approach. To estimate operating surplus of the individual economy actually counted in provincial GDP, we assume that the labor productivity of the individual economy are the same for those included in the National Economic Census and those recorded in the provincial GDP. Under this assumption, we adjusted the operating surplus in the individual economy estimated with National Economic Census Yearbook data using the ratio of employment of the individual economy counted in provincial data to that counted in the census data (see the *adjusted* column of the operational surplus, Table 4)[5] .We refer to this estimate as "operating surplus in the individual economy adjusted with provincial employment" in the remainder of this paper.

In the first two rows of Table 5, we report the labor share calculated using official provincial GDP in 2003 and 2004 in order to make a comparison with the adjusted estimates in rows 3-6. The labor share in the third row, i.e. adjustment 1, is adjusted using operating surplus in the individual economy directly computed with the national census data and is much higher than that in 2003. As Table 4 shows, the operating surplus in the individual economy with the census data is much higher than that adjusted with provincial employment. Therefore, when we subtracted the estimate computed with census data from total operating surplus and added it into labor compensation in provincial GDP, we actually overestimated labor compensation in provincial GDP by income approach. In contrast, the adjustment 2 is the labor share computed with operating surplus in the individual economy adjusted with provincial employment as reported in the *Adjusted* column of Table 4, which is much lower than the adjustment 1. The official 2003 estimate is much closer to the adjustment 2 than it is to both the official estimate and the adjustment 1 reported in rows (2) and (3).

In adjustment 1 and 2, we did not exclude the influence of the change in the GDP accounting method in the agriculture, which has overestimated labor share in this sector. As a result, the estimates of adjustment 1 and 2 have overestimated the increase in the labor share in 2004 from 2003. According to NBS (2007a), the operating surplus in the agriculture sector has been reported as zero or close to zero in over half of the provinces in 2004. To eliminate the impact of this change, we first need to estimate the operating surplus of the state-owned and collective- owned farms. Because the NBS does not provide these official statistics, we estimated them as follows. First we calculated the proportion of operating surplus in GDP by income approach of the agriculture sector in 2003 by province, and assumed that this proportion in each province did not change in 2004 from 2003. For provinces

[5] The adjusted estimate is the operating surplus estimated with National Economic Census Yearbook 2004 times the ratio of employment in individual economy in provincial data to that in census data. The employment in individual economy in provincial data is the summation across provinces reported in CSY (NBS, 2005). The employment in census data is the employment in individual economy reported in National Economic Census Yearbook 2004 (NBS, 2006b).

reporting zero or close zero operating surplus in the agriculture sector in 2004 (NBS, 2007a), we estimated the operating surplus in the agriculture sector by multiplying the value-add of the agriculture sector by the proportion of operating surplus in GDP by income approach in agriculture. From the labor compensation statistic reported in the GDP by income approach data of the agriculture sector in these provinces, we then subtracted the estimated operating surplus and added it back to the operating surplus in GDP by income approach of the agriculture sector by province. The adjusted GDP by income approach data for the agriculture sector are consistent with the estimates based on the pre-2004 GDP accounting method. In row (5) of Table 5, we report both the aggregate and agriculture labor shares calculated with the adjusted GDP by income approach in agriculture sector in 2004, which are both lower than the official estimates (see row 2).

In the last row of Table 5, labor compensation and operating surplus in both the non-agriculture and agriculture sectors are adjusted following the same methods used to create adjustment 3 and 4 respectively. We then calculated the weighted average of the adjusted sectoral labor shares to obtain an adjusted aggregate labor share (see row (6)). As Table 5 illustrates, the adjusted aggregate labor share is 0.5466 and is only one percentage point higher than the 2003 estimate. Since the official estimate of the labor share in 2004 is 0.4837, the net effect of the changes in the GDP accounting method on the aggregate labor share of GDP net of indirect tax is a decline of 6.3 percentage points. Among the 6.3 percentage points of this decline, 7.1 percentage points result from the change in the GDP accounting method in the non-agriculture sectors, and -0.8 percentage points result from the change in accounting methods in the agriculture sector. With the estimates of operating surplus in individual economy and agriculture sector, we can also calculate their net impact on the labor share in GDP. We find this impact is a decline of 5.4 percentage points and the two types of change in GDP accounting methods have overestimated and underestimated aggregate the labor share by 6.1 and 0.69 percentage points respectively.

The changes in GDP accounting methods in 2004 have remained in succeeding years. As Table 2 depicts, the labor share has declined by around 1.7 percentage points from 2004 to 2007. If we can obtain estimates of operating surplus in the individual economy and in state-owned and collective-owned farms for 2005, 2006 and 2007, we can adjust the data from these years as we did for 2004. This data is not available directly so we assumed that the impacts of the change in the accounting methods in the individual economy and agriculture sector on the aggregate labor share estimates during 2005-2007 equaled their impact on the 2004 estimates and recalculated the aggregate labor share from 2005 to 2007. In Table 6, we report adjusted factor income shares between 2004 and 2007 for various definitions that are comparable to pre-2004 period estimates with provincial GDP by income approach.

We compare the adjusted labor share of GDP and of GDP net of indirect tax to the original estimates in Figure 4. As Figure 4 illustrates, while the original labor share estimates suggested a sharp decline from 2003 to 2004 the adjusted estimates indicate a slight increase. The apparent increase in the labor share is probably due to

the assumption in estimating the operating surplus of state-owned and collective-owned farms. In a word, our adjustment reveals that the actual decline of the aggregate labor share between 1995 and 2004 is around five percentage points instead of the ten plus percentage points computed with official unadjusted statistics.

4. Driving Forces of Aggregate The labor share

4.1 Methodology

Though Ricardo famously originated the theory that factor income shares evolve as economies develop, it was Solow (1958) who first proposed an empirical method to analyze the impact of economic development on factor income shares. Even some of the most recent research on factor income distribution follows Solow's approach. For example, Serres, et al.(2002) find that the decline of the labor share in European countries such as France, Italy, and Germany during the mid-1980s and the mid-1990s can be explained by structural change using Solow's decomposition method.

In Solow (1958), the period-*t* aggregate labor share, α_t , is the average of each sector's labor share, α_{it} , weighted by the value-added share of that sectors, vsh_{it} :

$$\alpha_t = \sum \alpha_{it} \cdot vsh_{it}$$

where *i* is sector index, and vsh_{it} value-added share of sector *i.*

Using this formula, change in aggregate the labor share can be decomposed into the changes in sectoral value-added share (hereafter *structural change effect*) and changes in sectoral labor share (hereafter *within-sector effect*) as follows:

$$\begin{aligned}\alpha_{t1} - \alpha_{t0} &= \sum \alpha_{i,t1} \cdot vsh_{i,t1} - \sum \alpha_{i,t0} \cdot vsh_{i,t0} \\ &= (\sum \alpha_{i,0} \cdot (vsh_{i,t1} - vsh_{i,t0})) \qquad (structural\ change\ effect) \\ &\quad + (\sum (\alpha_{i,t1} - \alpha_{i,t0}) \cdot vsh_{i,t1}) \qquad (within\text{-}sector\ effect)\end{aligned}$$

Equation (4.1) has four qualifications we must consider before we apply it to decompose the changes in the labor share. First, equation only reflects changes in the labor share in single-year increments, for example from year *t0* year *t1*, but overlooks the whole period movement. Second, the structural change effect is defined as the sum of the changes in each sector's value-added share weighted by the sector's labor share in year *t0*. Since the sum of the value-added shares across sectors is always one, an increase in the value-added share of a sector is always accompanied by a decrease in another sector. For example, consider a two sector economy in which the value-added share of sector *p* increases and the value-added share of sector *q* correspondingly declines. The structural change effect on the aggregate labor share is negative if $\alpha_p < \alpha_q$, positive if $\alpha_p > \alpha_q$, zero if $\alpha_p = \alpha_q$. Third, the within-sector effect is defined as the sum of the changes in each sector's labor share

weighted by each sector's value-added share. As equation shows, the size of the sector weight, vsh_i determines the impact of a change in a sector's labor share on the aggregate labor share. If vsh_i is relatively low, changes in sector *i,* even if they are significant, will have negligible effects on the aggregate labor share[6] . As a result, the within-sector effect is determined primarily by movements in sectors with high value-added shares.

Finally, the most important qualification of equation is that it is not the only possible decomposition method. For example, the change in the labor share can also be decomposed into:

$$\begin{aligned}\alpha_{t1} - \alpha_{t0} &= \sum \alpha_{i,t1} \cdot vsh_{i,t1} - \sum \alpha_{i,t0} \cdot vsh_{i,t0} \\ &= (\sum \alpha_{i,t1} \cdot (vsh_{i,t1} - vsh_{i,t0}))\ (structural\ change\ effect) \\ &\quad + (\sum (\alpha_{i,t1} - \alpha_{i,t0}) \cdot vsh_{i,t0})\ (within\text{-}sector\ effect)\end{aligned} \qquad (4.2)$$

The structural change effect and within-sector effect computed using the two approaches will be virtually the same when α_i and vsh_i only undergo small changes from *t0* to *t1*. Another more popular decomposition is as follows:

$$\begin{aligned}\alpha_{t1} - \alpha_{t0} &= (\sum \alpha_{i,0} \cdot (vsh_{i,t1} - vsh_{i,t0})) \quad (structural\ change\ effect) \\ &\quad + (\sum (\alpha_{i,t1} - \alpha_{i,t0}) \cdot vsh_{i,0}) \quad (within\text{-}sector\ effect) \\ &\quad + (\sum (\alpha_{i,t1} - \alpha_{i,t0}) \cdot (vsh_{i,t1} - vsh_{i,t0})) \quad (co\text{-}movement\ effect)\end{aligned}$$

(4.3)

Equation (4.3) is based on the labor productivity decomposition proposed by Foster et al. (2001) and applied in more recent research (Morel, 2005; Ruiz, 2005; Young, 2005). This method is most appropriate when the sectoral labor shares and value-added shares have both undergone obvious changes between *t0* and *t1*. Otherwise, the co-movement effect calculated in this approach is trivial which implies that the results of equations and (4.3) are equivalent.

4.2 The Data

To apply these decomposition methods of analysis to the aggregate labor share, we need data on sectoral labor shares and sectoral value-added shares.

In China's National Accounts System, sectoral GDP by income approach is available at the aggregate level in I-O Tables and at the provincial level in Hsueh and Li (1999) and NBS (2007a). Because we calculated the aggregate labor share estimates using the provincial GDP by income approach data, we must also use this source to obtain sectoral GDP by income approach statistics. We created a

[6] As will be shown later, change in sectoral labor income share generally does not exceed 10 percentage points in China. Therefore, we actually mean a change no more than 10 percentage points by a significant change in sectoral labor income share here.

continuous time series for GDP by income approach by province and sector from 1978-2004 by combining data from Hsueh and Li (1999) for 1978-1993 and in NBS (2007a) for 1994-2004. With these data, we computed the annual labor share of major sectors (including agriculture, industry, construction and service sectors) from 1978 to 2003 as the weighted average of each sector's labor share across provinces, which are reported in Table 7.1. For 2004, we used the adjusted sectoral labor share (adjustement4 in Table 6) instead to eliminate the impact of the change in GDP accounting method.

To calculate sectoral value-added net of indirect tax, we summed sectoral value-added net of indirect tax across provinces and then calculated the value-added share of each sector to obtain economic structure. These results are reported in Table 7.2. As we do not have GDP by income approach data by sector for 2005-2007, value-added shares for each sector in these three years in Table 7.2 are calculated using the sectoral GDP by production method which assumes the shares of indirect tax in GDP in each sector do not change from 2004 to 2007.

In Figure 3, economic structure occupies the left panel and sectoral labor share is plotted on the right panel. As the figure illustrates, the relative size of the agriculture sector increased from 1978 to 1984 and then steadily declined since the mid-1980s. The service sector's share of the economy has grown since 1978 while the industry sector's relative size has fluctuated much during the past three decades. The construction sector follows no detectable trend(s) from 1978 to 2007. Because the labor share in agriculture has historically been greater than the labor share in the other three sectors included in the right panel of Figure 3, we expect that the structural change effect is positive before 1984 and negative since then.

The labor share in the industry sector over time follows a hump-shaped trend, increasing steadily until 1995 and then falling since 1998. Compared with the labor share in the industry sector, the labor share in service sector changes little, but the agriculture and construction sectors both experience small fluctuations in the labor share. As explained in the previous discussion, the within-sector effect is dominated by shifts in the labor shares of the largest sectors. Therefore, judging from the time-trend of the labor share in the industry sector, we expect that the within-sector effect is positive before the mid-1990s and negative after.

4.3 The Decomposition Results

Official statistics on the sectoral labor shares after 2004 are unavailable. To analyze the aggregate labor share after 2004 with the decomposition method, we apply equation (4.1) to do the analysis for later years.

As was mentioned in section 3, decomposition results are sensitive to the beginning and ending year. As Figure 4 illustrates, the aggregate labor share increases by about 4 percentage points from 1978 to 1984, fluctuates from 1984 to 1995, and then falls after 1995. For the post-1995 period, the aggregate labor share does not trend smoothly from 2003 to 2004 even though we have adjusted the sectoral labor shares in 2004. To ensure that the direction of the labor share's

movement is constant over each period, we divide the post-1978 period into four periods: 1978-1984 period, 1984-1995 period, 1995-2003 period and 2004-2007 period.[7]

Table 8 reports the decomposition results computed with equation . In column (1), we present the change of the labor share from year *t0* to year *t1*, (α_{t1}-α_{t0}). The structural change effect and within-sector effect computed with equation are respectively reported in columns (2) and (3). In columns (4)-(7), we report the contribution of each sector to the within-sector effect, i.e. $(\alpha_{it1} - \alpha_{it0}) \cdot vsh_{it1}$.

In the period 1978-1984, the share of agriculture increased and the labor share in industry also increased. As a result, the structural change effect and the within-sector effect were both positive, which explains the increase of the aggregate labor share by 3.68 percentage points.

During 1984 and 1995, the agriculture sector was eclipsed in size by the service sector and the labor share in industry continued to increase. As a result the structural change effect for this period was negative while the within-sector effect was positive. These conflicting forces explain why the aggregate the labor share moved little during the decade, declining by only 1.77 percentage points over 10 years.

From 1995 to 2003, both the structural change effect and the within-sector effect were negative causing the aggregate the labor share to decline by over five percentage points. The structural change effect had been always negative during since 1984 which implies that the labor share trend reversal since 1995 was caused by changes in the industry sector. As illustrated by a graphical plot of the labor share in industry in Figure 4, labor income in this sector plateaued in 1995 and declined starting in 1998.

The structural effect and within-sector effect between 2004 and 2007 have both remained negative although the within-sector effect is relatively more significant than the structural change effect in recent years.

4.5 Counterfactual Analysis

The decomposition results presented in Table 8 reveal that both the structural change effect and the within-sector effect have proved to be significant for explaining shifts in the labor share over the last thirty years. To demonstrate the relative importance of each force, we compute and compare two hypothetical series of the aggregate labor share: the aggregate labor share without changes in sectoral labor shares and the aggregate labor share without structural change. We display the actual aggregate labor share and the two hypothetical series in Table 9 and compare them in Figure 6.

The first hypothetical series in column (2) of Table 9 is the average of each sectoral labor share in 1978, weighted by actual sectoral value-added share since 1978. By fixing sectoral labor share at 1978, the hypothetical series only captures the impact of structural change. If there had not been the change of labor share within-

[7] We do not analyze the change between 2003 and 2004, as the labor share in the two years is not completely comparable even though we have eliminated the effect of change in GDP accounting methods in 2004.

sector, the aggregate labor share would have started to fall in 1984 and declined by over 10 percentage points by 2003 (column (2) of Table 9), as represented in the series labeled *Fixed Sectoral labor share* in Figure 5. This hypothetical series also declines more moderately than the actual series after the mid-1990s because the actual downward trend of actual series is intensified by the decline in the labor share of industry.

In Figure 6, the other hypothetical series labeled *Fixed Economic Structure* only captures changes in the sectoral labor share. This time series illustrates that if there had been no structural change shift from agriculture to service sector, a graphical plot of the aggregate labor share over time would be hump-shaped, increasing from 1978 to 1998, and declining by 3 percentage points from 1998 to 2003, much less than the 5 percentage points of decline in the actual aggregate labor share (see column (1) and (3) in Table 9).

Actually, the hump-shaped plot of *Fixed Economic Structure* is similar to that of the industry sector's labor share, since the change of the labor share in the industry sector dominates the within-sector effect (see Table 8). We compute another hypothetical aggregate labor share which only captures the movement in industry sector, denoted by *All Fixed Except for The labor share in Industry* in Table 9, and plot the two series in Figure 7. For each year, these series have very similar values and follow parallel trends. This comparison reinforces the conclusions that the industry sector is the dominant driver of the within-sector effect.

Combining the two hypothetical series in Figure 6, we can explain the movements of aggregate the labor share over the past three decades. As explained earlier, shifts of aggregate the labor share are determined by the net effect of the two forces- the structural transformations and the within-sector effects. When the two effects are in the same direction during 1978-1984 and 1995-2003,[8] aggregate labor share significantly increases and decreases respectively. The aggregate labor share fluctuates during 1984 and 1995 because the two effects have opposite signs and thus their impacts are counterbalanced.

Nevertheless, the structural change has always been the major force in the movement of the aggregate labor share. We can observe in Figure 6 that a plot of actual aggregate labor share data series and *Fixed Sectoral Labor Share* series follows similar trends in the three decades. This conclusion is supported by the decomposition results in Table 8; the structural change effect is always larger than within-sector effect in absolute value.

On the whole, both structural transformations and changes in sectoral labor share prove to be important in directing the movement of the aggregate labor share. Over the period studied, the structural change effect is relatively more important and the within-sector effect is driven mainly by industry sector changes. For the 1995-2003 period, we find that around 2/3 of the decline in the aggregate labor share can be explained by structural change effects and the remaining 1/3 is explained by the within-sector effect, as shown in Table 8. However, the relative importance has changed since 2004, during which over three quarters of the decline is the result of

[8] Actually the two effects also shared the same sign for 2004-2007, according to the decomposition results reported in Table 8.

within-sector effects.

5. Structural Change Effect: An Illusion from Accounting Method

The structural transformation has been the major driving force of the aggregate labor share over the last three decades. This section provides further analysis of the impact of structural transformation.

As stated previously, a major reason for the significant structural transformation impact that occurred over this period are due to differences between the agriculture sector and non-agriculture sectors in the labor share. As illustrated in Table 7.1, the labor share in the agriculture sector (around 0.9) has been much higher than in non-agriculture sectors. As a result, the structural change effect was positive when the relative size of the agriculture sector grew from 1978 to 1984, and negative when the relative size of the agriculture sector fell after 1984.

In Figure 8, we compare the labor share in the agriculture sector of China with those of other economies.[9] Among 41 economies, China has by far the highest agriculture sector labor share. The share in China is more than ten percentage points greater than that of Israel, the country with the next highest value. Most economies except for China, Israel, and Taiwan have an agriculture sector-labor share lower than 0.5.

This wide variation between China and the rest of the world is mainly due to China's accounting method of mixed income. Most economies have adopted the U.N. system of National Accounts and therefore treat mixed income of the self-employed as capital income. The self-employment rates vary among countries and within sectors which leads to variation in the factor income shares as shown in Figure 8. China, however, does not follow these accounting methods. In China, income of self-employed households in agriculture, the major source of the sector's value-added, is counted as labor compensation by the NBS (2003; 2006a; 2008) instead of capital income. Consequently, China has a distinguishingly high labor share in agriculture. Since the inception of the National Economic Census, the NBS regulated that all income except for production tax and depreciation of fixed assets of state-owned and collective-owned farms should be counted as labor compensation. Through these simplified accounting methods only depreciation of capital in agriculture has been counted as capital income in China and thus the NBS has overestimated the labor compensation in agriculture.

Estimation of the real factor income shares in agriculture is difficult particularly for China whose factor inputs such as land and labor in agriculture generally are not purchased from the market. Johnson (1948) estimated the functional distribution in agriculture for the U.S. In his estimate, he used the product of rate of return to capital and the net value of non-residential fixed assets as a proxy for capital income. He also assumed the wage of a farm owner was the same as the wage of hired labor.

[9] OECD publishes Input-Output tables for OECD countries after 1995 and expands the list to some non-OECD countries or regions since 2002. The labor income share in agriculture sector is computed with OECD Input-Output tables for each economy, defined by labor compensation over value-added at factor cost. Data in Figure 8 are average value when there are more than one observation for an economy.

To estimate land rent, Johnson employed two approaches. One method is to proxy land rent as the product of average rental price of land and total land area. The other method is to proxy land rent as the product of the average rate of interest on farm mortgages and the estimated value of farm real estate. In China, the lack of a nation-wide market for farm land implies that the rental price of land does not always reflect the real value of farm land.[10] For the same reason, it is not possible to obtain data on the non-residential fixed capital in agriculture. Therefore, under present conditions, it is difficult to estimate the real agriculture sector labor share in China.

Nevertheless, empirical test can show how the accounting method of household income in agriculture has affected the estimates of the aggregate labor share and its impact on the structural change effect. The test was conducted as follows. As before, we computed a synthetic aggregate labor share by taking the weighted average of each sectoral labor share. However, instead of using the actual labor share estimates for the agriculture sector, we tested four hypothetical values for the agriculture labor share. We chose a constant agriculture labor share based on the fact that changes in the agriculture labor share are not significant in the past three decades and show no impact on aggregate labor share.

According to our estimates using OECD Input-Output Table, Israel and Taiwan respectively have the second and third highest labor shares in agriculture. We employed the agriculture labor shares of these two economies, 0.74 and 0.66, to compute the first two synthetic aggregate labor share series in column (1) and (2) of Table 10. We computed another synthetic series in column (4) of Table 10 with an agriculture labor share of 0.28, which is the average agriculture labor share of the 40 economies in Figure 8 and also close to the average value of U.S. In column (3) of Table 10, the synthetic series are computed with an agriculture labor share of 0.48, which is the average value in the service sector in China from 1978 to 2004. Synthetic series in column (3) is computed to show the movement in aggregate labor share when the economic structure change happens between agriculture and service sectors with trivial differential in labor share.

Observing Figure 9, we find three interesting facts. First, when computed with agriculture labor shares of 0.74 and 0.66 that are less than the labor share in service sector, the synthetic series moves in a similar pattern as the official series, though, the synthetic ones exhibit increasing trends during the 1984-1995 period and their increasing and declining rates are more moderate during 1978-1984 and 1995-2003. This suggests that the structural change effect shrinks when the differential between the labor share of the agriculture sector and service sector is reduced.

Second, when the agriculture labor share equals and less than that of the service sector, the synthetic series, denoted by 0.48 and 0.28, increase from 1978 to 1998 and declines insignificantly after 1998. The movements of the two synthetic series are significantly different from that of the official estimates. For the series calculated using 0.48 as the agriculture labor share, the labor shares in agriculture and services are similar. As a result, the structural change effect from agriculture to services is insignificant. For the series denoted 0.28, the sign of the structural change effect is

[10] According to the Ministry of Agriculture, the area of land in rural regions on the planting rights markets was 55 million acres in 2005, just 4.57% of the total arable land of rural households in China.

different from that of the official estimates because the 0.28 agriculture labor share is now the lowest among all major sectors and hence the structural transformation from the agriculture to services results in an increase in the synthetic aggregate labor share. Therefore, when agriculture labor share is less than the service sector, the impact of structural transformation has different sign from the official series and the moving direction of the aggregate labor share changes accordingly.

Third, the decline of synthetic series since 1995 is more moderate than the decline of the official series, no matter which hypothetical agriculture labor share is employed. Actually, for the series calculated using agriculture labor shares of 0.74, 0.65 and 0.48, the negative effect from structural change is less than official estimates (and even zero in the case of 0.48) as the labor shares in agriculture and services converge. In the series calculated with 0.28, the structural change effect is positive, which even counterbalances the declining trend from the fall of labor share of industry sector since 1998. Therefore, from 1995 to 2007, we observe no decline in the synthetic aggregate labor share series denoted 0.28 in Figure 9.

The above analysis shows that the importance of the structural change effect depends on the GDP accounting method. Different accounting methods for the mixed income of the households in agriculture produce different aggregate labor share series. Though an agriculture labor share as low as 0.28 is commonly considered too low for China, certainly that the labor share in agriculture is lower than the official estimate of 0.9, since the land rent has not been separated from labor compensation in China. Therefore, the structural change effect is exaggerated by this overestimated differential between agriculture and service sectors. As a result, we argue that the real decline in the aggregate labor share was even less than five percentage points for the 1995 to 2003 period. Following this analysis, we conclude that the change in the labor share in the industry sector is the main reason for the real decline in the aggregate labor share.

6. The Labor Share In Industry: Explanations

Of all sectors, labor share movement in the industry sector has proven to be the driving force behind the within sector effect. This relationship is not surprising since industry has been the most important sector in China's economic structure for the past three decades and the labor share in industry has shifted more dramatically than in other sectors.

To explain the changes of the labor share in industry, we first identify the main determinants using a modeling method. Theoretically, determinants of factor income distribution fall under three categories: the relative price of labor to capital and factor input ratio, distortions in factor markets, and distortions in goods markets (Bentolila and Saint-Paul, 2003).

Following Bentolila and Saint-Paul (2003), we use the capital-output ratio to control for the impact of relative price of labor to capital and factor input. To control for the biased technological improvement and the difference in technologies among industries we use year dummies and industry dummies in our econometric model.

In most developed economies, researchers care about distortion in factor markets resulting from bargaining between firms and workers (Bentolila and Saint-Paul, 2003; Blanchard and Giavazzi, 2003; Giammarioli, Messina et al., 2002). In China, this kind of bargaining is rare. Instead distortions originate from regional protectionism (Bai et al., 2004) and also different behavior in employment and wage setting between the SOEs and non-SOEs (Bai, Lu and Tao, 2008). According to Bai, Li, and Wang (1997), Brandt and Zhu (2000) and Brandt, Hsieh and Zhu (2007), the average wage level at the SOEs is higher than at the non-SOEs and the SOEs are inclined to hire too many employees, therefore we expect that the labor share of the SOEs is higher as well. We investigate the impact of these factors on the labor share with region dummies and relative share of each type of ownership in owner's equity.

The incompleteness from monopolistic competition is the main distortion in the goods markets. When there is a bargaining mechanism between labor and firms, monopolistic profit is distributed between the two groups according to the relative bargaining power of each. Since no such bargaining arrangement exists in China, our model presumes that labor does not share any of the monopolistic profit. To test the impact of market monopoly power on factor income shares, we employ the following proxies: the price markup (hereafter *mkup*), computed with the ratio of sales revenue to sales cost, Herfindal index at 4-digit level (hereafter *HHI*), and the ten-firm concentration ratio (hereafter *CR10*) at 4-digit level. We expect that the labor share declines in these variables, since they are proxies for market power and higher market power implies a higher capital share.

We estimated the following econometric model for the industry sector using industrial survey data from 1998 to 2005[11] :

$$\alpha_{l,jt} = a \cdot mkp_{jt} + b \cdot KtY_{jt} + \sum_{x=s,c,lp,f,hmt} \gamma_x \cdot req\_x_{jt} + \gamma_{st} \cdot rs\_t + \sum \theta_t Dt + \sum \theta_i Di_j + \sum \theta_p Dp_j + c + a_j + v_{jt} \quad (1)$$

where $\alpha_{l,jt}$ is the labor share of firm j at time t; *mkp* is the proxy for monopoly power, meaning *mkup*, *HHI* or *CR10*; *KtY* is the capital-output ratio, which is used to control for changes in the factor ratio and relative prices of labor to capital; *req_x* is a set of relative shares of different ownership types in owner's equity, including the state-owned equity (*req_s*), collective-owned equity (*req_c*), legal person-owned equity (*req_lp*), equity held by foreign business (*req_f*), and equity held by Hongkong, Macao and Taiwan (*req_HMT*);[12] *rs_t* is the product of *req_s* and a time trend, which is included to control for changes in the differential between the labor share of SOEs and non-SOEs; *Dt*, *Di* and *Dp* are year dummies, two-digit industry dummies, and province dummies respectively; c is a constant; a_j captures time-invariant firm-specific factors; and v_{jt} controls for stochastic terms.

Given that *KtY* may be endogenous to the labor share in this model, model (1) is estimated using system GMM estimation. We included three years of *KtY* lags and two years of ΔKtY lags as GMM instruments in difference and level equations

[11] This dataset, collected by NBS, includes all SOEs and non-SOEs with sales revenue higher than 5 million RMB. We calculated the weighted average of the industry sector labor share and find that it has declined since 1998.
[12] The benchmark case is equity privately held

respectively in our estimation. Table 11 reports five estimations: in EST 1, 2 and 3, the proxy for monopoly power is *mkup*, *HHI* and *CR10* respectively; and EST 4 and EST 5 are estimations with samples excluding 2.5% and 5% tails of the labor share. As shown in Table 11, all five estimated models are comparable and have the same signs in all estimated parameters.

In the five estimation results, $\hat{a}$ is negative and significant, suggesting that the labor share is depressed by monopoly power in the goods market. $\hat{b}$ is insignificant in the five estimation results, meaning *KtY* is an insignificant factor and the elasticity of substitution in industry is not significantly different from one. The estimated $\hat{\gamma}_x$ reflect the difference in labor share between *x* type owned firms and private owned firms with other factors controlled. As Table 11 shows, $\hat{\gamma}_s$ is much higher than other $\hat{\gamma}_x$, therefore average labor share of the SOEs is much higher than that of the non-SOEs, with the ascending order of labor shares as follows: foreign enterprises, HMT enterprises, legal person funded enterprises, collectively owned enterprises, private owned enterprises, and the SOEs. This order follows our expectations and is consistent with other research (Dollar and Wei, 2007; Hsieh and Klenow, 2008). *rs_t* is the product term of state-owned ownership and time trend and its coefficient is significantly positive in all five estimation results, suggesting the differential between the SOEs and non-SOEs in labor share is shrinking over time. $\hat{\theta}_t$ shows no definite trend in the five regression results and hence there is no trend in year dummies, which implies that there is no biased technological improvement. The estimated parameters of all region and industry dummies are generally significant.

Though we can infer what factors have determined labor share with these estimated results, we still need to investigate how changes in these factors has resulted in the movement of labor share and also their relative contributions. This can be done by forecasting labor share with the estimated econometric model. However, one shortcoming with the five estimations in Table 11 is that they assume that some of the parameters of technology are the same for all sub-industries; they estimate model using all samples of the industrial survey and obtain similar estimated coefficients of *KtY*, *mkp*, *req_x*, *rs_t* for each sub-industry. If we use them to compute the relative contributions of each explanatory variable to the shifts in labor share, we may obtain biased results.

To improve this weakness, we next estimated model for each 2-digit industry using *mkup* as a proxy for monopoly power and thus obtain 37 econometric models for all of the 2-digit sub-industries in industry sector. Using these models, we calculated how the labor share in industry was affected by the explanatory variables from 1998 to 2005. It was performed as follows. We first estimated the annual labor share of each firm for each year. With these estimates we calculated the annual weighted average labor share for the whole industry sector and computed its change

since 1998. For each firm, we multiplied the change of each explanatory variable by the estimated parameter to calculate the contribution of each explanatory variable to its labor share change. The explanatory power of each independent variable in the industry sector is the weighted average of the contribution of the variable through each firm. All the weighted averages in the above procedure are calculated using the value-added share of each firm as the weight; the results are reported in Table 12.

These 2-digit industry models predict a labor share decline of 9.3 percentage points, 81% of the actual change in industry sector from 1998 to 2005. Of all the independent variables, the change in *req_x* has the most decisive influence, explaining 51% of the modeled change, around 4.7 percentage points. The decline of the SOEs, which have relatively high labor shares, explains the significance of *req_x*. Increase in monopoly power is the next most important factor, which explains about 2.1 percentage points of decline representing 23% of the simulated change in the industry sector labor share. The very small contributions from *KtY*, *D_t*, *D_i* and *D_p* indicate that there are negligible influences from the other factors considered, such as change in relative price and relative factor input ratio, biased technological improvement, and restructuring between industries and regions.[13]

This econometric analysis indicates that the main reasons for the decline of the labor share in the industry sector are the restructuring of the SOEs and the increase in monopoly power. Although economists generally view concentration of market power as a negative development, they overwhelmingly support the liberalization of China's state controlled industries. Although the capital-output ratio has declined in industry since 1998, it proves to have little impact on the labor share in our models, suggesting that changes in relative prices have been counterbalanced by changes in the factor input ratio. This finding implies that the elasticity of substitution between labor and capital is not much different from one in industry, consistent with the insignificance of *KtY* in the five regressions in Table 11. Policy makers attempting to alter factor income shares by changing the relative prices of labor and capital will be unsuccessful, at least regarding the industry sector.

Having focused thus far on explaining the decline in the labor share in industry since 1998, we now turn to discuss the increase from 1978 to 1995. According to Li (1992), a large part of workers' income used to be comprised of in kind payments, which were gradually replaced by wage income after *the Reform and Openness* and hence increased the statistical labor share. This argument might explain the rise of the labor share before the mid-1980s, however the continued increase between the mid-1980s and the mid-1990s requires further analysis.

Restricted by data availability, we cannot apply model to the period 1978-1995, during which the labor share in industry continued to climb by over 10 percentage points. However, we can still say something based on the above analysis. As shown in Table 11, the decline in the SOEs and increase in monopoly power in the industry sector are the two major forces causing the labor share in industry to decline since 1998. From 1985 to 1995, the share of the SOEs in industry output has fallen steadily from 66% to 30% while non-SOEs have experienced a corresponding

[13] Except for the significance of the 2005-year dummy due to the change in sample size

increase (NBS, 2005). During 1985 and 1995, on one hand, the boost in non-SOEs increases the competition in industry by reducing monopoly rent of the SOEs, as has been reflected by the rapid decline in the SOEs' profit and tax payments during this period. On the other hand, the transformation from the SOEs to the non-SOEs in industry implies a structural change effect because of the differential in the labor share between the two firm types. In another analysis (Bai and Qian, 2009b), we report findings that the labor share in the SOEs was lower than the non-SOEs during the period 1985-1995 and therefore the structural change effect from the SOEs to non-SOEs in industry was positive in this period.[14] As a result of the two changes, labor share increased from 1985 to 1995 in industry sector.

7. Discussions and Conclusions

This paper has analyzed the movement in the aggregate labor share since 1978 with a particular focus on the post 1995 decline. According to official NBS data, the aggregate labor share, defined as the ratio of labor compensation to GDP net of indirect tax, increased by 3.68 percentage points during 1978-1984, fluctuated and declined slightly by 1.77 points from 1984 to 1995, and then experienced a significant drop of over 12 percentage points from 1995 and 2007.

In Table 13, we summarize the reasons for the post 1995 decline of the labor share. As shown in Table 13, a change in statistical methodology explains 5.25 percentage points of decline, 42% of the total drop in the aggregate labor share from 1995 to 2007. From 1995 to 2003, the labor share declined by 5.48 percentage points, of which 61.31% of the decline originated from the structural transition from agricultural to services. The remaining 38.69% of the decline was due to change in sectoral labor shares, mainly in the industry sector. For the period 2004-2007, the aggregate labor share declined by 1.72 percentage points. Sectoral labor share changes explain 62% of this decline.

The dramatic post 1995 decline in the labor share has led many to assume that labor income has been seized by capital. However, our analysis does not support this view. Except for the increase in monopoly power, we find no connection between the significant explanatory variables and this common hypothesis. Aside from the accounting method change, structural transformation and change in the sectoral (mainly industry) labor share were the two main forces driving the decline of the labor share since 1995.

More importantly, we find that these two forces have been the drivers of the movement of aggregate labor share since 1978. The directions of the two effects were the same during 1978-1984 and 1995-2004, positive and negative respectively, consequently driving the aggregate labor share up during 1978-1984 and down

[14] One may wonder why labor income share in the SOEs is first lower in the 1985-1995 period and then higher in post-1998 period than the non-SOEs. We present possible explanation in Bai and Qian (Bai and Qian, 2009b) as follows. In the beginning of 1985-1995, labor income share in the SOEs is lower than the SOEs because the wage rate in the SOEs is lower than the non-SOEs. Later, the SOEs experience great loss in profit for the increasing market competition, but are not able to fire workers or decrease wage rate to reduce their labor compensation. As a result, labor income share in the SOEs sector increases steadily to a much higher level than the non-SOEs in the mid-1990s.

during 1995-2004. From 1995 to 2003, the directions of the two effects were opposite. The negative impact of structural change dominated the positive within-sector effect, so the aggregate labor share fluctuated and slightly declined. It should also be noted that the importance of the structural change effect is closely related to the accounting method of mixed income of the agriculture producing households. For example, the structural change effect would not be significant if mixed income were partly counted as capital and if the labor shares in agriculture were close to that of services.

The major reason for the within-sector effect was the change in the industry labor share, which rose between 1978 and 1995 and then began to decline in 1998. Contrary to common opinion that relative input factor price shifts or biased technological change caused the industry sector labor share to drop, our analysis attributes the decline to the dismantling of the SOEs and increased monopoly power. According to decomposition analysis, the within-sector effect caused a further decline of the aggregate labor share by 1.08 percentage points from 2004 to 2007.

In 2007, the aggregate labor share in GDP declined to as low as 0.45 in China. Compared to other nations, this is a relatively low share, especially considering that the agriculture labor share is statistically overestimated in China. Since labor compensation is the main source for China's households, it is not surprising that the sustained decline of the labor share has spurred a corresponding decline in the household share of national disposable income. Likely a result of the reduced disposable income share of households, the rate of private consumption in China has been much lower than the aggregate investment rate and has continued to decline over the past ten years or so. One possible solution to rebalance the structure of the aggregate demand is to increase household income by increasing the labor share. A method of doing so, as this paper suggests, would be to enhance the development of the service sector. The labor share in services is higher than that in industry so an increase in services income would result in a positive structural change effect on the labor share. Another policy would be to enhance market competition as much as possible, since our model shows that monopoly power is negatively related to the labor share. Increased monopoly power has been one of the main reasons for labor share decline in industry sector. However, increasing wage levels by law or industry rules, as favored by some scholars and policy makers in China, will not be an effective policy. Our models indicate that this method will have insignificant influence on the labor share since the elasticity of substitution between capital and labor is one, but will increase unemployment.

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Tables and Figures

Table 1: The labor share in GDP from various sources, N1

Year	Input-Output	Flow of Funds	GDP by Income Approach at provincial level			lshare_GDP
	(1) ,a	(2) ,b	(3),c	(4) ,d	(5),e	(6) ,N2
1978			0.4981			0.4981
1979			0.5101			0.5101
1980			0.5115			0.5115
1981			0.5268			0.5268
1982			0.5357			0.5357
1983			0.5354			0.5354
1984			0.5445			0.5445
1985			0.5290			0.5290
1986			0.5282			0.5282
1987	0.4723		0.5211			0.5211
1988			0.5172			0.5172
1989			0.5151			0.5151
1990	0.4944		0.5342			0.5342
1991			0.5117			0.5117
1992	0.4523	0.5459	0.5010			0.5010
1993		0.5143	0.5039	0.4949	0.5062	0.4949
1994		0.5230	0.5117	0.5035	0.5120	0.5035
1995	0.4692	0.5278	0.5288	0.5144		0.5144
1996		0.5210		0.5121	0.5340	0.5121
1997	0.5487	0.5302		0.5103	0.5279	0.5103
1998		0.5251		0.5083	0.5314	0.5083
1999		0.5256		0.4997	0.5238	0.4997
2000	0.5406	0.5042		0.4871	0.5138	0.4871
2001		0.4959		0.4823	0.5145	0.4823
2002	0.4838	0.5041		0.4775	0.5036	0.4775
2003		0.4921		0.4616	0.4962	0.4616
2004		0.4707		0.4155		0.4155
2005	0.4173	0.5073			0.4140	0.4140
2006		0.4972			0.4061	0.4061
2007	0.4136				0.3974	0.3974

Source: a. Input-Output tables in China Statistical Yearbook (various years); b. Flow of Funds Accounts, 1992-2004 data from NBS (2008b) and 2005 and 2006 data from China Statistical Yearbook 2008 and 2009; c. Hsueh and Li (1999); d. NBS (2007c); e. China Statistical Yearbook (vol1995-vol2008).

Notes: N1. Labor income is share of labor compensation in GDP by income approach; N2. We combine the labor share computed with GDP by income approach at provincial level into one series, where 1978-1992 data are from column (3), 1993-2004 data are from column (4), and 2005-2007 data are from column (5).

Table 2: The labor share in value-added at factor cost by various sources, [N1]

Year	Input-Output	Flow of Funds	Income Approach			lshare_FPR
	(1) ,a	(2) ,b	(3),c	(4) ,d	(5),e	(6) ,N2
1978			0.5696			0.5715
1979			0.5904			0.5855
1980			0.5821			0.5821
1981			0.5980			0.5980
1982			0.6062			0.6061
1983			0.6056			0.6056
1984			0.6086			0.6185
1985			0.6015			0.6015
1986			0.6037			0.6037
1987			0.6011			0.5956
1988			0.5950			0.5949
1989			0.5941			0.5941
1990			0.6144			0.6144
1991			0.5769			0.5921
1992	0.5157	0.6385	0.5783			0.5783
1993		0.6095	0.5960	0.5758	0.5869	0.5758
1994		0.6192	0.5918	0.5842	0.5928	0.5842
1995	0.5256	0.6136	0.6061	0.5910		0.5910
1996		0.6132		0.5869	0.6108	0.5869
1997	0.6346	0.6281		0.5868	0.6079	0.5868
1998		0.6282		0.5858	0.6136	0.5858
1999		0.6278		0.5772	0.6059	0.5772
2000	0.6324	0.6024		0.5668	0.5985	0.5668
2001		0.5964		0.5603	0.5988	0.5603
2002	0.5647	0.6086		0.5540	0.5909	0.5540
2003		0.5949		0.5362	0.5790	0.5362
2004		0.5533		0.4837		0.4837
2005	0.4830	0.6047			0.4821	0.4821
2006		0.5978			0.4753	0.4731
2007	0.4837				0.4629	0.4665

Source: same as Table 1; Notes: same as Table 2.

Table 3: The labor share by sector

Year	Aggregate	Agriculture	Industry	Construction	Service
2003	0.5362	0.8607	0.4444	0.6810	0.4900
2004	0.4837	0.9222	0.3823	0.5975	0.4098

Source: NBS (2007a) and Author's calculations, see text for details.

Table 4: Components of GDP by income approach for the individual economy in non-agricultural sectors in 2004 (Unit: 100 million RMB, 10 thousand person)

	Employment		Labor Compensation [N1]	Depreciation [N1]	Net Production Tax [N1]	Operating Surplus [N1]	
	whole nation[N1]	sum across provinces [N2]				official	adjusted
National	9422.38	4587.11	4064.59	818.63	1996.93	20981	10214
Industry	2565.75	1249.09	1627.38	212.01	430.61	4544	2212
Construction	461.64	224.74	313.2	17.4	39.39	508	247
Service	6394.98	3113.28	2123.98	589.21	1526.92	15929	7755

Source: Authors' calculation, see text for details. Notes: N1. Numbers calculated with China Economic Census Yearbook 2004 (NBS, 2006b); N2. Numbers calculated with China Statistical Yearbook (NBS, various years)

Table 5: various adjustment to the The labor share in 2004

	Aggregate	Agriculture	Industry	Construction	Service
(1) 2003: official	0.5362	0.8607	0.4444	0.6810	0.4900
(2) 2004: official	0.4837	0.9222	0.3823	0.5975	0.4098
(3) 2004: adjustment 1	0.6295	0.9222	0.4642	0.6546	0.6794
(4) 2004: adjustment 2	0.5547	0.9222	0.4221	0.6253	0.5411
(5) 2004: adjustment 3	0.4757	0.8654	0.3823	0.5975	0.4098
(6) 2004: adjustment 4	0.5466	0.8654	0.4221	0.6253	0.5411

Source: Authors' calculation, see text for details.

Notes: Adjustment 1 adjusts the labor share in all non-agricultural sectors using operating surplus in individual sector in the official column of Table 4, Adjustment 2 uses operating surplus value of adjusted column in Table 4. Adjustment 3 adjusts the labor share in agricultural sector as explained in the text. Adjustment 4 adjusts the labor share in both agricultural sector and non-agricultural sector.

Table 6: Factor income shares: original and adjusted

	capital share in GDP, N1		capital share in GDP, N2		capital share in GDP net of indirect tax, N2		labor share in GDP		labor share in GDP net of indirect tax	
	original	adjusted	original	adjusted	original	adjusted	original	adjusted	original	adjusted
2003	0.5384		0.3993		0.4638		0.4616		0.5362	
2004	0.5845	0.5305	0.4435	0.3895	0.5163	0.4534	0.4155	0.4696	0.4837	0.5466
2005	0.5860	0.5320	0.4448	0.3908	0.5179	0.4551	0.4140	0.4680	0.4821	0.5449
2006	0.5939	0.5399	0.4523	0.3983	0.5269	0.4641	0.4061	0.4601	0.4731	0.5359
2007	0.6026	0.5486	0.4545	0.4005	0.5335	0.4706	0.3974	0.4514	0.4665	0.5294

Source: Authors' calculation, see text for details

Notes: N1. Capital income includes deprecation of fixed asset, net production tax and operating surplus;

N2. Capital income includes deprecation of fixed asset and operating surplus;

Table 7.1: Sectoral the labor share in GDP net of production tax: 1978-2004

Year	Aggregate,N1	The labor share			
		Agriculture	Industry	Construction	Service
1978	0.5719	0.8945	0.3452	0.7348	0.4769
1979	0.5859	0.8913	0.3487	0.7345	0.4852
1980	0.5822	0.8938	0.3546	0.7149	0.4876
1981	0.5981	0.9075	0.3537	0.7132	0.4898
1982	0.6052	0.9011	0.3558	0.7033	0.4917
1983	0.6057	0.9077	0.362	0.6946	0.4738
1984	0.6087	0.9108	0.3746	0.715	0.4776
1985	0.6014	0.917	0.3854	0.7216	0.4701
1986	0.6037	0.9062	0.3963	0.7413	0.4823
1987	0.5943	0.8961	0.4049	0.7306	0.4668
1988	0.598	0.8927	0.4237	0.7391	0.4719
1989	0.5937	0.8865	0.4396	0.7335	0.4683
1990	0.614	0.8856	0.4663	0.7539	0.4799
1991	0.6014	0.8892	0.4777	0.7569	0.4614
1992	0.5792	0.8869	0.4513	0.7245	0.4589
1993	0.5758	0.8787	0.4744	0.6929	0.4635
1994	0.5842	0.8728	0.4777	0.6822	0.4873
1995	0.591	0.8833	0.4901	0.6945	0.4865
1996	0.5869	0.8879	0.4856	0.6914	0.4826
1997	0.5868	0.8876	0.4923	0.6944	0.4897
1998	0.5858	0.8889	0.493	0.7112	0.4923
1999	0.5772	0.8866	0.4885	0.6935	0.4936
2000	0.5668	0.8792	0.47	0.706	0.5014
2001	0.5604	0.8764	0.4677	0.6976	0.4984
2002	0.554	0.8712	0.4619	0.6803	0.5019
2003	0.5362	0.8607	0.4444	0.681	0.4900
2004,N2	0.5466	0.8654	0.4221	0.6253	0.5411

Notes: N1. aggregate the labor share series are the weighted average of sectoral the labor share, which are not the same as those in Table 2 for statistical discrepancy; N2. We employ Adjustement4 in Table 5 instead of original results.

Table 7.2: Sectoral composition in value-added at factor cost

Year	Sectoral Value-added Share, N1			
	Agriculture	Industry	Construction	Service
1978	0.3242	0.4180	0.0569	0.2009
1979	0.3484	0.4016	0.0563	0.1936
1980	0.3327	0.4034	0.0576	0.2062
1981	0.3527	0.3787	0.0556	0.213
1982	0.367	0.3574	0.0561	0.2195
1983	0.366	0.3524	0.0565	0.2251
1984	0.3551	0.3547	0.058	0.2322
1985	0.3275	0.3629	0.0623	0.2472
1986	0.3205	0.3535	0.0613	0.2647
1987	0.3105	0.3539	0.0612	0.2744
1988	0.301	0.3449	0.0603	0.2938
1989	0.2901	0.3503	0.0531	0.3065
1990	0.3069	0.3215	0.051	0.3207
1991	0.2798	0.319	0.051	0.3503
1992	0.2512	0.3355	0.0579	0.3554
1993	0.2262	0.3622	0.0629	0.3487
1994	0.2299	0.3623	0.0604	0.3473
1995	0.2297	0.3619	0.058	0.3503
1996	0.2254	0.3599	0.057	0.3577
1997	0.212	0.3616	0.0577	0.3687
1998	0.2014	0.3562	0.0614	0.3811
1999	0.1861	0.3548	0.0616	0.3975
2000	0.1704	0.3617	0.0603	0.4076
2001	0.1616	0.3576	0.0597	0.4212
2002	0.151	0.3591	0.0602	0.4298
2003	0.1386	0.3753	0.0621	0.424
2004	0.1423	0.3855	0.0618	0.4104
2005, N2	0.1400	0.3915	0.0563	0.4122
2006, N2	0.1300	0.4010	0.0570	0.4119
2007, N2	0.1291	0.4005	0.0573	0.4132

Notes: N1. value added share are the share of each major sector in GDP net of indirect tax. We obtain sectoral value-added net of indirect tax in the whole nation by the summing across provinces and the aggregate value-added net of indirect tax is the sum across sectors; N2. We assume that the share of indirect tax in GDP by income approach are the same as that in 2004 for each sector and estimate sectoral value-added share for 2005-2007 with GDP by production approach.

Table 8: Decomposition of Aggregate Labor Share with Equation (3.1)

Period	Change in Labor Share	Structural Change Effect	Within-sector Effect	Contribution of The labor share by Sector			
				Agriculture	Industry	Construction	Service
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1978-1979	0.0140	0.0120	0.0020	-0.0011	0.0012	0.0000	0.0019
1978-1980	0.0103	0.0059	0.0044	-0.0002	0.0033	-0.0012	0.0025
1978-1981	0.0262	0.0168	0.0094	0.0046	0.0030	-0.0013	0.0030
1978-1982	0.0333	0.0256	0.0077	0.0023	0.0038	-0.0018	0.0034
1978-1983	0.0338	0.0262	0.0076	0.0047	0.0060	-0.0023	-0.0007
1978-1984	0.0368	0.0216	0.0152	0.0058	0.0104	-0.0011	0.0002
1984-1985	-0.0073	-0.0104	0.0031	0.0014	0.0039	0.0004	-0.0026
1984-1986	-0.0050	-0.0150	0.0100	-0.0011	0.0079	0.0015	0.0016
1984-1987	-0.0144	-0.0191	0.0047	-0.0034	0.0110	0.0009	-0.0038
1984-1988	-0.0107	-0.0237	0.0130	-0.0042	0.0178	0.0014	-0.0020
1984-1989	-0.0150	-0.0308	0.0158	-0.0056	0.0235	0.0011	-0.0033
1984-1990	0.0053	-0.0252	0.0305	-0.0058	0.0332	0.0023	0.0008
1984-1991	-0.0073	-0.0364	0.0291	-0.0050	0.0373	0.0024	-0.0057
1984-1992	-0.0295	-0.0458	0.0163	-0.0055	0.0278	0.0006	-0.0066
1984-1993	-0.0329	-0.0554	0.0225	-0.0074	0.0361	-0.0013	-0.0049
1984-1994	-0.0245	-0.0546	0.0301	-0.0087	0.0373	-0.0019	0.0034
1984-1995	-0.0177	-0.0551	0.0374	-0.0063	0.0418	-0.0012	0.0031
1995-1996	-0.0041	-0.0012	-0.0029	0.0006	-0.0017	-0.0002	-0.0017
1995-1997	-0.0042	-0.0070	0.0028	0.0006	0.0008	0.0000	0.0014
1995-1998	-0.0052	-0.0106	0.0054	0.0008	0.0011	0.0010	0.0025
1995-1999	-0.0138	-0.0166	0.0028	0.0005	-0.0006	-0.0001	0.0030
1995-2000	-0.0242	-0.0231	-0.0011	-0.0006	-0.0075	0.0007	0.0063
1995-2001	-0.0306	-0.0265	-0.0041	-0.0010	-0.0084	0.0002	0.0050
1995-2002	-0.0370	-0.0304	-0.0066	-0.0017	-0.0106	-0.0009	0.0065
1995-2003	-0.0548	-0.0352	-0.0196	-0.0031	-0.0172	-0.0008	0.0015
2003-2004,N1	0.0104	0.0008	0.0096	0.0007	-0.0086	-0.0034	0.0210
2004-2005,N1	-0.0017	-0.0019	0.0003	N.A.	N.A.	N.A.	N.A.
2004-2006,N1	-0.0107	-0.0062	-0.0044	N.A.	N.A.	N.A.	N.A.
2004-2007,N1	-0.0172	-0.0065	-0.0108	N.A.	N.A.	N.A.	N.A.

Source: Authors' calculation and see text for details. Notes: N1. Sectoral labor share in 2004 used in the decomposition is the estimates of adjustment 4 in Table 5.

Table 9: Aggregate Labor Share: Actual vs. Hypothetical

Year	Actual,N1	Fixed Sectoral Labor Share,N2	Fixed Economic S tructure, N3	All Fixed Except for The Labor Share in Industry, N4
	(1)	(2)	(3)	(4)
1978	0.5719	0.5719	0.5719	0.5719
1979	0.5859	0.5840	0.5740	0.5734
1980	0.5822	0.5775	0.5766	0.5758
1981	0.5981	0.5887	0.5810	0.5755
1982	0.6052	0.5976	0.5797	0.5763
1983	0.6057	0.5979	0.5803	0.5789
1984	0.6087	0.5934	0.5885	0.5842
1985	0.6014	0.5819	0.5939	0.5887
1986	0.6037	0.5800	0.5985	0.5933
1987	0.5943	0.5757	0.5951	0.5969
1988	0.5980	0.5727	0.6034	0.6047
1989	0.5937	0.5656	0.6070	0.6114
1990	0.6140	0.5759	0.6213	0.6225
1991	0.6014	0.5649	0.6237	0.6273
1992	0.5792	0.5525	0.6096	0.6163
1993	0.5758	0.5399	0.6157	0.6259
1994	0.5842	0.5407	0.6194	0.6273
1995	0.5910	0.5401	0.6285	0.6325
1996	0.5869	0.5383	0.6271	0.6306
1997	0.5868	0.5327	0.6314	0.6334
1998	0.5858	0.5300	0.6336	0.6337
1999	0.5772	0.5238	0.6303	0.6318
2000	0.5668	0.5160	0.6224	0.6241
2001	0.5604	0.5127	0.6194	0.6231
2002	0.5540	0.5082	0.6151	0.6207
2003	0.5362	0.5014	0.6020	0.6134
2004	0.5466	0.5015	0.6013	0.6041
2005	0.5449	0.4983		
2006	0.5359	0.4931		
2007	0.5294	0.49283		

Notes: N1. weighted average of actual sectoral the labor share using actual value-added share as weights; N2. weighted average of sectoral the labor share in 1978 using actual value-added share as weights; N3. weighted average of actual sectoral the labor share using sectoral value-added share in 1978 as weights; N4. weighted average of sectoral the labor share using value-added share in 1978 as weights, computed with actual the labor share in industry for each year but 1978 the labor share for other sectors.

Table 10: Aggregate labor share: Actual vs. Hypothetical

Year	Hypothetical Aggregate The labor share, N1			
	(1)	(2)	(3)	(4)
1978	0.5218	0.4926	0.4375	0.3727
1979	0.5331	0.5018	0.4426	0.3729
1980	0.5310	0.5010	0.4445	0.3779
1981	0.5389	0.5072	0.4472	0.3767
1982	0.5461	0.5131	0.4507	0.3773
1983	0.5443	0.5114	0.4491	0.3759
1984	0.5480	0.5161	0.4557	0.3847
1985	0.5434	0.5139	0.4582	0.3927
1986	0.5504	0.5215	0.4670	0.4029
1987	0.5459	0.5179	0.4651	0.4030
1988	0.5521	0.5250	0.4738	0.4136
1989	0.5511	0.5250	0.4757	0.4177
1990	0.5694	0.5418	0.4896	0.4282
1991	0.5597	0.5345	0.4869	0.4310
1992	0.5423	0.5197	0.4770	0.4268
1993	0.5444	0.5241	0.4856	0.4404
1994	0.5536	0.5329	0.4939	0.4479
1995	0.5580	0.5374	0.4983	0.4524
1996	0.5536	0.5333	0.4950	0.4499
1997	0.5555	0.5364	0.5004	0.4580
1998	0.5559	0.5378	0.5036	0.4633
1999	0.5500	0.5332	0.5016	0.4644
2000	0.5430	0.5277	0.4987	0.4647
2001	0.5384	0.5239	0.4964	0.4641
2002	0.5343	0.5207	0.4950	0.4648
2003	0.5194	0.5069	0.4834	0.4556
2004	0.5287	0.5159	0.4917	0.4633
Agricultural	0.74	0.65	0.48	0.28

Notes: All series are weighted average of sectoral the labor share using actual labor income of each sector as weights. We employ actual the labor share for non-agricultural sectors and present the hypothetical the labor share in agricultural sector in the last row of the Table.

Table 11: Regression Results

Variables	EST1	EST2	EST3	EST4	EST5
CR10 ($\hat{d}$)		-0.0160***			
HHI ($\hat{d}$)			-0.0465***		
Mkup ($\hat{a}$)	-0.1795***			-0.2788***	-0.2522***
KtY ($\hat{b}$)	0.0011	0.0012	0.0012	-0.0001	-0.0001
req_c ($\hat{\gamma}_x$)	-0.0054***	-0.006***	-0.0060***	-0.0046***	-0.0042***
req_lp ($\hat{\gamma}_x$)	-0.0077***	-0.0094***	-0.0094***	-0.0059***	-0.0059***
req_f ($\hat{\gamma}_x$)	-0.0637***	-0.0698***	-0.0699***	-0.0540***	-0.0493***
req_hmt ($\hat{\gamma}_x$)	-0.0356***	-0.0385***	-0.0385***	-0.0300***	-0.0273***
req_s ($\hat{\gamma}_x$)	0.1259***	0.1205***	-0.1205***	0.1200***	0.1080***
rs_t ($\hat{\gamma}$)	-0.0043***	-0.0042***	-0.0042***	-0.0043***	-0.0040***
D_1999 ($\hat{\theta}_t$)	0.0027***	0.0035***	0.0034***	0.0024***	0.0024***
D_2000 ($\hat{\theta}_t$)	0.0022*	0.0039***	0.0038***	0.0014	0.0011
D_2001 ($\hat{\theta}_t$)	-0.0013	0.0011	0.001	-0.0036***	-0.0044***
D_2002 ($\hat{\theta}_t$)	-0.0072***	-0.0044***	0.0044***	-0.0100***	-0.0111***
D_2003 ($\hat{\theta}_t$)	-0.0139***	-0.0108***	0.0109***	-0.0174***	-0.0190***
D_2004 ($\hat{\theta}_t$)	-0.0005	0.0031**	0.0034**	-0.0055***	-0.0072***
D_2005 ($\hat{\theta}_t$)	-0.0286***	-0.0257***	-0.0255***	-0.0352***	-0.0382***
Constant	0.6556***	0.6042***	0.6004***	0.6888***	0.6793***
D_p	Yes	Yes	Yes	Yes	Yes
D_i	Yes	Yes	Yes	Yes	Yes
Observations	982245	982245	982245	933144	884030
Instruments	94	94	94	94	94
AB(4)-p value	0.382	0.384	0.397	0.43	0.244

Notes: EST4 and EST5 are estimated excluding observations belonged to the 2.5% and 5% tails of the labor share.

Table 12: Estimated movement in the labor share in industry

	Actual,N1	*Estimated*	*Simulated Change from Various Sources, N2*					
	Lsh	*Lsh*	*req_x*	*mkup*	*KtY*	*D_t*	*D_i*	*D_p*
1998-1999	-0.038	-0.0180	-0.012	-0.006	0.000	0.001	-0.001	0.000
1998-2000	-0.075	-0.0620	-0.026	-0.032	0.000	-0.004	-0.002	0.003
1998-2001	-0.083	-0.0670	-0.031	-0.026	0.001	-0.008	-0.006	0.002
1998-2002	-0.074	-0.0550	-0.032	-0.016	0.001	-0.004	-0.002	-0.001
1998-2003	-0.098	-0.0650	-0.039	-0.019	0.000	-0.006	0.001	-0.001
1998-2004	-0.097	-0.0590	-0.040	-0.017	-0.001	0.002	0.001	-0.003
1998-2005	-0.115	-0.0930	-0.047	-0.021	-0.005	-0.019	0.004	-0.006

Notes: N1. Actual the labor share change computed with National Accounts; N2. Simulated result with econometric models by 2-digit industry.

Table 13: Summary of the Decline of Aggregate Labor Share: 1995-2007[N1]

Reasons for the decline in labor share: 1995-2007	Points	Contribution, N2		
	-12.45	**100%**		
1995-2003	**-5.48**	**44.00%**	**100%**	
(1) structural transformation	-3.52	61.31%		
(2) sectoral labor share change	-1.96	38.69%	100%	
(2.1) industry sector	-1.72		77.83%	100%
Of which: SOEs' restructure, N3	-0.68			40%
Increase in monopoly power, N3	-0.33			19%
Other, N3, N4	-0.12			7%
Residuals, N3	-0.58			34%
(2.2)agriculture, construction and tertiary sector	-0.25		22.17%	
2003-2004, N5	**-5.25**	**42.16%**	**100%**	
(1) accounting method	-6.29	120%	100%	
(1.1) individual owners' income	-7.09		113%	
(1.2) state or collective owned farms	0.81		-12.90%	
(2) structural transformation	0.08	-5.33%		
(3) sectoral labor share change, N5	0.96	-14.70%	100%	
Of which: (3.1) agriculture	0.07		14.29%	
(3.2) industry	-0.86		-105%	
(3.3) construction	-0.34		-41.60%	
(3.4) tertiary sector	2.10		232%	
2004-2007, N5	**-1.72**	**13.84%**	**100%**	
(1) structural transformation	-0.65	37.5%		
(2) sectoral labor share change	-1.08	62.5%		

Notes: N1. The aggregate labor share is defined as the labor share in GDP net of indirect tax; N2. We set the decline in the labor share caused by some reason as 100%, and the contribution of each factor of this reason is the percentage share in this decline explained by each factor; N3.We compute the percentage contribution of each factor with the 1998-2003 row of the lower panel in Table 12 and further estimate the percentage points explained by each factor with their contribution and actual decline in the labor share in industry, 1.65; N4. Other factors include restructure among regions and industries, biased technological improvement, relative price change and relative factor input ratio; N5. We use the official aggregate and sectoral labor share for the 2004 estimates.

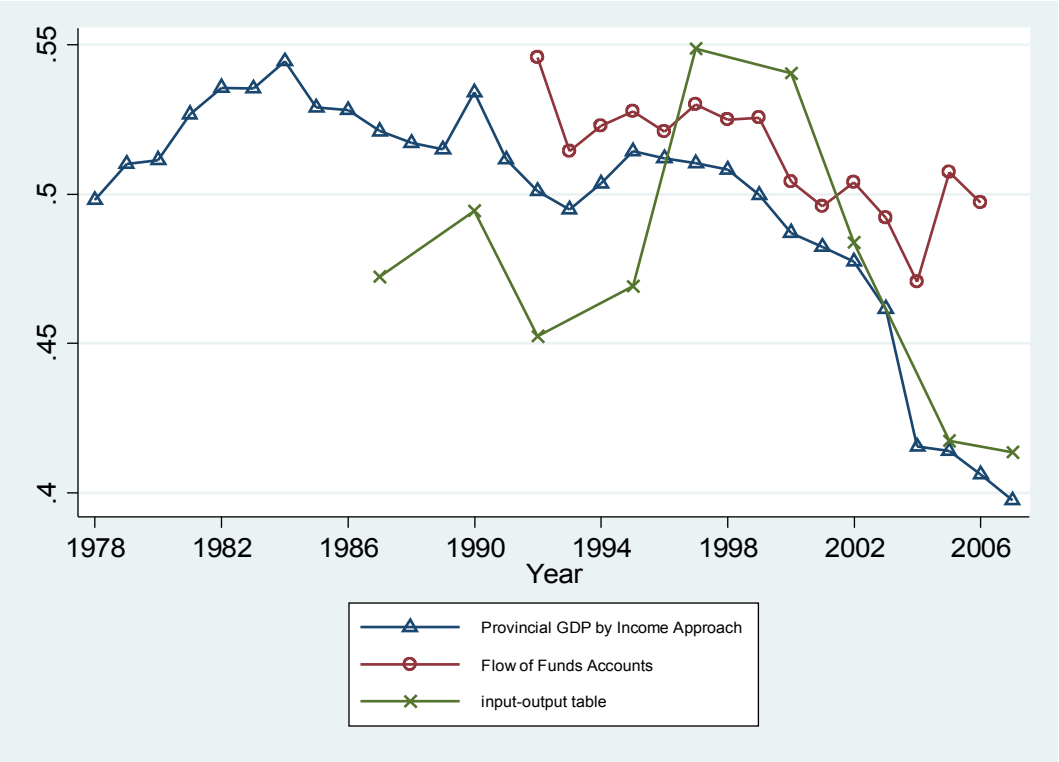


Figure 1: The labor share in GDP: various sources

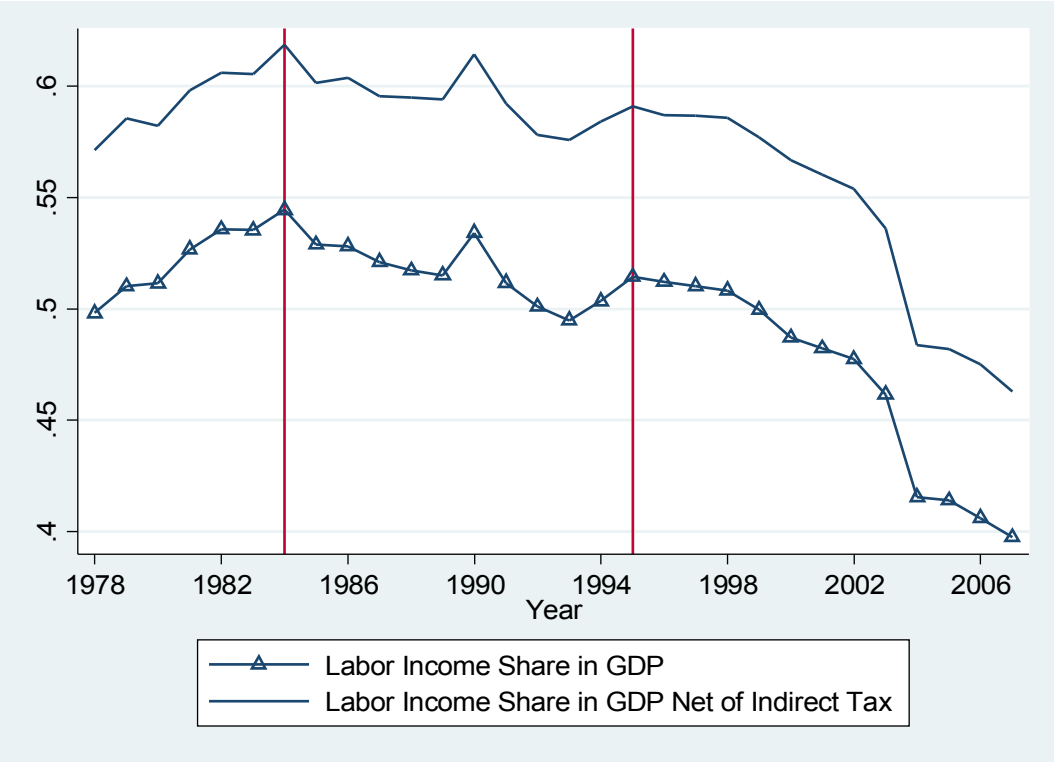
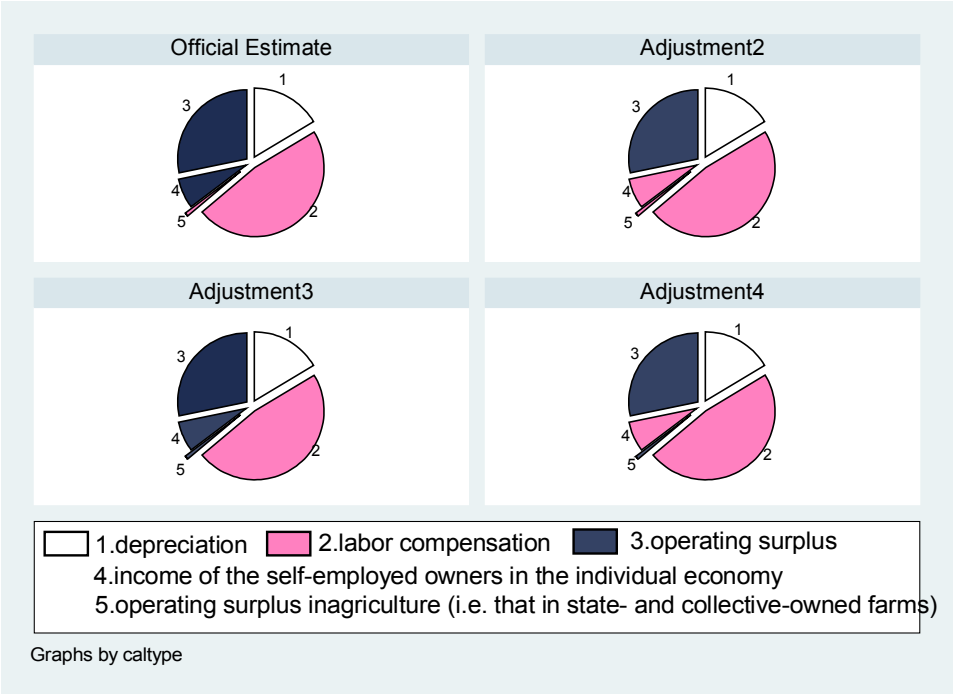


Figure 2: The labor share under Different Definitions



Notes：(1) Official Estimate: labor compensation=2+5; operating surplus=3+4; (2) Adjustment2: labor compensation=2+5+4; operating surplus=3; (3) Adjustment3: labor compensation=2; operating surplus=3+4+5; (4) Adjustment4: labor compensation=2+4; operating surplus=3+5; (5) 4 and 5 are author's estimation, see detailed estimation process in text.

Figure 3：The Factor Income Distribution in 2004: Official and Adjusted

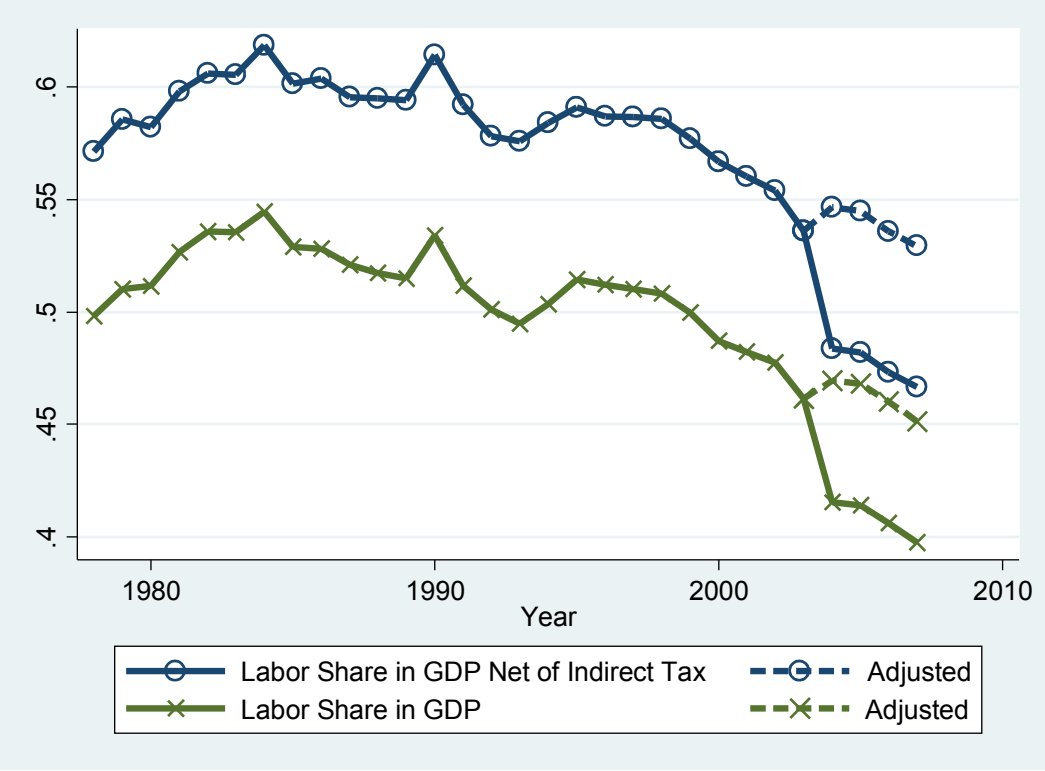


Figure 4: The labor share: original vs. adjusted estimates

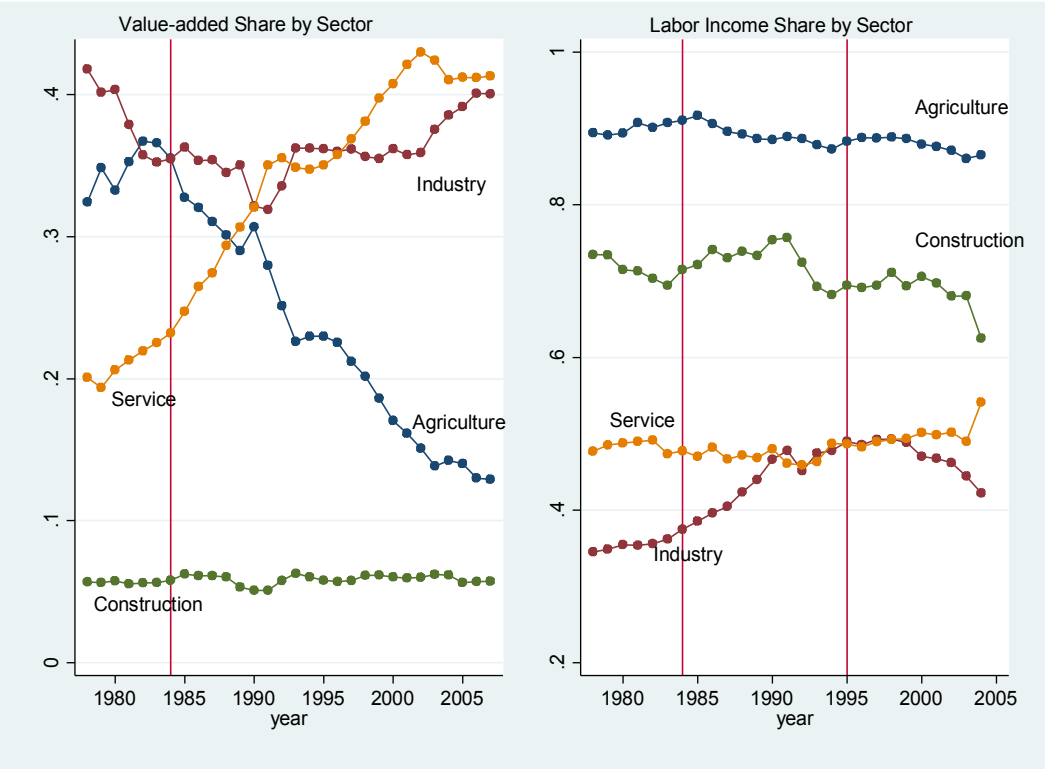


Figure 5. Sectoral Value-added Share and Sectoral The labor share

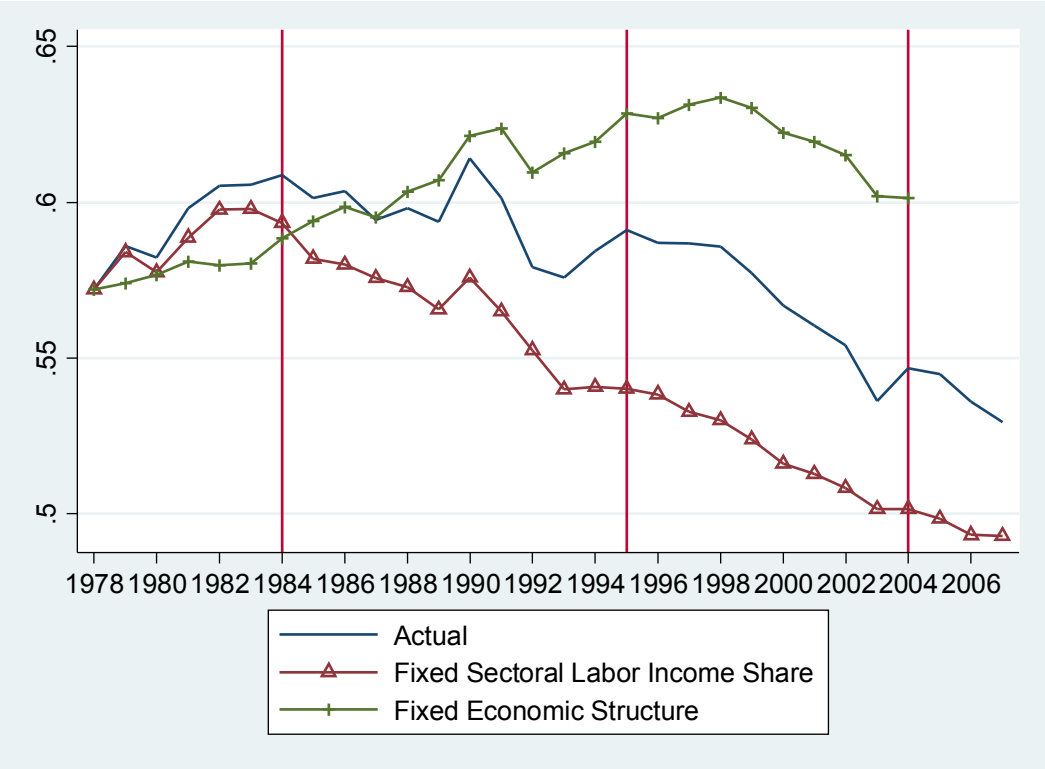


Figure 6. The labor share in GDP Net of Indirect Tax: Actual vs. Hypothetical

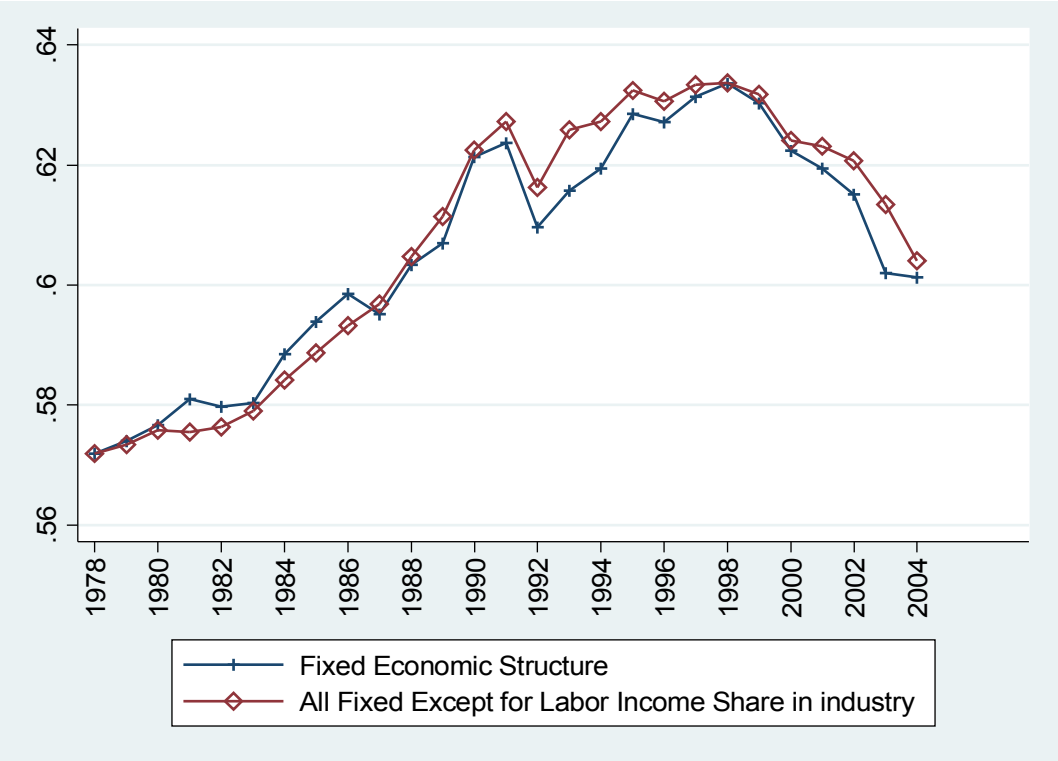


Figure 7: The Dominant Industry Sector in Within-Sector Effect

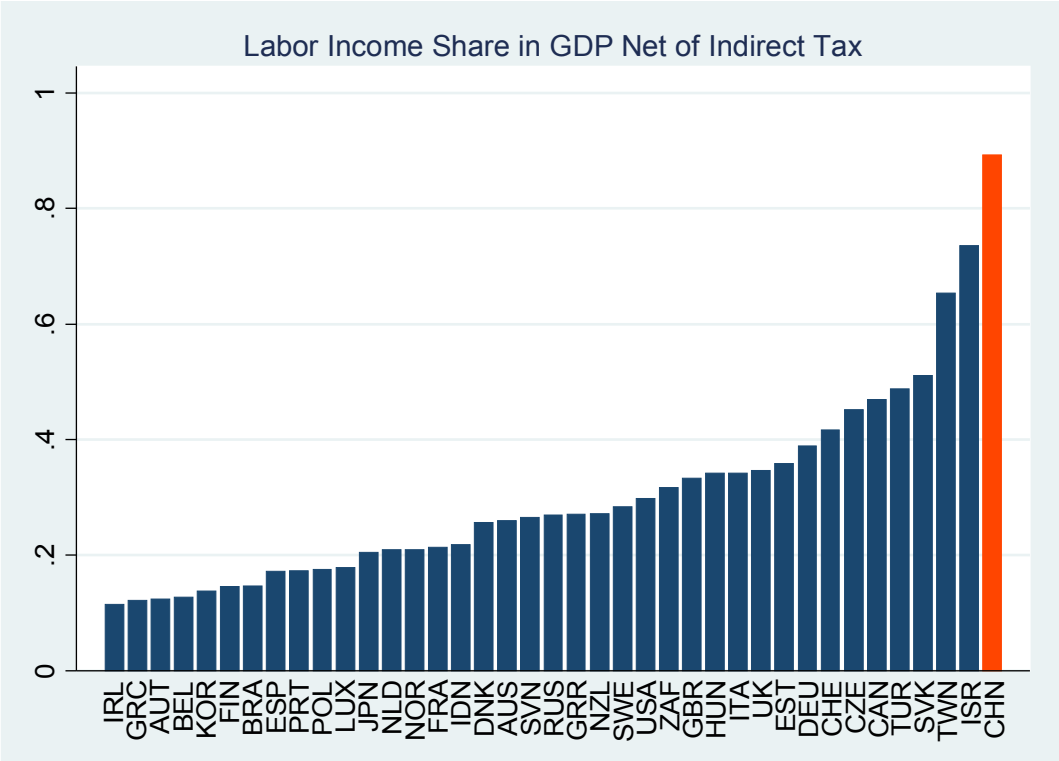


Figure 8: Agriculture Labor Share in GDP Net of Indirect Tax: International Comparison

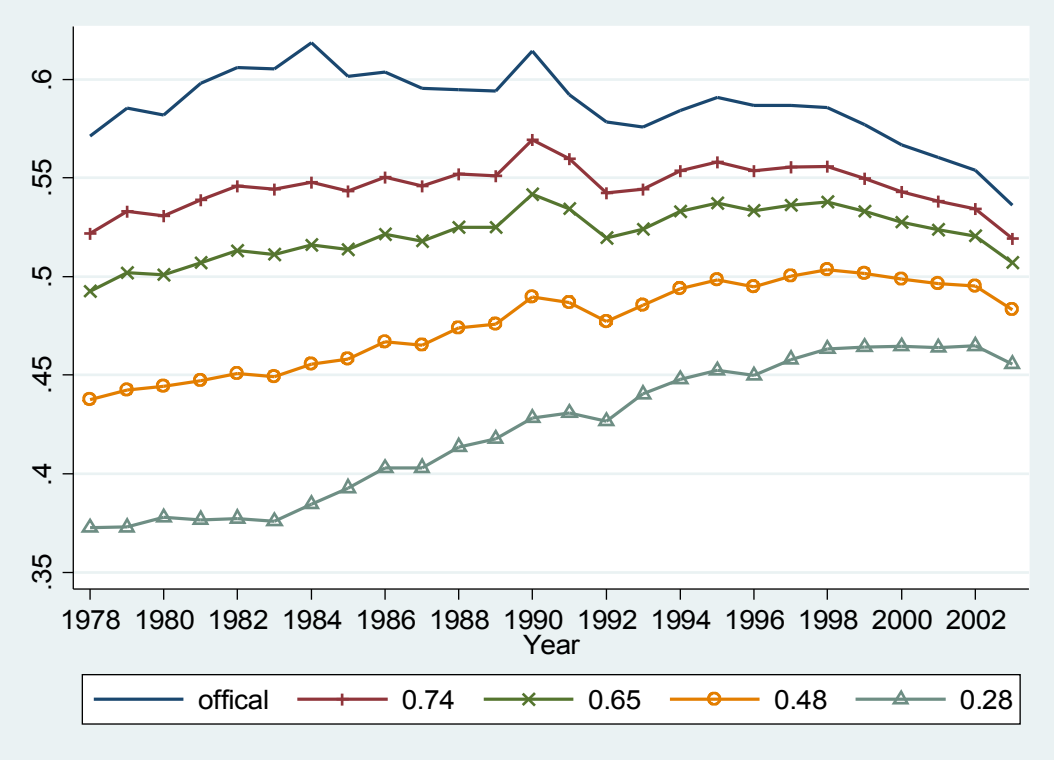


Figure 9: Mixed Income in Agriculture and Its Implications