The Relationship Between The GDP Growth Rate And The Change In The Tertiary Industry In China

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CONTENT

1. Introduction

China has become the world's second largest economy in terms of GDP and China's GDP has continued to grow quickly. The average GDP growth rate was around 12.8 percent and GDP per capita grew from 156 to 8123 US dollars in the period since China's liberalization and opening up from 1978 to 2016. However, China's GDP growth rate is only average 7.1 percent over last five years. Such a growth rate is still impressive but compared with the earlier period of the post-reform era, the growth rate has decreased. At the same time, the tertiary industry has experienced a period of fast development, and the service sector now makes up the largest part of China's GDP.

Many researchers have studied the relationship between labour productivities in different sectors and the growth of GDP. In China, agricultural reform increased productivity and freed labour to move from primary sector to secondary and tertiary sectors, which is a form of expression of the structural transformation. The definition of the structural

change is shift or reallocation the economic resources across three sectors agriculture, manufacturing and services.

The structural transformation in the beginning of China's post-reform period involved labour moving from agriculture to non-agriculture. Maddison (1980) stated that the fall of agriculture's labour share may be associated with a rise and then decline of the manufacturing share and a rise in the service employment share. Today's Chinese structural transformation involves a shift into the service sector. Baumol(1967) believed that the tertiary industry is inherently less productive so that services does not have a larger productivity than manufacturing. Less productivity in service means lower GDP growth rate if the economy moves towards this sector. Therefore, I am wondering that whether exists a relationship between the GDP growth slowdown and the service share in China.

To capture the main idea, I first present a case study of two provinces, Guangxi and Zhejiang, in China. Variables such as GDP per capita and disposable income per capita

show that Zhejiang is more advanced in its development than Guangxi province. In figure 1, we can observe that province Guangxi's GDP growth rate is higher than the GDP

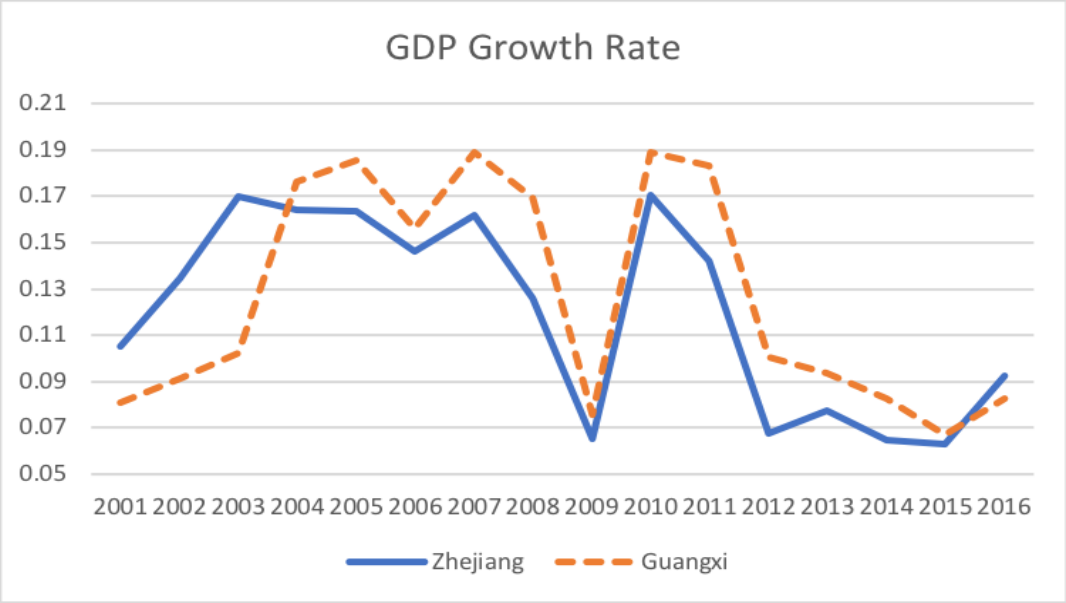

Figure 1

growth rate of Zhejiang province in most years between 2001 and 2016. We can see the tertiary industry share of the two provinces in figure 2. Before 2005, the two provinces have the same service share, but Zhejiang's service sector share increased sharply after 2005 and Guangxi's service share still remained around its previous level. This case study suggests

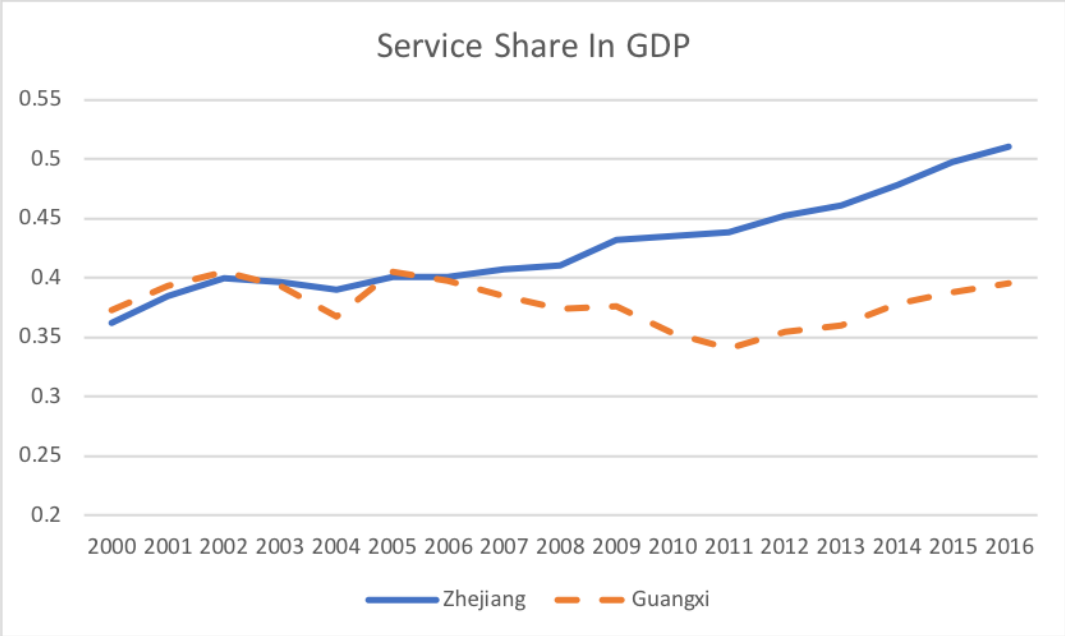

Figure 2

the possibility that the growth rate of China's GDP has a negative relationship with the change in its service sector share of GDP.

Hence, in this paper, I use four steps to suggest that the GDP growth rate in China is negatively related to the change in the tertiary industry share and analyze the relationship between structural transformation and growth. First, I will show Chinese national aggregate trends in share of GDP by sector. Then, at the provincial level, I compare 31 provinces' service share in 2001 and 2016. I next run two sets of regressions using panel

data by province. One is China's GDP on service share(level to level) and the other is GDP growth rate on the change in the share of the service sector(change to change). Finally, I present two simple decompositions to find how the reallocation of labour from manufacturing to services has contributed to the growth of labour productivity.

The figures imply that the tertiary industry has kept increasing as a share of GDP at both the national and provincial level in the post-reform period. At the same time, the share of agriculture in GDP reached its lowest level and the manufacturing share started to decline in recent years. The OLS results show that the development of China's tertiary industry has a negative relationship with GDP growth. My first simple decomposition, based on Brandt, Hsieh and Zhu(2008), shows that movement of labour from agriculture to non-agriculture sectors has led to higher Chinese aggregate labour productivity. But the second simple decomposition implies that the labour reallocation from the secondary sector to tertiary sector has had a negative effect on the growth of labour productivity in China. This is because the output per labour in manufacturing is higher than service.

Therefore, when the share of services becomes larger, China's GDP growth rate may decline.

The paper is organized as follows. In the next section, I document some related literature studying structural transformation and China's sectoral changes from agriculture to non-agriculture. Section 3 describes the data that I use in this paper. In Section 4, I discuss my methodological steps and results. I conclude in Section 5.

2. Literature Review

Numerous scholars have studied structural transformation and some of them have study Chinese structural change in post-reform period. Hence, in this section, I provide some key theories and show how these studies are related to this article.

2.1 Models and Explanations in Structural Transformation

Scholars have used different ways to measure and explain structural transformation. For instance, Herrendorf, Rogerson and Valentinyi(2014) reviewed articles and evaluated recent advances in research about structural transformation. They described structural transformation as a process which is the reallocation of economic resources between the sectors agriculture, manufacturing, and services. Firstly, they showed that the first step of analysis of structural transformation is to build and study one-sector growth models. But they found that the literature has placed too much attention on balanced growth as they believe that exact balanced growth is too strictly . Therefore, they explored a model called multi-sector model and used different ways to measure structural transformation on the production and consumption sides. They argued that such a multi-sector model can give a sharper insights for understanding economic development.

Ngai and Pissarides(2007) use a multisector model to find that if the final goods have a lage difference between each industrial sector, different growth rates of total factor

productivity(TFP) in each sector can predict sectoral employment changes consistently with the facts. Their model contains many consumption goods and one capital good which is produced by the manufacturing sector. In their model, labour moves from low TFP growth to high TFP growth sectors. In a balanced aggregate growth economy, structural changes are toward the high TFP goods. But there is a shift of employment from the high rate of technological progress section toward the lower growth section. Eventually, employment converges to two sectors: capital goods producing sector and the low rate of productivity sectors. In the next section of this paper, I will provide graphs which show how employment changes are related to the structural changes in GDP composition in China. In 2016, China had larger shares in secondary and tertiary industries, which in line with the results in this article.

Labour flow is an important element of in structural transformation. Duarte and Restuccia (2010) used labour productivity to explain the process of structural transformation. They looked at the behavior of GDP per hour in different countries compared with the United

States. They found an interesting catch-up experience in many countries between 1960 and 2004. GDP per hour in those countries rose from about 35% to 75%. They built a panel data set and developed a general equilibrium model of structural transformation. In the model of structural changes, the labour productivity in the secondary industry can explain 50% of catch-up effect. Differences in labour productivity between rich and poor countries are much larger in the agriculture and tertiary industries.

At the same time, McMillan and Rodrik(2011) showed that, during structural transformation, the main engine of development is labour flows from low productivity sectors to high productivity sectors. They gave the example of Latin America, Africa and Asia. In the 1990s, labour moved from high productivity activities to low productivity activities in Latin America and Africa. However, at the same time, Asia countries' productivity performance was much better than that of Latin America and Africa. There, labour moved in the opposite direction. They provided three factors that may affect the direction of structural transformation. Firstly, an economy with abundant primary

resources may have a disadvantage in structural transformation. Second, economies with undervalued currencies may have growth-enhancing structural change. Finally, a more flexible labour market may enhance structural change.

2.2 Post-reform Structural Transformation in China

Most articles on China's structural transformation have researched the period from the 1970s to the 2000s. China is a developing country and in this period of time, China's main structural changes were from the agricultural sector to the nonagricultural sector.

Cao and Birchenall(2013) showed that agricultural productivity has played an important role in China's economic growth in post reform period. First, they found the total factor productivity in agriculture grew about 6.5% and labour input decreased around 4.5-5.5% every year between 1991 and 2009. The growth rate of TFP in agricultural sector was four times larger than in the non-agricultural sector. Second, Cao and Birchenall argued the significance of agricultural related to non-agricultural TFP in contributing to China's

growth and structural transformation during the post reform period. They stated that the reallocation of labour from the primary industry to the secondary and tertiary industries is due to the rapid growth of agricultural productivity. About 35% of labour was still in the agricultural sector, so China still could gain a lot from reallocation and structural transformation.

Dekle and Vandenbroucke(2012) showed that China's structural change from 1978 to 2003 was a reallocation of resources from the agricultural sector to the non-agricultural sector. They built a two-sector neoclassical growth model to evaluate the main driving forces of China's structural transformation between 1978 and 2003. They found that productivity growth in agriculture and nonagriculture enhanced structural transformation. Increases in the productivity in both sectors raised income and lowered the demand for agricultural goods. Labour moved from the primary industry to the secondary industry. They also found another potential driving force of structural changes which is the reduction of the relative size of the Chinese government. In their model, a lower tax rate

increased invention and increased the productivity in nonagricultural sector. At the same time, lower inefficiencies may have increased the income and raised the demand for products from the nonagricultural sector.

Brandt, Hsieh and Zhu(2005) stated that there were two important factors in the structural transformation that helped China to have an impressive growth performance from 1978 to 2004. Firstly, the share of total employment in the agricultural sector decreased from 69 to 32 percent in that period. There was a labour flow from low productivity sectors to high productivity sectors. They confirmed that the growth rate of labour productivity in agricultural sector was higher than that of in nonagricultural sectors. The increasing productivity in primary industries released the labour force and led to labour reallocation. They made a simple decomposition and concluded that reallocation across the sectors helped lead to growth. The reallocation of labour contributed about 24.6% of growth in labour productivity between 1978 and 2004. Secondly, the authors developed a dynamic three-sector model that helped to find the role of the difference of TFP across sectors and

the shift of economic activities from farming. They showed that there was a transformation or reallocation of labour and other resources from state-owned enterprises(SOEs) to enterprises outside the state sector. Reducing the size of SOEs increased the growth of aggregate labour productivity and cross-provincial data revealed the negative impact of state sector on growth.

2.3 The Productivity of Service and The Growth Rate of Output

Baumol(1967)'s points may give us the reason that the increasing weight of service section make the growth rate of GDP slow down since tertiary industry does not have a larger productivity than secondary industry. There are a number of services in which the labour is an end in itself, and the quantity or productivity is strongly decided by the amount of labour. He mentioned teaching as a clear-cut example. Only one teacher can teach in the class, and therefore, class size reflects the quantity of teaching. Despite the invention of teaching technology, the productivity of teaching may still be limited to the class size. Moreover, in the author's unbalanced productivity model, he stated that more

and more labour force must be transferred to the non-progressive sector when the outputs of two sectors is held constant.

Baumol(1967) also argued that secondary industry is likely to continue to decline in relative cost and does not need a large number of labour, which makes it more difficult for the economy to maintain its overall growth rate of output. In this paper, when the ratio of output between service and non-service sector at the same level, labour force moved from non-service to service and service has lower productivity than manufacturing. The share of service in China's GDP may therefore be negatively related to growth rate of aggregate output.

3. Data and Descriptive Statistics

In this paper, I use data from the China Statistical Yearbook(CSY) between 2001 and 2017, which is a publication cataloguing the overall national economy and social development. The subnational administrative divisions of China include three levels: the

provincial (province, autonomous region, municipality, and special administrative region), county, and township level. In this paper, we will use data in national and provincial levels. There are 31 provinces in the data, since the Yearbook does not include the Hong Kong Special Administrative Region, the Macao Special Administrative Region and Taiwan Province.

We divide the economy into three sectors: primary(agriculture), secondary(manufacturing) and tertiary(service). I use data on the GDP of each sector, calculated at current prices, and the labour employed in each sector, from 2000 to 2016. I also calculate the labour productivity across the three sectors from 2000 to 2016. The labour productivity of year t is calculated as the GDP of sector i divided by the total labour in sector i.

Here I summarize the data in three categories: GDP, number of employed individuals and labour productivity (the quotient of these two variables). I show the average across years of the China-wide values of the data in the period from 2000 to 2016.

	Average	**2000**	**2016**
National Level			
GDP	358400.3176	100280.1	744127.2
Total Employed Persons (10 000 persons)	75353.70588	72085	77603
Labour Productivity	4.594848149	1.39113685	9.58889734
Primaiy Industry			
GDP	35220.27647	14717.4	63670.7
Total Employed Persons (10 000 persons)	29748.05882	36043	21496
Labour Productivity	1.283067925	0.40832894	2.96197897
Secondary Industry			
GDP	158631.7353	45664.8	296236
Total Employed Persons (10 000 persons)	19893.47059	16219	22350
Labour Productivity	7.444178401	2.81551267	13.2544072
Tertiary Industry			
GDP	164548.3176	39897.9	384220.5
Total Employed Persons (10 000 persons)	25712.11765	19823	33757
Labour Productivity	5.802075295	2.01270746	11.3819504

Table 0

4. Results

In this section, I will show evidence that China's rising GDP share of service sector has had a negative effect on GDP growth rate in four steps. I will look at aggregate total as a share of GDP, provincial level trends, regression evidence and two simple decompositions.

4.1 Aggregate Totals As Share of GDP

In the post-reform period, starting in 1978 in China, China has had a tremendous GDP growth rate in the 1980s, 1990s and early 2000s. During the structural transformation from 1980s to 2000s, economic resources relocated from agricultural sector to the non-agricultural sector. Such reallocation helped make China become the fastest growing country in that period. From figure 3, we can observe that the average growth rate of GDP is lower than 10% in the most recent decade, still higher than most of developed countries, but the one of the lowest periods since 1978. Moreover, the service sector has

taken over largest share of GDP in recent years. In figure 4, we can see that the tertiary industry contributes to the largest part of China's GDP as of around 2012. The secondary

Figure 3

industry had always be the most significant sector in GDP in the post-reform period, but the share of manufacturing sector is slightly below than 0.4 as of 2016.

Figure 4 shows that in the structural transformation in China from 2000 to 2016, economic activity and labour reallocated from the nonservice sector to the service sector. The labour reallocation will be shown in the next section. The share of the service sector

in China's GDP has been increasing over the a long term and 2012 is a notable year in which the service sector became the biggest part of GDP and 36.1% of employed

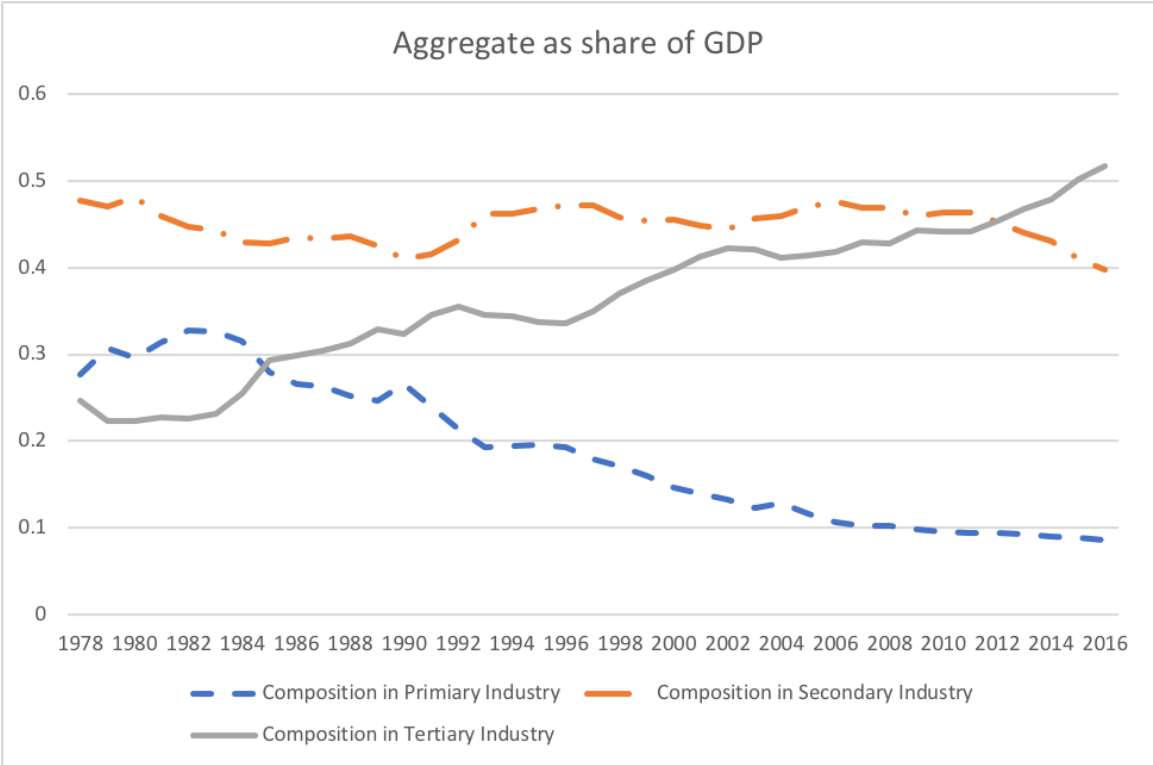

Figure 4

labour was in the service sector or related to the service sector.

4.2 Provincial Level Trends

From 2001 to 2016, every province in China experienced a sharp increase in their GDP. At the same time, the tertiary industry increased its weight in provinces' GDP as well.

Figure 5 reflects a comparison in share of tertiary industry for 31 provinces in China

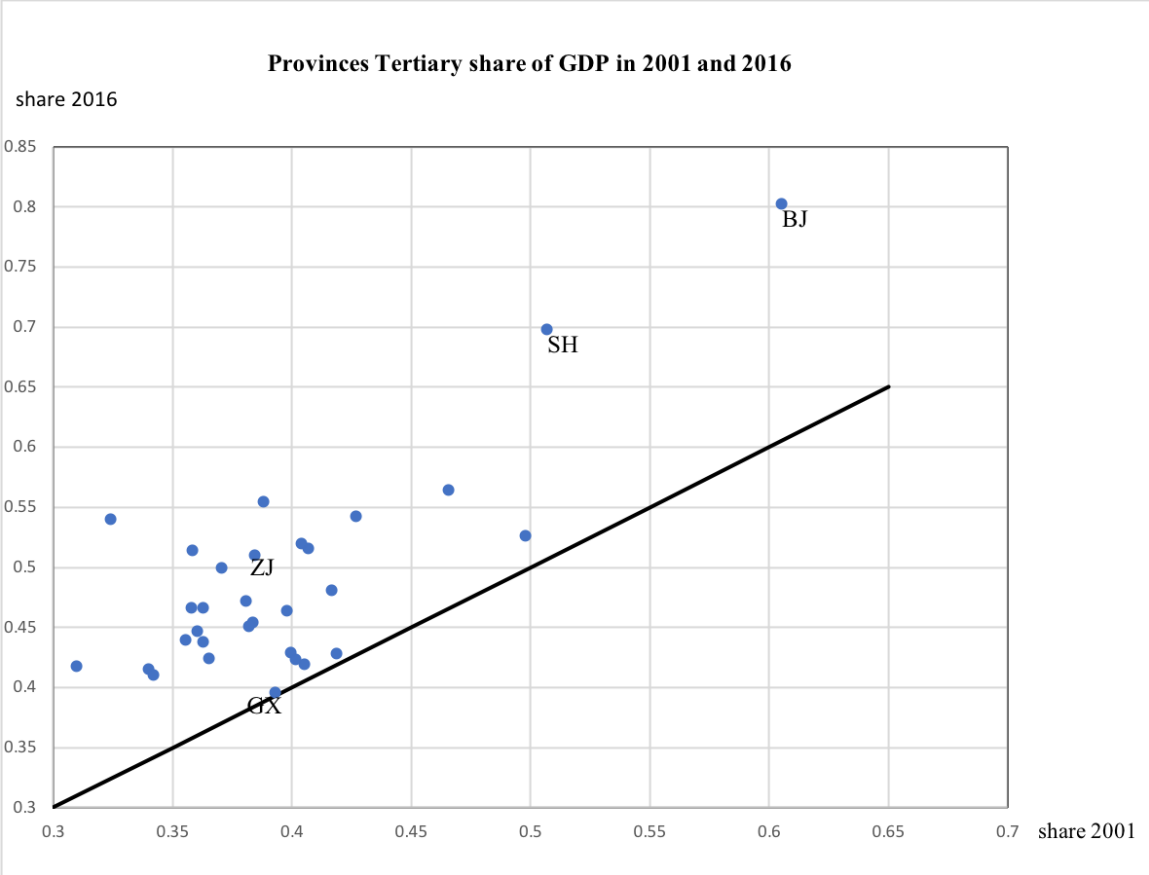

Figure 5

between 2001 and 2016. In figure 5, the black line is the 45 degree line. We can observe that most provinces increased their service sector share in these16 years since most of the points are above the 45 degree line. We also can see the points: Zhejiang(ZJ) and Guangxi(GX) that we discussed in the introduction section. Zhejiang and Guangxi had

the same level of tertiary share in 2001, but the weight of services in Guangxi, lying on the 45 degree line, did not change much.

Therefore, the growth rate of national GDP is decreasing and China achieved a higher share of tertiary industry in recent years. But this occurred at different rates in different provinces. I would like to take advantage of this heterogeneity to run some regressions exploring the relationship between the size of the service sector and China's GDP growth rate.

4.3 Regression Evidence

I now examine the relationship across provinces between of China's GDP growth rate and the share of the service sector. Thus, I will provide two regressions which relate GDP(growth) to share of services. The first regression related ln(GDP) to service share(level to level). The second one relates GDP growth rate to the change of service share(change to change).

First equation:

$$\ln(GDP_{it}) = \beta_0 + \beta_1 service\ share_{it} + \alpha_t + \gamma_i + \mu_{it} \qquad (1)$$

This equation means that the logarithm of GDP_{it} is related to the provincial service share in GDP in year t at province i. I will run the regression with both province and year fixed effects, so I will use within-province variation, net of year by year means across provinces, to estimate β_1. The error term is μ_{it}. I will provide empirical results for OLS estimates.

Table 1. Regression result of ln(GDP) on the service share

Variables	Include Outliers (1)	Without Outliers (2)
Services share	-1.019**	-1.171***
	(0.447)	(0.39)
constant	8.048***	8.061***

	(0.182)	(0.153)
$\boldsymbol{R^2}$	within = 0.985 between = 0.016 overall = 0.351	within = 0.986 between = 0.180 overall = 0.358
Observations	Number of obs = 527 Number of groups = 31	Number of obs = 493 Number of groups = 29

Note: 1) Robust standard errors are clustered by province.

2) * p<0.1; ** p<0.05; *** p<0.01

Table 1 shows the relationship between the growth rate and share of service sector. In column 1, the marginal effect sign of service share is negative, and the coefficient value is -1.019 which is significant at the 5% level. Controlling for province and year fixed effects, an increase in one percentage point of service share is associated with a 1.02% decrease in the province's GDP. The coefficient reflects that the share of service sector is negatively related to the GDP growth rate.

At the same time, I also consider that some large major cities such as Beijing(BJ) and Shanghai(SH) in figure 4 already had over 50% service share and high GDP since the 2000s, and these cities may influence the OLS results. Therefore, I put Beijing and Shanghai as two outliers and recalculate the regression. Table 1 column 2 shows that the sign of marginal effect is not much change and it is now statistically significant at the 1% level, so the OLS result becomes more precise.

Second equation:

$$GDP\ \ growth\ \ rate_{it}\ \ = \beta_0 + \ \ \beta_1\ \ \Delta service\ \ share_{it} + \alpha_t + \gamma_i + \mu_{it} \qquad (2)$$

In this regression, $\Delta service\ \ share_{it}$ means the change of the share of services in GDP in year t at province i. This regression could reflect the relationship between the provincial GDP growth rate and the share of the tertiary industry. Equation (2) also controls for year and province fixed effects.

Table 2. Regression result of the change in GDP growth rate on service share		
	Include Outliers	Without Outliers
Variables	(1)	(2)
ΔServices share	-0.136*	-0.14*
	(0.07)	(0.073)
constant	0.095	0.094
	(0.004)	(0.005)
$\boldsymbol{R^2}$	within = 0.626	within = 0.654
	between = 0.250	between = 0.266
	overall = 0.592	overall = 0.618
Observations	Number of obs = 496	Number of obs = 464
	Number of groups = 31	Number of groups = 29

Note: 1) Robust standard errors are clustered by province.

2) * p<0.1; ** p<0.05; *** p<0.01

Table 2 shows the OLS results of second equation, which show that GDP growth rate is still negatively related to the service share. In table 2 column 2, dropping outliers does not change the result of the regression since the coefficient value only slightly decreases.

Hence, I use two directions to examine the fixed effect regression specifications and both methods give me the same point of view that when Chinese provinces increase the share of tertiary industry in the structural transformation period , the growth rate of their GDP slows down.

4.4 Simple Decomposition

Having shown the negative relationship between the tertiary share and the GDP growth rate across provinces, I would like to find out whether aggregate in labour productivity has been affected by structural transformation. Since there has been labour reallocation

and there is a difference in labour productivity in different sectors, I will calculate two simple decompositions to verify the effects of this reallocation between sectors.

Brandt, Hsieh and Zhu(2005) showed a simple decomposition in their article based on a weighted average of productivities in the two sectors:

$$y_t = y_{at} l_{at} + y_{nt}(1 - l_{at}) \quad (3)$$

Where y_t, y_{at}, and y_{nt} are labour productivities in three sectors: aggregate, agriculture, and non-agriculture, respectively, in year t, and l_{at} is agriculture's share of the total labour force in year t. We could express equation (3) to be:

$$dlny_t = \left(\frac{y_{at} l_{at}}{y_t}\right) dlny_{at} + \left[\frac{y_{nt}(1 - l_{at})}{y_t}\right] dlny_{nt} + \left[\frac{y_{nt} - y_{at}}{y_t}\right] dl_{at} \quad (4)$$

Here d denotes the rate of change and ln means logs. Brandt, Hsieh and Zhu(2005) only compared the agricultural sector and the nonagricultural sector since they considered the

structural transformation in earlier period of China post-reform to be mainly labour force reallocation from agricultural sector to manufacturing and service sector. Here is the labour reallocation results that they achieved reproduced in table 3.

Table 3. Simple growth decomposition: contribution of each source to growth	
	1978-2004
Aggregate	100
Output per worker in agriculture	27.30
Output per worker in nonagriculture	48.01
Reallocation	24.60

Source: see text.

However, in figure 6, we can observe that a large part of the labour force still reallocated between sectors in China from 2000 onwards. In this period, secondary and tertiary industry still gained labour from the primary industry. Therefore, I will continue the work of Brandt, Hsieh and Zhu(2005), but I extend the time period from 2000 to 2016, which shows that there still exist a positive effect on GDP from labour reallocation from agriculture.

Figure 6

Table 4. Simple growth decomposition: contribution of each source to growth

	2000-2016
Aggregate	100
Output per worker in agriculture	15.06
Output per worker in nonagriculture	72.08
Reallocation	12.86

Table 4 explains that China's growth output per worker in agriculture and non-agriculture contributed 15.06 percent and 72.08 percent to the growth in total labour productivity, while reallocation of labour from agriculture to non-agriculture contributed 12.86 percent of growth in output per worker. So the contribution of growth of in agricultural labour productivity becomes smaller compared with Brandt, Hsieh and Zhu(2005)'s work, while manufacturing and services productivity growth contributed almost three-quarter of output per worker growth.

Secondly, I examine another simple decomposition which considers non-agriculture only and calculate the role of labour reallocation between manufacturing sector and service sector in growth of non-agricultural labour productivity. The weighted average of productivities in the two sectors is:

$$y_{nonagr} = y_{mt} l_{mt} + y_{st}(1 - l_{mt}) \quad (5)$$

Here y_{nonagr}, y_{mt} and y_{st} are labour productivities in: non-agriculture, manufacturing and service, respectively, in year t, while l_{mt} is manufacturing's share of the total labour force in year t. I express equation (5) as equation (6):

$$dlny_{nonagr} = \left(\frac{y_{mt} l_{mt}}{y_{nonagr}}\right) dlny_{mt} + \left[\frac{y_{st}(1 - l_{mt})}{y_{nonagr}}\right] dlny_{st} + \left[\frac{y_{st} - y_{mt}}{y_{nonagr}}\right] dl_{mt} \quad (6)$$

Where d denotes the rate of change and ln means logs. Table 5 implies that output per worker in manufacturing and services contribute 50.67 percent and 58.54 percent of

growth output per worker, which indicates that reallocation has an negative sign. Such reallocation

Table 5. Simple growth decomposition: contribution of each source to growth	
	2000-2016
Aggregate	100
Output per worker in manufacturing	50.69
Output per worker in service	58.54
Reallocation	-9.23

means that labour flow from manufacturing to service contribute about -9.23 percent of output growth. Therefore, non-agricultural labour reallocation has negative effects on labour productivity. In figure 7, I also graph the non-agriculture labour productivity alongside GDP from 2000 and 2016, which shows that these are closely positively related to each other.

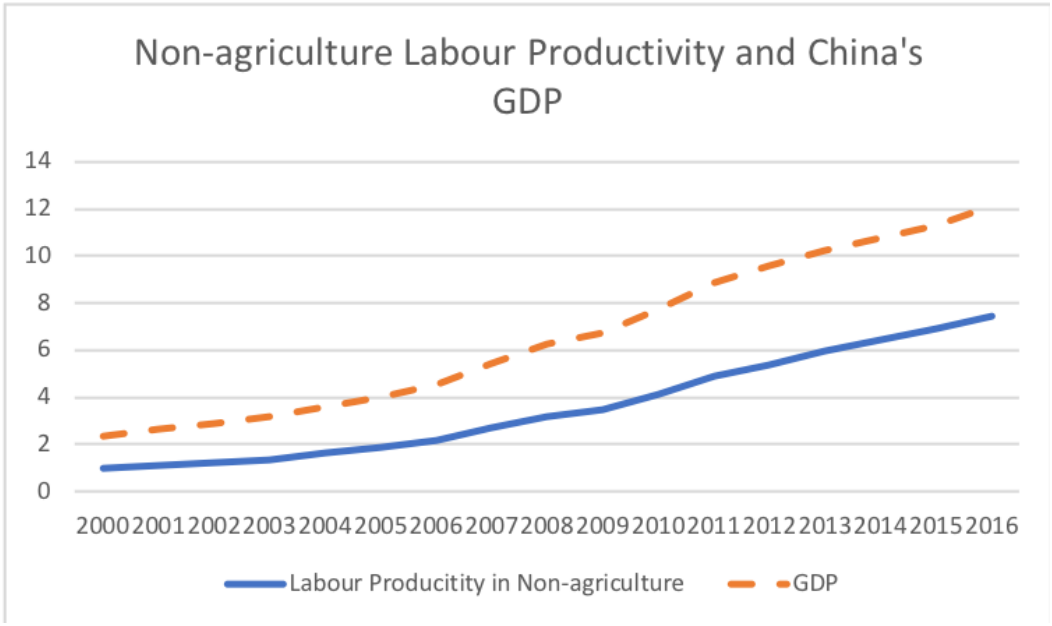

Figure 7

The second simple decomposition tells us that reallocation across these sectors is negatively associated with growth in non-agricultural GDP. To build on these results, I estimate another fixed effect regression, about the tertiary share and China's manufacturing and service GDP:

$$\ln(M\&S\ \ GDP\ _{it}) = \beta_0 + \ \beta_1\ service\ \ share_{it} + \alpha_t + \gamma_i + \mu_{it} \qquad (7)$$

Here, $M\&S\ GDP_{it}$ indicates the GDP of Chinese manufacturing and services in province i in year t as the dependent variable and $service\ share_{it}$ means the share of tertiary industry at province i in year t. Table 6 gives the OLS results.

Table 6. Regression result of the non-agricultural GDP on service share

	Include Outliers	Without Outliers
Variables	(1)	(2)
Services share	-1.211**	-1.301**
	(0.506)	(0.516)
constant	7.92	7.896
	(0.207)	(0.204)
$\boldsymbol{R^2}$	within = 0.983	within = 0.984
	between = 0.009	between = 0.168
	overall = 0.353	overall = 0.366

Observations	Number of obs = 527 Number of groups = 31	Number of obs = 493 Number of groups = 29

Note: 1) Robust standard errors are clustered by province.

2) * p<0.1; ** p<0.05; *** p<0.01

The OLS regression gives the results that an increasing share of tertiary industry has negative consistent with manufacturing and service GDP. Column (1) shows that the coefficient value is -1.233 and it is significant at the 5% level. Controlling for province and year fixed effects, increasing tertiary share by one percentage point, nonagricultural GDP in the province would decrease by 1.21%. Column (2) coefficient value, without outliers, does not change the results.

The results from simply growth decomposition shows that labour flow from the secondary industry to the tertiary industry is responsible for the slower growth in labour productivity in the non-agricultural sector, since the labour productivity in manufacturing sector is higher than service sector. This provides a reason why when the share of service increases, GDP growth rate decreases.

5. Conclusion

In this paper, I have shown that there is an negative relationship between China's GDP growth rate and the change in the tertiary industry share of GDP across provinces from 2000 to 2016. In a decomposition exercise, I have also showed that reallocation of labour from manufacturing to services has had a negative effect on labour productivity growth with the non-agricultural sector.

I have provided figures showing that the share of China's tertiary industry has risen in the most recent decade at the national and provincial levels. On the contrary, the growth rate of GDP has declined in the last 5 years. I have created two regressions and the OLS results show that the GDP growth rate is negatively related to the change in service share across provinces. Simple decompositions also support the results of OLS, in the sense that because labour productivity in manufacturing is higher than the labour productivity

in service, the labour flow from manufacturing to services has led to slower non-agricultural growth.

In this research paper, the time range mainly is from 2000 to 2016, and I believe that China is still in the process of structural transformation. Therefore, for the further study, I would like to take a larger database and recalculate the regression and simple decompositions in future. Many other reasons can cause the decreasing GDP growth rate not only the labour allocation between sectors. These other causes are good topics for future research.

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