Economic Growth Goal and Labor Productivity: Theoretical and Empirical Analysis

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Abstract: Based on the provincial panel data of 30 provinces in China from 2003 to 2020, this paper studies the relationship between economic growth goal and labor productivity by using the double fixed effect model. The results show that the economic growth goal significantly inhibits labor productivity. The moderating effect shows that the interaction between financial pressure and economic growth goal is significantly positive, which means the interaction between financial pressure and economic growth goal can promote the growth of labor productivity.

Key words: Economic growth goal; Labor productivity; Financial pressure.

1. Introduction

Labor productivity especially refers to the relationship between the output generated by work and labor consumption in each period. Output is usually measured by two indicators: yield and output value, which are affected by supply efficiency and demand value respectively. Labor productivity is a key indicator to measure the level of economic development in a country or region. Since the reform and opening up, China's traditional industries have greatly improved the labor productivity by relying on the advantages of cheap labor force and resources. However, as the population ages, the cost of factors of production increases significantly. Industry, especially the manufacturing industry, is gradually losing its competitive advantage and falling into a low-end development dilemma. The 19th plenary session of the Party pointed out that high-quality economic development must be based on the improvement of the quality and efficiency of economic growth. Raising labor productivity has become an important means of high-quality economic growth. Therefore, in the context of irreversible population aging and the uncertain impact of the digital economy, improving labor productivity is an important driving force for industrial transformation and modernization. Industrial industry is the basic industry to support China's economic development, and the transformation and modernization of industrial structure are directly related to the optimization of the internal structure of the economy and the transformation of the development momentum, which are crucial to the high-quality development of China's economy and society.

At the beginning of each year, the central government of China and the people's governments all over the country will work out the economic growth goal and the range of the goal for that year in the *Government Work Report*. Economic growth goal refers to the government officials' reasonable forecast and prospect of the national economic growth in the current year. The development and completion of the economic growth goal not only explain how China's economy and society transition from high-speed growth to a sustainable, green and efficient direction, but also serves as an important policy orientation to promote the sound development of China's economy and society in the future. As China's economic growth goal has been changing for a long time and has undergone a gradual transition from the overall national macro-control strategy goal to the expected economic growth control goal of the national economic strategy, the gradual transition of the relationship between the intrinsic goal and the policy nature takes place in order to slow down economic growth and prepare for efficient economic development. After China's economic and social development was basically stable, it began to rely on the national economic growth goal to stimulate the development of the national economy. The Sixth Five-Year Plan first proposed the production growth goal of workers and peasants on an experimental basis. The Seventh Five-Year Plan first proposed the annual economic growth goal of gross domestic product (GDP). During this process, and during the

development planning process at this stage, Party organization leaders and other government leaders in China have also proposed the formulation of a "three-step" national economic development goal and have always adhered to and continuously revised and supplemented it. They have supplemented the five-year plan goal with the annual national economic development goal in the government work report, and have gradually established a short-, medium-and long-term goal framework for national economic development. The economic growth goal of "development is the absolute principle" has promoted the economic growth rate of China. Since the reform and opening up, this goal has been in the role of a big power and a high-power engine that has pushed China from an underdeveloped agricultural country to an industrial power integrating socialism with modernization. Therefore, the rapid economic growth of China is also considered as an economic growth miracle driven by the economic growth goal. However, in recent years, the overall economic growth goal has shown a downward trend.

This empirical study focuses on the use of provincial panel data in China, and makes an in-depth analysis on the impact of economic growth goal on labor productivity. The main contributions of this paper are as follows: Firstly, the impact of financial pressure and marketization on China's labor productivity is comprehensively investigated. On this basis, the interaction between financial pressure and marketization is introduced to explore the impact of the interaction between financial pressure and marketization on labor productivity. The domestic research on financial expenditure and labor productivity is relatively few and the research perspective is relatively novel. Secondly, the high-speed economic development may cause the loss of labor productivity. At the same time, this paper provides some data to prove it, and carries out the corresponding robustness test to make the research conclusion robust and reliable.

2. Literature Review

The improvement of labor productivity is the core factor of economic growth (Qi Mingzhu, 2013), and the direct driving factor of economic growth is also labor productivity (Li Jingbo et al., 2020). Experts at home and abroad have different views on the factors affecting labor productivity and have certain achievements. In this paper, some foreign and domestic literature are summarized as a reference and basis for this article.

2.1 Physical Capital and Human Capital

Based on Solow's growth model: Robert M. Solow (1968) was the first person to decompose the contribution of economic growth into the combined effects of capital, labor and technological growth. In the endogenous growth theory, human capital is crucial to improve labor productivity, which in turn affects long-term economic growth. For example, Spiegel (1994) studied the data of long-term labor productivity growth by using transnational data, established a regression model by using endogenous economic growth theory, and found that the accumulation of material capital and human capital can significantly improve labor productivity. Zhao Wenjun (2015) introduced the labor productivity division of different provinces in China from 1990 to 2012. The results show that human capital and physical capital play an important role in the rapid growth of labor productivity in our province, among which physical capital plays a more important role. Simone (2015) analyzed the factors that affected the overall and interregional labor productivity in Italy from the 1980s to 2006, and found that physical capital and human capital played an important role in labor productivity.

2.2 Fiscal Expenditure

Domestic and foreign scholars do not study the factors that affect the labor productivity profoundly, or only focus on the specific expenditure of a certain aspect. Hansson and Henrekson (1994) studied the relationship between government expenditure and labor productivity and economic growth by using the data of several countries and industries from 1970 to 1987, and concluded that the portion of government expenditure spent on consumption has a negative impact on productivity, while the

government expenditure on education has a positive impact on productivity. The research conclusions of Jiang Yucheng and Jia Tingyue (2020) found that compulsory education and secondary education can have a positive impact on labor productivity. Meanwhile, scholars have found that increasing investment in public education can in turn improve labor productivity (Cai Guowei and Liu Jianxiong, 2014), and increasing investment in education to enhance human capital are important measures to accelerate economic development and promote productivity improvement (Gao Chunliang and Li Shantong, 2019).

2.3 Industrial Structure

Wang Liying and Liu Houping (2010) analyzed the impact of changes in industrial structure on labor productivity based on the data of nearly 10 years from provinces and regions in China. The study found that the adjustment of industrial structure in each province has a positive effect on the improvement of labor productivity in the past 10 years. By comparing the total labor productivity of China and India, it is found that the main reason why the total labor productivity of China is higher than that of India is that the labor productivity of primary and secondary industries is higher than that of India (Yang Tianyu, Liu He He, et al., 2012). Wang Zhenhua (2018) used the data analysis of 285 cities in China. The results show that the relationship between labor productivity and the ratio of secondary and tertiary industries is not simply increasing or decreasing, but showing a positive relationship at the beginning, and becomes negative with the passage of time.

2.4 Impact of The Economic Growth Goal

As Xu Xianxiang et al. (2018) proposed, through the analysis of the provincial panel data, it is found that setting a higher economic growth goal will lead to the inhibition of high-quality economic development, and will have a negative impact on the enhancement of urban economic resilience. Based on the analysis results of the prefecture-level cities in China, it is found that the promotion effect of economic growth goal on the local actual economic growth is mainly reflected in the period of economic decline, while this positive effect is not significant in the period of economic growth (Li Shujuan and Xu Xianxiang, et al., 2021). The guidelines in the economic growth goal can indirectly promote economic growth, increase the speed and scale of economic growth and achieve or even exceed the economic growth goal by promoting the concentration of resources allocation, expanding local or regional investment (Liu Shulin et al., 2019), attracting foreign investment and introducing foreign enterprises (Huang Liangxiong et al., 2021). In the meantime, the restriction on the economic growth goal will lead to unbalanced and even distorted resource allocation, which will have a negative impact on the upgrading of the industrial structure, thus affecting the quality of economic growth (Yu Yongze et al. 2019). Therefore, in recent years, the central and local governments have adjusted the setting of economic growth goal in the *Government Work Report* to make it more consistent with the high-quality and sustainable development of the economy.

In the short term, higher economic growth goal can concentrate resources to promote development and thus improve labor productivity. However, in the long term, it often leads to social problems such as environmental pollution, high consumption of resources and low utilization rate, and lower labor productivity, which in turn reduce the quality and sustainability of economic development. Li Jiyun and Zhou Xue (2023) used the provincial panel data from 2003 to 2017 and systematic GMM estimation method, and found that excessively high economic growth goal will inhibit the growth of total factor productivity. With the increase of the economic growth goal, total factor productivity will also be significantly inhibited by fiscal decentralization.

3. Research Design

3.1 Model

In order to further study the impact of economic growth goal on labor productivity, the following model is constructed:

$$Gt_{it} = \beta_0 + \beta_1 Pr_{it} + \beta_2 CONTROL + \varepsilon_{it} \quad (1)$$

Where, i represents the region, t represents the year, the core explanatory variable Pr represents the economic growth goal. The explanatory variable, labor productivity, is represented by Gt, CONTRAL is the control variable, and ε is the random disturbance term.

In order to verify the moderating role of financial pressure and marketization in the process of the impact of economic growth goal on labor productivity, financial pressure (Fp) and marketization index (Market) and their interaction with economic growth goal are introduced respectively based on equation (1), and the following models are constructed respectively:

$$Gt_{it} = \beta_0 + \beta_1 Pr_{it} + \beta_2 Fp + \beta_3 Fp \times Pr_{it} + \beta_4 CONTROL + \varepsilon_{it} \quad (2)$$

$$Gt_{it} = \beta_0 + \beta_1 Pr_{it} + \beta_2 Market + \beta_3 Market \times Pr_{it} + \beta_4 CONTROL + \varepsilon_{it} \quad (3)$$

3.2 Variable Setting

The explained variable Gt is labor productivity, which refers to the ratio of expected labor output created by workers within a certain period of time to the corresponding labor expenditure. In this paper, it refers to the ratio of actual GDP of each province to the quantity of employment. The explanatory variable Pr is the economic growth goal mentioned in the provincial government reports. In terms of control variables, the industrial structure and its proportion have an impact on the change of labor productivity. The proportion of the secondary industry is used, which is represented by Two. The improvement of infrastructure has certain impact on labor productivity. The per capita road area is used to express the degree of infrastructure construction, which is represented by Road. Human capital (Stu) is the number of ten thousand college students. Opening up (Fr) represents the proportion of import and export trade in GDP. Government intervention (Gr) is the proportion of government expenditure in GDP.

3.3 Data Source

This paper selects the panel data of 30 provinces (cities, autonomous regions) from 2003 to 2020, and excludes the data from Tibet, Hong Kong, Macao and Taiwan. The data are mainly from *China Statistical Yearbook*, statistical yearbooks of provinces (cities, autonomous regions) and EPS database. A small number of missing data are filled in by using averages or growth rates.

See Table 1 for descriptive statistics of each variable.

Table 1 Descriptive Statistics

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
Pr	540	9.255	1.954	3.800	15
Ptmnt	540	0.0222	0.0157	-0.0175	0.0700
Fp	540	0.494	0.191	0.049	0.852
Market	540	7.378	1.910	2.472	11.93
Two	540	0.452	0.0854	0.158	0.615
Road	540	13.72	4.843	4.040	26.78
Stu	540	174.2	66.48	38.62	412.5
Gr	540	0.217	0.0979	0.0792	0.643
Fr	540	0.305	0.369	0.00757	1.721

4. Analysis of Empirical Results

4.1 Analysis of Baseline Estimation Results

In order to verify the impact of economic growth goal on labor productivity, the static panel model is used for testing first, and the model in Table 2 is tested with the double fixed effect model, and the location and time are controlled. The PRO(1) column in Table 2 is the estimation result of the impact

of economic growth goal on labor productivity, and the estimation result after taking the control variable into consideration is added in PRO(2).

Table 2 shows that the economic growth goal variable is significantly negative, indicating that the economic growth goal has an important negative constraining effect on labor productivity, which means that blindly pursuing the so-called excessively high economic growth goal or "excessive policy steps" in the economic goal will cause the labor productivity to be further restricted. It can be seen that the economic growth goal is an important reason affecting labor productivity. In terms of control variables, the coefficients of the control variables are all negative, but the infrastructure and human capital are not significant, indicating that there is a weak negative effect on labor productivity.

Table 2 Baseline Estimation Results

	PrO(1)	PrO(2)
Pr	-0.295*** （-7.60）	-0.223*** （-6.37）
Two		-3.200*** （-2.92）
Road		-0.044** （-2.28）
Stu		-0.003 （-1.10）
Gr		-6.891*** （-5.84）
Fr		-2.496*** （-6.78）
Time effect	YES	YES
Regional effect	YES	YES
Constant term	5.079*** （17.12）	8.417*** （15.66）
R^2	0.8722	0.908
Obs	540	540

Note: * * *, * *, * are significant at the levels of 1%, 5% and 10% respectively. The figures in brackets represent the estimated t values of the explanatory variable coefficient (the same hereinafter).

4.2 Analysis of Regional Heterogeneity

Economic growth goals have certain differences due to the differences in resource factors, environment and economic and social development speed of each region, and cause differences in economic growth rates within regions, so the economic growth goals are not consistent. Therefore, the impact on labor productivity will also have certain differences. From Table 3, it can be seen that the economic growth goals of East, Central and West China all have negative effects on labor productivity, but the effects of control variables are different. For example,in the central region ， the coefficient of the proportion of the secondary industry is positive, and the proportion of the secondary industry has a significant positive effect on labor productivity . At the same time, it can be seen that the proportion of the secondary industry is significant at the level of 1% and has significant inhibitory effect in the eastern region, but it is insignificant and has a weak positive effect in the western region. Other variables are in a similar way.

Table 3 Heterogeneous Regression

	East	Central	West
Pr	-0.204**	-0.119***	-0.267***
	（-2.03）	（-2.91）	（-6.74）
Two	-10.237***	3.819***	1.645
	（-3.33）	（3.38）	（0.98）
Road	0.021	-0.233***	0.072**
	（0.56）	（-7.29）	（2.60）
Stu	0.005	0.001	-0.006
	（1.09）	（0.41）	（-1.49）
Gr	-13.006***	0.119	-3.000**
	（-3.33）	（0.05）	（-2.08）
Fr	-1.835***	-6.537***	4.938***
	（-3.20）	（-5.76）	（4.48）
Time effect	YES	YES	YES
Regional effect	YES	YES	YES
Constant term	12.579***	3.542***	3.079***
	（9.77）	（4.47）	（3.08）
R^2	0.9243	0.9749	0.9288
Obs	198	144	198

4.3 Moderating Effect Analysis

Financial pressure and market-oriented index are introduced as adjusting variables respectively, the coefficient of the interaction term between financial pressure and economic growth goal is significantly positive, and the coefficient of market-oriented and economic growth goal is significantly positive, which indicate that there is an alternative effect between economic growth goal and the impact of financial pressure or market-oriented index on labor productivity. It means that economic growth goal will inhibit the impact of financial pressure and market-oriented on labor productivity, and vice versa.

Table 4 Mediation Effect

	PrO(1)	PrO(2)
Pr	-0.776***	0.186**
	（-8.86）	（2.09）
Fp	-10.282***	
	（-5.54）	
Pr*Fp	0.957***	
	（6.82）	
Market		0.636***
		（4.25）
Pr*Market		-0.064***
		（-5.01）
two	-3.101***	-2.597**
	（-2.95）	（-2.41）
Road	-0.006	-0.009
	（-0.35）	（-0.42）
Stu	0.001	-0.002
	（0.29）	（-0.97）
Gr	-3.942***	-5.127***
	（-3.22）	（-4.07）
Fr	-1.863***	-2.200***
	（-5.11）	（-6.03）
Time effect	YES	YES
Regional effect	YES	YES
Constant term	12.893***	3.399***
	（12.90）	（2.80）
R^2	0.9160	0.9125
Obs	540	540

4.4 Robustness Analysis

4.4.1 Consider the time effect.

The effect of economic growth goal on labor productivity has lag effect, so the explanatory variable of two-phase lag is added to the regression model. From the result, under the condition of double fixed time and space, the coefficient of economic growth goal of two-phase lag is still significantly negative at the level of 1%

4.4.2 Replace the explanatory variable.

In order to test the stability mentioned above, the provincial economic goal was replaced by the difference value between the provincial economic growth goal and the national economic growth goal (represented by Ptmnt) to reflect the "excessive policy steps", and the results are shown in table 5. The coefficient is significantly negative at the significant level of 1%, which is in line with the above conclusion. the "excessive policy steps" of the economic growth goal limits the growth of labor productivity.

3. Endogenous problems.

As China continuously pays attention to high-quality economic development, local governments set new economic growth goals, so there will be missing variables that affect the stability of the results. Therefore, the instrumental variable method is adopted, and the instrumental variable is the economic growth goal with one-phase lag. For one thing, the one-phase lag economic growth goal will not directly affect the current labor productivity, which means it is exogenous. For another, the economic growth goal for the current period and the changes in GDP will affect the setting of the economic growth goal for the one-phase lag, which are relevant. According to Table 5, R^2 of the first stage regression is close to 1, and at the same time, it is significantly negative at the significance level of 1%, indicating that the instrument variable has a strong correlation with the economic growth goal. Cragg-DF is the critical value of F at the significant level significantly greater than 10%, so there is no problem of "weak instrumental variables", and the data of explanatory variables are equal to the number of instrumental variables, so it is just identified, and there is no problem of over-identification. It can be seen that the results are still stable after considering the endogenous problem.

Table 5 Robustness Test Results The z values are in parentheses of the column of instrumental variable method.

	Two-phase lag	Change variables	Instrumental variable method	Replace samples
l2.Pr	-0.207*** （-5.41）			
Ptmnt		-22.573*** （-6.37）		
Pr			-0.341*** （-3.64）	-0.175*** （-5.74）
Two	-3.667*** （-3.01）	-3.200*** （-2.92）	-1.659 （-1.61）	-2.291** （-2.48）
Road	-0.065*** （-2.95）	-0.044** （-2.28）	-0.151 （-1.51）	0.009 （0.44）
Stu	-0.002 （-0.60）	-0.003 （-1.10）	-0.003 （-1.05）	-0.012*** （-4.82）
Gr	-5.978*** （-4.63）	-6.891*** （-5.84）	-5.276*** （-3.94）	-7.190*** （-7.20）
Fr	-1.973*** （-4.75）	-2.496*** （-6.78）	-2.434*** （-4.84）	-1.926*** （-4.84）
Time effect	YES	YES	YES	YES
Regional effect	YES	YES	YES	YES
Constant term	9.015*** （14.12）	6.837*** （12.95）	23.103*** （36.33）	6.988*** （12.76）
Cragg-DF			339.714	
R^2	0.9021	0.9080	0.962	0.929
Obs	480	540	510	468

5. Conclusions and Suggestions

5.1 Conclusions

Based on the provincial panel data of 30 provinces from 2003 to 2020, this paper analyzes the relationship between economic growth goal and labor productivity, and analyzes the impact of the interaction between financial pressure and marketization on labor productivity, and draws the following conclusions:

The economic growth goal will significantly inhibit the growth of labor productivity. The higher the economic growth goal, the greater the inhibitory effect on labor growth rate. For developed regions, the effect of the government's economic growth goal will be weakened, and the inhibitory effect of the economic growth goal on labor productivity will be reduced, and vice versa.

Financial pressure and economic growth goal have significant negative impact on labor productivity, indicating that financial pressure and economic growth goal are important factors limiting labor productivity growth. The regression results with the introduction of mutual terms show that the coefficient of mutual terms is positive and significant at the level of 1%, indicating that there is a substitutional relation between the two effects on labor productivity, which means the interaction between financial pressure and economic growth goal is conducive to promoting labor productivity, and it is the same for marketization. The results of the robustness test of the economic growth goal further prove the above conclusion. This has certain reference value for the policy proposal.

5.2 Suggestions

(1) The provincial governments should reduce the "excessive policy steps" of economic growth goal, reduce restrictions and optimize the allocation of resources, so as to liberate the labor force to speed up economic construction and high-quality economic development.

(2) For regions with relatively high levels of economic development, the levels of infrastructure, marketization and other aspects are relatively high, and the industrial structure is undergoing positive transformation. Therefore, the regulatory role of the government's economic growth goal has certain limitations. For regions with relatively backward economies, due to their relatively limited economic and resource capabilities, it is still necessary to adhere to the task of vigorously developing the economy and strengthening economic construction.

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