

# Chapter 19

## Research on Medium- and Long-Term Employment and Labor Market Development



Yang Du, Meiyang Wang, Xiaobo Qu, Yue Qu, Yang Lu, and Peng Jia

In recent years, employment and the operation of the labor market are generally stable. Although the labor market showed short-term fluctuations under the impact of the COVID-19 epidemic in 2020, in the medium and long term, the basic conditions for the stable development of the labor market still exist. In the medium and long term, we should pay more attention to the structural impact of new technological changes on employment, and maintain the basic stability of the labor market while improving labor productivity.

### 19.1 Employment and the Development of Labor Market

The 13th Five-Year Plan proposes to implement the employment priority strategy to achieve high-quality employment. Create more jobs by implementing a more active employment policy, focus on solving structural employment contradictions, encourage entrepreneurship to bring employment, and achieve more adequate and high-quality employment. In recent years, the actual operation of the labor market shows the following characteristics.

#### 19.1.1 *The Employment Situation is Generally Stable*

Although China's economic development experienced many severe challenges during the "13th Five-Year Plan" period, the labor market remained basically stable

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Y. Du (✉) · M. Wang · X. Qu · Y. Qu · Y. Lu · P. Jia  
Institute of Population and Labor Economics, Chinese Academy of Social Sciences, Beijing,  
China  
e-mail: [13693186775@163.com](mailto:13693186775@163.com)

under the circumstances of increasing downward pressure on the economy, accelerating structural adjustment and drastic changes in the external environment, which became an important guarantee for the healthy development of China's economy. The overall stable employment situation is mainly reflected in the following aspects.

First of all, the total number of employed people continues to grow. At the end of the 12th Five-Year Plan, the total number of urban jobs was 404 million. According to the relevant progress, the total number of urban jobs in 2019 reached about 442 million. By the end of the 13th Five-Year Plan, the total number of urban jobs could increase by more than 10% compared with the end of the 12th Five-Year Plan. The number of migrant workers continues to grow. By the end of 2019, the total number of migrant workers was 174 million, an increase of about 5.41 million or 3.2% compared with the end of the 12th Five-Year Plan.

Secondly, the unemployment rate remains at a low level. In 2017, the urban unemployment rate was started to investigate. By the end of 2019, the average monthly urban unemployment rate was 5.04%, with a standard deviation of 0.15%, indicating that the unemployment rate had little fluctuation and the labor market was generally stable. Although the COVID-19 epidemic caused a short-term increase in urban unemployment rate in 2020, with the economic recovery, the medium-and long-term unemployment rate will return to the normal level.

### ***19.1.2 The Wage Level Continues to Increase***

In recent years, the wage level has maintained steady growth, but the growth rate of wage has slowed down. Due to the continuous improvement of the integration of China's labor market, the wage level changes of different groups show a similar trend.

#### **(1) Employed persons in urban units**

The wage changes of urban employees mainly reflect the changes of labor costs in urban formal departments. On the whole, the wages of employed people in urban units have increased steadily. During the "Twelfth Five-Year Plan" period, the compound annual growth rate of the average annual real wages of employees in urban units was 8.1%. During the "Thirteenth Five-Year Plan" period, the wage growth rate of this group slowed slightly, and the average annual compound growth rate of per capita wage was 7.8%.

#### **(2) Migrant workers**

The wages of migrant workers are most affected by market changes, and it can best reflect the change of supply and demand in the labor market. During the "Thirteenth Five-Year Plan" period, the growth rate of migrant workers' wages also slowed down. According to the data collected by the National Bureau of Statistics, the average annual compound growth rate of the actual wages of migrant workers during the Tenth Five-Year Plan period is 7.5%; the growth rate reached its peak in the "Eleventh

Five-Year Plan” period, with an average compound annual growth rate of 14.4%; During the 12th Five-Year Plan period, it remained at 12.7%; From 2016 to 2019, the speed slowed down significantly, to 6.6%. After the period of rapid wage growth after Lewis turning point, the wage growth rate of migrant workers has gradually converged to the economic growth rate.

### (3) Agricultural employees

The change of agricultural workers’ wages reflects the change of rural labor market. According to the survey of agricultural product costs by the National Development and Reform Commission, we use the labor cost of three main crops to reflect the wage changes of rural labor market. During the 12th Five-Year Plan period, the compound annual growth rate of the actual wages of employees was 10%, but there was no growth in 2016–2019.

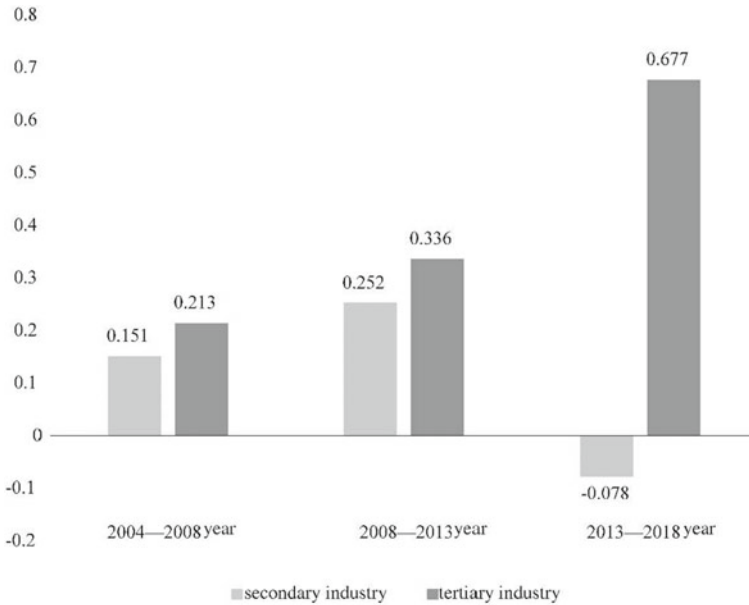
## ***19.1.3 The Labor Market Structure has Changed Significantly***

The degree of industrialization and urbanization has been continuously improved, which has had an impact on the employment structure. From 2015 to 2019, the urbanization rate of permanent residents increased by 4.3% points, which also promoted the non-agricultural employment structure. According to the data of the National Bureau of Statistics, the proportion of agricultural employed population in total employment has dropped from 28.3% at the end of the 12th Five-Year Plan to 26.1% in 2018.

During the “13th Five-Year Plan” period, the non-agricultural employment structure is also undergoing an important transformation: the service industry has become the most important sector to generate jobs, while the employment of the secondary industry began to decrease during the “13th Five-Year Plan” period. According to the newly published economic census data, we can calculate the employment changes of the secondary and tertiary industries in different periods, as shown in Fig. 19.1. It can be seen that the main source of employment growth in recent years is the development of the service industry, while the employment of the secondary industry has dropped to  $-0.078$ , becoming the sector with net employment loss.

## ***19.1.4 The Active Employment Policy System has Been Further Improved***

The outline of the 13th Five-Year Plan states that we should “give more prominence to the promotion of full employment as the priority goal of economic and social development, adhere to classified management, increase the labor participation rate, and stabilize and expand the scale of urban employment”. In recent years, the active employment policy system has been further improved.



**Fig. 19.1** Employment changes of different industries in different periods. *Source* The author calculated according to the data of Bulletin of Economic Census (previous) of National Bureau of Statistics

Firstly, the relationship between active employment policy and macro-control is further clarified. Premier Li Keqiang put forward in the Government Work Report in 2019 that the active employment policy should be incorporated into the government’s macroeconomic policy system, thus further deepening the correlation between the macroeconomic regulation and control system and the regulation of the labor market, and also helping to give full play to the role of the active employment policy in promoting the stable and healthy development of the economy.

Secondly, the major reform of employment regulation index has been achieved in the target of regulation, and the replacement of registered unemployment rate by survey unemployment rate has become the main target of employment policy and the important planning target of government work. Compared with the registered unemployment rate, the survey unemployment rate is more scientific in coverage, index collection process and correlation with other economic indicators, which can more appropriately reflect the actual changes of the labor market. Investigating the unemployment rate as the basis of the government’s work objectives is an important embodiment of improving the governance capacity.

Finally, the ability of active employment policy to make decisions according to the current situation was strengthened. Faced with the increasing downward pressure of the economy and the increasing uncertainty of the external environment, the measures of “six stability” and “six guarantees” focusing on “stabilizing employment” and

“ensuring employment” were put forward in time, which played a positive role in stabilizing the labor market in the short term.

### ***19.1.5 Steadily Push Forward the System Reform Related to the Labor Market***

The household registration system is the basic system that affects the operation of the labor market, and the reform of the household registration system has been steadily advanced. In 2016, the urbanization rate of registered population was 41.2%, reaching 43.4% in 2018, an increase of more than 2% points. In 2019, the reform of household registration system has taken another step forward. The progress of household registration system reform in the second half of the 13th Five-Year Plan will exceed that in the first half of the 13th Five-Year Plan. It is expected that the urbanization of household registration population will increase by 3% points. Overall, the urbanization rate of registered population will increase by about 5% points.

The institutional framework of the labor market has been further improved, which has played an important role in building harmonious labor relations. According to the Statistical Bulletin on the Development of Human Resources and Social Security, from 2016 to 2018, the labor contract signing rate of enterprises in the whole country remained at 90%, and the number of valid collective contracts reviewed by the human resources and social security department declined slightly.

We should flexibly grasp the frequency and range of adjusting the minimum wage according to the needs of social and economic development. During the “Thirteenth Five-Year Plan” period, the minimum wage will be adjusted from at least once every two years to at least once every two to three years. From 2016 to 2019, the number of provinces (autonomous regions and municipalities directly under the Central Government) that adjusted the minimum wage was 9, 19, 15 and 8 respectively, while during the 12th Five-Year Plan period, on average there are 24 provinces (autonomous regions and municipalities directly under the Central Government) adjusted the minimum wage every year; The adjustment range of the minimum wage standard is reduced. From 2016 to 2019, the national average minimum wage increased by 4.5% annually, which was significantly lower than the growth rate of per capita GDP and social average wage in the same period. It is also lower than that of the national average minimum wage during the 12th Five-Year Plan period (13.4%). During the “Thirteenth Five-Year Plan” period, the actual minimum wage level in some areas even decreased.

## 19.2 Mid- and Long-Term Operation Trend of Labor Market

### 19.2.1 *On the Whole, Labor Supply Is Still Tight*

China's working-age population has formed a long-term trend of gradual reduction. Since 2013, China's working-age population aged 16–59 has continued to decrease, with a decrease of 890,000 in 2019 compared with the previous year, and a cumulative decrease of 14.56 million in the four years from 2015 to 2019. With the total population of working age decreasing year by year, the employment pressure is relatively small, and the labor market can maintain a weak balance on the whole, that is, keep the unemployment rate low and slow growth in employment.

China's fertility rate has fluctuated greatly in history. The low birth rate in 1959–1961 reduced the number of people who dropped out of the labor market<sup>1</sup> in 2019–2021, so the total working-age population even increased slightly. Since 1962, the birth population has increased greatly. As this generation gradually enters the retirement age, the total working-age population aged 16–59 will decrease at an unprecedented rate, and will decrease by more than 25 million in the next five years.<sup>2</sup> Although the continuous reduction of the number of working-age population has alleviated the employment pressure in total, it will also bring great pressure on pension payment. It is more urgent than any other period in history to improve labor productivity.

### 19.2.2 *The Growth of Total Employment Slowed Down*

In China's current labor statistics system, the "total urban employment" is the closest to the "total non-agricultural employment" commonly used in developed economies. This index infers the total amount of urban employment according to the sample survey of urban households, which is equivalent to the current international employment data collection method. At present, China's planning and control policies still use "new employment in cities and towns". Because only the creation of jobs is counted, the loss of employment is not considered, and the information collection is based on the statistical report system, so the difference between this index and the actual operation of the labor market is more and more obvious.

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<sup>1</sup> Strictly speaking, a certain age does not necessarily become a clear boundary for withdrawing from the labor market, but based on the current retirement system, the labor participation rate of workers after the age of 60 does drop significantly.

<sup>2</sup> Because the actual fertility level in the first decade of the twenty-first century is not clear, assumptions based on different fertility levels will lead to different prediction results. Based on the prediction of low fertility rate, the number of working-age population aged 16–59 will decrease by more than 30 million in the next five years.

Unlike most developed economies, which have completed the urbanization process, China's urbanization process has entered the late stage, but the transformation of urban-rural employment structure is still not over. Therefore, the process of rural labor migration to cities will continue in the medium and long term. Therefore, by combining the total employment in cities and towns with the total employment of migrant workers, we can roughly judge the changing trend of the total employment in China.

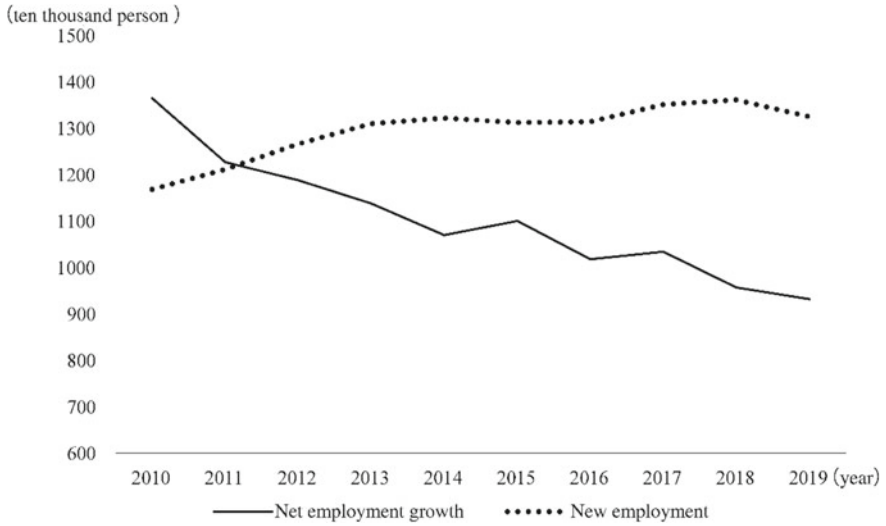
Due to the accelerated change of population structure, the difference between the net increase of urban employment and the new employment in urban areas is constantly expanding. The former reflects the net change of employment between years, while the latter only counts the increase of urban employment every year, without considering the loss of employment. In the period when the total working-age population is increasing, the number of people entering the labor market every year is often greater than the number of people leaving the labor market. At this time, the net increase in urban employment may be greater than the number of new jobs in urban areas. On the contrary, when the population is aging, and the number of people who quit the labor market every year is greater than the number of new people entering the labor market, the net increase in urban employment may be less than the number of new jobs in urban areas. As shown in Fig. 19.2, the net increase in urban employment in 2010 was greater than the number of new urban employment in that year, but the difference between them reversed as the total working-age population began to decrease. During the "Thirteenth Five-Year Plan" period, the number of new jobs in cities and towns remained stable, but the net increase of urban jobs showed a downward trend, resulting in the widening gap between them. As the trend of population structure change has become clearer, we expect that the growth of total urban employment will continue to slow down.

Secondly, the number of migrant workers is another important indicator reflecting the change of total employment. There is a statistical coincidence between the employment of migrant workers and urban employment. Because migrant workers have strong mobility, it is very difficult to include migrant workers in urban employment statistics in the actual operation process. Therefore, the "migrant workers monitoring survey" of migrant workers' outflow places by the National Bureau of Statistics can reflect the change of the total employment of migrant workers more accurately.

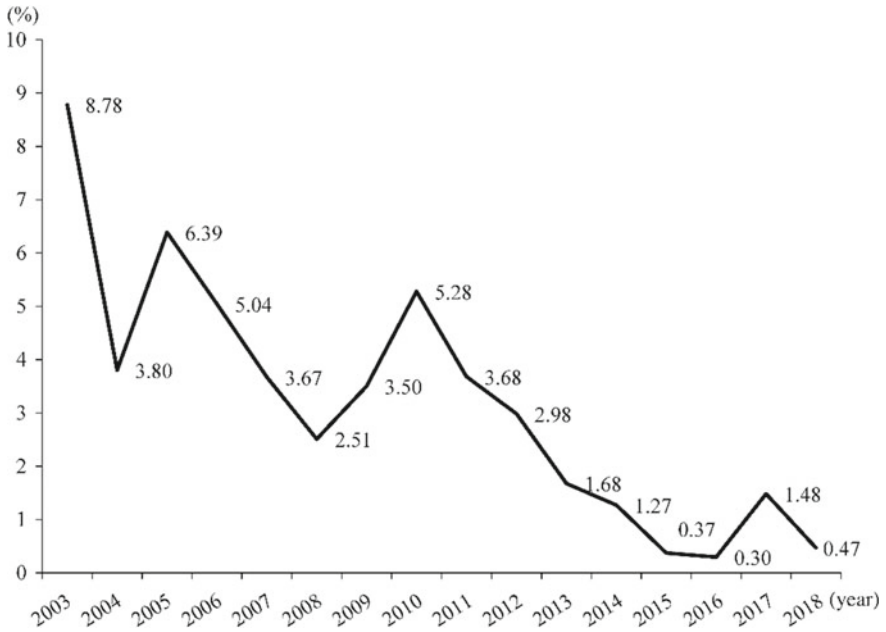
As shown in Fig. 19.3, after China's labor market crossed the Lewis turning point, the total growth of migrant workers began to slow down. From the 10th Five-Year Plan to the 13th Five-Year Plan, the average annual compound growth rate of migrant workers is 6.31, 4.00, 1.99 and 0.79% respectively, and the trend of slowing growth is very obvious. Due to the increasing aging of rural areas and the rising level of urbanization caused by labor mobility, the rural labor resources available for transfer may soon be exhausted,<sup>3</sup> and the increase of the total number of migrant workers will further slow down or even stagnate.

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<sup>3</sup> Du and Peng (2018).



**Fig. 19.2** Changes of new employment in urban Areas and net employment growth in urban areas: 2010–2019. *Source* National Bureau of Statistics



**Fig. 19.3** Annual growth rate of total migrant workers. *Source* The author calculated according to the data of “Migrant Workers Monitoring Survey” of National Bureau of Statistics



### 19.2.3 Determine the Direction of Active Employment Policy According to the Nature of Unemployment

After the economy enters a new normal, the fluctuation of employment and unemployment rate is more in line with the characteristics described by neoclassical economics. Therefore, we should pay more attention to the level of unemployment rate, the composition of natural unemployment rate, and investigate the changes of unemployment rate and registered unemployment rate, so as to improve the accuracy of employment planning and the implementation effect of employment policies.

Figure 19.4 shows that from 2017 to 2019, the surveyed unemployment rate fluctuated slightly around the average level of 5%, but the registered unemployment rate in the same period showed a gradual downward trend. The registered unemployment rate does not include non-local residents in the statistics, which mainly reflects the unemployment situation of urban local residents. From the quantitative relationship, the registered unemployment rate is close to the natural unemployment rate, and the stable change trend of the registered unemployment rate is consistent with the definition of the natural unemployment rate.

If we infer the future operation of China’s labor market according to the changing characteristics of China’s labor market, the neoclassical characteristics will be more obvious. Maintaining an unemployment rate of 5% can roughly achieve full employment, which is also the embodiment that China’s economy continues to maintain a new normal. As the natural unemployment rate is close to the survey unemployment

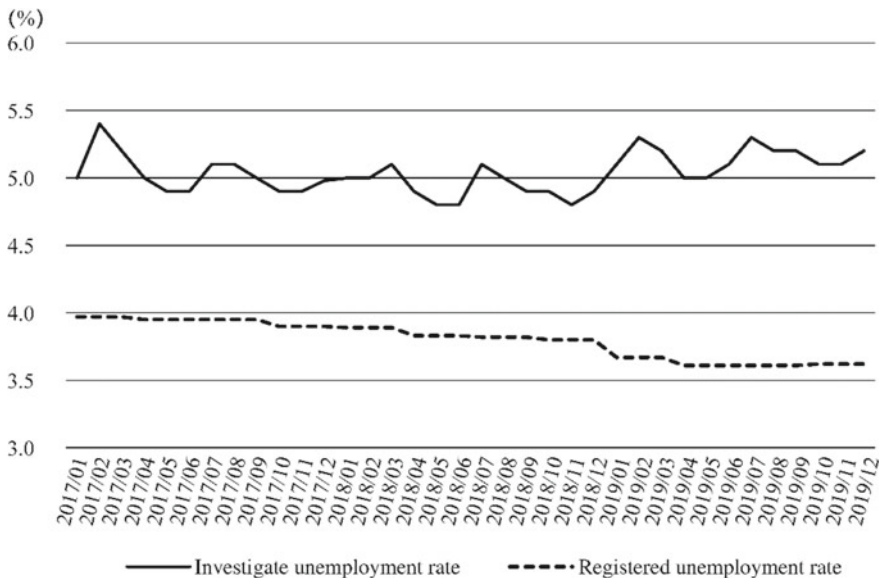


Fig. 19.4 Changes of survey unemployment rate and registered unemployment rate from 2017 to 2019. Source National Bureau of Statistics

rate, structural unemployment and frictional unemployment still constitute the main part of unemployment. However, the proportion of periodic unemployment in the unemployment rate is small, and it still needs to be solved through structural reform rather than short-term demand management. The main reason for natural unemployment is that under the current employment system of urban residents, the level of employment protection of rural–urban workers is relatively low,<sup>4</sup> they will also be the objects that need attention in the further reform of the employment system.

#### ***19.2.4 The Direction of Employment Structure Adjustment has Changed***

As China's economy enters a higher stage of development, the structural adjustment driven by industrialization and urbanization will also change. As industrialization enters the later stage, the speed of urbanization slows down, and the way of employment structure adjustment will also undergo important changes.

First of all, with the decreasing compensatory effect on urbanization, the urbanization rate of permanent residents is likely to slow down. In the past, the process of rapid urbanization in China was not only the embodiment of rapid economic growth, but also the compensation for the long-term suppression of urbanization in the planned economy period. With the gradual release of these factors, the speed of urbanization will probably slow down gradually. The change of employment structure related to urbanization is the flow of rural labor force to cities and the change of employment mode from agriculture to non-agriculture. Due to the slowdown of urbanization, the employment allocation between agriculture and non-agriculture will gradually become stable.

Secondly, China's industrialization process has entered the later stage. As the labor cost has obviously increased in the past decade, the development advantages of labor-intensive industries in industry have gradually decreased. China's manufacturing industry has made great progress along with the globalization process, but its competitive advantage has also been weakened due to the increase of unit labor cost. Due to rising wages, the industrial upgrading of replacing labor with technological progress has gradually accelerated. All these factors will continue to strengthen in the medium and long term. At present, the secondary industry has become a sector with reduced employment. From the general experience of developed countries, this trend will continue, and jobs will increasingly depend on the development of the service sector.

From the departmental effect of the adjustment of employment structure, it has shown that within the secondary industry, the larger the original employment scale,

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<sup>4</sup> Under the current employment system, the level of employment protection of rural–urban migrant workers is relatively low, and their unemployment rate is also lower. According to “China's Urban Labor Market Survey” by Institute of Population and Labor Economics of Chinese Academy of Social Sciences, the unemployment rate of migrants in cities is very low, about 1.8%.

the greater the employment losses suffered by the industry. Each point in the above figure in Fig. 19.5 represents the employment situation of an industry within the industrial sector. The horizontal axis reflects the employment level of this industry in 2013, while the vertical axis shows the change of employment in this industry from 2013 to 2018. As we can see, the points in the above figure show an obvious downward trend to the right, which means that the greater the number of jobs in the initial period (and the more obvious advantages), the more serious the employment losses will be in the subsequent structural adjustment process. The following figure shows the employment changes of various industries in the tertiary industry. Although the fitting line in the figure below is not as steep as that in the figure above, it still shows an obviously different upward trend, which means that the employment changes in the service sector show a very different pattern from that in the industrial sector.

The general law of economic structure change shows that in the late middle-income period, the economic structure change will be mainly manifested in the diversification of internal sectors of the industry.<sup>5</sup> This law will be manifested in different ways in the change of employment structure in different industries, and the diversification of employment structure in manufacturing sector will be manifested in the extension of value chain and the further refinement of division of labor; In the service sector, it may be reflected in the emergence of new service industries and the increase in the proportion of high-end service industries. From the perspective of the operation of the labor market and the change of employment forms, both of them reflect the finer division of labor in the labor market, the higher degree of specialization and the higher level of cooperation.

Therefore, the change trend of employment structure in the medium and long term will be as follows: first, the employment of the secondary industry continues to decrease, and the service industry is the main sector of employment increase; Second, the replacement of labor by technological progress has an impact on employment; Third, the division of labor and specialization of enterprises have been further improved.

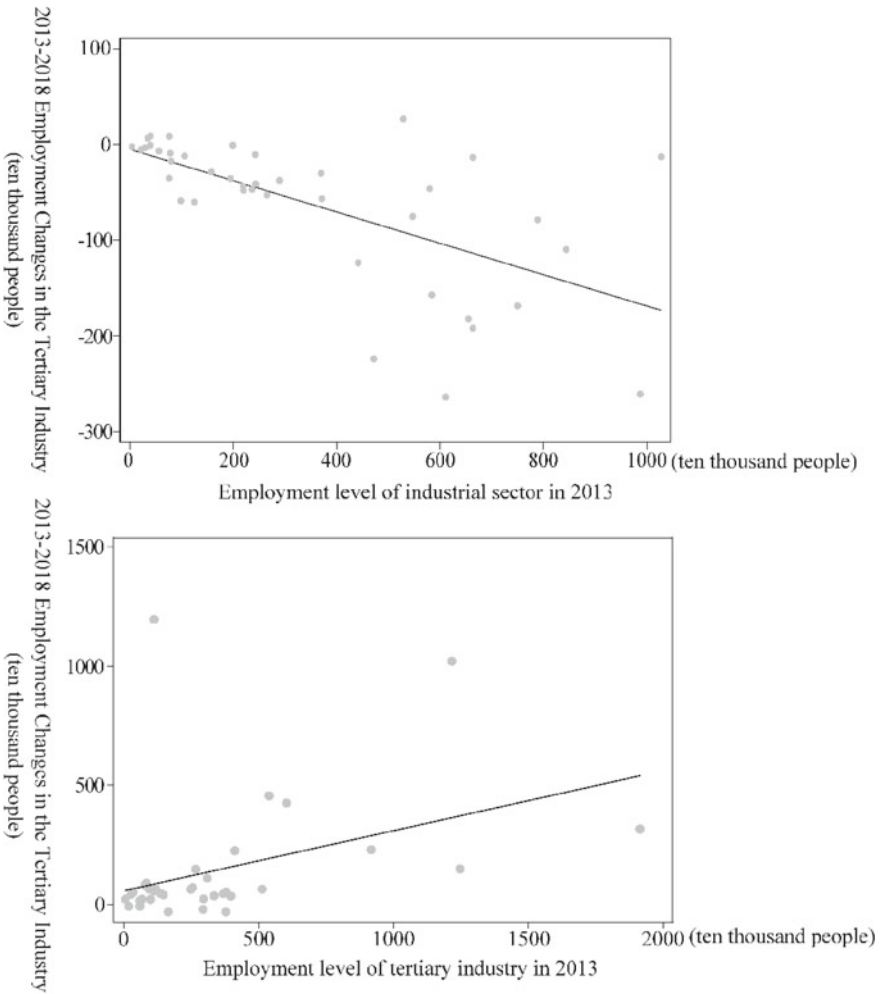
These employment trends inevitably require more effective allocation of labor force, so that labor force can flow more effectively between departments and enterprises. This inevitably puts forward higher requirements for the allocation function of the labor market, and also requires the labor market system and employment policy to keep pace with these new changes.

### 19.3 Key Issues of Labor Market Reform and Development

Based on the analysis of the trend of social and economic development and the running situation of the labor market, we believe that we need to devote ourselves to improving the level of labor productivity, meet the persistent challenge of a new round of scientific and technological revolution, make the basic system of the labor

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<sup>5</sup> Imbs and Wacziarg (2003).



**Fig. 19.5** Employment changes in non-agricultural industries. *Source* The author calculated according to the data of Bulletin of Economic Census (previous) of National Bureau of Statistics

market basically finalized and mature, and further improve the way to realize the active employment policy.

### 19.3.1 Promote the Sustained Growth of Labor Productivity

China’s aging population is accelerating. Due to the generation who were born in “baby boom” that started in 1962, is about to reach the pension age, the pressure of

pension payment is greater than any previous period. Based on the fact that China's pension system adopts the pay-as-you-go system, the foundation of pension payment depends heavily on the fund payment level of the employed population, while the latter directly depends on the level of labor productivity and its growth rate.

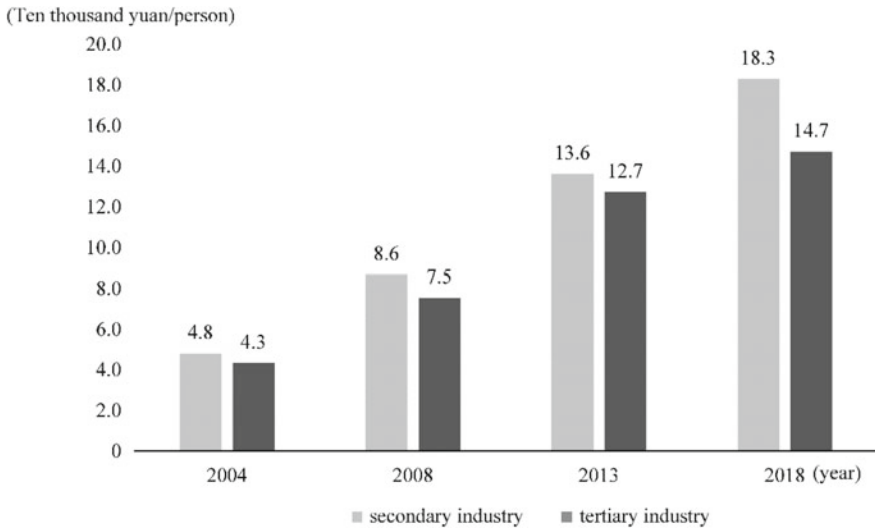
Maintaining the growth of labor productivity is also the basis for achieving sustained wage growth. Only the growth of labor productivity can provide material guarantee for the continuous improvement of income distribution pattern, thus realizing the synchronization of wage growth and labor productivity growth.

On the one hand, due to the accelerated population aging and sustained income growth, the increasing demand for labor productivity is more urgent than ever before; On the other hand, the changing trend of economic structure and employment structure makes it more difficult to increase labor productivity, which forms a paradox.

As mentioned earlier, the changes of employment structure during the 12th Five-Year Plan and 13th Five-Year Plan have clearly shown the trend of employment transformation from the secondary industry to the tertiary industry in China. In the future, the pattern of employment reduction in the secondary industry and employment creation relying on the tertiary industry is basically determined. However, judging from the changes of labor productivity in the secondary and tertiary industries, it will be a major problem to resolve the paradox of labor productivity. Figure 19.6 shows the labor productivity of the secondary and tertiary industries calculated according to previous economic census data. As the survey year of the economic census happens to be the middle year of the five-year plan, the data of the four census years can roughly reflect the average level of the four five-year plan periods from the 10th Five-Year Plan to the 13th Five-Year Plan. As shown in Fig. 19.6, there has always been a significant gap between the labor productivity of the tertiary industry and that of the secondary industry. For example, the average labor productivity of the tertiary industry was 89.6% of that of the secondary industry during the Tenth Five-Year Plan period, and it has further decreased to 80.3% by the 13th Five-Year Plan period. Considering the substantial increase of employment in the tertiary industry, the impact of employment structure on the overall labor productivity growth is even more obvious.

It can be predicted that in the medium and long term, the transformation of employment to the tertiary industry with lower labor productivity will inevitably slow down the growth rate of overall labor productivity. On the basis of giving full play to the decisive role of market mechanism, policy intervention and promoting labor productivity growth will also become one of the core objectives of economic development policy and labor market policy.

First of all, we should continue to tap the growth potential of total factor productivity. From the perspective of production function (supply side), the growth of labor productivity comes from three sources: labor time, capital-output ratio and total factor productivity. Obviously, the growth potential of labor time is limited, and with the economic development and the improvement of people's living standard, the general rule is that labor time will be gradually reduced; the improvement of capital-output ratio depends on the continuous growth of investment. In the past, when the



**Fig. 19.6** Changes of average labor productivity of non-agricultural industries. *Source* The author calculated according to the data of Bulletin of Economic Census (previous) of National Bureau of Statistics

economic growth mode has been excessively dependent on investment, the room for improvement of capital-output ratio is very limited. Therefore, relying on the growth of total factor productivity to improve labor productivity is almost the only choice in the medium and long term. Its main means are to promote labor-saving technological progress and market-oriented reform to improve the allocation efficiency of production factors.

Secondly, it is necessary to strengthen technological progress and continue to promote the sustained growth of labor productivity in the manufacturing sector. As mentioned earlier, the manufacturing sector is a sector with higher productivity. To continue to exert its productivity advantages, it is necessary to better integrate traditional manufacturing with new technologies, and improve labor productivity by developing modern manufacturing. Optimizing the allocation of various production factors, promoting division of labor and specialization, and extending the industrial chain of manufacturing industry are important ways to improve the productivity of manufacturing sector.

Finally, efforts should be made to improve the labor productivity of the service industry. Because job creation mainly depends on the tertiary industry, the growth of labor productivity in the service sector will play a decisive role in improving the overall labor productivity. In the past, the main reason why the productivity level of service sector was lower than that of manufacturing sector was that low-end service sectors such as living services occupied a large proportion in the tertiary industry, resulting in the low overall productivity level of service sector. In the medium and long term, we can improve the labor productivity of the service industry from the

following two aspects: First, by deepening reform and opening-up, we should vigorously develop high-end service industries such as producer services (such as financial services, industrial design, creative industries, etc.) and increase their proportion in service industry employment; Secondly, to reform the traditional service industry with modern technology and improve the labor productivity of life service industry. For example, using Internet technology can improve the efficiency of life service industry, thus improving its labor productivity.

### ***19.3.2 Actively Respond to the Challenge of a New Round of Scientific and Technological Revolution***

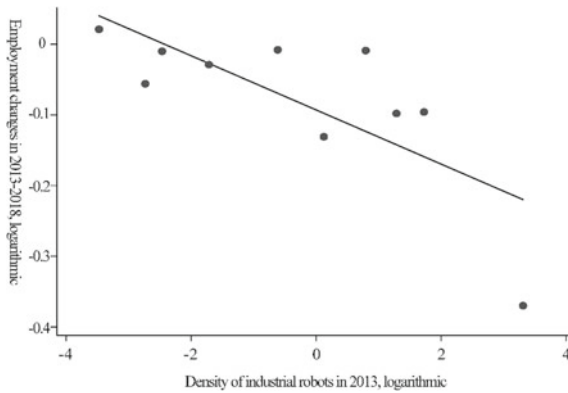
During the “13th Five-Year Plan” period, the application of new technologies in various social and economic sectors showed explosive growth: the degree of automation in the manufacturing sector was greatly improved, which was highlighted by the substantial increase in the density of industrial robots. In 2013, the number of industrial robots used per 10,000 people in the manufacturing sector was 2.66, increasing to 39.55 in 2018<sup>6</sup>; the deep integration of Internet technology with the tertiary industry has promoted the explosive growth of cash payment business, platform economy and modern logistics industry, and has become an important source of new employment. The algorithm and computing power of big data have greatly improved, resulting in the rapid accumulation of big data and the rapid development of wireless communication technology. Artificial intelligence technology is in the ascendant, and it is very likely to achieve deep integration with many industrial sectors in the medium and long term. Therefore, we should pay full attention to the challenges brought by these new technologies to the labor market, and make full preparations for relevant systems and policies.

- (1) The new round of scientific and technological revolution has a strong attribute of replacing labor.

From the characteristics of this new technological revolution, the attribute of replacing labor with new technology is stronger than the complementarity between new technology and labor, and its impact on employment cannot be ignored. From the course of economic development, technological progress is a continuous process, but the accelerated development of replacing labor with technology in recent years is the result of the constant changes in the relative prices of capital and labor. As mentioned earlier, during the 12th Five-Year Plan and 13th Five-Year Plan period, China’s labor costs rose rapidly, and the growth rate of labor costs was at the forefront among major economies in the world. In this case, in order to maintain the competitive advantage in the global competition, the manufacturing sector must replace

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<sup>6</sup> Manufacturing employment data comes from the Bulletin of Economic Census of the National Bureau of Statistics; Industrial data source IFR.



**Fig. 19.7** Industrial robot density and employment change. *Source* Employment data of various industries comes from the Bulletin of Economic Census of the National Bureau of Statistics; Industrial data source IFR

labor with labor-saving technology to save production costs and improve economic efficiency.

Figure 19.7 clearly depicts the change of this trend, which shows the employment impact of using industrial robots in some manufacturing industries. The horizontal axis of the graph is the density (logarithm) of industrial robots in 2013, and the vertical axis is the change of employment (logarithm) from 2013 to 2018. Each point in the graph represents an industry. Obviously, the employment loss in industries with higher use of industrial robots is also more severe. At present, compared with 2013, the density of robots in manufacturing industry has been greatly increased, and the industries involved are more common, so we have reason to believe that this mode of replacing labor with technology will continue and have a greater impact.

(2) The impact of technological progress on employment is not balanced.

From the characteristics of this round of technological progress, the impact of technological progress on employment is not the same among different groups. The experience of developed countries shows that workers engaged in different types of work are affected differently by the new round of scientific and technological revolution.

Generally speaking, if the work is in accordance with the established design scheme and has the characteristics of proceduralization and repeatability, then this kind of work will be more easily replaced by automated machines. This kind of work is likely to be replaced by machines, whether it is routine operation with physical strength or requires higher skills. On the other hand, if the work has uncertain attributes and requires immediate solutions or processing and decision-making, the possibility of this unconventional task being replaced is even smaller. Replacing labor with technological progress such as automation and artificial intelligence first impacts the workers engaged in repetitive and regular work.



The experience of developed countries shows that automation replaces a large number of routine jobs with intermediate income. Therefore, the employment in the labor market is polarized: the number of jobs providing life services is increasing, and the number of jobs engaged in creative labor will also increase, but the number of jobs with intermediate income will decrease.<sup>7</sup> Compared with developed countries, China's extensive application of technology to replace labor lags behind, but judging from the development trend during the 13th Five-Year Plan period, the next period may be an important period when a new round of scientific and technological revolution will have an impact on the labor market.

Of course, the wide application of new technologies will also create new jobs. For example, the development of e-commerce and modern logistics industry has accelerated the growth of express delivery business and become an important source of new employment; Platform economy has given birth to some live webcasts and a series of new occupations attached to them. The experience of developed countries shows that in the period of rapid technological development, new employment mainly comes from the emergence of new occupations.<sup>8</sup> However, in most cases, the emergence of these new occupations can only make workers (young and highly educated) who can quickly adapt to technological changes become beneficiaries, while the unemployed who have lost their traditional jobs often miss this opportunity. Therefore, although the rapid application of new technology does not necessarily lead to the reduction of the total number of jobs, it will certainly lead to the increase of structural unemployment. We should improve the governance mechanism of structural unemployment according to the changes of new technologies, and deal with possible structural unemployment problems.

### (3) The productivity effect of new technologies.

As mentioned earlier, the acceleration of population aging has a more urgent demand for the growth of labor productivity. Obviously, the acceleration of the application of new technology and the further integration of new technology and traditional economy are the most important means to improve labor productivity and the main way to solve the "productivity paradox". On the other hand, although the new round of scientific and technological revolution may bring some negative impacts on the labor market and social and economic life, only by embracing the new round of scientific and technological revolution can the economy obtain the source of lasting productivity growth, and some negative effects produced by the scientific and technological revolution need to be resolved by perfecting social policies.

The application of labor substitution technology will cause employment loss at first, but the expansion of new technology application will increase productivity, reduce production costs, lower prices of products and services, and promote the increase of demand for products and services, which will lead to the increase of

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<sup>7</sup> Autor et al. (2003).

<sup>8</sup> In the United States, the total employment increased by 17.5% from 1980 to 2007, of which more than half (8.84%) came from the emergence of New Job Titles, Acemoglu and Restrepo (2016), and the same result was frequently seen in the employment changes after many major technological revolutions in history.

employment demand. From the perspective of economic globalization, applying new technologies to improve productivity will enhance the international competitiveness of Chinese products and services, and ultimately increase employment demand. Therefore, it is necessary to combine the promotion of technological progress with globalization, transform productivity advantages into competitive advantages, give full play to productivity advantages with a more comprehensive globalization and a higher level of openness, and expand employment.

### ***19.3.3 Continue to Reform and Improve the Basic System Related to the Labor Market***

As the household registration system is the basic system that affects the labor market, reforming and perfecting the household registration system is also an important task of China's transition to a market economy. The outline of the 13th Five-Year Plan puts forward clear requirements to promote the reform of household registration system and the equalization of basic public services, and accelerate the citizenization of rural migrants. In the actual operation of local-led and classified reform, the reform of household registration system is still far from its ultimate goal. Therefore, the household registration system, as the main field of labor market system reform, should grasp the key points and keys of the reform, solve the difficulties of the reform, and realize the ultimate goal of the reform of the household registration system.

During the "Thirteenth Five-Year Plan" period, the urbanization rate of registered population in eastern provinces only increased by less than 1% point, and the gap between the absolute number of permanent residents and registered population in cities even increased; The reform of household registration in the central and western provinces has made rapid progress, and the urbanization rate of household registration population and the gap between urban permanent residents and the absolute number of household registration population are better than those in the eastern provinces. The reform of household registration system is a systematic project. It is necessary to increase the system design at the national level, and all regions and departments should make concerted efforts to deepen the reform of household registration system and comprehensively improve the urbanization level of household registration population.

### ***19.3.4 Pay Attention to the Realization of Active Employment Policy***

Incorporate the active employment policy into the macro-economic policy system, and pay more attention to its concrete realization, so as to change the current

phenomenon that the labor market indicators are out of touch with other macro-economic indicators. Learn from the successful experience of developed countries, and incorporate the labor market indicators into the target indicators of macro-control. To put the active employment policy at the macro-policy level, it is necessary to further strengthen the coordination with other macro-economic policies, which is reflected in the following aspects.

First of all, the employment index should be the main target index of macroeconomic regulation and control. The experience of developed countries shows that it is feasible to take labor market indicators such as unemployment rate and employment growth as direct targets of monetary policy. Taking the labor market indicators as the basis of decision-making will naturally strengthen the connection between other macroeconomic policies and employment policies. Of course, taking the employment index as the basis of decision-making needs to rely on more accurate and rapid labor market information, which also puts forward higher requirements for China's labor market statistics system.

Secondly, according to the linkage between natural unemployment rate and economic growth and price level, we should determine the direction and intensity of active employment policy and other regulatory policies. After the labor market enters the neoclassical form, the economic growth, unemployment rate and price level always fluctuate around the potential economic growth rate, natural unemployment rate and appropriate price level. The ultimate goal of fiscal policy, monetary policy and active employment policy is to narrow the difference between the actual indicators and the above balanced indicators.<sup>9</sup> Obviously, this also puts forward higher requirements for the implementation of the active employment policy: it is necessary not only to understand the dynamic development of the labor market, but also to master the law of the interaction between active employment and major economic indicators, especially to grasp the equilibrium level and its changes in various markets.

Finally, in the process of policy implementation, it is necessary to strengthen the coordination among various functional departments of the government. Not only the macro-decision-making departments should play a role in the coordination of employment policies among departments, but also the employment authorities should play a coordinating role in other macro-economic decisions. We should ensure the goal of "stable employment", manage the fluctuation of the labor market more from the demand side, and eliminate the unemployment caused by cyclical economic fluctuations and the unemployment caused by changes in economic structure. Therefore, the comprehensive management department of macro-economy should be responsible for overall arrangement of macro-control policies, comprehensive coordination of fiscal policies and monetary policies, so as to assume more responsibilities for solving cyclical unemployment and structural unemployment. At the same time, the employment department's participation in the coordination of macroeconomic policies is also conducive to bringing the dynamic information of the labor force into

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<sup>9</sup> Powell (2018).

the decision-making and implementing the macro-control plan for the labor market indicators.

## **19.4 Policy Suggestions for Medium and Long-Term Development of Labor Market**

### ***19.4.1 Adjust the Employment Planning Objectives and Steadily Push Forward the Extension of Retirement Age***

Due to the rapid change of population structure, the process of population aging will be accelerated. A large number of workers enter retirement age, which brings more and more financial pressure to the old-age security payment system. Therefore, it is possible to expand the supply of endowment resources by expanding employment as much as possible. Therefore, increasing the employment index can not only reduce the unemployment rate, but also increase the labor participation rate as much as possible, so that the total employment will continue to expand.

From the specific indicators of employment planning, there is a growing difference between “new employment in cities and towns” and “net growth of urban employment”.<sup>10</sup> From the past policy objectives, the indicators for maintaining the stability of the labor market are constantly changing. At present, the combination of registered unemployment rate in cities and towns and new employment in cities and towns has changed to the combination of surveyed unemployment rate in cities and new employment in cities and towns. With the further change of population structure, the work of “stabilizing employment” should not only pay attention to the unemployment rate, but also pay attention to the employment creation ability. Therefore, it will be more appropriate to take “urban survey unemployment rate” and “urban employment net growth” as the control objectives of employment planning.

As the employment rate is directly related to the retirement age, steadily advancing the extension of the retirement age can alleviate the pressure of pension payment and the shortage of labor supply. We can push forward the relevant reforms in a way that the retirement age of women are delayed by one year every two years and that of men are delayed by one year every four years.

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<sup>10</sup> The statistical sources of “new urban employment” and “total urban employment” are also different. The former is based on the statistics of the administrative records of the Ministry of Human Resources and Social Security, which is actually the concept of personnel mobility. When the employment situation fluctuates, for example, migrant workers frequently change jobs, the employment scale will be exaggerated; The latter is based on household survey information, and its statistical method conforms to international norms, which can properly reflect the changes of the labor market situation.

### ***19.4.2 Improving Labor Productivity Is the Core Goal of Labor Market Reform***

Improving labor productivity is the fundamental need to maintain sustainable economic development, and it is also a key problem that needs to be solved urgently. First of all, from the perspective of planning objectives, improving labor productivity should be regarded as the core objective as important as maintaining the stability of the labor market. It is necessary to prevent the long-term operation efficiency of the labor market from being damaged while maintaining the short-term employment balance. For example, high employment rate and low unemployment rate are the ideal goals to be pursued by the regulation and control of the labor market, and also an important embodiment of the prosperity of the labor market. In contrast, the combination of low unemployment rate and low employment rate has achieved the short-term goal of labor market regulation to a certain extent, but the utilization of human resources is not sufficient and the efficiency of the labor market has not been brought into play. Therefore, the work of “stabilizing employment” should not only focus on the short-term unemployment rate, but also constantly expand the employment creation ability through various means.

According to the development experience of various countries, to improve labor productivity, we must respect the decisive role of the labor market in the allocation of labor resources and give more flexibility in the institutional arrangement of the labor market. Adhere to efficiency as the leading factor in the initial distribution, and put the issue of fairness more into redistribution to solve.

An important means to improve labor productivity is to encourage the application of new technologies. Some technologies that replace labor may cause local employment losses in the short term, but as long as productivity is continuously improved and industrial chain is continuously extended, new forms of employment can be continuously created, and the dual effects of productivity progress and employment expansion can be achieved in the medium and long term. Therefore, from the perspective of policy implementation, we should have a strategic vision and tolerance for possible employment losses in the short term.

### ***19.4.3 Actively Respond to the Challenges of the New Round of Scientific and Technological Revolution and Improve Relevant Systems***

A new round of scientific and technological revolution will have a greater impact on the medium and long-term labor market. We should not only actively embrace the new technological revolution to promote the development of productivity, but also do a good job in building relevant systems in advance to minimize the structural shock of the labor market caused by technological progress. Although the impact of

the new round of scientific and technological revolution is long-term and uncertain, the following two aspects still need to be done well.

First of all, we should be prepared for the impact of short-term structural unemployment. As mentioned earlier, the groups impacted by new technology are not balanced, and some workers lack the ability to change jobs in a short time due to their own defects. Moreover, the traditional industry is not only more seriously damaged when it encounters external shocks, but also difficult to recover after being damaged. We must build a social safety net and strengthen social protection for these workers. Make good use of the unemployment insurance fund and other resources accumulated during the 13th Five-Year Plan period, and increase the assistance to the short-term unemployed when encountering the impact of unexpected events such as Sino-US trade friction and COVID-19 epidemic.

Secondly, we should consider the long-term and structural impact of the new round of scientific and technological revolution on the labor market and its distribution problems, and adjust them with redistribution policies. The large-scale popularization of technologies to replace labor will inevitably lead to the change of national income distribution pattern. On the basis of paying attention to efficiency in initial distribution, redistribution should consider the influence of technological progress. While ensuring productivity growth, we should strive that the overall pattern of income distribution will not deteriorate due to technological progress.

#### ***19.4.4 Complete the Reform of Household Registration System***

The reform of the household registration system should enter the final stage. It is necessary to strengthen the top-level design, promote the reform in the whole country, thoroughly solve the problem of “incentive incompatibility” between the central and local governments, and eliminate the gap between the urbanization rate of permanent residents and registered residents. On the basis of the existing reforms, except for a few super-large central cities, we will strive to fully liberalize the restrictions on settlement as soon as possible.

Improve the cost-sharing mechanism of urbanization of agricultural transfer population. Basic public services such as compulsory education are completely borne by the central government. Employment, medical care, old-age security, housing security, etc. are solved by all levels of overall planning. Quasi-public service projects such as infrastructure, legal aid, recreation and sports are supported by the central government and shared by governments at all levels and social forces.

Strengthen the coordination between the household registration system and other related systems, such as the land transfer system, strive to build a labor market system and social security system that integrate urban and rural areas, strengthen the coordination and linkage of relevant institutions, and establish a nationwide

networked residence permit system, so as to realize the simultaneous and free transfer of population, household registration and insurance accounts.

#### ***19.4.5 Make the Active Employment Policy Truly a “Priority” Policy***

The employment priority policy has already been established in the government policy system. What needs to be solved is how to make the active employment policy a “priority” policy. The following two aspects need to be highlighted.

First, in order to achieve the employment goal in the macroeconomic policy system, we should take the main employment indicators (such as investigating the unemployment rate and total employment) as the target and decision-making basis of macroeconomic regulation and control. On the basis of perfecting the existing employment statistics system and improving the quality and frequency of employment statistics, we should learn from the experience of developed countries and let the labor market indicators really play a role in macroeconomic decision-making. Taking the unemployment rate surveyed during the 13th Five-Year Plan period as the basis for decision-making has achieved good results. It is necessary to further play the guiding role of investigating unemployment rate, expand the scope of investigation, increase the number of samples, make it representative at the provincial level, and improve its position and role in macroeconomic decision-making.

Second, when the employment goal conflicts with other social policies, there should be a decision-making and settlement mechanism. In the process of social and economic development, different policies are bound to be implemented. Due to the different objectives of different policies, some policies may objectively conflict with the employment priority principle, and may even cause employment losses. This situation has been reflected in the 13th Five-Year Plan period. When other policies conflict with the employment priority principle, defining the priority position of employment is not only conducive to better implementing the employment priority principle, but also enables governments at all levels to define the functional orientation of various policies and reduce the shock of the labor market.

#### ***19.4.6 Extend Compulsory Education and Build a More Effective Human Capital Accumulation System***

The promotion of human capital is the golden key to solve many problems in the labor market and economic development. The promotion of human capital of workers is the fundamental way to continuously improve labor productivity, and it is also an effective measure to adapt to the adjustment of economic structure and the ever-changing employment structure. In the previous five-year plans, great attention has

been paid to the accumulation of human capital such as education and training. On this basis, the outstanding problem to be solved is to improve the efficiency of the human capital accumulation system, so that every penny can really play its due role.

First of all, we should continue to increase investment in human capital, and bring preschool education and senior high school education into the compulsory education system. Our analysis shows that the change of economic structure will accelerate in the future, and the tertiary industry will become the main source of employment growth. Therefore, compared with the initial stage of industrialization, the demand for employment skills is more uncertain, and the investment in vocational education and training aiming at specific positions will face more risks of investment failure. Therefore, in the distribution of vocational education and general education in senior high school, the investment scale of vocational education should be reduced and the proportion of general education should be strengthened.

The existing research results show that increasing the input and improving the quality of preschool education plays an important role in the formation and accumulation of lifelong human capital. It is necessary to reallocate the resources of primary and pre-school education according to the characteristics of demographic changes, and bring pre-school education into the compulsory education system.

Secondly, the accumulation of human capital should conform to the requirements of a new round of scientific and technological revolution. Because the new round of technological revolution represented by Internet technology, big data application and artificial intelligence is quite different from the technological progress in the process of industrialization, the rate of technological change is accelerated and the uncertainty of skill demand is enhanced, so the traditional education and training mode is difficult to adapt to the human capital demand of the new technological revolution. Therefore, it is necessary to strengthen the prior assessment of government-led investment in human capital, especially in vocational training, and pay attention to the effect of investment.

Finally, pay more attention to the role of market mechanism in human capital accumulation. The victims of the impact of technological progress are often the workers with low education level and old age. How to improve their ability to adapt to the market is an important problem to be solved by the human capital accumulation system. A number of world-class technology companies have emerged in China, and they have the ability to identify workers' skills needs and provide personalized training services. We should make full use of the market mechanism, give full play to their advantages, and improve the quality of workers in a targeted manner.



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