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## The intersection of migration and public pension balance in China:

a comparative analysis of Guangdong province and Heilongjiang province

### **Extended abstract**

Since 1995, China has established a contribution pension system which covered over 345 million urban workers in 2015. At the beginning, there were a large number of retired workers without contribute and it was a heavy burden on the central government. The decision of each province running its own pension was partly the result of historical events. The local governments accumulated contributions to pay current benefits, including the legacy pensions. Thus, the demographics, age structure and the economic situation diversified among provinces affected the balance of pension systems at provincial level obviously.

Heilongjiang, an inland province located in Northeast China, was the most developed industry area in the 1960s. However, with industry upgrading, the economy declined and more and more young people left Heilongjiang for the coastal areas. Meanwhile, the fertility of Heilongjiang, which historically was among the lowest in China, declined further, and the TFR was 0.75 according to the last population census in 2010. The state pension system began to bankrupt a few years ago because contributions were inadequate to support payment of benefits, and the national government had to contribute financial support.

In comparison, Guangdong province is a fertile coastal province in the south of China, near Hong Kong and Macao. Guangdong province experienced an economic boom starting in the 1980's, especially after President Deng Xiaoping established Shenzhen, a city of Guangdong, as a special economic zone. It developed quickly and absorbed a large number of young people

from provinces nearby. The pension rate in Guangdong province has remained the lowest level for 20 years.

From pension regulations issued by China, the total financial contribution into the public pension system is determined by three factors: the number of employee in the system, the contribution rate and the individual's wage. The contribution on behalf of one employee is about 28% of his or her wages, 20% (the upper limit) of which comes from the employer and 8% from the worker. To illustrate, suppose that the total contribution of an area at year n is  $I_n$ , the local contribution rate is  $C_r$ ,  $L_n$  is the number of employees, and  $W_{xn}$  is the individual wage. The total contribution of the area at the n year is as shown :

$$I_n = \sum_{x=1}^{L_n} W_{xn} * C_r * 12$$

Among the three factors, the individual wage is most variable across participants, making the measure to the impact of the three factors is very hard. To simplify, this paper assumes that all employees' contribution base is the average wage in society, which was issued each year by the National Statistical Bureau . Under this assumption, an adjusted contribution rate, which I call "relative contribution rate", would be variable. Supposed that the "relative contribution rate" is  $C_r'$ , and the average salary in social is  $W_n$ , then the adjusted formula is as below :

$$I_n = L_n * C_r' * W_n * 12$$

The article uses the insurance data of the two provinces from 1995-2015 to demonstrate how the three factors affect the contribution. Findings suggest that among the three factors, the number of employees and the contribution rate affect the total contribution in different directions (see Figures 2,3): when one increases, the other always declines. Because the average wage is also an important parameter when calculating the benefit, the benefit, as well as the contribution, would also change with the variation of wage, making the balance of the pension system would not to be affected obviously. Thus, the number of the employee is the most important and valid factor to the balance, while the contribution rate is always relatively stable.

Figure 3 shows that in Guangdong the number of employees plays a main role during the 20 years, and when employees increased, the relative contribution rate declined, and the two factors influenced one another. Combined with more and more people flowing into Guangdong (Table 2) and the lower and lower contribution rate (Figure 1), the two factors shows the interaction.

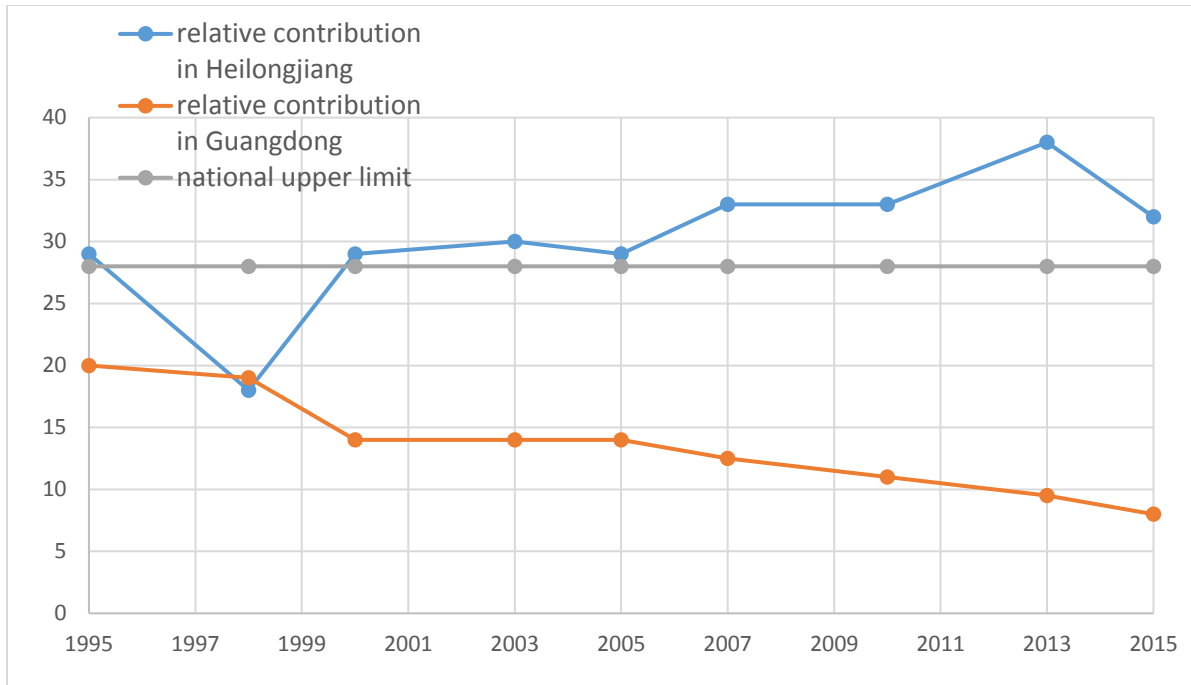
Figure 2 shows that in Heilongjiang the average wage mainly affected the total contribution during the 20 years, with the number of employees having only a small impact. The first two periods are worth noting. In 1995-1998, both the number of employees and the contribution rate play an important role in shaping the total contribution, but in opposite directions. The contribution rate dropped from 29% to 14% (Figure 1), while the number of employees jumped 65%, the most during the 20 years (Table 1). In the second period, with the increased number of employees, the contribution rate would be expected to be lower. However, the contribution rate surprisingly bounced to 29%, which is controlled by the local government. As a result, the growth of total contributions was up by 147%, which is remarkable (see Figure 3). The contribution rate has remained at high levels since then (see Figure 1), much higher than the upper limit, making the enterprises bear a heavy financial burden, and more and more people have flowed out (see Table 2). In fact, because of low fertility and many young people flowing out of Heilongjiang, the pace of the growth of the employees cannot match the pace of increase in number of retired people, and the government had to improve the contribution rate to pay the benefit. However, the resulting high rate served to block the enterprises from moving in and resulted in more of the labor force looking for jobs outside, yielding a higher contribution rate. Thus in Heilongjiang, the two factors influence contributions to the state pension system in different ways, but still in the opposite direction.

Table1 The change of the employee and average wage from 1995–2015, Guangdong and Heilongjiang (%)

effect factors	province	1995–1998	1998–2000	2000–2003	2003–2005	2005–2007	2007–2010	2010–2013	2013–2015
% change in number of employees	Guangdong	36	95	27	21	24	44	30	10
	Heilongjiang	65	4	14	8	8	15	12	5
% change in average wages	Guangdong	36	17	48	26	24	39	39	13
	Heilongjiang	45	45	40	26.5	31	61	29	38

Source: yearbooks of human resources and social security, Labor and social security yearbooks

Figure 1 The trend of the relative contribution rate of the two provinces from 1995 to 2015(%).



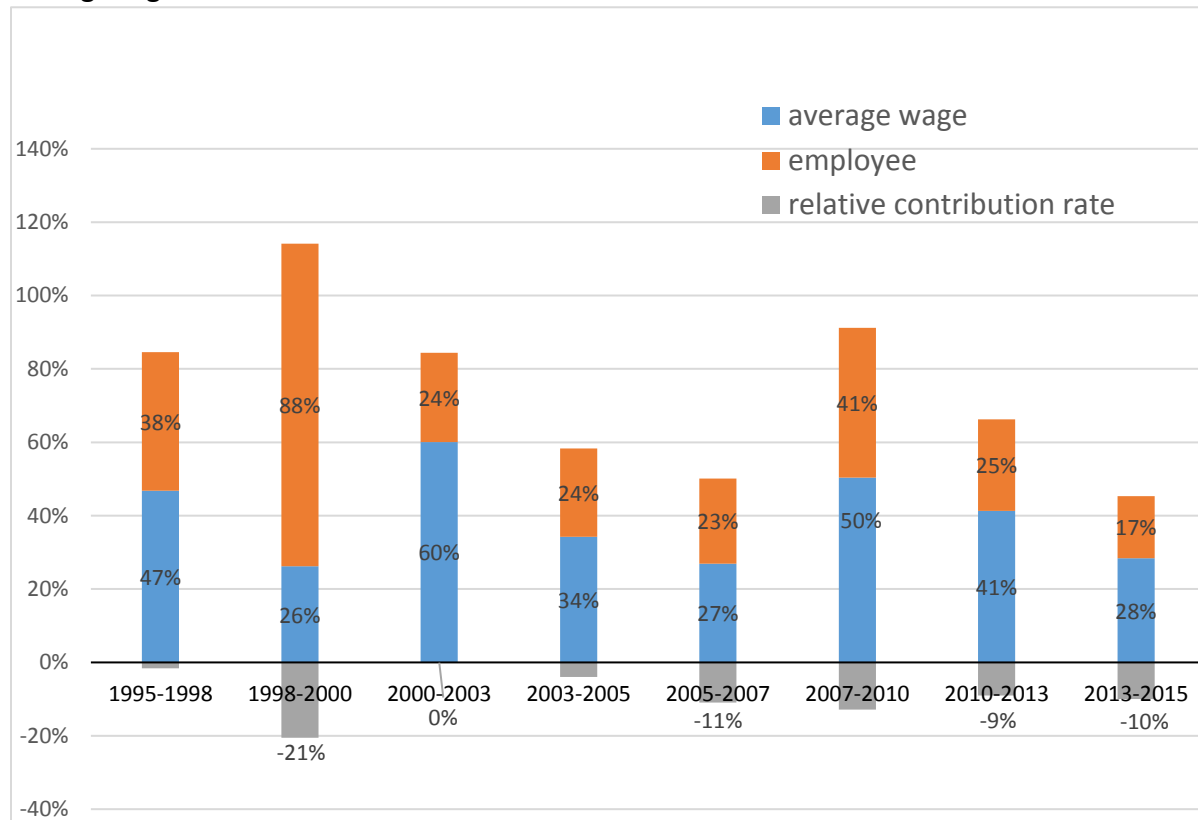
source: calculated by the data from yearbooks of human resources and social security.

Figure 2 The contributions of three factors to the total contribution from 1995 to 2015, Heilongjiang



source: yearbooks of human resources and social security from 1995 to 2015.

Figure 3 The contributions of three factors to the total contribution from 1995 to 2015, Guangdong



Source: yearbooks of human resources and social security from 1995 to 2015

Table 2 The comparison of some demographic indexes of two provinces (Thousand people)

demographic index	province	1995	2000	2005	2010	2015
net inflow	Guangdong	10900	17715	17835	21160	22787
	Heilongjiang	-200	-1108	-1528	-2077	-2232
labor force population	Guangdong	32280	46710	50570	63450	67260
	Heilongjiang	21050	23220	23300	24530	22490
the population in the system	Guangdong	3230	10280	15650	28750	46120
	Heilongjiang	2730	4800	5450	5890	6470
retired population	Guangdong	1174	1740	2312	3396	4733
	Heilongjiang	903	1590	2232	3630	4711

Source: National census and 1‰ census.

Summary: In China, the financial balance of the province-level state pension system is affected by three factors: the average wage, the relative contribution rate and the number of employees. The latter two factors influence one another in opposite directions. When the number of employees increases, the contribution rate would be reduced and vice versa. The number of employees is the most important factor to the balance of the pension system. Meanwhile, the number of employees is mainly determined by migration. Level of migration impacts the balance of the pension system, but as well, an unbalanced pension system impacts the direction of migration.