9

How much have the wages of unskilled workers in China increased?

Data from seven factories in Guangdong

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China has experienced strong economic growth for a long time. The sustainability and character of that growth depends, to a large extent, on whether China has exhausted its rural surplus labour. In this chapter, we use unique payroll data from seven large manufacturing factories to show that wages of unskilled labour in these factories have not increased significantly, if at all. These findings could shed some light on whether China has reached a 'Lewisian turning point' and the extent to which Chinese economic growth could be sustainable.

China has had 15 years of unprecedented economic growth, which, to a significant extent, is related to a large-scale movement of surplus labour from the low-productivity rural sector to the high-productivity urban sector. Rural–urban migration provided Chinese industries with cheap labour and facilitated the rapid growth of labour-intensive manufacturing exports. Those who are interested in the issue of the sustainability of Chinese economic growth would be eager to learn the extent to which rural–urban migration can continue to drive the fast pace of economic growth.

Many recent studies have predicted that China has exhausted its surplus labour and reached the point whereby labour shortages (the Lewisian turning point) are occurring (Garnaut and Huang 2006; Cai and Wang 2006; Cai and Wang 2007a, 2007b). The most effective way to measure whether China has reached the Lewisian turning point is to examine the wage trend of unskilled labour. The idea is that if surplus labour is approaching exhaustion, the wages of unskilled workers will start to rise significantly. Unfortunately, Chinese

official statistics do not provide data on the wages of migrant workers, who make up the majority of non-agricultural unskilled labour. Survey data of migrant workers are often based on non-random sampling of migrants and are cross-sectional in nature. A few studies that indicate the possible exhaustion of surplus labour use mainly wage data of urban residents as indicators (see, for example, Garnaut and Huang 2006; Cai and Wang 2007a). This could be misleading, as the Chinese urban labour market still operates under a two-tier system whereby urban-resident workers are paid a premium wage and are hired mainly in high-status jobs, while their rural-migrant counterparts are employed mostly in unskilled jobs and are paid a wage below the marginal productivity level (Meng and Zhang 2001; Knight et al. 1999; Meng 2001). To date, no study has examined how the wages of unskilled migrant workers have changed in recent years—due mainly to the lack of available data.

Here we employ a unique payroll data set for seven labour-intensive manufacturing factories in Guangdong Province for the period from 2000 to 2004 to examine how the wages of migrant workers in these factories have changed in that period. Hopefully, our findings will shed some light on the bigger issue of whether China has reached the Lewisian turning point.

Data

In 2004–05, we participated in a wage and working condition study of some labour-intensive factories in Guangdong Province, contracted by an outsourcing company. The project was designed to investigate whether factories in China, which work for the outsourcing company, are fulfilling their fair-wage commitments and following the outsourcing company's code of conduct.

The outsourcing company provided a list of 82 contracting factories in Guangdong Province. Based on this list, a group of 20 factories was selected randomly based on the stratification of region (Guanzhao, Dongguan, Shenzhen, Zhongshan and others), products (footwear, apparel and accessories and gears) and size (firms with more than 1,000 workers and with 1,000 or less workers). Nine of the 20 firms either refused or did not respond to the request from the outsourcing company. The remaining 11 firms represent Guangzhou and Shenzhen cities, the footwear industry and large firms. To correct for this bias, five additional factories were added to the list and two of them were selected. The final list comprised 13 factories, and each was then interviewed.

Although the factories were given assurances that the study would not reveal any identifying information about individual factories, many were nevertheless apprehensive about participating.

During interviews, the general situation regarding wages, employment and benefits was discussed and the requirements of payroll data collection were presented, stressing that original data collected would not be provided to the outsourcing company. Among the 13 factories visited, six refused to participate. Seven factories agreed to provide payroll and personnel data, of which one factory agreed to provide data only for one of its many production lines.

Participating factories provided personnel and monthly records of payroll data for the period from 2000 onwards. Of the seven factories involved, two were footwear factories, two were apparel factories and three were accessories and gear factories. Most of the factories were large; three were in Dongguan, two in Guangzhou, one in Shenzhen and one in Zhongshan. The valid data consisted of 1,163,857 wage records. In August 2004 (the last month for which all sample firms had wage records), the largest factory in the sample had 12,032 workers, while the smallest had 651 workers. In that month, three of the sample factories had more than 1,000 workers and the remaining four had less than 1,000 workers (Table 9.1).

The purpose of the data collection and the voluntary nature of data provision could indicate that the seven factories that provided data were the best performers (law abiding) in the area of fair wages and living conditions. The results obtained from these data, therefore, might not be representative of China in general; however, they are likely to be an overestimate in terms of wages, wage growth and other conditions, and hence, are likely to be biased in favour of the conjecture that China has reached the Lewisian turning point.

Table 9.1 **Industry, region, and size distribution of the sample factories**

Firm code	City	Reported number of workers	Factory type	Number of workers in August 2004	Data period
1	Dongguan	5,553	Footwear	12,032	2000–2004
2	Guangzhou	7,326	Footwear	7,641	2000–2004
3	Dongguan	1,200	Apparel	837	2001–2004
4	Dongguan	900	Apparel	669	2002–2004
5	Shenzhen	550	Accessories and gears	651	2002–2004
6[a]	Zhongshan	6,900	Accessories and gears	701	2000–2004
7	Guangzhou	917	Accessories and gears	1,119	2002–2004

[a] data provided for only one production line.

Table 9.2 presents summary statistics of the data. The first panel shows the sample distribution by year and industry. Figures from this panel indicate that in each of the five years the sample is dominated by the footwear industry, which accounted for a minimum of 83 per cent of the sample (2003) and a maximum of 99 per cent of the sample (2000) when investigating annual data. This important feature of the data should be kept in mind when interpreting the results presented below. Note that among the three types of industry, footwear has the most labour-intensive and unskilled jobs. Most workers work on production lines. Apparel workers, although working on individual machines, require a fairly low level of skill. The accessories and gear industry, on the other hand, requires higher skill levels. These factories were producing mainly golf clubs, in which the major job involved metal polishing, which had a high skill content.

The second panel of Table 9.2 shows the gender distribution of workers in the sample. On average, the sample is female dominated, with women accounting for 75 per cent of workers. The distributions vary considerably, however, across different industries. For example, while the footwear industry is mainly female dominated, accessories and gear is dominated by male workers.

The third panel presents the distribution of rural migrant workers relative to urban workers. The footwear industry has the largest percentage of rural migrants, the proportion for all industries has increased to more than 80 per cent since 2003 and, by 2004, the proportion of rural workers accounted for 90 per cent of the total sample.

The fourth panel summarises the average age of the sample population. The mean age of the sample in 2000 was 23.4 years, while in 2004 it increased to 25.5 years. Anecdotal evidence provided to support the idea that China has reached the Lewisian turning point is that many factories are unable to find young workers (aged 15–25), who are more energetic and more suited to these factory jobs. Does the increase in the average age of our sample over time support such a conjecture? One of the reasons for a two-year increase in average age could be related to the panel nature of the data. As workers stay longer, they become older. To understand the extent to which this increase in average age of the sample is due to the panel nature, we also examine the age of the newly hired workers to see if factories are hiring older workers. The data show that for the new workers, the average age increased from 22.5 in 2000 to 23.3 in 2004—an increase of less than one year. Although this is consistent with the anecdotal evidence, the change is not significant.

The educational distribution of the workers is presented in the bottom panel of the table. As indicated, the majority of workers are junior high school

graduates: about 81–86 per cent. A substantially higher proportion of male workers have senior high or technical high school qualifications relative to female workers. Just less than 1 per cent of the total workers have a college or university degree. Here again, there is a larger proportion of male workers than female workers. For the newly hired workers, the proportion of junior high school graduates increased from 81 per cent in 2000 to 87 per cent in 2004. At the same time, the proportion of people who held primary school qualifications and those held senior high school qualifications decreased.

Wages and wage growth: first glance

The most important data for this chapter are wages and hourly wage rates. Before presenting data on wages it is important to understand the wage structure in these factories. Table 9.3 presents the different reporting methods regarding wages used in each of the seven factories.

Table 9.3 shows that the sample factories record wages in very different ways, and some records are much more complicated than others. Although many factories use piece rates to calculate the wages of production workers—especially in the apparel and accessories and gear industries—when it comes to accounting, all the wage data are converted to some type of time-rate wages (based mostly on the new rules set by the outsourcing company with differential normal time and overtime pay for Monday to Friday, weekends and public holidays).[1] The general format of the payroll data is to record the amount workers earned (A), the amount of deductions (B) and the final (net) payment, which equals (A)-(B).

Wages reported in the payroll data are at a monthly rate, including a basic wage and other components. Payroll data also provide workers' working days and hours. In some cases, however, working days and hour data are not directly available. Formulae provided by the factories are used to calculate workers' monthly working hours. Based on this information, hourly wage rates can be calculated. In addition, as the data present the five years of wage changes, a city-specific consumer price index (CPI) series is used to calculate real wages based on the price level in 2000.[2]

Table 9.4 presents summary statistics for wages and hours worked. The left panel of the table presents the average real total monthly wages, working hours and hourly wage rates for the total sample for the five-year period by gender and product types,[3] while the right panel presents the data for migrant production workers only.

The data from the left panel show that, on average, real monthly total earnings increased by 3.3 per cent per annum (Column 1). Male workers earn, on

Table 9.2 **Industry distribution of the data, 2000–2004**

Annual industrial share of workers	2000	2001	2002	2003	2004	Total
Footwear	98.57	94.90	85.15	82.82	83.81	87.72
Apparel		1.75	6.33	6.99	6.53	4.91
Accessories and gears	1.43	3.35	8.52	10.18	9.66	7.36
Total number of records	167211	182864	259881	293031	260870	1163857
September share of workers						
Footwear	97.94	97.07	83.03	82.72	83.18	87.11
Apparel		0.00	6.02	7.05	6.37	4.64
Accessories and gears	2.06	2.93	10.95	10.23	10.45	8.25
Total number of records	12846	16786	21943	23027	23916	98518
Annual proportion of male workers						
Footwear	27.53	23.62	20.34	20.24	22.29	22.18
Apparel		22.54	42.25	39.28	38.57	39.17
Accessories and gears	71.39	75.42	59.52	62.79	67.02	64.00
Total	28.05	25.02	24.27	24.93	26.93	25.66
The share of rural migrants in the sample						
Footwear	59.88	71.12	81.43	85.03	90.91	79.08
Apparel		16.40	31.93	60.71	84.65	57.08
Accessories and gears	51.72	56.26	82.22	76.11	82.76	77.55
Total	59.76	69.67	78.36	82.42	89.72	77.89
Average age of the sample						
Footwear	23.38	23.76	24.11	25.00	25.54	24.57
Apparel			28.59	27.86	27.35	27.71
Accessories and gears	23.12	23.17	25.48	25.89	26.14	25.67
Total	23.38	23.74	24.35	25.21	25.69	24.75

Average age for the new entrance						
Footwear	22.49	22.02	22.32	23.17	23.11	22.74
Apparel			27.58	24.88	25.66	25.52
Accessories and gears	21.59	20.33	23.40	22.47	23.65	23.13
Total	22.48	21.98	22.48	23.19	23.32	22.88
Education distribution (total)						
Primary	4.86	3.81	2.52	2.08	2.05	2.69
Junior high	81.72	82.82	84.88	85.76	84.87	84.51
Senior high	10.2	9.41	8.56	8.37	8.74	8.85
Technical high	2.71	3.35	3.36	3.02	3.52	3.25
College	0.44	0.56	0.54	0.59	0.65	0.57
University	0.06	0.05	0.14	0.17	0.17	0.14
Education distribution (males)						
Primary	1.27	1.54	1.7	1.61	1.53	1.56
Junior high	73.07	70.74	70.76	71.03	71.16	71.2
Senior high	20.71	21.34	20.6	20.37	19.46	20.31
Technical high	3.69	4.66	5.05	5.1	6.03	5.15
College	1.03	1.54	1.38	1.32	1.3	1.32
University	0.22	0.18	0.51	0.58	0.52	0.46
Education distribution of the new entrance						
Primary	3.40	2.54	0.14	0.46	1.16	1.11
Junior high	80.97	85.25	90.86	87.73	87.15	87.47
Senior high	9.47	6.82	4.22	6.84	6.69	6.34
Technical high	5.51	5.02	3.60	4.03	4.20	4.22
College	0.64	0.37	0.70	0.63	0.66	0.63
University	0.00	0.00	0.49	0.32	0.14	0.23

Table 9.3 **Wage structures of the sample factories**

Factory 1
Total wage=Time rate+Bonus+Customer reward+Other reward+Position pay+Seniority pay+efficiency reward
Total deductions =Meal charge+Accom. Charge+Medical insurance+Income tax+Other deduction
Net wage=Total wage-Total deduction-balance
End of year bonus (not included in the wages)
Factory 2
Total wage=basic pay+weekday overtime pay+weekend overtime pay+holiday overtime pay+Other pay
Total deductions=Penalty deduction+accom. charge+social security+unemployment insurance+Income tax
Net wage=Total wage-Total deduction
End of year bonus
Factory 3 (2001.09-2003.06)
Total wage =Transport subsidy+Other subsidy+pay back bond for borrowed tools+basic wage+night work pay+bonus+pieace rate
Total deductions =deduction of no excuse leave+accom. charge+penalty+social security+Medical charge+electricity charge+temporary registration charge+Factory ID charge
Net wage = Total wage-Total deduction
End of year bonus
Factory 3 (2003.07-2004.09)
Total wage =basic wage+weekday overtime pay+weekend overtime pay+holiday overtime pay+bonus+other subsidy
Total deductions =accom charge and electricity charge+social security charge+Medical expenditure+temporary registration charge+meal charge+Other charge+no excuse leave penalty
Net wage = Total wage-Total deduction
End of year bonus
Factory 4
Total wage =Basic wage+Subsidy+Bonus
Total deductions =Accom. Charge+Government adm. Charge
Net wage = Total wage-Total deduction
End of year bonus plus paid holiday (Not included in the wages)

Factory 5

Total wage =basic wage100%+overtime pay150%+weekend overtime pay 200% +holiday overtime pay 300%+bonus+extra production bonus+piece rate+Holiday pay +subsidy for night time work meal

Total deductions =Income tax+superannuation+medical insurance+meal charge+other charge

Net wage = Total wage-Total deduction

End of year bonus

Factory 6

Total wage=piece rate+basic wage+special subsidy+living subsidy+night work subsidy+bonus+No leave bonus+New year subsidy+Managerial subsidy+work subsidy+transport subsidy+medical subsidy+meal subsidy+Other subsidy+overtime pay+overtime subsidy+wages paid when waiting for material

Total deductions =Meal charge+Contract charge+Supperannuation+Other social security payment+Income tax+pay beck borrowing+Other deduction

Net wage+Total wage-Total deduction

End of year bonus

Factory 7 (before Oct. 2004)

Total wage =Basic wage+Overtime wage+No leave bonus+efficiency bonus+subsidy+Other bonus

Total deductions =Social security payment

Net wage = Total wage-Total deduction

End of year bonus

Factory 7(since Oct. 2004)

Total wage =Basic wage+overtime1.5+Overtime2+Overtime3+bonus+Other subsidy+piece rate

Total deductions =Social security payment

Net wage = Total wage-Total deduction

End of year bonus

Table 9.4 **Monthly and hourly real wages and hours worked, 2000–2004** (yuan)

	Total sample				Migrant production workers			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total monthly earnings	Total[a]	Females (F)	Males (M)	F/M	Total	Females (F)	Males (M)	F/M
2000	838.96	806.07	923.34	87.30	829.22	794.72	941.90	84.37
2001	847.35	794.35	1006.35	78.93	812.19	766.79	972.99	78.81
2002	942.85	875.66	1153.65	75.90	912.83	851.75	1143.16	74.51
2003	929.67	872.42	1103.79	79.04	896.09	847.43	1073.20	78.96
2004	988.82	930.46	1148.34	81.03	952.51	904.41	1110.35	81.45
Average annual growth (%)	3.34	2.91	4.46		2.81	2.62	3.35	
Monthly hours worked								
2000	200.08	200.35	199.36	100.49	200.80	200.66	201.23	99.72
2001	192.35	190.91	196.65	97.08	191.66	190.12	197.09	96.46
2002	210.75	210.45	211.72	99.40	210.32	210.10	211.20	99.48
2003	199.67	200.36	197.59	101.40	198.87	199.95	194.94	102.57
2004	206.82	207.12	205.99	100.55	206.44	207.09	204.29	101.37
Average annual growth (%)	0.66	0.67	0.66		0.56	0.63	0.30	
Total hourly earnings[b]								
2000	4.34	4.15	4.88	85.11	4.21	4.05	4.75	85.34
2001	4.47	4.24	5.14	82.50	4.30	4.12	4.95	83.17
2002	4.59	4.23	5.76	73.45	4.46	4.12	5.77	71.36
2003	4.89	4.42	6.34	69.73	4.75	4.29	6.42	66.79
2004	5.06	4.60	6.36	72.34	4.94	4.48	6.46	69.37
Average annual growth (%)	3.11	2.08	5.45		3.23	2.03	6.34	

Notes: [a] The sample for the total differs from that by gender as around 20 per cent of the sample has no personnel records.
[b] The sample for hourly earnings is slightly different from that for total earnings as around 2 per cent of the sample has no record of working hours.

average, 13–25 per cent more than female workers (Column 5) and the annual growth of monthly real earnings is much faster for men than for women, with a difference of 1.5 percentage points per annum.[4]

Turning to monthly hours worked, the total hours worked are about 197 to 212 a month, which amounts to 46 to 50 hours a week. This is about 8–8.3 hours a day, with six working days a week. This seems to be on the low side relative to common perceptions and common findings of hours worked for migrant workers from other survey data sources. For example, Meng and Zhang (2001) found that in Shanghai in 1995 migrant workers worked an average of 56 hours a week. A recent survey of income distribution for migrant workers in 11 provinces (including Guangdong) showed that the sample migrant workers worked, on average, 61 hours a week in 2002, whereas the number for Guangdong Province was 65 hours weekly.[5] Interestingly, the average weekly hours worked was also much lower than the maximum 60 hours a week required by the outsourcing company. One possible reason for this is that the pattern of production is seasonal, with peaks and troughs. When calculating annual monthly averages, they could appear lower than the maximum hours required by the outsourcing company. The other possible reason is that firms could have misreported information about hours worked to satisfy the outsourcing company's code of conduct. The total monthly hours worked varies only slightly across different years: on average, they increased by 0.2 per cent per annum, and did not differ between men and women. The number of monthly hours worked, however, is often higher for female than for male workers.

Combining the information on monthly earnings and hours worked, hourly earnings data are then calculated. Note that as information on hours worked could be biased downwards, hourly earnings data could be biased upwards accordingly. The major difference observed between data on hourly earnings and monthly earnings is that the annual growth of hourly earnings for male workers is much higher than the annual growth of their monthly earnings. This further prompts one to wonder if the information provided for hours worked is accurate.

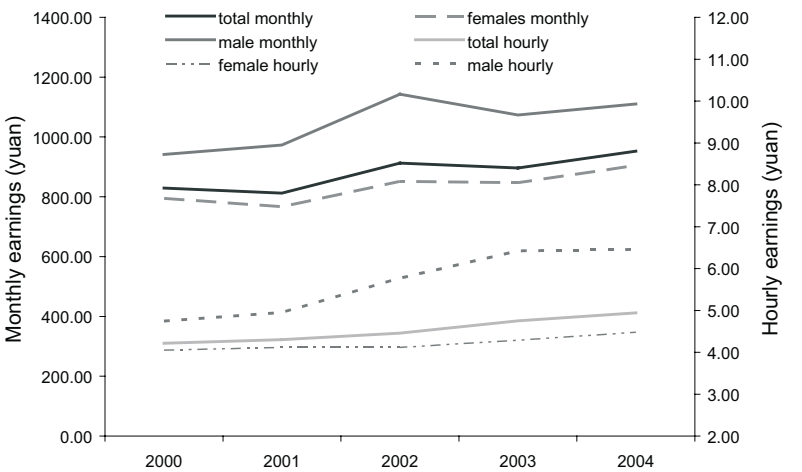
The above descriptions are based on the total sample, including service workers, managerial and technical staff. The right panel of Table 9.4 presents the same information for migrant production workers, which indicates the wages for unskilled workers. The most important difference between the total sample and the sample of production workers is that the rate of wage growth is much slower for the latter, with an annual monthly wage increase of 2.8 per cent—about 0.5 percentage points lower than that for the total sample. In particular, for female production workers—the most unskilled group—the real hourly wage increased by only 2 per cent per annum.

Monthly and hourly earnings data for the migrant production workers is shown in Figure 9.1. While male monthly earnings increased significantly between 2001 and 2002, they flattened out after 2002. For the total and female samples, the monthly wage increase has been limited. For example, female monthly earnings were about 800 yuan and, by 2004 (five years later), had increased to only 900 yuan—an annual increase of 2.6 per cent—whereas for males the increase was faster, at an annual rate of 3.4 per cent. The hourly earnings data indicate a much larger difference in the wage growth rate, with 2 per cent for women and 6.3 per cent for men.

Having described average levels and changes of wages in these factories, we wonder how they compare with the average minimum wages for the regions covered and with average urban wage changes in Guangdong Province. More importantly, how do they compare with the income levels of the migrant workers' respective rural home towns? Since about 90 per cent of the sample workers are from Jiangxi, Henan, Hubei, Hunan and Sichuan provinces, aggregated data for these five provinces are presented.

Table 9.5 compares average minimum wages for the four regions covered in this study, urban manufacturing workers' wages for Guangdong Province and average per capita rural net income for the five provinces listed above, with the

Figure 9.1 **Monthly and hourly earnings by gender, 2000–2004** (yuan)



Source: Authors' calculations.

average basic monthly pay and the average monthly wages for the sample of migrant production workers in the period 2000–04. The first two rows present the average minimum wages for the four regions in Guangdong—the average nominal monthly basic pay for our sample of production workers. They show that while the minimum wages increased by 2.62 per cent per annum between 2000 and 2003, the basic pay for the sample of production workers increased by 4.2 per cent per annum in the same period. When comparing the level of average minimum wages with the average basic pay, the basic pay for the production workers in every single year is higher than the official minimum wages. In 2002 and 2003, it is about 9–10 per cent higher. This finding suggests that the sample firms have been paying their workers in line with local government labour legislation. It is important to keep in mind that all seven firms studied in this chapter are large and volunteered their payroll data. This finding might not be representative of the large number of factories that refused to participate in the study. In fact, anecdotal evidence and many newspaper articles have revealed problems regarding firms' violation of the minimum wage law.[6]

Rows (4) and (5) present the average monthly total earnings for the sample of migrant production workers and the urban manufacturing sector in Guangdong.[7] It is found that migrant workers earned about 67–80 per cent of the urban manufacturing average wage during the whole period and the gap has been enlarged.

Table 9.5 also compares average monthly wages of the sample firms with the rural average net monthly income[8] per labourer for Hunan Province, where almost 40 per cent of the sample workers come from. We find that although the average annual growth rate of rural-per-labourer income amounted to 4.2 per cent during this period, it was driven mainly by the 2004 government policy to cut the rural tax to zero. Before that, the average annual growth rate of rural income per labourer between 2000 and 2003 was only 2.6 per cent. Most importantly, we find that, on average, migrant workers in the sample factories earned 2.7 to 2.9 times the income they would have earned had they stayed in rural Hunan. This difference is, perhaps, the best explanation as to why migrant workers are willing to work in these factories. It is also a good indication of whether China has reached the Lewisian turning point: when rural surplus labour is exhausted, rural and urban wages will start to equalise. This is certainly not happening in China—if anything, the rural–urban income gap has increased over time (Figure 9.2).

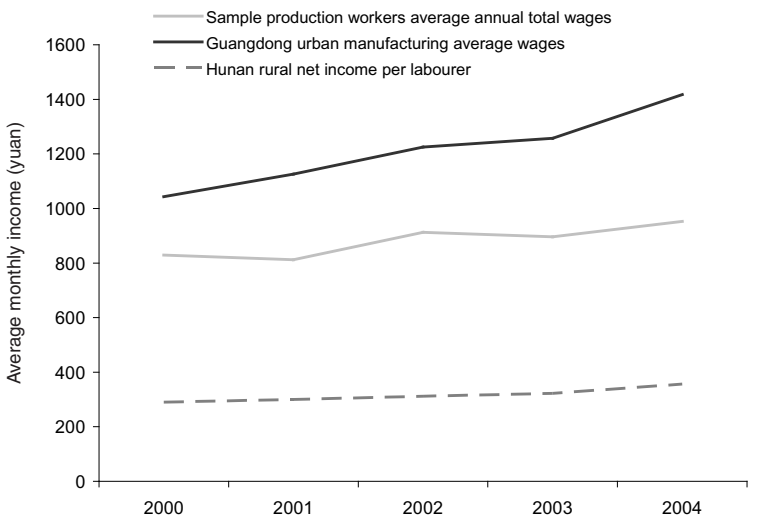
The above comparison, however, has one crucial weakness. The *China Statistical Yearbooks* do not provide data on hourly wage rates. It is likely that urban Guangdong workers work fewer hours and hence have much higher

Table 9.5 **Comparison of wages and incomes, 2004–2004**

		2000	2001	2002	2003	2004	Annual growth rate
Sample production workers average monthly basic wage	(1)	433	458	497	511	524	4.22
Guangdong four regions average minimum monthly wage[a]	(2)	422	448	453	468		2.62
(1) as proportion of (2)	(3)	102.64	102.25	109.82	109.19		
Sample production workers average monthly total wages	(4)	829	812	913	896	953	2.81
Guangdong urban manufacturing average wages[b]	(5)	1043	1126	1225	1258	1417	6.32
(4) as proportion of (5)	(6)	79.48	72.13	74.51	71.25	67.21	
Hunan rural per household net monthly income[c]	(7)	822	847	879	922	1026	4.54
Hunan rural net monthly income per labourer[d]	(8)	291	300	312	323	356	4.17
(4) as proportion of (8)	(9)	285.45	270.43	292.81	277.86	267.25	

Notes: [a] Guangdong four regions' (Guandzhou, Dongguan, Shenzhen, Zhongshan) average mimimum monthly wages are provided by Adidas Guangdong office.
[b] Guangdong urban manufactory average wages are reported in Tables 5–22 of C*hina Statistical Yearbook*, 2001, 2002 and 2003 and Table 5–25 of *China Statistical Yearbook*, 2004. The data presented here are annual figures divided by 12.
[c] Per capita net income per households is generated by multiply per capita income and average households size for western China reported in Table 10–18 on page 380 of *China Statistical Yearbook*, 2004. The figures presented here are annual figures divided by 12.
[d] Per household labourer net income is generated by dividing per household net income by average number of labourer for western China reported in Table 10–18 on page 380 of *China Statistical Yearbook*, 2004. The figures presented here are annual figures divided by 12.

Figure 9.2 **Income gap among urban workers, migrant workers and rural workers, 2000–2004**



Source: Authors' calculations.

hourly wage rates than the sample workers. Du et al. (2006) show that, on average, migrant workers work 55 per cent more hours a week than their urban-resident counterparts. It can be imagined that the hourly earnings gap between urban workers and migrant workers should be much more prominent than the gap between the annual wages shown in Figure 9.2.

Wage growth: more in-depth analysis

The above analyses present the raw data on wage levels and changes for migrant workers. Raw data could, however, be misleading, as many different factors could contribute to the level and change of wages. For example, the longer a worker stays with a factory, the higher his/her earnings will be. Given that our data trace individuals over five years, at the end of the data period, the average firm tenure of the worker is longer than at the beginning of the period (19 months versus 26 months), and this could contribute to the higher average earnings at the end of the period. In addition, factories could hire more better-educated workers at the end of the period than at the beginning. This could also contribute to a seeming increase of earnings by looking at only the raw

data. To examine the wage changes due purely to supply shortage, all these factors have to be controlled for. We estimate the following earnings equation for this purpose

$$ln(Y_{ijt}) = \alpha + \beta X_{ijt} + \delta_t + \theta_j + \varepsilon_{ijt} \quad (1)$$

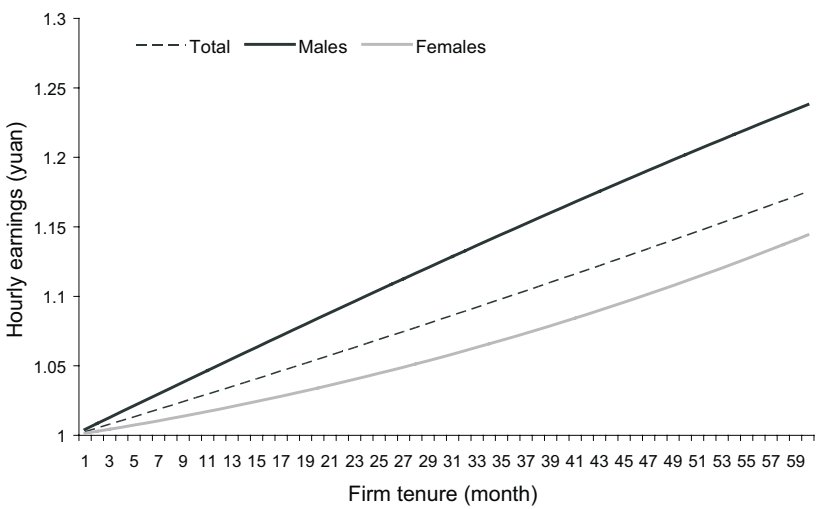
where Y_{ijt} is hourly earnings of individual i in firm j at time t; X_{ijt} is a vector of control variables that could affect earnings, including age and its squared term, firm tenure as measured in months and its squared term, education level, occupation and industry dummy variables, dummy variables for each month to capture seasonality effects, a dummy variable for urban workers and a gender dummy variable. θ is factory fixed effect, δ is year fixed effect and ε is a random error term. While education measures the formal training, firm tenure indicates on-the-job training. Age, on the other hand, proxies for general labour market experience and some possible age-related physical conditions, such as eyesight and physical strength, which could affect labour productivity. Gender and migrant status could to some extent capture labour-market discrimination. To investigate wage changes over time, the most important coefficients for this study are the year fixed effects, δ. If, over the period we studied, there is a significant labour shortage, we should observe a significant increase in δ.

The earnings model is estimated for the total sample and a sample of migrant production workers only. The results are presented in Table 9.6 (the left panel for the total sample and the right panel for the migrant production workers). The first and fourth columns of each panel report the results for the total sample, while the rest of the columns present the results for male and female workers separately. Results from the total sample reveal that about 21–27 per cent of the wage variations are explained by the variables included in the regression. All human capital related variables have the right signs and are statistically significant. In particular, firm tenure and general labour market experience have a normal relationship with earnings. Education contributes positively to earnings and managerial staff earn more than production workers, while women earn about 10–12 per cent less than men. Note that in Table 9.4 much larger gender raw wage differentials are observed (about 15–32 per cent); the lower results indicated here suggest that part of the gender earnings differential can be explained by the difference in human capital possessions and other firm and individual characteristics controlled for in the regression. The seasonal variables play an important role in earnings determination. In particular, earnings in January are much higher than the rest of the year and this is due mainly to the fact that most factories pay an extra bonus before the Chinese New Year (the results are available on request from the authors).

More interesting results are revealed when the earnings equations are estimated separately by gender. In particular, on-the-job training (firm tenure) plays a more significant role in earnings determination for men than for women. Figure 9.3 shows the relationship between the number of months a worker works in a firm and his/her earnings (tenure–earnings profile) and it indicates that after one year a male worker earns about 5 per cent more than when he first entered the factory; this rate doubles in two years to 10 per cent, all other things being equal. In contrast, the wages of female workers increase by only 4.2 per cent after two years in the factories. Note that in the less-skilled footwear and apparel industries, more than 77 per cent of workers are women, while in the more skill-intensive accessories and gear industry, 63 per cent of workers are men.

The observed difference by gender could, to a large extent, reflect structural wage differences across different industries. The types of skills required in different jobs and industries differ significantly. For example, during interviews, accessories and gear factories indicated that it required two years for a worker to become skilled. Consequently, workers in this industry are more likely to be paid piece rates. In this kind of environment, the longer you work, the more skilled you become, the more pieces you make and the higher pay you receive. On the other hand, workers in footwear and apparel factories—where most female workers in our sample work—tend to be unskilled and operate in

Figure 9.3 **Tenure earnings profile for migrant production workers**



Source: Authors' calculations.

Table 9.6 **Earnings equations for the total sample and the sample of production workers**

	Total sample			Migrant workers' sample		
	Total	Males	Females	Total	Males	Females
Constant	0.942	0.526	1.028	0.976	0.291	1.067
	(0.006)***	(0.017)***	(0.006)***	(0.008)***	(0.023)***	(0.007)***
Age	0.035	0.067	0.030	0.033	0.087	0.028
	(0.000)***	(0.001)***	(0.000)***	(0.001)***	(0.002)***	(0.001)***
Age^2	–0.001	–0.001	–0.001	–0.001	–0.001	–0.001
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Firm tenure/10	0.024	0.039	0.010	0.027	0.043	0.014
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Firm $tenure^2/10^4$	0.089	–0.047	0.237	0.007	–0.120	0.143
	(0.000)***	(0.000)***	(0.000)***	(0.000)**	(0.000)***	(0.000)***
Senior and technical high	0.063	0.024	0.112	0.034	–0.013	0.109
	(0.001)***	(0.002)***	(0.001)***	(0.001)***	(0.003)***	(0.001)***
College and university	0.379	0.360	0.386	0.259	0.230	0.259
	(0.004)***	(0.007)***	(0.005)***	(0.007)***	(0.012)***	(0.012)***
Service workers	0.000	0.030	–0.029			
	–0.002	(0.004)***	(0.003)***			
Managerial/technical	0.165	0.105	0.202			
	(0.001)***	(0.002)***	(0.001)***			
Dummy urban workers	–0.041	–0.043	–0.032			
	(0.002)***	(0.005)***	(0.002)***			
Dummy for males	0.101			0.120		
	(0.001)***			(0.001)***		

2001	−0.028	−0.028	−0.030	−0.038	−0.052	−0.038
	(0.001)***	(0.004)***	(0.001)***	(0.001)***	(0.004)***	(0.001)***
2002	−0.064	−0.070	−0.070	−0.070	−0.082	−0.075
	(0.001)***	(0.003)***	(0.001)***	(0.001)***	(0.004)***	(0.001)***
2003	−0.029	−0.024	−0.037	−0.034	−0.038	−0.042
	(0.001)***	(0.003)***	(0.001)***	(0.001)***	(0.004)***	(0.001)***
2004	0.019	0.011	0.012	0.015	−0.003	0.009
	(0.001)***	(0.003)***	(0.001)***	(0.001)***	−0.004	(0.001)***
Observations	769598	193709	575889	660247	143313	516934
R-squared	0.27	0.24	0.28	0.21	0.25	0.19

Notes: Standard errors in parentheses
* significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent
Source: Authors' calculations.

production lines. By and large, they are paid time-rate wages. In this kind of job, the extent to which experience on the job can increase productivity is limited. Thus, job tenure does not seem to affect wages as much as in the other industries.

Another interesting result is the difference of formal education levels on earnings between men and women. While formal education plays an important role in earnings for women, male workers with senior high school qualification earn less than their counterparts who have only junior high school qualification. One of the reasons why formal education plays an important role for women—who work mainly in the unskilled footwear and apparel industries—is, perhaps, due to the inability of the current study to control for detailed types of work performed by individuals. The data used here identify only whether a worker is involved directly in production and do not reveal the exact type of work they do. Perhaps more educated workers are more likely to be a foreman or supervisor and hence earn more. Another reason could be that when workers work on production lines, productivity and quality cannot be monitored individually. Thus, education is used as a screening device.

The results showing that male workers with more education (those working mainly in the accessories and gear industry) are receiving lower pay are abnormal. One possible conjecture is that for these types of jobs, experience at a younger age might be important. Younger people could learn quickly and be more dexterous than older people. People who have only junior high school qualifications could start working earlier than people who have higher education and hence be more skilful than those with higher qualifications, other things being equal. This could not be tested empirically as the data we use have information only about current employment: earlier similar experience cannot be investigated.

The most important result for this chapter is the year effect. We find that controlling for all the other variables, wages barely increased in the five years studied. Almost all the year dummy variables have negative signs, indicating that, relative to the year 2000, earnings of other years have reduced. Figure 9.4 presents the results on δ for the migrant production worker sample. It uses the coefficients obtained from the estimation of Equation 1 to simulate wages for a 20-year-old, with a junior high or primary school qualification and zero months of firm tenure, in January for each of the five years. The figure shows that a newly hired 20-year-old with junior high school qualification earned almost the same amount in 2004 as his/her counterparts in 2000. For a woman, her hourly earnings were 4.12 yuan in 2000, which declined to 3.8 yuan in 2002, and then increased gradually to 4.16 yuan in 2004—an average annual growth of less

Figure 9.4 **Wage growth simulation, hourly earnings, 2000–2004**

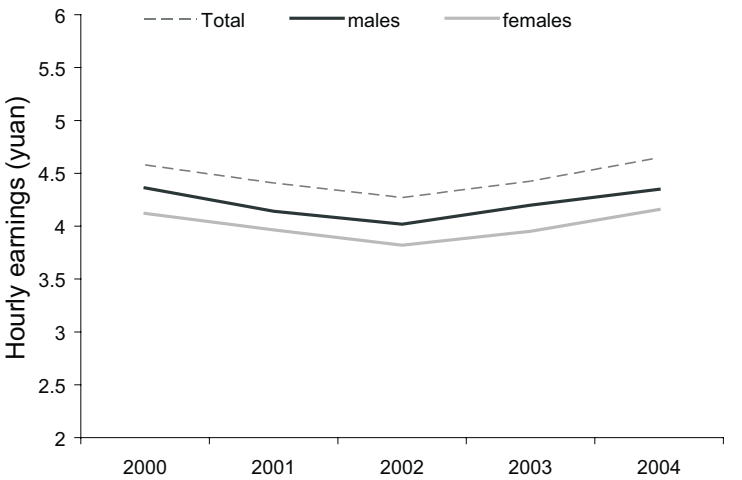
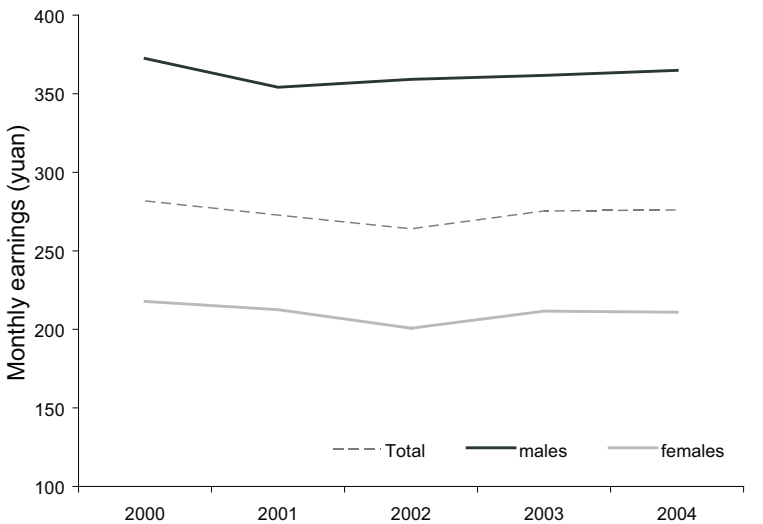


Figure 9.5 **Wage growth simulation, monthly earnings, 2000–2004**



Source: Authors' calculations.

than 0.2 per cent. For a man, the 2000 hourly earnings were 4.36 yuan, dropping to 4 yuan in 2002, and increasing to 4.35 yuan in 2004—barely catching up with the 2000 level. If, however, we ignore the first two years, when there was a reduction in earnings, and compare the lowest earnings in 2002 with those of the final year, we observe a slight wage increase of about 2.5 per cent per annum for men and women.

Recall that factories could have misreported the data for hours worked. If so, it could bias the estimated earnings growth. To test this, we also estimated Equation 1 using log monthly earnings as the dependent variable.[9] The simulation using these results is presented in Figure 9.5, which shows that the monthly earnings growth for men and women is zero to negative for the entire period and 0.5–1.5 per cent for the last three years.

Based on the data available, wage growth in the sample factories between 2000 and 2004 has been very slow, in particular for migrant production workers.

Conclusions

The empirical results indicate three main findings.

1. Of the seven sample factories, average hourly wages increased by about 6 per cent per annum between 2000 and 2004 for the total sample of workers, but for production workers the annual average growth rate was much lower, at 3.5 per cent.
2. The major wage growth comes from wage growth for male workers. For female workers—who accounted for more than 70 per cent of the total sample—the average annual wage growth was about 2.4 per cent.
3. Once we control for education, firm tenure and other variables that could affect wage levels, the observed wage growth for the total sample and male and female samples are all very low. For the five years, average annual wage growth has been negative or near zero. For the last three years, the growth rate was about 0.5–1.5 per cent. With such small wage increases, one could hardly argue that China has reached the Lewisian turning point.

The main finding, although important, could suffer from the following caveats. First, the current study could suffer significantly from a sample selection bias. Although effort was made to make sure that the sample was selected randomly, due to the unwillingness to participate among the listed firms, the final sample is not a randomly selected one. It is possible that the factories that were willing to participate in the study were those that followed

the outsourcing company's code of conduct and the official minimum wage increases better than those that refused to participate. Thus, the general picture of wage levels and wage growth might not be as optimistic as we find in this chapter.

Second, the main data used in this study are from payroll records. It is not clear whether these records are genuine. It is commonly known that many factories in China adopt a double accounting practice. There is evidence that the payroll data provided by some factories are based on some kind of conversion rules required by the outsourcing company. In addition, the data on hours worked seem to be low. Although it is not clear to what extent this kind of behaviour could affect the accuracy of the earnings and hours-worked data, the direction of the effect is clear. Factories that volunteered to participate would want to present higher earnings and earnings growth (keeping up with the increase in minimum wages). If there is any systematic bias of the data, it should be biased upwards.

Finally, the data used in this study end in 2004. It is possible that since 2004 wages have been growing at a much faster pace than what we found for the period between 2000 and 2004. The lack of a systematic study of migrants, however, and their wage changes have prevented us from finding out this information. The current studies that argue that China has reached the Lewisian turning point do not seem to be based on unskilled workers' wage data. We hope that the current study can shed limited light on the issue, at least up to 2004.

Notes

1 Based on the interview record, the Monday–Friday normal time pay is set at one; Monday–Friday overtime pay is 50 per cent higher (1.5 times normal pay); weekend pay is 100 per cent higher (two times normal pay); while public holiday pay is 200 per cent higher (three times normal pay).

2 The city-level CPIs provided by the Guangdong Bureau of Statistics are presented in Table A1.

3 The data calculated by region are not presented for confidentiality reasons, as two of the four regions have only one factory.

4 Note that as the data used for the total sample differ significantly from those used for males and females separately—due to a 20 per cent sample without personnel records—the figures presented using the total sample are not directly comparable with those for the gender groups. Nevertheless, the trends are comparable.

5 This survey was conducted by the Institute of Economics at the Chinese Academy of Social Sciences in 2003. The total sample of workers was 5,327 and the sample for Guangdong Province was 368 migrant workers.

6 See, for example, http://finance.dayoo.com/gb/content/2006-07/14/content_2566970.htm

7 Manufacturing comprises about 23 different industry types. Ideally, the average annual

earnings of the footwear, apparel and accessories and gear industries for Guangdong Province should be used for this comparison. The *China Statistical Yearbook*, however, does not provide detailed information for these industries separately, nor does it indicate the employment and earnings distribution among these different industry types. The comparison presented here, therefore, should be read with caution.

8 This is calculated by dividing annual data by 12.

9 The results are not presented, but are available on request from the authors.

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Table A9.1 **City level CPI 2000=100**

	2000	2001	2002	2003	2004
Guangzhou	100.00	98.90	96.53	96.62	98.27
Shenzhen	100.00	97.80	98.97	99.67	100.96
Dongguan	100.00	98.20	96.33	97.01	99.92
Zhongshan	100.00	99.80	99.10	100.29	103.40

Source: Data provided by National Bureau of Statistics of China