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IZA DP No. 3270

Earnings Instability and Earnings Inequality in Urban China: 1989-2006

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December 2007

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ABSTRACT

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This paper investigates the evolution of earnings inequality in urban China from 1989 to 2006. After decomposing the variance of log of earnings into transitory and permanent two parts, we find that both components are important contributors to the total variance of earnings. We also find that the share of the transitory part has been decreasing from early 1990 to 2004; however, this decreasing trend is reversed from 2004 to 2006. Compared female to male, though these two populations share similar trends in the changes of transitory and permanent components, changes are more pronounced for female than for male. Our results suggest that the time-invariant part and time related part in permanent earnings are negatively correlated. This implies converge of earnings profile in long run and also implies that there is more mobility within the distribution of long-term earnings.

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I. Introduction

The widening earnings distribution in urban China is one of the most remarkable shifts in the structure of labor compensation in China labor market since the Chinese economic reform starting in 1979. The Gini indices have increased from 0.191 in 1985 to 0.269 in 2001 in urban China, see Wu and Perloff (2004). This phenomenon attracts much attention from economists and the trend of increasing inequality is well documented in the literature, e.g. Zhao et al. (1994) and Zhao, Li and Riskin (1999). Numerous studies have investigated the driven forces behind this trend, such as skill-biased technological change, supply and demand factors, and many other related issues.[1]

Since Friedman (1957), permanent income and transitory income have become two important concepts in studying income issues. Gottschalk and Moffitt (1994) have shown that a growing instability in wages is a major factor causing the widening of earnings distribution, and increasing of variance of transitory earnings can explain one-third of overall increasing of inequality of earnings in the United States from the 1970s to the 1980s. Recently, an increasing amount of literature has characterized the transitory earnings and earnings instability, and has gained important insights on the dynamics of earnings. The studies include Dickens (2000) and Ramos (2003) for Great Britain, Haider (2001), Moffitt and Gottschalk (2002), and Cunha and Heckman (2006) for United States, Baker and Solon (2003) for Canada, and Cappellari (2003) for Italia, among others.[2]

Conceptually, decomposing the earnings inequality in China into transitory and permanent two parts should be an important issue, especially in urban China. On the one hand, reform of the state-owned enterprises (SOE), deregulation of urban

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[1] For recent research, please refer to the published papers in the symposium on Chinese inequality in the December 2006 issue of the Journal of Comparative Economics.

[2] All these studies focus on male workers. Our analysis will cover both male and female workers.

labor market, influx of rural migrants all create a competitive labor market and make the labor market more flexible, hence will increase the mobility of job and the instability of earnings; but the above mentioned shocks can be permanent, so they could have permanent impacts on the distribution of earnings. One the other hand, the increase of rate of return to education in the past twenty years (e.g. see Zhang et al. 2005), and the improvement of human capital endowment of Chinese urban population (see Bargain et al. 2007) will induce a shift in permanent earnings.

Given different forces work on different directions, characterizing the relative importance of transitory and permanent component in the evolution of Chinese earnings inequality is an important empirical exercise. However, little attention is paid to this important aspect in income and earnings distribution literature on China[3]. In this paper, we will follow the approach in Moffitt and Gottschalk (2002), Ramos (2003) and others to decompose the variance-covariance structure of log of earnings into permanent and transitory two parts, and to study the importance of each part empirically using a panel data set, the China Health and Nutrition Survey.

After decomposing the variance of log of earnings into transitory and permanent two parts, we find that both components are important contributors to the total variance of earnings. Around 70% of the total earnings variance is from the transitory part.

We also find that from early 1990 to 2004, the share of the transitory part has decreased from 75% to 65%; however, this decreasing trend is reversed from 2004 to 2006. Compared female to male, though these two populations share similar trends in the changes of transitory and permanent components, changes are more pronounced for female than for male.

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[3] The one exception is a paper by Khor and Pencavel (2006), who have studied income mobility in urban China from 1990 to 1995 based on recall data. We will discuss this paper more in the following sections.

Our results suggest that the time-invariant part and time related part in permanent earnings are negatively correlated. This implies converge of earnings profile in long run and also implies that there is more mobility within the distribution of long-term earnings.

The rest of the paper is organized as follows: Section 2 describes the data set, the China Health and Nutrition Survey. In this section, we also briefly discuss attrition and measurement error. Section 3 provides a simple analysis on the earnings dynamics in urban China from 1989 to 2006 based on a simple approach proposed by Moffitt and Gottschalk (2002). Section 4 outlines a formal econometric model, heterogeneous random growth model, to formally analyze transitory and permanent components of earnings inequality. Section 5 summarizes main results, and also carries out robustness check. Section 6 is conclusion remarks.

II. Data Description and Related Issues

Data set used in this paper is the China Health and Nutrition Survey (CHNS). CHNS is a longitudinal survey, which has collected seven waves of data in 1989, 1991, 1993, 1997, 2000, 2004, and 2006. CHNS utilizes a multistage, random cluster-sampling scheme. The survey covers 9 out of 31 provinces in China, including coastal, middle, northeastern and western provinces.[4] In each province, both big cities and small cities are sampled. CHNS also includes cities from different income levels, and surveys both rural and urban residents. Currently there are about 4,400 households with 19,000 individuals in the survey. Among these individuals, about 30% are from urban area and 70% are from rural area.

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[4] Please refer to Appendix 1 for the 9 provinces in the CHNS and a map of survey regions.

In this paper, we use the longitudinal data sets of the CHNS prepared and released by the Carolina Population Center at the University of North Carolina at Chapel Hill. We restrict our analysis on the urban residents; furthermore, we only include prime age population in our sample, i.e. observations with age from 20 to 60, since our paper is on the earnings dynamics. We also exclude students and retirees. In order to increase the sample size, we include all observations who reported positive earnings at least in one of the seven waves. Therefore, we have an unbalanced panel, and the final sample has a total of 8,692 of individual-wave observations.

Our earnings measurement is the log of monthly earnings. We include income from all jobs, both primary and secondary occupations, but we do not include non-labor income in our measurement.[5]

Before closing this section, we want to make several remarks on the attrition and measurement error issues.

Since the focus of this paper is on the study of transitory and permanent components of earnings, this requires us to use panel data. However, like any study based on panel data, the attrition and the potential bias caused by non-random attrition is always an issue. There is virtually no formally study on the attrition in the CHNS, and the information on attrition from the documents of the CHNS is spotty. However, in their analysis of the attrition in the Indonesia Family Life Survey, Thomas, Frankenberg, and Smith (2001) state that "among large-scale surveys in developing countries, the China Health and Nutrition Survey … has probably been among the most successful in terms of keeping attrition low." In this paper, we will not consider the potential bias associated with the attrition except we will try to exclude observations in Heilongjiang and Liaoning two provinces when we carry out

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[5] More specifically, we construct our earnings measurement from the m07wages dataset released by the CHNS team.

sensitivity check, since these two provinces are not presented in all seven waves (see Appendix 1 for detail).

Another source that could possibly bias the estimates is measurement error. Several comments are in order. First, Benjamin, Brandt and Giles (2005) have compared the earnings from the CHNS rural sample with other data sources, and they find that the earnings variable from the CHNS is comparable to other sources.

Second, in the context of regression, it is well known that non-classical measurement error will bias the estimated coefficients. However in a recent study, Gottschalk and Huynh (2006) provide both analytical results and empirical evidence to show that non-classical measurement error will result in little bias in term of estimating earnings mobility and instability, especially when the measurement is mean-reverting. They rationalize that the main reason for their finding is that different parts of bias will be cancelled out when the measurement is mean-reverting. Though we do not know the characteristic of the earnings measurement error in the CHNS, Bound and Krueger (1991) have found that the measurement error in earnings is non-classical and mean-reverting in the United States. This finding is also confirmed in other studies in the context of developed countries, see Bound, Brown and Mathiowetz (2001). In the context of developing county, Akee (2007) also reaches similar conclusion as Bound and Krueger (1991) using data from Micronesia, i.e. the measurement error in earnings variable is non-classical and mean-reverting.

Third, some researcher who are using the CHNS worry about the quality of earnings variables in the wave of 1989, e.g. see Benjamin, Brandt, Loren and Fan (2003). The CHNS team has also admitted some problems in the 1989 wave of the

CHNS, but in the current CHNS webpage, they state that "(t)hose problems have been corrected and the CHNS 1989 data are now of high quality."[6]

III. Trend of Transitory and Permanent Components

The basic model is from Gottschalk and Moffitt (1994) and Moffitt and Gottschalk (2002). Following their works, we have the following standard permanent-transitory model:

$$y_{it} = \mu_i + v_{it}, \quad \text{cov}(\mu_i, v_{it}) = 0 \tag{1}$$

where y_{it} is log monthly earnings for individual i at time t, μ_i is time-invariant component of earnings, which captures the permanent earnings, and v_{it} is transitory part of earnings. Assuming μ_i and v_i are uncorrelated, which is a standard assumption in the literature.

Under this basic setup, the variance of y_{it}, which reflects the distribution of earnings, can be decomposed into two components:

$$V = \text{var}(y_{it}) = \text{var}(\mu_i) + \text{var}(v_{it}) \tag{2}$$

If we further assume that the transitory earnings shock is not persistent, i.e. when v_{it} and v_{it}' are sufficiently apart (e.g. 3-5 years), then $\text{cov}(v_{it}, v_{it}') = 0$. We have:

$$C = \text{cov}(y_{it}, y_{it}') = \sigma_\mu^2 \tag{3}$$

This gives us the variance from permanent earnings component. Both V and C can be easily calculated from the sample, and the difference of these two is the variance from transitory earnings part.

$$T = \sigma_v^2 = V - C \tag{4}$$

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[6] http://www.cpc.unc.edu/projects/china/design/quality.html. (Last time accessed: December 20, 2007)

This simple formula allows us to investigate the relative importance of each part on the widening of earnings distribution in urban China. This approach is easy to implement. Moffitt and Gottschalk (2002) find that results from this simple method are consistent with their preferred formal model.

Figures 1 to 4 present results from this simple approach.[7] From these figures, we have several observations. First, the variance of log of earnings has increased significantly from early 1990 to the middle 2000, both for male and for female (see Figure 1), and this is consistent with the findings in the previous literature, e.g. Demurger, Fournier and Li (2006),

Second, Figure 2 shows that both transitory and permanent earnings are important contributor to the variance of log of earnings. Roughly speaking, about two-third of the variance of log of earnings are from transitory component. From 1993 to 2004, the transitory part has decreased from about 75% to 65%. However, from 2004 to 2006, the decreasing trend is reversed, and the share of transitory part has been rising again, and exceeds 70% in 2006.

Third, If we exam female and male separately, we can see that both male and female follow the above mentioned trends. Female has experienced a decreasing of transitory part from 80% in 1993 to 60% in 2004, and then the contribution of transitory part has rapidly risen to 70% in 2006 (see Figure 3). The dynamics of male's earnings shares similar picture, though in a less pronounced fashion, see Figure 4.

The upward trend of variance in permanent earnings is also observed in the analysis by Khor and Pencavel (2006). However, unlike their analysis, our variance in transitory earnings dominates the variance in permanent earnings. This probably due

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[7] All the figures are based on residues from regressing log of earnings on age and age squared, i.e. we take out life profile from the earnings.

to the fact that we restrict the permanent component to be constant over time; hence some actual permanent shocks are treated as temporary shocks, so the variance in the transitory earnings is falsely inflated. We will address this issue in the next section, and allow for more flexible evolution of permanent earnings.

It also needs to point out that we observe that our data has some inconsistency with the previous literature, e.g. the variance of log of earnings in 1989 is larger than the one in 1991. This probably reflects that there is still unresolved quality issue in the 1989 wave of the CHNS.

IV. Error Component Model

The simple method in the previous section is straightforward and easy to implement. However, it is also restrictive. Especially, it does not allow the evolution of the permanent earnings along with time, and rule out permanent shocks in the earnings life profile.

We extend the simple model in the previous section as follows:

$$y_{it} = \mu_i + \gamma_i t + v_{it} \tag{5}$$

$$v_{it} = \rho v_{it-1} + \varepsilon_{it} \tag{6}$$

$$\text{cov} \begin{pmatrix} \mu_i \\ \gamma_i \\ v_i \end{pmatrix} = \begin{pmatrix} \sigma_\mu^2 & \sigma_{\mu\gamma} & 0 \\ \sigma_{\mu\gamma} & \sigma_\gamma^2 & 0 \\ 0 & 0 & \sigma_v^2 \end{pmatrix} \tag{7}$$

where ε_{it} is white noise and is uncorrelated with v_{it-1} and is also serially uncorrelated.

Equation (5) is the main equation, which allows the permanent earnings to grow with time. $\mu_i + \gamma_i t$ specifies dynamics of permanent earnings. It has two parts: time-invariant part μ_i, and heterogeneous growth part $\gamma_i t$. We also allow μ_i and γ_i to be correlated.

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The transitory earnings follows an AR (1) process, as specified in Equation (6).[8] As in Section 3 and as in other studies in the literature, we also assume the permanent earnings is uncorrelated with the transitory earnings, which is captured by the variance-covariance in (7).

Following the practice in the literature, we estimate the above model through Chamberlain's minimum distance estimator, see Chamberlain (1984). This estimator was subsequently applied by Abowd and Card (1989) to estimate the variance-covariance structure of earnings in the United States. Most of the studies on permanent and transitory earnings mentioned in the introduction section of this paper are also estimated by this approach.

When estimating the model, the researcher usually follows the suggestion of Altonji and Segal (1996), and uses identity matrix as weighting matrix instead of using the optimum weighting matrix proposed by Chamberlain (1984). Altonji and Segal (1996) indicate that in small sample, weighting by the optimum weighting matrix, i.e. the inverse of fourth moment earnings matrix, could result in large bias due to the correlation of sampling error between the second and the fourth moments. In this paper, we also use identity matrix as a weighting matrix when estimating the model.

V. Results

Table 1 and Table 2 are estimates from the models. Column 1 in both table are estimates from the base model. σ_μ^2 and σ_γ^2 reflect time-invariant heterogeneity and growth heterogeneity in permanent earnings, respectively. Both parts are important

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[8] Previous studies suggest specifying the transitory earnings parts as AR(1) fitting the data well, see the discussions in Cappellari (2003).

and significant at conventional level. Male has a larger σ_μ^2 while female has a

bigger σ_γ^2, which is consistent with Figure 3.

Another parameter for the permanent component is $\sigma_{\mu\gamma}$, the covariance of μ_i

and γ_i. It tells us the relationship between time-invariant heterogeneity σ_μ^2 and

growth (or time related) heterogeneity σ_γ^2 in permanent earnings. Unlike findings in

Cappellari (2003) for Italian male workers, we find that $\sigma_{\mu\gamma}$ are significantly negative

both for male and for female. This indicates that two parts of the permanent earnings

could offset each other. The negative of $\sigma_{\mu\gamma}$ implies converge of earnings profile in

long run and also implies that there is more mobility within the distribution of long-

term earnings, as discussed in Cappellari (2003). One explanation for this finding is

that the economic reform in urban China affords its people more equal opportunity;

and the permanent shocks from China's transition from planning economy to market

economy is not positively correlated with the "earnings ability" in old system.

Our results also show that the transitory part, σ_ε^2, is important, both for male

and for female. However, the correlation between transitory earnings is low. The

temporary shock is more persistent for female than for male. ρ in the AR(1) process

of transitory earning is 0.08 for female, and is only 0.03 for male.

Columns 2 and 3 in Tables 1 and 2 are estimates after controlling for

education level, and controlling for education level plus region.[9] Compared these

results with the ones in Column 1, we can see that the picture are remain unchanged.

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[9] We fit the model using residuals from regressing log of earnings on education level, or on education level and regional dummies. The effect of education (or education plus regional impact) is partialled out through this exercise. We divide our sample into three regions: western area, middle area, coastal area and northeastern area.

The CHNS originally has 8 survey provinces. In 1997, Heilongjiang replaced Liaoning. [10] In 2000, Liaoning returned to the survey, and both Liaoning and Heilongjiang stay in the survey since then. It is possible that some findings we just discussed may be driven by change of the survey provinces. In order to investigate this issue, we exclude observations in Heilongjiang and Liaoning and run the base model again. The results are in Column 4 of Tables 1 and 2. Overall, we see an increase of the parameters for permanent earnings component, but the findings are qualitatively similar to the whole sample case.

VI. Conclusions

In this paper, we investigate the evolution of earnings inequality in urban China from 1989 to 2006. After decomposing the variance of log of earnings into transitory and permanent two parts, we find that both components are important contributors to the total variance. Around 70% of the total variance is from the transitory earnings.

We also find that from early 1990 to 2004, the share of the transitory part has decreased from 75% to 65%; however, this decreasing trend is reversed from 2004 to 2006. Compared female to male, though these two populations share similar trend, changes are more pronounced for female than for male.

Our results suggest that the time-invariant part and time related part in permanent earnings are negatively correlated. This implies converge of earnings profile in long run and also implies that there is more mobility within the distribution of long-term earnings.

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[10] Both Heilongjiang and Liaoning are located in the Northeastern area of China.

We also find that transitory earnings is important, but the correlation between transitory earnings is low, and the temporary shock is more persistent for female than for male.

In the middle of survey, the CHNS has changed survey provinces. After we exclude Heilongjiang and Liaoning from our estimation, overall we find an increase of the parameters for permanent earnings component, but the estimates are qualitatively similar to the whole sample case.

Nonetheless, we only have seven waves of data, this limit us to estimate more supplicated and general model. We also do not address the possible measurement error issue, especially for the wave of 1989, though the study of Gottschalk and Huynh (2006) suggests that mean-reverting measurement error only creates little bias when studying earnings mobility and instability.

References

Abowd, John M and David Card (1989), "On the Covariance Structure of Earnings and Hours Changes," Econometrica, Vol. 57, 411-45.

Akee, Randall (2007), "Errors in Self-Reported Earnings: the Role of Previous Earnings Volatility," unpublished manuscript.

Altonji, Joseph G. and Lewis M. Segal (1996), "Small-Sample Bias in GMM Estimation of Covariance Structures," Journal of Business and Economic Statistics, Vol. 14, 353-366.

Baker, Michael and Gary Solon (2003), "Earnings Dynamics and Inequality among Canadian Men, 1976-1992: Evidence from Longitudinal Income Tax Records," Journal of Labor Economics, Vol. 21, 289-321.

Benjamin, Dwayne, Loren Brandt, Loren and Jia-Zhueng Fan (2003), "Ceaseless Toil? Health and Labour Supply of the Elderly in Rural China," unpublished manuscript.

Benjamin, Dwayne, Loren Brandt and John Giles (2005), "The Evolution of Income Inequality in Rural China," Economic Development and Cultural Change, Vol. 53, 769-824.

Bound, John and Alan B. Krueger (1991), "The Extent of Measurement Error in Longitudinal Earnings Data: Do Two Wrongs Make a Right?" Journal of Labor Economics. Vol. 9, 1-24.

Bound, John, Charles Brown and Nancy Mathiowetz (2001) "Measurement Error in Survey Data" in Handbook of Econometrics, Vol. 5, Chapter 59, eds. James J. Heckman and Edward Leamer, Elsevier Science, New York, 3705-3843.

Cappellari, Lorenzo (2003), "The Dynamics and Inequality of Italian Men's Earnings: Long-Term Changes or Transitory Fluctuations?" The Journal of Human Resources, Vol. 39, 475-499.

Chamberlain, Gary, (1984), "Panel data", in Handbook of Econometrics, Vol. 2, Chapter 22, eds. Z. Grilliches and M. D. Intriligator, 1247-1318, Elsevier Science, New York.

Demurger, Sylvie, Martin Fournier and Shi Li (2006), "Urban income inequality in China revisited (1988-2002)," Economic Letters, Vol. 93, 354-359.

Dickens, Richard (2000), "The Evolution of Individual Male Earnings in Great Britain: 1975-95," The Economic Journal, Vol. 110, 27-49.

Friedman, Milton (1957), "A Theory of the Consumption Function," Princeton University Press, Princeton, New Jersey

Gottschalk, Peter and Minh Huynh (2006), "Are Earnings Inequality and Mobility Overstated? The Impact of Non-Classical Measurement Error," IZA Discussion Papers 2327, Institute for the Study of Labor (IZA).

Gottschalk, Peter and Robert Moffitt (1994), "The Growth of Earnings Instability in the U.S. Labor Market," Brookings Papers on Economic Activity, 1994, 217-272.

Haider, Steven (2001), "Earnings Instability and Earnings Inequality of Males in the United States: 1967-1991," Journal of Labor Economics, Vol. 19, 799-836.

Khor, Niny and John H. Pencavel (2006), "Income Mobility of Individuals in China and the United States," Economics of Transition, Vol. 14, 417-458.

Moffitt, Robert and Peter Gottschalk (2002), "Trends in the Covariance Structure of Earnings in the U.S.: 1969-1987," unpublished manuscript, Department of Economics, The Johns Hopkins University.

Moffitt, Robert and Peter Gottschalk (2002), "Trends in the Transitory Variance of Earnings in the U.S.," The Economic Journal, Vol. 112, C68-C73.

Ramos, Xavier (2003), "The Covariance Structure of Earnings in Great Britain, 1991-1999," Economica, Vol. 70, 353-374.

Thomas, Duncan, Elizabeth Frankenberg, and James P. Smith (2001), "Lost but Not Forgotten: Attrition and Follow-up in the Indonesia Family Life Survey," Journal of Human Resources, Vol. 36, 556-592.

Whalley, John and Ximing Yue (2006), "Rural Income Volatility and Inequality in China," NBER Working Paper 12779, National Bureau of Economic Research.

Wu, Ximing and Jeffrey M. Perloff (2005), "China's Income Distribution, 1985-2001," The Review of Economics and Statistics, Vol. 87, 763-775.

Zhang, Junsen., Yaohui Zhao, Albert Park and Xiaoqing Song (2005), "Economic returns to schooling in urban China, 1988 to 2001," Journal of Comparative Economics, Vol. 33, 730-752.

Zhao, Renwei, Keith Griffin, Shi Li and Ling Zhu (1994), "Studies of Income Distribution in China," Press of Chinese Social Sciences, Beijing.

Zhao, Renwei, Shi Li and Carl Riskin (1999), "Re-studies of Income Distribution in China," China Economics and Finance Press, Beijing.
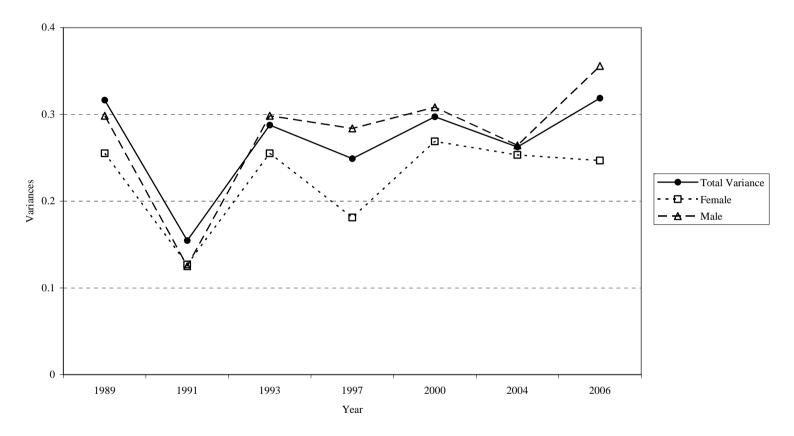
Figure 1. Total Variances of Log Earnings Adjusted for Age: 1989-2006

Figure 2. Contributions to Variances of Log Earnings by Permanent and Transitory Components

Note: Permanent (%) and Transitory (%) refer to the contribution of permanent and transitory components to the total variance. Please refer to the secondary vertical axis for the contribution from each part.

Figure 3. Contributions to Variances of Log Earnings by Permanent and Transitory Components: Female

Note: Permanent (%) and Transitory (%) refer to the contribution of permanent and transitory components to the total variance. Please refer to the secondary vertical axis for the contribution from each part.
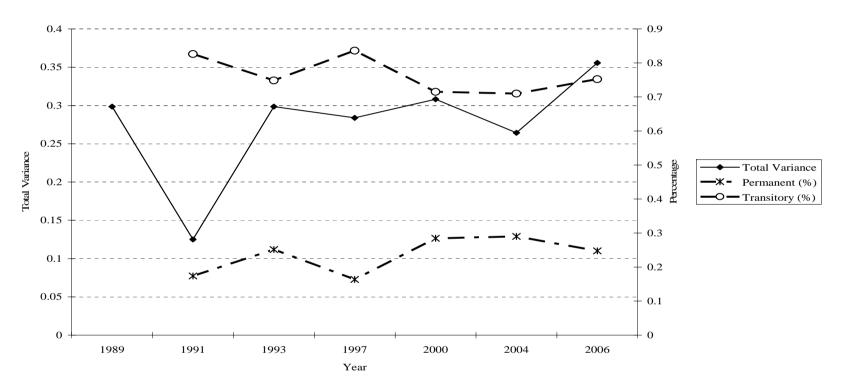
**Figure 4. Contributions to Variances of Log Earnings by Permanent and Transitory Components:
Male**

Note: Permanent (%) and Transitory (%) refer to the contribution of permanent and transitory components to the total variance. Please refer to the secondary vertical axis for the contribution from each part.

Table 1. Estimates for Female

	(1) Whole Sample		(2) Control for Education Level		(3) Control for Education Level and Region		(4) Exclude Observations in Heilongjiang and Liaoning	
	Permanent Part	Transitory Part	Permanent Part	Transitory Part	Permanent Part	Transitory Part	Permanent Part	Transitory Part
σ_μ^2	0.0687 (0.0304)		0.0664 (0.0285)		0.0688 (0.0284)		0.1009 (0.0343)	
σ_γ^2	0.0076 (0.0026)		0.0059 (0.0023)		0.0062 (0.0023)		0.0093 (0.0030)	
$\sigma_{\mu\gamma}$	-0.0148 (0.0083)		-0.0128 (0.0075)		-0.0142 (0.0075)		-0.0211 (0.0096)	
σ_ε^2		0.2164 (0.0165)		0.2120 (0.0162)		0.2067 (0.0157)		0.2165 (0.0196)
ρ		0.0782 (0.0606)		0.0680 (0.0606)		0.0670 (0.0610)		0.0205 (0.0657)

Note: Standard errors are in parentheses.

Table 2. Estimates for Male

	(1) Whole Sample		(2) Control for Education Level		(3) Control for Education Level and Region		(4) Exclude Observations in Heilongjiang and Liaoning	
	Permanent Part	Transitory Part	Permanent Part	Transitory Part	Permanent Part	Transitory Part	Permanent Part	Transitory Part
σ^2_μ	0.0923		0.0927		0.0868		0.1225	
	(0.0237)		(0.0233)		(0.0232)		(0.0270)	
σ^2_γ	0.0048		0.0035		0.0038		0.0065	
	(0.0018)		(0.0017)		(0.0017)		(0.0020)	
$\sigma_{\mu\gamma}$	-0.0120		-0.0098		-0.0107		-0.0182	
	(0.0061)		(0.0060)		(0.0059)		(0.0070)	
σ^2_ε		0.2480		0.2422		0.2417		0.2460
		(0.0149		(0.0148)		(0.0144)		(0.0174)
ρ		0.0312		0.0130		0.0227		0.0000
		(0.0535)		(0.0536)		(0.0518)		(0.0625)

Note: Standard errors are in parentheses.

Appendix 1: Map of Survey Regions

Note: 1. The darker shaded regions are survey provinces: Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong.

2. The waves of 1989, 1991, and 1993 include eight provinces: Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong. In 1997, Heilongjiang replaced Liaoning. In the waves of 2000, 2004 and 2006, both Liaoning and Heilongjiang are included in the survey along with other provinces.

Source: CHNS webpage
Link: http://www.cpc.unc.edu/projects/china/proj_desc/chinamap.html