How does the Pattern of Growth Impact Poverty in Rural China?

Nanak Kakwani
University of New South Wales, Australia and
Beijing Normal University, China

Email: n.kakwani@unsw.edu.au

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- **If we accept that the reduction in absolute poverty is a meaningful development goal, then China has indeed succeeded in achieving this goal.**

- **Based on the official poverty line in 1978, the incidence of poverty in rural China reduced from 30.7% in 1978 to 1.6% in 2007.**

- **The official poverty line was revised upward in 2010 to Yuan 2300 per annum per person. Consequently, the poverty rate increased from 30.7% in 1978 to 97.5% in 2010.**

- **Even with higher poverty line, the poverty rate continued to decline reaching only 5.7% in 2015.**

It is important to understand why and how China was able to achieve such a high degree of poverty reduction. This is my main objective of this talk.

In this talk, I will provide a brief analysis of the patterns of growth in Rural China in the period 2007-2013, utilizing the *Household and Income Project (CHIP).*
I will draw some policy conclusions, identifying which policies are pro-poor, and which are not. Which policies can achieve a rapid reduction in poverty?

Defining the Pattern of Growth

- What is economic growth?

- Entitlement to output produced in the economy.

- A composite measure of entitlement is income, which people can exchange for goods and services produced in the economy.

- income derived from productive activities:
- Participation in the labor market.
- entrepreneurial activities.

- Unproductive sources :
- interest payments, rental income and transfer payments.

- Sources of income: Wages and salary, other labor income (bonuses), proprietor and rental income, dividends, interest income and transfers.

- We use sources of income to measure the pattern of growth.

Defining the Pattern of Growth (continued)

- From a production process emerges an entitlement vector :

$$\tilde{y} \approx (y_1, y_2, \dots\dots\dots\dots\dots, y_N) \approx f(\mu, L(p))$$

where N is the number of individuals in a country and y_i is the entitlement (or income) of the *i*th individual.

- The entitlement of an ith individual is determined by how the individual derives income from different sources.

- The entitlements of all individuals can be summarized by two factors:

  - Mean income μ, which measures the society's average standard of living .

  - The Lorenz curve L(p), which is the proportion of income enjoyed by the bottom p percentage of population. It is general measure of relative inequality.

μ and L(p) together fully determine the people's entitlements, which describes the pattern of growth.

The Incidence of Poverty is Determined by the Pattern of Growth

Given an absolute poverty line z, we can write a general class of absolute poverty measures as

$$\theta = \theta(z, \mu, L(p))$$

The incidence of poverty depends on two factors:
(1) mean income or average standard of living and
(2) relative distribution of income.

Thus, in the determination of poverty, what matters is the pattern of growth that emerges from a growth process.

To understand how poverty changes: whether due to growth in mean income or change in distribution, we use two concepts: Kakwani (1993, 2000)

- **Growth effect: the effect of change in the mean income on poverty when distribution remains constant.**
- **Redistribution effect: the effect of change in distribution on poverty when the mean income remains constant (no growth).**

Growth, Inequality and Poverty Triangle PGI (Bourguignon 2004)

Based on Kakwani's (1993, 2000) idea of growth and Redistribution effects Burguignon in 2004 introduced the idea of Growth, Inequality and Poverty Triangle.

Under the assumption that the distribution of income is lognormal, he arrived at the following identity:

Growth in Poverty=f[Growth elasticity of poverty, Inequality elasticity of Poverty]

Applying this identity, he could separate contributions of growth and distribution impact on poverty. He concluded that changes in distribution matters. It can slow down the reduction in poverty. In some instances, change in distribution may even offset the favorable effects of growth on poverty.

Measuring inequality elasticity is problematic because income distribution can change in an infinite number of ways. There exists no inequality measure that has a monotonically Increasing or decreasing relationship with any known measures of poverty. Bourguignon's The PGI Triangle is valid only under lognormal distribution, an implication of which is that income distribution can only change in a limited way such that the entire Lorenz curve shifts either upward or downward.

Income Source Elasticity of Poverty

The individuals receive their entitlements through various sources of income, which determine the pattern of growth.

We measure the patterns of growth throgh poverty elasticity of income components.

$$x = \sum_{i=1}^{m} g_i(x)$$

x=Net disposable income and

$g_i(x)$ **=is the income of the ith source of individual with disposable income x.**

$$\mu = \sum_{i=1}^{m} \mu_i$$

μ_i **=mean of the ith income source.**

δ_θ **= Poverty elasticity with respect to the mean of total income. Kakwani 1993**

$\delta_{\theta i} = \frac{\partial \theta}{\partial \mu_i} \frac{\mu_i}{\theta}$ **=Poverty elasticity with respect to mean of the ith income sources**

$$\delta_\theta = \sum_{i=1}^{m} \delta_{\theta i}$$

The following six income sources used in the paper, are explained as follows:

1. **Local wage income includes local wage income earned by household members without migration experience in the surveyed years. The wage income includes both the cash wage and in-kind income from jobs.**

2. **Migrant wage income includes the wage income by a household member with migration experiences. If the household member migrated outside of the household for more than a half year, his/her wage income counted as migrant wage income.**

3. **Agriculture income includes business income from farming activities**

4. **Non-agriculture income includes business income from non-farming activities**

5. **Property income includes net property income (net interest income, rent PLUS dividend income)**

6. **Transfer income includes net transfer income (Net transfer income minus remittances minus tax paid)**

Sources of Growth in Rural China

$$\gamma = \sum_{i=1}^{m} s_i \gamma_i$$

γ =growth rate of total mean income,

γ_i =growth rate of mean of the ith income source

s_i =share of the ith income source

Table 2: Growth of per capita income and its sources

	2007		2013		Annual Growth rate	Sources of Growth
	Mean	Shares	Mean	Shares		
Local wage income	1404	24.03	4036	40.59	31.26	64.13
Migrant wage income	1067	18.27	1106	11.13	0.62	0.96
Agriculture income	2227	38.13	2274	22.87	0.35	1.15
Non-agriculture income	666	11.40	1247	12.54	14.54	14.15
Property income	186	3.19	581	5.84	35.26	9.61
Transfer income	290	4.97	700	7.04	23.56	9.99
Total income	5841	100	9946	100	11.71	100.00

All incomes are in 2013 prices based on a national average basket

Characterization of the Pattern of Growth

A change in mean of ith income component has two effects:

- **First, it changes the total mean income, which impacts poverty.**
- **Secondly, it changes the distribution.**

The elasticity of ith income sources can be decomposed as

$$\delta_{\theta i} = \frac{\mu_i}{\mu}\delta_\theta + (\delta_{\theta i} - \frac{\mu_i}{\mu}\delta_\theta)$$

The first term on the right-hand side is the growth effect and the second term is the redistribution effect (which may also be called inequality effect).

- **The growth effect is always negative because an increase in any income component will always reduce poverty.**
- **The redistribution effect can be either positive or negative. It is the redistribution effect, which tells us whether an increase in any income source favors the rich or the poor.**

This decomposition is similar to the famous Slutsky equation in consumer theory

We propose a pro-poor index:

$$\varphi_i = \frac{\mu\delta_{\theta i}}{\mu_i\delta_\theta}$$

The magnitude of this index determines how effective the ith income source is in reducing poverty. The ith income source is pro-poor (anti-poor) if the index is greater (less) than 1.

Overall Pro-poorness of Growth

$$\frac{d\theta}{\theta} = \sum_{i=1}^{m} \delta_{\theta i}\gamma_i = \delta_\theta \gamma + \delta_\theta \sum_{i=1}^{m} s_i(\varphi_i - 1)(\gamma_i - \gamma)$$

The first term is the growth effect and the second term is the distribution effect.

The overall pattern of growth is pro-poor (anti-poor) if

$$\rho = \frac{\sum_{i=1}^{m} \delta_{\theta i}\gamma_i}{\delta_\theta \gamma}$$

greater (less) than 1.

Poverty Equivalent Growth Rate (PEGR) introduced by Kakwani and Son (2008) is the growth rate that would result in the same proportional change in poverty as the present growth rate if the growth process was not accompanied by any change in distribution, i.e, when everyone in the society enjoys the same proportional benefits from growth. the PEGR is given by

$$\hat{\gamma} = \gamma\rho = \gamma + (\rho - 1)\gamma$$

Which measures the impact growth on poverty. There is gain (loss) of growth because growth is pro-poor (anti-poor)

Table 3: Poverty elasticity with respect to income sources

	2007		2013	
	Poverty gap	Severity of poverty	Poverty gap	Severity of poverty
Local wage income	-0.37	-0.40	-0.41	-0.50
Migrant wage income	-0.34	-0.36	-0.59	-0.65
Agriculture income	-1.11	-1.23	-0.77	-0.78
Non-agriculture income	-0.11	-0.10	-0.09	-0.01
Property income	-0.04	-0.04	0.00	-0.01
Transfer income	-0.13	-0.16	-0.21	-0.19
Total income	-2.10	-2.28	-2.06	-2.15

The growth elasticity of poverty gap with respect to growth in wage income in 2007 was 0.37, which means that growth in wage income of 1% contributed to a reduction in poverty by 0.37%. Of which -0.50 was due to the income (or growth) effect, and 0.13 was due to the redistribution effect.

The poverty elasticity with respect to agriculture income is -1.11. of which -.80 was the growth effect and -31 was the redistribution effect. The actual reduction in poverty was 1.11%, but the reduction would have been.80% if the inequality had not decreased.

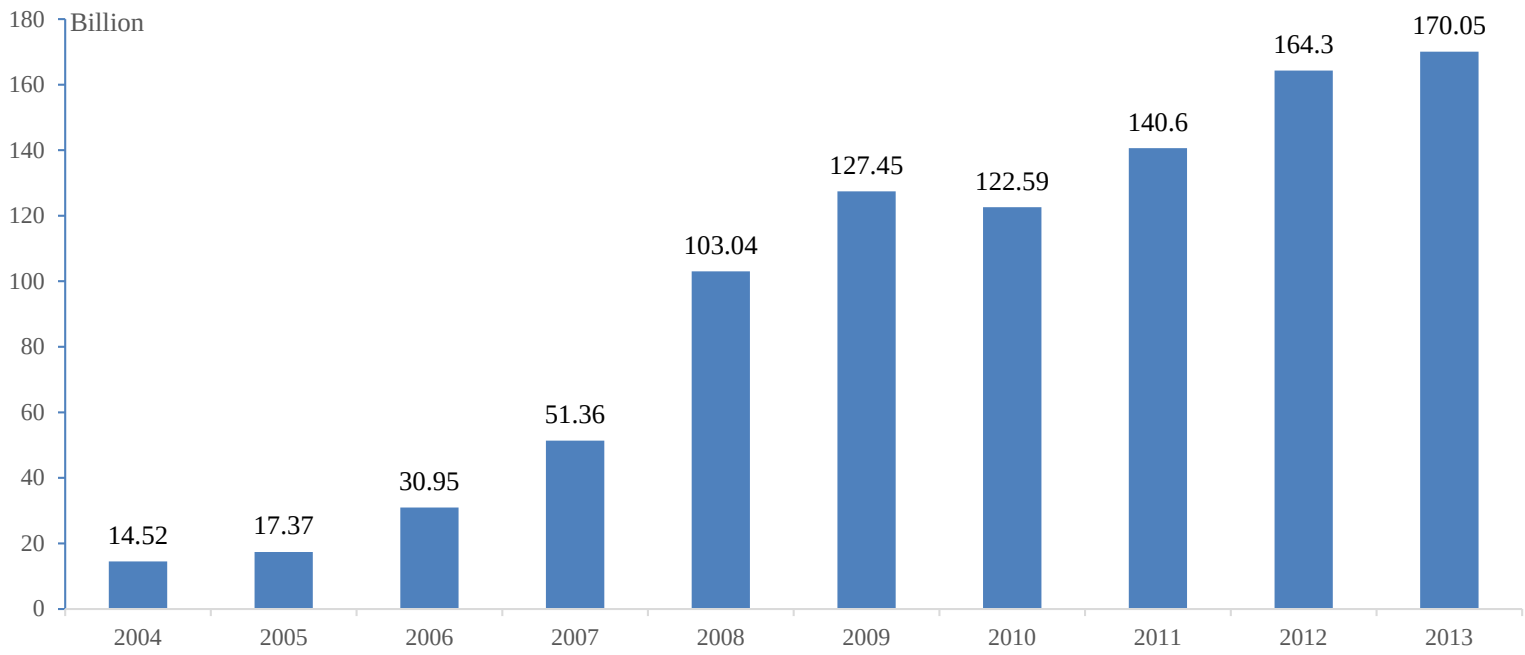
Table 4: Pro-poor index				
	2007		2013	
	Poverty gap	Severity of poverty	Poverty gap	Severity of poverty
Local wage income	0.74	0.73	0.48	0.57
Migrant wage income	0.88	0.86	2.57	2.71
Agriculture income	1.39	1.41	1.64	1.60
Non-agriculture income	0.46	0.38	0.35	0.04
Property income	0.57	0.60	-0.01	0.10
Transfer income	1.26	1.37	1.42	1.27
Total income	1.00	1.00	1.00	1.00

Table 5: Contributions of income sources to poverty reduction: 2007-2013						
	Poverty reduction		Growth effect		Inequality effect	
	Gap	Severity	Gap	Severity	Gap	Severity
Local wage income	-11.58	-12.46	-15.75	-17.13	4.17	4.67
Migrant wage income	-0.21	-0.22	-0.24	-0.26	0.03	0.04
Agriculture income	-0.39	-0.43	-0.28	-0.31	-0.11	-0.13
Non-agriculture income	-1.60	-1.43	-3.48	-3.78	1.88	2.35
Property income	-1.34	-1.55	-2.36	-2.57	1.02	1.02
Transfer income	-3.10	-3.65	-2.45	-2.67	-0.65	-0.98
All components	-18.23	-19.75	-24.57	-26.71	6.34	6.97

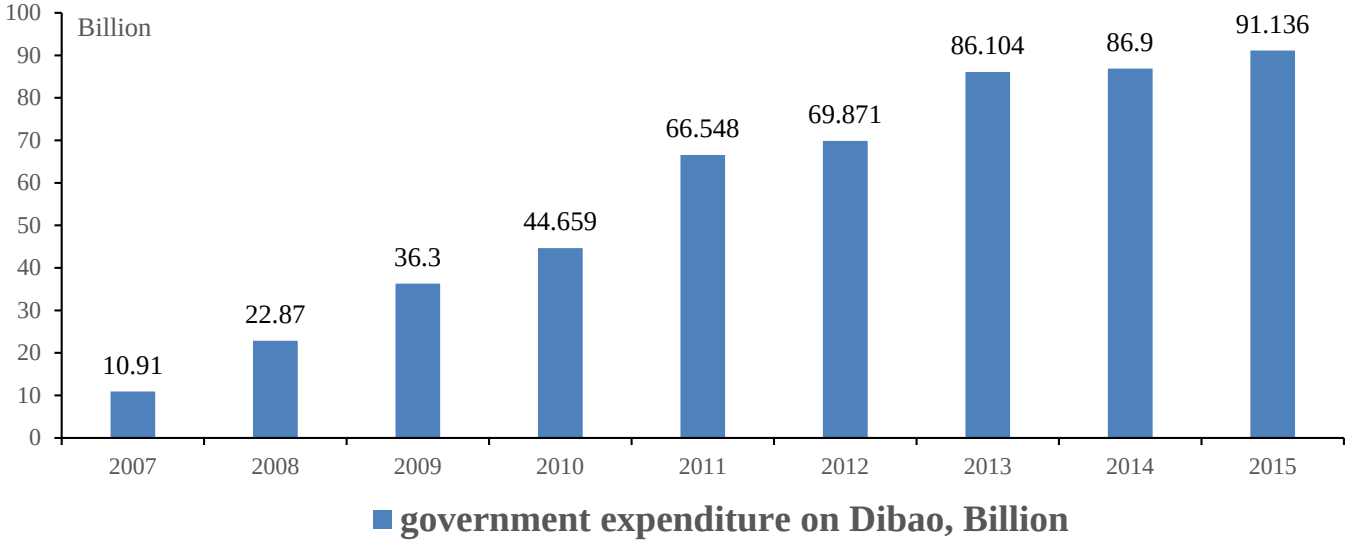
Contributions to poverty reduction
Labor income=64%.
Agriculture income=2.1%
Non-agriculture activities =8.8%
Property income =6.3%
Transfers=17%

Table 6: Poverty elasticity and pro-poor index of transfer income: 2013

	Mean	The share of the total income	Poverty elasticity		Pro-poor index	
			Poverty gap	Severity	Poverty gap	Severity
Pension	428	4.30	-0.08	-0.10	0.91	1.05
Minimum living standard guarantee (Dibao, 低保)	32	0.32	-0.05	-0.06	7.08	8.59
Other social reliefs except Dibao	29	0.30	-0.02	-0.01	2.47	2.08
Subsidies for living	34	0.35	-0.02	-0.02	2.21	2.27
Reimbursed medical expenditure	83	0.83	-0.02	-0.03	1.15	1.61
Subsidies on agriculture activities	120	1.20	-0.10	-0.12	3.87	4.51
Other subsidies	275	2.76	-0.10	-0.15	1.79	2.45
Transfer expenditures	-300	-3.02	0.17	0.28	2.72	4.37
Total (net) transfer income	700	7.04	-0.21	-0.19	1.42	1.28



Gross subsidies on agriculture activities



Dibao=32*6.20=19.8 billion Yuan , Agriculture subsidy=120*6.20=74.4 billion Yuan

Some Policy Conclusions

- Poverty Equivalent Growth Rate (PEGR) informs how much is the gain (loss) of growth rate when the growth is pro-poor (anti-poor). The Chinese overall growth has been anti-poor resulting in a loss of almost 25% of growth rate.
- The labor income is anti-poor contributing 63% to the total reduction in poverty,
- The agricultural income is highly pro-poor but it contributes only 2.1% to the poverty reduction. Despite heavy subsidies, the agricultural sector is not growing.
- The property income is highly anti-poor but it contributes 6.3% to poverty reduction. The property income is growing very rapidly so it may be a good idea is tax it more heavily because the rich will be paying the taxes.
- The non-agricultural activities are growing rapid, which may be generating employment in the Rural China. Although this sector is anti-poor but it is contributing 8.8% to poverty reduction.
- The government transfers are highly pro-poor and contributing 17% to poverty reduction. The government is spending enormous amount of money on various subsidies which are not run very efficiently.