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## CONTRIBUTION TO ECONOMIC GROWTH FROM RURAL-URBAN MIGRANT WORKERS AND THE INCOME SHARE IN THE PROCESS OF URBANIZATION: EVIDENCE FROM 1995-2009 IN CHINA

*The paper applies Cobb-Douglas production function to analyze the migrant workers' output contribution to China's GDP and their income level. The conclusion reveals that the average output contribution rate made by migrant workers takes up 14%-17% of China's GDP. The urban workers' contribution to GDP is 1.143 times as much as the migrant workers' counterpart. However, the local urban workers' average income is 1.66 times higher than the migrant workers' counterpart. The conclusion provides new ideas for the new policy on expanding domestic demand.*

*Keywords:* migrant workers; urban workers; contribution rate; the level of income.

Чуньчао Ванг, Чень Цзинь

## ЕКОНОМІЧНИЙ ВНЕСОК МІГРАНТІВ ІЗ СІЛ В МІСТА В ЕКОНОМІЧНЕ ЗРОСТАННЯ І ПРОЦЕС УРБАНІЗАЦІЇ

(ЗА ДАНИМИ КИТАЮ ЗА 1995-2009 Р.Р.)

*У статті застосовано функцію Кобба-Дугласа для аналізу частки внеску мігрантів із сіл у міста у ВВП Китаю і їх рівня доходів. Результати показали, що середній вклад мігрантів із сіл у міста у ВВП Китаю - 14-17%. Частка міських жителів вища всього в 1,143 раза. При цьому заробітна плата місцевого міського жителя в 1,66 раза вище зарплати мігранта. Висновки дослідження можуть бути корисними при розробці нової політики підвищення внутрішнього попиту.*

*Ключові слова:* робітники-мігранти; міські робітники; рівень внеску; рівень доходів.

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## ЭКОНОМИЧЕСКИЙ ВКЛАД МИГРАНТОВ ИЗ СЕЛ В ГОРОДА В ЭКОНОМИЧЕСКИЙ РОСТ И ПРОЦЕСС УРБАНИЗАЦИИ

(ПО ДАННЫМ КИТАЯ ЗА 1995-2009 Г.Г.)

*В статье применена функция Кобба-Дугласа для анализа доли вклада мигрантов из сел в города в ВВП Китая и их уровня доходов. Результаты показали, что средний вклад мигрантов из сел в города в ВВП Китая - 14-17%. Доля городских жителей выше всего в 1,143 раза. При этом заработная плата местного городского жителя в 1,66 раза выше зарплаты мигранта. Выводы исследования могут быть полезны при разработке новой политики повышения внутреннего спроса.*

*Ключевые слова:* рабочие-мигранты; городские рабочие; уровень вклада; уровень доходов.

**1. Introduction.** More and more peasants have been going out of rural areas in search of non-agricultural jobs in urban areas along with the rapid economic development of China. According to the estimations by the National Bureau of Statistics of China, the total number of rural labors working in non-agricultural sectors not only in rural areas but also in urban counterparts all over China is 242 mln., and 122.64 mln. of them are migrant workers in urban non-agricultural section in 2010.

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Nowadays migrant workers are playing a more and more significant role for the development of urban China (Wang, 2011). However, the level of rural migrant workers' income is relatively lower than the local urban workers' income, and their social well-being and security are not sound, their living conditions are. In terms of macroscopic analysis, the level of outward rural migrant workers' income and their well-being are probably underestimated compared to the output contribution they are making. This paper establishes production function for measuring the earnings gap between rural migrant workers and their local urban counterparts. The authors find the primary reasons which can interpret the phenomena represented above. The aim of this research is to estimate the output contribution and the income share for rural migrant workers and to provide new ideas for the new round of expanding domestic demand policy during the period of the 12th five-year plan (2010-15) in China.

**2. Literature review.** The ordinary definition of rural migrant workers is as follows: those peasants whose census registrations are still in the rural areas move out from the Primary Industrial to the Second Industrial section or the Third one. They usually have much linkage with their rural relatives and the majority of them come back home when they have earned enough money. Their identity is peasantry and they work in the second or third industrial section.

Among the classical theories, the "dual economy" theorem explains the reason why more and more redundant laborers from rural areas are swarming into cities, and the conclusions were that the incomes of redundant workers from rural areas are lower under the institutional restraint of "dual economy" (Lewis W. A., 1954). Lees and Francis (1980) argued that partial causes of the rapid development of economy in China (average growth rate of GDP per annum is 9.2%) and the output growth can be attributed to the laborers' mobility which contribution may be 16.3%. Eliakim Katz and Oded Stark (1986) made a pioneering work developing Todaro model and demonstrating that a small chance of receiving a high reward is sufficient to trigger rural-to-urban labor migration. And the new analytical framework of labor mobility indicated that because of the deficiency and imperfection of the labor market in developing economies, peasants with worker identities whose aim is income maximization are always in the state of migration. The above reasons usually lead to unstable employment and affect the management of enterprises and wages payment for these migrant workers (Stark and Bloom, 1992). Paul, Leng and Xin Meng find out that the average hourly compensation for an urban worker is more than double that of migrants. The non-wage compensation is higher than that of hourly wages, that's why urban workers are much more likely to benefit from various social security schemes than rural migrants in China (Paul Frijters, Leng Lee and Xin Meng, 2009). Meanwhile, other researches reveal similar conclusions that urban residents' annual earnings are 1.3 times as high as the rural migrants earn as observed in the nationally representative sample in 2002 (Sylvie Dimurger, Marc Gurgand, Li Shi and Yue Ximing, 2009). Francis Green points out that among the causes which affected workers' resignation rate and degree of satisfaction, well-being and income are more significant than health and working environment (Green and Francis, 2010). Susanna, Massimiliano, Nora and Giovanni estimated a logit model for immigrants' likelihood of being employed, conclusion is as follows: The immigrant status needs stronger signals which can be reduced to reputation, ethnic networks and educational level com-

pared to that necessary for a native worker, and this may cause immigrants accept job qualifications lower than those achievable through the embodied educational level (Susanna Mancinelli et al., 2010). Most researches on discrimination against migrants in Chinese cities focus on wage differentials, however, Zhang (2010) focuses on institutional discrimination against migrants by studying workers' job mobility rates in 3 cities in China. Zhang concludes that institutional discrimination reduces the number of jobs available to migrants, increases their job search costs and the costs of losing job. Hu et al. (2011) made a social survey with a conclusion that permanent residents with better education experience, stable jobs and high salaries are more likely to accommodate to city life. Those laborers whose family had more children and more land were inclined to move and live a wandering life because of registered permanent residence restriction and deficiency of land rent market. The literature presented above analyzed the significant contributions that migrant workers have made to Chinese economy; nevertheless they haven't calculated the specific output contributions and the workers' corresponding income particularly. Herbert et al. (2011) found that spatial correlation studies which use the variance of the foreigners' share across regions for identifying the wage and employment effects of immigration tend to reveal an actual impact of foreign immigration.

Based on the previous literature, this paper makes some improvements in the estimation of output and income share for rural migrant workers. The laborers working in urban areas may be divided into two groups: migrant workers and urban workers, and some indices such as the number of laborers, labor productivity, the rate of education and labor intensity will be considered carefully. The total GDP and the fixed capital stock take 1995 as the base time for the analysis. Then the Cobb-Douglas production function will be applied to estimate the contribution rate that migrant workers make for Chinese economy. In addition, this paper makes a comparison of income-contribution rate between migrant workers and urban workers, analysing the degree of promotion for the economy theoretically if we raise the migrant workers' wages and reduce this income gap. Finally, this paper represents the recommendations and new ideas for the new round of expanding domestic demand policy.

### **3. Data and method**

#### *A. Rural migrant workers' contribution*

Fig. 1 represents the approximate tendency of the migrant workers' growth in China in the last 15 years.

Since the implementation of reforms and open policy in China, large quantities of peasants engaged in the farm work have been going out of rural areas to find jobs in urban areas instead of working on their farmlands, and the number of outward rural migrant workers is becoming larger and larger. The number of migrant workers in China rises from about 2 mln. in 1978 up to 145.33 mln. in 2009 (Fig. 1). Such a large scale of rural migrant workers in China plays a very important role for the economic development. The contributions to the economy by rural migrant workers may be firstly measured.

Number of migrant workers (Unit: mln.)

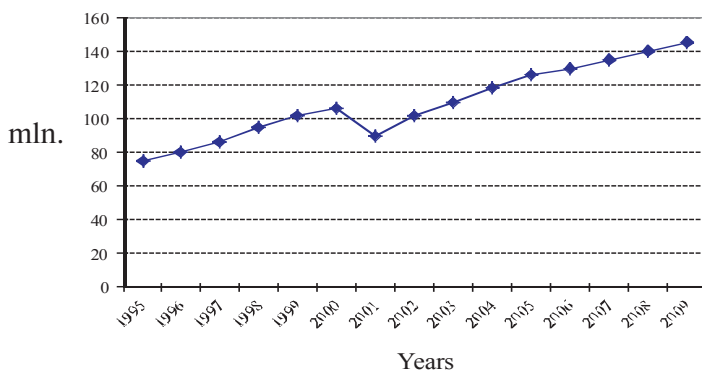


Figure 1. The scale of rural migrant in China workers (1995-2009).

Notes: The data and taken from "China Statistical Yearbook" and "China's Population Statistics Yearbook".

The authors quote the classical Cobb-Douglas production function with some modifications added to determine the contributions to China's economy made by rural migrant workers.

$$\ln Y_t / L_t = \ln A_t + b \ln K_t / L_t + \varepsilon$$

$Y_t$  stands for China's total GDP in the year  $t$ .

Subject to the constraint:

$Y_{it}$  stands for the industry  $i$ 's total output;  $Index_{it}$  stands for the industry  $i$ 's real index ( $i = 1, 2, 3 \dots$ ). (Take 1995 as the base period)

Table 1. China's GDP in 1995-2009 (100 mln. yuan)

year	$Y_{t1}$	$Index_{t1}$	$Y_{t2}$	$Index_{t2}$	$Y_{t3}$	$Index_{t3}$	$Y_t$
1995	12135.8	100	28679.5	100	19978.5	100	607.93
1996	14015.4	105.1	33835	112.1	23326.2	109.4	648.40
1997	14441.9	108.7	37543	123.87	26988.1	121.1	658.80
1998	14817.6	112.5	39004.2	134.89	30580.5	131.27	653.82
1999	14770.0	115.6	41033.6	145.82	33873.4	143.48	645.25
2000	14944.7	118.4	45555.9	159.53	38714	157.4	657.74
2001	15781.3	121.7	49512.3	172.93	44361.6	173.61	671.51
2002	16537.0	125.2	53896.8	189.88	49898.9	191.67	676.26
2003	17381.7	128.3	62436.3	213.99	56004.7	209.88	694.09
2004	21412.7	136.4	73904.3	237.74	64561.3	231.08	747.23
2005	22420.0	143.5	87364.6	265.56	73432.9	235.45	797.10
2006	24040.0	150.7	103162	300.08	84721.4	263.94	824.29
2007	28627.0	156.3	124799	344.19	103879.6	300.36	891.59

The End of Table 1

2008	33702.0	164.7	149003	377.9	131340	331.6	994.99
2009	35226.0	171.6	157639	415.3	147642.1	362.4	992.25

Notes: From "China Statistical Yearbook".

$L_t$  stands for the second and the third industry's labor force in the year  $t$ .

Subject to the constraint as follows:

$L_{tm}$  stands for the labor input of migrant workers,  $L_{tu}$  stands for the labor input of urban workers.  $L_{tm}$  and  $L_{tu}$  are under the restraint of labor intensity (short —  $L_{nti}$ ), education factor (short —  $Edu_i$ ) and the number of their  $Num_i$  people ( $Num_i$ ). That is:

$$L_t = L_{tm} + L_{tu} = Lnt_m \cdot Edu_m \cdot Num_{tm} + Lnt_u \cdot Edu_u \cdot Num_{tu}$$

The migrant workers the paper presents are those peasants who work in the cities but possess country registered permanent residences. According to the statistical data about on the all over China and some other researches, we generally define 80% of the floating population (for short as Flo) as migrant workers. The number of migrant workers is determined by the following function:

$$Num_{tm} = Num_{tFlp} \cdot 80\%$$

According to many investigations and demonstrations, if we take the urban factor as the standard of 1, the educational rate of migrant workers is only 0.77, but their working intensity is 1.5. The estimates are reported in Table 2 as follow:

Table 2. The Laborers of the Second and Third Industry Sections in 1995-2009 (10 thous. people)

year	$Num_{tm}$	$Num_{tm} + Num_{tu}$	$Num_{tu}$	$L_t$
1995	7500	19040	11540	20202.5
1996	8000	19922	11922	21162
1997	8600	20781	12181	22114
1998	9500	21616	12116	23088.5
1999	10200	22412	12212	23993
2000	10600	23151	12551	24794
2001	9000	23940	14940	25335
2002	10200	24780	14580	26361
2003	11000	25639	14639	27344
2004	11800	26476	14676	28305
2005	12600	27331	14731	29284
2006	13000	28310	15310	30325
2007	13500	29350	15850	31442.5
2008	16080	30210	14130	32702.4
2009	16880	31120	14240	33736.4

Notes: The data are taken from China Statistical Yearbook.

$K_t$  stands for the convert value of the fixed capital stock in the year  $t$ .

Subject to the constraint as follows:

$K_{t-1}$  is the index of the past year's fixed capital,  $\Delta K$  stands for the fixed assets investment during the whole year  $t$ ,  $\delta$  means depreciation. (with 1995 as the base).

The estimates are reported in Table 3 as follow:

Table 3. Fixed Capital Input in 1995-2009 (100 mln. yuan)

year	$\Delta K$	Index $\Delta$	$\delta$	$K_t$
1995	20019.3	100	9182	13671.35
1996	22913.5	103.9	9540	10481.50
1997	24941.1	105.7	10739	12176.85
1998	28406.2	105.5	11973	12970.79
1999	29854.7	105.1	13408	15001.04
2000	32917.7	106.3	14848	15009.79
2001	37213.5	106.7	16396	16525.18
2002	43499.9	106.9	18171	19046.56
2003	55566.6	109.3	20332	23172.98
2004	70477.4	115.4	23262	32310.70
2005	88773.6	129.2	26043	44441.27
2006	109998.2	143.4	28905	59876.27
2007	137323.9	158.9	32029	77977.84
2008	172828.4	171.3	34528	102805.98
2009	224598.8	167.1	33681	139160.84

Notes: The data are taken from "China Statistical Yearbook".

Substituting the data calculated above into the production function which is a double-logarithm model, and introducing the technical variable quantity, the model can be rewritten as the following equation:

Suppose it is under constant returns to scale, the contribution made to GDP

$$\ln Y_t / L_t = rt + b_1 \ln K_t / L_t + \varepsilon.$$

by labor force is  $b_2 = 1 - b_1$ .

Substituting the data into the production function and analysing it through Eviews, we can get the consequence:

$$\ln Y_t / L_t = -0.046591t + 0.659928 \ln K_t / L_t$$

Introduction of the corrected labor force and fixed capital worked into the production function produced a positive and significant coefficient on China's total GDP, as expected. The R-squared is 0.999106, F-statistics is 14533.45, Prob(F-statistics) is 0.000000, which means the model is statistically and economically significant. The consequences of t-statistics are -2.987553 and 120.5548, proving the corrected labor force and fixed capital can be two good interpretations for the economy. Our results are robust.

And then we can get the results:  $b_2 = 0.340072$ .

Contributions made by migrant workers ( $b_m$ ) are as follow:

$$b_m = (L_{tm} / L_t) \cdot b_2.$$

Table 4 shows the migrant workers' contribution from 1995 to 2009.

Table 4. Rural Migrant Workers' Contribution Rate in China, 1995-2009

year	$b_m$
1995	0.145817285
1996	0.148486215
1997	0.145817285
1998	0.161614658
1999	0.166981546
2000	0.167923752
2001	0.139532206
2002	0.151981648
2003	0.158009609
2004	0.16374638
2005	0.169002452
2006	0.168381899
2007	0.168643481
2008	0.170289875
2009	0.171047958

The estimation conclusion reveals that the average contribution rate made by rural migrant workers takes up 14-17% of China's GDP. It is obvious that rural migrant workers play a significant role in the process of China's urbanization.

*B. Rural migrant workers' income*

Table 4 presents the migrant workers' average contribution to GDP from 1995 to 2009 (16.03%). The contribution degree of urban workers ( $b_u$ ) can be calculated in the same way:

$$b_m = (L_{tu} / L_t) \cdot b_2.$$

The consequence shows that the average contribution rate of urban workers is 18.32%, which is about 1.143 times higher than that of migrant workers'.

By processing the data, the main work for us is to compute the average income per migrant worker. "China Statistical Yearbook" enumerates the statistical data of "average total income per person in rural households (Avg. Inc(rural inhabitant))" over the years, which is divided into some sub-items such as "wages income". "Wages income" can be regarded as migrant workers' income, but still needs certain improvement, because it is the average index of total rural population but not migrant workers. So the revenue mentioned above should be multiplied by the "rural population (Numr)", and divided by the number of migrant workers (Numm), then it can roughly be equal to the average income of migrant workers. During the statistical analysis, there is no need to correct the index because of the usage of ratio method.

We can conclude that the urban workers' contribution to GDP is 1.143 times higher than that of the rural migrant workers' in the above analysis. Meanwhile, the urban workers' average income is 1.66 times higher than that of migrant workers', and the maximum ratio is 2.62. Apparently, the income of rural migrant workers is relatively low compared to urban workers.

**Table 5. Income Comparison between Rural Migrant Workers and Urban Workers from 1995 to 2009**

year	Avg Inc (rural inhabi- tant)	Numu	Numm	Avg Incm	Avg Inc (urban inhabi- tant)	Numu/ Numu	Avg Incu	Avg Incu/ Avg Incm
1995	357	85344	7500	4024	4279	0.39	4444	1.10
1996	450	85681	8000	4828	4936	0.40	5008	1.04
1997	514	85947	8600	5142	5323	0.41	5450	1.06
1998	573	85085	9500	5137	5542	0.43	5859	1.14
1999	630	84177	10200	5201	6005	0.45	6675	1.28
2000	702	83153	10600	5509	6295	0.45	6960	1.26
2001	771	82038	9000	7036	7907	0.37	6829	1.97
2002	840	80837	10200	6658	8177	0.41	9239	1.38
2003	918	79563	11000	6642	9061	0.42	10878	1.63
2004	998	76851	11800	6503	10128	0.44	13043	2.00
2005	1174	75705	12600	7056	11320	0.46	14967	2.12
2006	1374	73742	13000	7798	12719	0.45	16897	2.16
2007	1596	72750	13500	8601	14908	0.45	20280	2.35
2008	1853	72135	14041	9523	17067	0.46	23619	2.48
2009	2061	71288	14533	10110	18858	0.46	26521	2.62

Notes: The data and taken from "China Statistical Yearbook".

### 3. Concluding remarks

According to the above analysis, we reveal that the rural internal migrant workers' contribution to GDP is 16.03% vs. 18.32% of urban workers in China. The urban workers' contribution to GDP is 1.143 times as much as the migrant workers' one. Meanwhile, the urban workers' average income is 1.66 times as much as the migrant workers' one.

Actually, the income of rural migrant workers in non-agricultural sections is relatively low compared to their contribution and the urban counterparts as well. A furthermore precise measurement will be conducted, but this research is probably a precedent for calculating economic contributions and their benefits for specific laborers in developing economies.

The results of the econometric analyses indicate that compared to their contribution the rural migrant workers' incomes have been underestimated, however their potential consumption capacity is probably huge.

Thus we may get a further deduction: Under the tendency of expanding domestic demand, the government's policy should focus on the migrant workers' economic behavior and explore a new effective method during the period of the 12th five-year plan and even for a comparatively long period of time afterwards. The rural migrant workers' consumption capacity has great potential to expand domestic demand, so Chinese government should take appropriate measures to increase



the income of the group and guide their amount of consumption to grow steadily, which will be an important channel to expand domestic demand in the future.

In terms of relative policy on Chinese rural-urban migrant workers, in order to improve their situation of lower income in non-agricultural section, the authority should concentrate on the aspects as follow: first of all, the government may truly rely on the perfect labor market; secondly, the government should also rely on the political or institutional innovations in the future process of urbanization; thirdly, the economy should speed up the pace of the rural migrant workers' education and vocational training. From the "Labor Shortage" phenomenon in the recent years we have realized that the market plays an important role in the automatic adjustment processes in China, nevertheless it is insufficient to rely on the market only.

The government can make a difference for migrant workers, such as improving employment and the income security system or increasing the income of migrant workers properly. The government needs to create all sorts of approaches to guide migrant workers in improving their personal techniques and skills so as to deal with the enterprises' requirements and industrial upgrade challenges. All these improvements will probably promote Chinese social stability and national economic sustainable development.

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