



香 港 樹 仁 大 學

**The Discrepancy between the Total Value of Monetary  
Transactions and GDP in China**

**POON, Che cheong  
WOO, Kai Yin**

April 2007

經 濟 學 系

**Working Paper Series**

**Economics Department  
Hong Kong Shue Yan University**

Working Paper Series  
April 2007

All Rights Reserved  
ISBN: 13: 978- 962-8719-65-5  
Copyright © 2007 by Hong Kong Shue Yan University

Information on the Working Paper Series can be found on the last page. Please address any comments and further inquiries to:

Dr. Shu-kam Lee  
Working Paper Coordinator  
Department of Economics  
Hong Kong Shue Yan University  
10 Wai Tsui Crescent  
Braemar Hill Road  
North Point  
Hong Kong  
Fax: 28068044  
Tel: 25707110  
Email: sklee@hksyc.edu

## The Discrepancy between the Total Value of Monetary Transactions and GDP in China

POON, Che cheong\*  
Associate Professor, Department of Economics  
Hong Kong Shue Yan University  
North Point, Hong Kong  
Phone No. 852-25707110  
Fax No. 852-28068044  
e-mail address: [ccpoon@hksyu.edu](mailto:ccpoon@hksyu.edu)

Woo, Kai Yin  
Assistant Professor, Department of Economics  
Hong Kong Shue Yan University  
e-mail address: [kywoo@hksyu.edu](mailto:kywoo@hksyu.edu)

---

### *Abstract*

*Following the availability of more comprehensive macroeconomic statistics in China and based on the fact that China's velocity of money circulation of M1 and M2 were significantly lower than those in other advanced and developed countries in 1995-2005, a number of papers that focus on investigating the relationship between China's money supply and GDP have been published recently. We noted that some of these papers were erroneously based on the expression of  $MV=GDP$  to develop their policy suggestions. To enhance the empirical applicability of this expression, this article attempts first to identify the discrepancy between MV and GDP by introducing a new parameter to the expression, and then introduce some major factor that contribute to the discrepancy between the Total Value of Monetary Transactions and GDP in China.*

*In order to show the total value of monetary transactions (PT) in a country is defined to be greater than the value of its GDP, we first use Fisher's exchange equation  $MV + M'V' = PT$  together with the Cambridge equation  $M^d = k \cdot GDP$  to derive an estimator of " $\lambda$ " by which we can measure the discrepancy between PT and GDP. That is,  $PT = \lambda \cdot GDP$ , where  $\lambda > 1$ . After that, we calculate the estimated  $\lambda$  values of China and compare these values with those calculated from selected countries to highlight the surprisingly high  $\lambda$  values in China; and then, we proceed to identify the factors contributing to China's high  $\lambda$  value during the observed period.*

---

Keywords: value of monetary transactions, velocity of money circulation, Fisher equation, Cambridge cash balance equation

JEL codes: P24, E26, E51

\* Corresponding author

## 1. Introduction

Following the availability of more comprehensive monetary statistics in China<sup>1</sup>, a number of papers which focus on investigating the relation between China's money supply and GDP have been scattered in some local and international journals (Ding 2003, Zhao & Wang 2005, and Lu 2005). Unfortunately, being ignore the operational characteristics of the economy of China, authors of these articles have erroneously used the year-end money supply statistics rather than the monthly one and substituted the PT on the right hand side of the Fisher's exchange equation by GDP to facilitate their analysis; and thus, the bias occurred in the estimated value of the velocity of money circulation (V) made their empirical results questionable. In order to explore the empirical applicability of the Fisher's exchange equation and the Cambridge equation in formulating monetary policy in China, the main objective of this paper is to identify some major exogenous factors that determining the extent of the discrepancy between the total value of monetary transactions and GDP in China.

Although reforming the price system to reflect supply and demand rather than being artificially set by central government planners has encountered enormously difficult, China today has successfully achieved its price reform target with about 99% commodity prices that are market determined. With the establishment of a price mechanism, the role of money is not just a lubricant that greases the wheels of economic activity in the days of a State controlled social economy but now it also plays a key role in influencing the performance of the economy as a whole; so that monetary policy has become a more and more important policy tool in regulating economic activity in China.

In the theory of monetary management, classical monetarists postulate that there is a stable relationship between money and aggregate nominal income and that a monetary rule to control, for example, the growth rate of the money supply, however defined, was considered the most effective mechanism for monetary policy in the long run. To this extent, it is to be hoped that this framework would be workable in practice to identify the above-mentioned exogenous factors by investigating the relationship between the money stock and GDP flow in China.

---

<sup>1</sup> Quarterly and monthly monetary statistics on  $M_0$ ,  $M_1$  and  $M_2$  have been available since 1990 and 1997 respectively in the People's Bank of China Quarterly Bulletin.

## 2. Theoretical background and formula derivation

### a. Applying the Fisher's exchange equation

The version of Fisher's exchange equation (Fisher 1922, pp. vii, pp.8-32, pp.276-306, pp.372-375) separate money into components of currency and bank deposits, while the turnover of each was treated separately. This equation is written as

$$MV + M'V' = \sum pq ,$$

where M is the currency component, M' is bank deposits, V and V' are the velocities of currency and deposits respectively,  $\sum pq$  is the sum of all prices (p) times the physical volume of trade (q). For the sake of simplicity, we replace  $\sum pq$  by PT, and write the Fisher exchange equation as

$$MV + M'V' = PT \quad \dots\dots\dots (1)$$

Note in particular that, money (including M and M') is the average amount of currency and deposits in circulation in the community during the year and should be the simple arithmetic mean of the amounts of money existing at successive instants separated from each other by equal intervals of time indefinitely small. Hence, when Fisher's exchange equation is applied in empirical research, we should use monthly average monetary statistics if they are available<sup>2</sup>.

As we know, a country's nominal GDP measures the total expenditure on final goods (and services) during a year; however, the expenditure of money for the purchase of goods (PT) on the right-hand side of the exchange equation encompasses of both final and intermediate goods. To view the Fishers' exchange equation in this way, we have reason to say that the value of PT must greater than the value of GDP; and thus, we can write

$$PT = \lambda \cdot GDP ; \quad \text{where } \lambda > 1 \quad \dots\dots\dots (2)$$

---

<sup>2</sup> Taking China's 2005 M1 figure as an example, the year-end figure was 10727.99 billion Yuan but the monthly average figure was 9873.49 billion Yuan. That is, the year-end M1 was 8.65% higher than its monthly average figure; as a consequence, the computed velocity of M1 circulation dropped from 1.85 to 1.70 °

By substituting (2) into (1), we have

$$MV + M'V' = \lambda \cdot \text{GDP} \quad \dots\dots\dots (3)$$

To facilitate empirical study, we let  $M = M_0$  (currency in circulation),  $V = V_{m0}$  ( $M_0$  velocity),  $M' = D$  (demand deposits),  $V' = V_d$  (demand deposits velocity), and then, equation (3) can be rewritten as:

$$M_0 \cdot V_{m0} + D \cdot V_d = \lambda \cdot \text{GDP} \quad \dots\dots\dots (4)$$

By letting  $D = \alpha M_0$  (i.e.  $\alpha = \frac{D}{M_0}$ ) and  $V_d = \beta V_{m0}$  (i.e.  $\beta = \frac{V_d}{V_{m0}}$ ), (4) can be rewritten

as:  $M_0 V_{m0} + (\alpha \cdot M_0)(\beta \cdot V_{m0}) = \lambda \cdot \text{GDP}$

or

$$M_0 V_{m0} (1 + \alpha \cdot \beta) = \lambda \cdot \text{GDP} \quad \dots\dots\dots (5)$$

**b. Synthesizing Fisher equation and Cambridge cash balance equation**

The Cambridge equation may be expressed as being  $M^d = k \cdot \text{PNy}'$ . If we replace  $k$  and  $\text{PNy}'$  by  $1/V$  ( $V$  represents income velocity) and  $\text{GDP}$  respectively, and assuming  $M^d = M^S$ , the equation becomes

$$M^S = \frac{1}{V} \cdot \text{GDP} \quad \text{or} \quad M^S V = \text{GDP} \quad \dots\dots\dots (6)$$

Since the two observed variables,  $M^S$  and  $\text{GDP}$ , in the above income form of the quantity equation are available in the national monetary statistics worldwide, it is sensible to observe the empirical relationship between money supply and  $\text{GDP}$  in selected countries via equation (6) before we proceed to further analysis. The data listed in Table 1 below shows the monthly averages of monetary aggregates and year-end nominal  $\text{GDP}$  for Mainland China, Hong Kong, the United States, Russia, Hungary, Cze Republic, and Poland. We have also calculated the money circulation velocity ( $M_0$  velocity and  $M1$  velocity) in these countries and the results are reported in Table 2.

Table 1. GDP, Currency in circulation ( $M_0$ ), Demand deposits (D) and Narrow Money (M1) in China, Hong Kong, United States, Russia, Hungary, Cze Republic and Poland: 1995-2005

Year	Mainland China				Hong Kong				United States				Russia			
	(Billions of Yuans)				(Billions of HK dollars)				(Billions of US dollars)				(Billions of Rubles)			
	GDP	$M_0$	D	M1	GDP	$M_0$	D	M1	GDP	$M_0$	D	M1	GDP	$M_0$	D	M1
1995	5847.8	738.2	1484.9	2223.2	1096.3	70.9	100.5	171.4	7397.7	366.2	776.4	1142.6	1429.0	75.9	66.9	142.8
1996	6788.5	826.1	1758.4	2584.5	1210.9	74.2	107.5	181.7	7816.8	381.6	724.1	1105.8	2008.0	94.0	74.3	168.3
1997	7446.3	963.7	2176.5	3140.2	1344.5	80.6	121.9	202.4	8304.3	409.2	660.0	1069.2	2343.0	124.0	108.3	232.2
1998	7834.5	1059.5	2455.8	3515.3	1279.9	81.2	95.8	177.0	8747.0	441.2	638.5	1079.7	2630.0	140.1	135.8	275.9
1999	8206.8	1183.8	2842.4	4026.2	1246.1	86.8	97.2	184.0	9268.4	485.8	615.6	1101.5	4823.0	208.5	197.4	406.0
2000	8946.8	1380.2	3440.1	4820.3	1288.3	91.6	109.0	200.6	9817.0	523.0	580.7	1103.7	7306.0	313.8	339.0	652.8
2001	9731.5	1477.2	4014.1	5491.3	1269.9	96.8	112.8	209.6	10128.0	555.0	585.2	1140.2	8944.0	481.9	492.9	974.8
2002	10517.2	1600.8	4772.3	6373.1	1248.0	108.3	130.5	238.8	10469.6	609.0	587.3	1196.2	10830.5	636.0	574.6	1210.5
2003	11739.0	1812.6	5780.5	7593.1	1234.0	122.2	168.6	290.8	10960.8	647.7	626.1	1273.8	13243.2	897.8	807.2	1704.9
2004	13687.6	2005.3	6835.4	8840.6	1291.6	136.6	243.8	380.4	11712.5	680.7	664.2	1344.9	16966.4	1272.0	1062.6	2334.6
2005	18232.1	2203.3	7670.2	9873.5	1382.1	144.1	226.5	370.6	12455.8	710.1	661.8	1371.9	21598.0	1651.9	1425.6	3087.5
S.D.	3407.6	461.9	1998.6	2457.6	70.4	24.0	50.0	72.83	1534.4	116.4	57.7	102.5	6400.6	506.4	430.8	938.6
Mean	9907.1	1386.4	3930.1	5316.5	1262.9	99.4	137.7	237.0	9734.4	528.1	647.3	1175.4	8374.6	536.0	480.4	1017.3
CV	0.34	0.33	0.51	0.46	0.06	0.24	0.36	0.31	0.16	0.22	0.09	0.09	0.76	0.94	0.90	0.92
$\bar{r}$ (%)	12.04	11.55	17.84	16.08	2.34	7.34	8.47	8.02	5.34	6.84	-1.59	1.85	31.20	36.07	35.78	35.98

Table 1. *Continued*

Year	Hungary				Cze Republic				Poland			
	(Billions of Forints)				(Billions of Koruny)				(Billions of zlotys)			
	GDP	M <sub>0</sub>	D	M1	GDP	M <sub>0</sub>	D	M1	GDP	M <sub>0</sub>	D	M1
1995	5614.0	425.1	518.4	943.4	1466.5	91.7	297.0	388.7				
1996	6893.9	461.3	613.2	1074.4	1683.3	110.5	311.4	422.0				
1997	8540.7	528.7	778.2	1307.0	1811.1	117.2	283.5	400.7	444.7	26.3	44.8	71.1
1998	10087.4	607.4	1104.1	1711.5	1996.5	110.5	269.7	380.2	589.4	29.2	51.6	80.7
1999	11393.5	723.5	1307.9	2031.5	2080.8	140.2	276.3	416.6	666.3	33.5	66.1	99.6
2000	13172.3	820.0	1540.7	2360.7	2189.2	166.3	313.0	479.3	744.6	34.1	69.6	103.7
2001	14849.8	910.3	1760.0	2670.2	2352.2	174.0	366.4	540.4	779.2	35.0	71.7	106.7
2002	16740.4	1097.0	2062.4	3159.4	2464.4	188.5	528.1	716.6	807.9	40.6	83.0	123.5
2003	18574.0	1275.6	2399.3	3674.8	2577.1	213.5	614.4	827.8	842.1	46.8	97.1	143.9
2004	20216.2	1316.7	2559.9	3876.7	2781.1	231.4	702.6	934.0	922.2	50.3	116.1	166.4
2005	21802.3	1453.7	3024.1	4477.8	2978.2	251.4	760.3	1011.7	975.0	53.9	134.9	188.7
S.D.	5210.9	348.0	796.6	1143.6	445.9	51.4	177.7	226.1	217.3	9.1	27.9	36.9
Mean	13444.0	874.5	1606.2	2480.7	2216.4	163.2	429.3	592.5	674.8	38.8	81.6	120.5
CV	0.39	0.40	0.50	0.46	0.20	0.31	0.41	0.38	0.32	0.23	0.34	0.31
$\bar{r}$ (%)	14.53	13.08	19.29	16.85	7.34	10.61	9.86	10.04	10.30	9.37	14.78	12.98

Notes:

M<sub>0</sub>, D, and M1 are monthly average figures. M1 = M<sub>0</sub> + D.

Data on Polish monetary aggregates published by the National Bank of Poland started in December 1996.

S.D. stands for standard deviation.

CV (Coefficient of variation) is calculated as  $CV = \frac{S.D.}{\bar{X}}$  where  $\bar{X}$  refers to the sample mean.

$\bar{r}$  (%) is the average rate of change, which is equal to  $\left[ \sqrt[n]{\frac{X_{t+n}}{X_t}} - 1 \right] \times 100\%$ , where  $X_t$  and  $X_{t+n}$  represents the first and the last value of the observed period.

Data sources:

The People's Bank of China Quarterly Statistical Bulletin, various issues.

HKMA Monthly Statistical Bulletin, various issues.

Hong Kong Census and statistics Department, 2006, Gross Domestic Product, 2005

IMF International Financial Statistics, various issues.

<http://www.federalreserve.gov/releases/h6/hist/h6hist5.txt>

[http://www.cbr.ru/eng/statistics/credit\\_statistics/print.asp?file=mon\\_survey\\_04\\_e.htm](http://www.cbr.ru/eng/statistics/credit_statistics/print.asp?file=mon_survey_04_e.htm)

[http://english.mnb.hu/engine.aspx?page=mnben\\_statistikai\\_idosorok](http://english.mnb.hu/engine.aspx?page=mnben_statistikai_idosorok)

[http://www.czso.cz/eng/redakce.nsf/i/hdp\\_ts](http://www.czso.cz/eng/redakce.nsf/i/hdp_ts)

[http://www.cnb.cz/cnb/stat.STAT\\_DATA\\_ARAD.index\\_page?p\\_url=/cnb/](http://www.cnb.cz/cnb/stat.STAT_DATA_ARAD.index_page?p_url=/cnb/)

[http://www.nbp.pl/en/statystyka/bilans\\_skons/bilans\\_skons\\_en.xls](http://www.nbp.pl/en/statystyka/bilans_skons/bilans_skons_en.xls)



Table 2. The money circulation velocity in China, Hong Kong, United States, Russia, Hungary, Cze Republic and Poland: 1995-2005

Year	China		Hong Kong		United States		Russia		Hungary		Cze Republic		Poland	
	M <sub>0</sub> Velocity	M1 Velocity	M <sub>0</sub> Velocity	M1 Velocity	M <sub>0</sub> Velocity	M1 Velocity	M <sub>0</sub> Velocity	M1 Velocity	M <sub>0</sub> Velocity	M1 Velocity	M <sub>0</sub> Velocity	M1 Velocity	M <sub>0</sub> Velocity	M1 Velocity
1995	7.92	2.63	15.46	6.40	20.20	6.47	18.83	10.0	13.21	5.95	16.00	3.77	n.a.	n.a.
1996	8.22	2.63	16.32	6.66	20.48	7.07	21.36	11.93	14.95	6.42	15.23	3.99	n.a.	n.a.
1997	7.73	2.37	16.69	6.64	20.29	7.77	18.90	10.09	16.15	6.53	15.45	4.52	16.91	6.26
1998	7.39	2.23	15.76	7.23	19.82	8.10	18.77	9.53	16.61	5.89	18.07	5.25	20.21	7.30
1999	6.93	2.04	14.36	6.77	19.08	8.41	23.13	11.88	15.75	5.61	14.84	5.00	19.92	6.69
2000	6.48	1.86	14.06	6.42	18.77	8.89	23.28	11.19	16.06	5.58	13.17	4.57	21.83	7.18
2001	6.59	1.77	13.11	6.06	18.25	8.88	18.56	9.17	16.31	5.56	13.52	4.36	22.26	7.30
2002	6.57	1.65	11.52	5.22	17.19	8.75	17.03	8.95	15.26	5.30	13.08	3.44	19.92	6.54
2003	6.48	1.55	10.10	4.24	16.92	8.60	14.75	7.77	14.56	5.05	12.07	3.11	18.01	5.85
2004	6.83	1.55	9.45	3.40	17.21	8.71	13.34	7.27	15.35	5.21	12.02	2.98	18.33	5.54
2005	8.28	1.85	9.59	3.73	17.54	9.08	13.07	7.00	15.00	4.87	11.85	2.94	18.10	5.17

Notes:

$$M_0 \text{ Velocity} = \frac{\text{GDP}}{M_0}, M_1 \text{ Velocity} = \frac{\text{GDP}}{M_1}.$$

Data sources: Same as those in Table 1

It is interesting to note that the figures for  $M_0$  velocity in these countries are significantly higher than the figures for  $M_1$  velocity. Taking the United States as an example, the 9.08  $M_1$  velocity in 2005 demonstrating that the average hoarding of narrow money ( $M_1$ ) in hands of the non-bank public was 40.2 days; however, the 17.54  $M_0$  velocity demonstrating that the average hoarding of currency ( $M_0$ ) was 20.81 days. View in this way, it should be reasonable to interpret the variable  $M^S$  in equation (6) as  $M_0$  rather than  $M_1$ . That is,  $M^S$  and  $V$  in equation (6) should be respectively referred to  $M_0$  and  $M_0$  velocity ( $V_{m0}$ ). Thus, equation (6) can be rewritten as

$$M_0 V_{m0} = \text{GDP} \quad \dots\dots\dots (7)$$

By substituting (7) into (5), we have

$$\text{GDP}(1 + \alpha \cdot \beta) = \lambda \cdot \text{GDP}$$

or

$$\lambda = 1 + \alpha \cdot \beta = 1 + \frac{D}{M_0} \cdot \frac{V_d}{V_{m0}} \quad \dots\dots\dots (8)$$

where  $V_d$ <sup>3</sup> is considered as an institutional parameter, and  $V_d \neq \frac{\text{GDP}}{D}$

From (7), we have  $V_{m0} = \frac{\text{GDP}}{M_0}$ , after substituting it into (8) and simplifying the results, we have:

$$\lambda = 1 + V_d \cdot \frac{D}{\text{GDP}} \quad \dots\dots\dots (9)$$

For the sake of straightforward comparison of the  $\lambda$  values across countries, we assume the demand deposit account balance ( $D$ ) is cleared every week, and so the average demand deposits velocity ( $V_d$ ) is 52 per year. After rearranging equation (9), we obtain a formula to estimate  $\lambda$ :

$$\lambda = 1 + 52 \cdot \frac{D}{\text{GDP}} \quad \dots\dots\dots (10)$$

The empirical values of  $\lambda$  have been calculated and reported in Table 3. Four characteristics can be observed: firstly, the  $\lambda$  values in Mainland China are the highest amongst the countries under

---

<sup>3</sup> If  $V_d = \frac{\text{GDP}}{D}$ , then  $\lambda = 2$ .

investigation; secondly,  $\lambda$  values of the five former social economies showed an upward trend while a general decline is observed in a mature market economy as the United States; thirdly, the pattern of  $\lambda$  values in Hong Kong appears to follow that in the United States before its reunion with Mainland China in 1997, but after that, the movement follows that of China's rising pattern; and finally, in the case of China and Russia, it demonstrates that a higher money growth rate is not necessarily associated with a lower velocity of money circulation. Among these four characteristics, the abnormally high  $\lambda$  values in Mainland China should be the one with significant policy implications.

### **3. Major factors contributing to the discrepancy between the total value of monetary transactions and GDP in China**

After a thorough examination of the working of the economy of China regarding the relationship between total value of monetary transactions and GDP, we have come to a tentative conclusion that the China's settlement system, the existence of a shadow economy, the extent of intermediate transactions and the value of net exports are the four major exogenous factors determining the velocity of money circulation due mainly to the existence of a discrepancy between PT and GDP, and therefore affecting the effectiveness of demand management monetary policy.

#### **a. The payments settlement system:**

In the pre-financial reform period of 1990s, China government wanted better control of the real sector as well as the financial sector, and the prevention for corruption and illegal business transactions, it required the state-owned enterprises and public units to settle their economic transactions through a non-bank accounts transfer system as practicable as possible. There was also a cash circulation control policy which disallows institutions using cash to settle transaction exceed a particular amount. Although these regulations has gradually become an obsolete stuff, they have already enhanced non-cash transactions outside the financial sector and contributing to a low velocity of money circulation because the public trend to hold more cash in the form of precautionary balance to facilitate emergent personal purchases.

As we may note that the monetarization process in China, which is defined as the proportion of economic transactions conducted using money for measurement of value and as the medium of exchange, has been (Yi, 1993, 2003) and will be increased significantly after the transitional period specified by the WTO . We can acknowledge that the monetarization process would be continued in

Mainland China and it may, in the long run, contribute to a rapid growth in  $M_0$  as well as  $V_{m0}$ , and a lower  $\lambda$  resulting from narrowing the gap between PT and GDP. This pattern can explain the high  $\lambda$  value or low velocity of money circulation in China in the past decade was partly due to the low level of monetarization.

b. Shadow economy:

The existence of a shadow economy will lead to understatement of the GDP figures, which helps explain the high value of  $\lambda$  in China. A shadow economy can be defined as “market-based production of goods and services, legal or illegal, which escapes detection in the official estimates of GDP” (Smith, 1994). Illegal activities in a shadow economy include trade in stolen goods, drug dealing and manufacturing, smuggling, prostitution, fraud and the like, whereas legal activities include unreported income from unreported work as well as tax evasion and avoidance activities. Generally, the above examples in a shadow economy may be common in Mainland China. The growth of the shadow economy may be caused by many factors, including the rise of the tax burdens and the complexity of the tax system, increased regulation in the official economy, corruption and bureaucracy, the decline of civic virtue towards the Government and the decline of tax morale (Schneider and Enste, 2000). Based upon a survey in 1998-99, the size of shadow economy shared 14% of GDP in Hong Kong, but in Russia, it shared 44% (Schneider and Enste, 2002). Since the problem of shadow economy in a emerging economy such as Mainland China could be much more serious than a well-developed economy, we have reason to believe it contributes to a high value of  $\lambda$  or a low velocity of money circulation.

c. Number and value of intermediate transactions

According to standard Economics textbooks, nominal GDP is a measure of the market values of all final goods produced in a country in a given year. PT measures the total values of all transactions including all intermediate goods as well as final goods. Intermediate goods include those that are purchased for resale or for further processing or manufacturing during the stages of production. Final goods are those that are purchased for final use. Included in the values of intermediate goods, PT must then be larger than nominal GDP. In Mainland China, such gap between PT and GDP is found to be much wider than other countries mentioned in Table 1, thereby leading to higher value of  $\lambda$  than other countries.

d. Difference between the value of imports and net exports

Net exports equal exports minus imports of goods and services. Nominal GDP includes the market values of net exports but PT includes the total values of domestic demand for all goods and services, produced by both local and foreign resources. In other words, PT includes monetary transactions for imported goods and services (in the forms of private consumption expenditure, fixed domestic capital formation, and government consumption expenditure) but excludes those for exports. So that, the larger the difference between imports and net exports, the higher the value of  $\lambda$  may be observed.



Table 3. The computed  $\lambda$  value for China, Hong Kong, United States, Russia, Hungary, Cze Republic and Poland: 1995-2005

Year	Mainland China	Hong Kong	United States	Russia	Hungary	Cze Republic	Poland
1995	14.20	5.77	6.46	3.44	5.80	11.53	n.a.
1996	14.47	5.62	5.82	2.92	5.63	10.62	n.a.
1997	16.20	5.71	5.13	3.40	5.74	9.14	6.24
1998	17.30	4.89	4.80	3.68	6.69	8.02	5.55
1999	19.01	5.06	4.45	3.13	6.97	7.91	6.16
2000	20.99	5.40	4.08	3.41	7.08	8.44	5.86
2001	22.45	5.62	4.00	3.87	7.16	9.10	5.78
2002	24.60	6.44	3.92	3.76	7.41	12.14	6.34
2003	26.61	8.11	3.97	4.17	7.72	13.40	7.00
2004	26.97	10.82	3.95	4.26	7.58	14.14	7.55
2005	22.88	9.52	3.76	4.43	8.21	14.28	8.19

## References

1. China Statistical Information and consultancy Service Centre, China Report: Social & Economic Development (1949-1989), Influxfunds Co. Ltd. And Zie Yongder Co. Ltd. Hong Kong, 1990.
2. Ding Sin, Study on Monetary Environment and Monetary Performance of China, China Finance Publisher, 2003, pp 239. (Chinese)
3. Fisher, Irving, The Purchasing Power of Money, (first Edition 1911, Second Edition 1922), Reprinted by Augustus M. Kelley Publishers, 1971.
4. Fleming, Matthew H., Roman, John, Farrell, Graham, The Shadow Economy, Journal of International affairs, 0022197X, Spring 2000, Vol. 53, Issue 2.
5. Friedman, Milton, Quantity Theory of Money, in Eatwell J., Milgate M., and Newman P. (ed.), The New Palgrave Dictionary of Economics, Macmillan, 1987.
6. Hong Kong Census and statistics Department, 2005, Gross Domestic Product, 2005.
7. Hong Kong Census and Statistics Department, Hong Kong Annual Digest of Statistics, 1978, 1988, 1998, 2004, 2005 Editions, Government Press, Hong Kong.
8. Hong Kong Monetary Authority, Hong Kong monthly Statistical Bulletin, Various issues.
9. Lu Yun Hang, The Empirical Research on the Relationship among Monetary Supply, Prive Level and GDP in the Chinese Economy: 1952 – 2003, Economic Science, No.2, 2005. Peking University Press.
10. Miles M. A., Feulner E. J., and O’Grady M. A., Index of Economic freedom, The heritage Foundation and Dow Jones & Company, Inc., 2004.
11. Poon C.C., Towards a Cashless Society, Economic Journal of HKSYC, 1987.
12. Prasad E. (ed), China’s Growth and Integration into the World Economy: Prospects and Challenges, Occasional Paper 232, IMF, 2004.
13. Rogoff K.S., Husain A.M., Mody A., Brooks R. and Oomes N, Evolution and Performance of Exchange Rate Regimes, Occasional Paper 229, IMF, 2004.
14. Schneider, Friedrich, Dimensions of the Shadow Economy, Independent Review, Summer 2000, Vol. 5, Issue 1.
15. Schneider, Friedrich and Dominik H Enste, Shadow Economies: Size, Causes, and consequences, Journal of Economic Literature, Vol. XXXVIII (March 2000) pp. 77-114.
16. Schneider, Fredich and Dominik Enste, Hiding in the Shadows: The Growth of the Underground Economy, IMF Economic Issues No. 30, March 2002.



17. Schneider, Friedrich, The Size of Shadow Economies in 145 Countries from 1999 to 2003, the Brown Journal of World Affairs, 2005.
18. Smith, Philip, Assessing the Size of the Underground Economy: The Canadian Statistical Perspectives, Canadian Economic Observer, Cat. No. 11-010, 3.16-33, at 3.18, 1994.
19. State Statistical Bureau, China Statistical Year Book, China Statistical publishing House, various years.
20. The People's of China, The People's Bank Of China Quarterly Statistical Bulletin, Various issues (1998-2005).
21. Vickers, Douglas, Money, Banking, and the Macroeconomy, Prentice-Hall, 1985.
22. Yi, Gang, Money, Banking, and Financial Markets in China, Westview Press, 1994.
23. Yi, Gang, The Monetization Process in China (Chinese book), Commercial Press, 2003.
24. Zhang Xiaojing, Report on Martetization Process in China, The Chinese Economy, vol. 37, no. 3, November-December 2004, pp. 68-84.
25. Zhao Liuyan and Wang Yiming, Chinese Experience on Monetary Stock and Price Level, Economic Science, No.2, 2005. Peking University Press.

The working paper series is a series of occasional papers funded by the Research and Staff Development Committee. The objective of the series is to arouse intellectual curiosity and encourage research activities. The expected readership will include colleagues within Hong Kong Shue Yan University, as well as academics and professionals in Hong Kong and beyond.

#### Important Note

All opinions, information and/or statements made in the papers are exclusively those of the authors. Hong Kong Shue Yan University and its officers, employees and agents are not responsible, in whatsoever manner and capacity, for any loss and/or damage suffered by any reader or readers of these papers.

**Economics Department**  
**Hong Kong Shue Yan University**

