Is the Quantity Theory of Money Relevant to China?
A full paper is available at: www.sktsang.com/ArchiveIII/Tsangc91.PDF

Introduction

The quantity theory of money, despite its affinity with Western pro-market economics, has been one of the accepted doctrines of socialist monetary authorities.

An idealized version of the theory is ***MV = Py*** where:

given the constancy of (or reliable information on) the velocity of monetary circulation (V) and the level of real output (y), the government could then automatically supply the appropriate amount of money (M) to the economy to facilitate transactions and maintain stability in the price level (P). Hence money is endogenous and passive, driven by socialist planning.

This view should be set against the peculiar institutional framework in CPEs, especially the mono-banking system and the separation of the two monetary circuits: cash versus deposit circuits (read my previous notes on 微觀考慮：**Micro Factors).**

The standard practice in China was to relate the amount of currency in circulation to the volume of retail sales as retail transactions were mediated almost exclusively with cash. A ratio of 1:8 was generally regarded as normal and conducive to price stability while a ratio greater than 1:6 was believed to be inflationary [Shi, 1982; Zhao, 1986]. These criteria were apparently derived from experience and little theoretical justification was given. Seen from this perspective, nevertheless, the task of monetary control for the Chinese "monobank" appeared to be relatively simple, at least in the less complicated circumstances of the pre-reform period. For the monitoring of the deposits of the enterprises, the Bank needed only to act according to the credit plan and carefully scrutinize their movements. As to currency control, given the information on velocity (which might change in accordance with cyclical and seasonal patterns) and the level of relevant output (total of retail goods and services, for example), the Bank could then supply the appropriate amount of new cash to the system to maintain price stability, which some advocates of the "traditional view" of socialist inflation [Wang, 1980] argued meant zero inflation.

If this perspective is appropriate, one would find the quantity theory generally a valid explanatory tool for macroeconomic trends involving the monetary variable in China, leaving aside the questions of exogeneity and causality.[2] Chow [1987] has pioneered an econometric exercise to apply the theory to China, employing the more recently developed techniques of cointegration tests and error-correction modelling on annual data covering the period of 1952-83. He makes it clear that he is more interested in "explaining the price level in China" than establishing a viable money-demand function. In any case, he comes out with the conclusion that the quantity theory provides a "reasonable first approximation" in explaining the demand for money in China [p.325] and that "the price level P can be reasonably explained by the ratio M/y as suggested by the quantity theory" [p.326]. He even finds that a short-run price-determining equation, constructed in the spirit of cointegration (so that it gravitates towards a long-run quantity relation), a satisfactory model for the period up to 1983, as the Chow Test shows no signs of structural breaks before and after the dividing year of 1979, when the economic reform was launched.

In any case, Chow's findings are surprising, even given his emphasis on the price equation. Despite official adherence and some arguments advanced to support the relevance of the classical quantity theory to socialist countries in general [Portes, 1983], there are important counter-arguments which throw serious doubts on this view, particularly on the continued relevance of the theory after the launching of the economic reform, not to mention that of the same short-run dynamic equation. After all, China's socialist experiment since 1949, marked by turbulent events such as the Great Leap Forward, the Cultural Revolution and the Economic Reform of the Eighties, has been characterized by transformations and structural changes which have been more drastic than those witnessed in most CPEs. Given all these marked fluctuations and changes, one would be hard pressed to explain why money has still exhibited stable relations with variables such as output and the price level in any simple manner over the whole era of Chinese socialism. These arguments equally apply even if we restrict ourselves, like what Chow [1987] did, to a consideration of the relation between the narrow definition of money, i.e. currency in circulation, on the one hand and income and prices on the other.

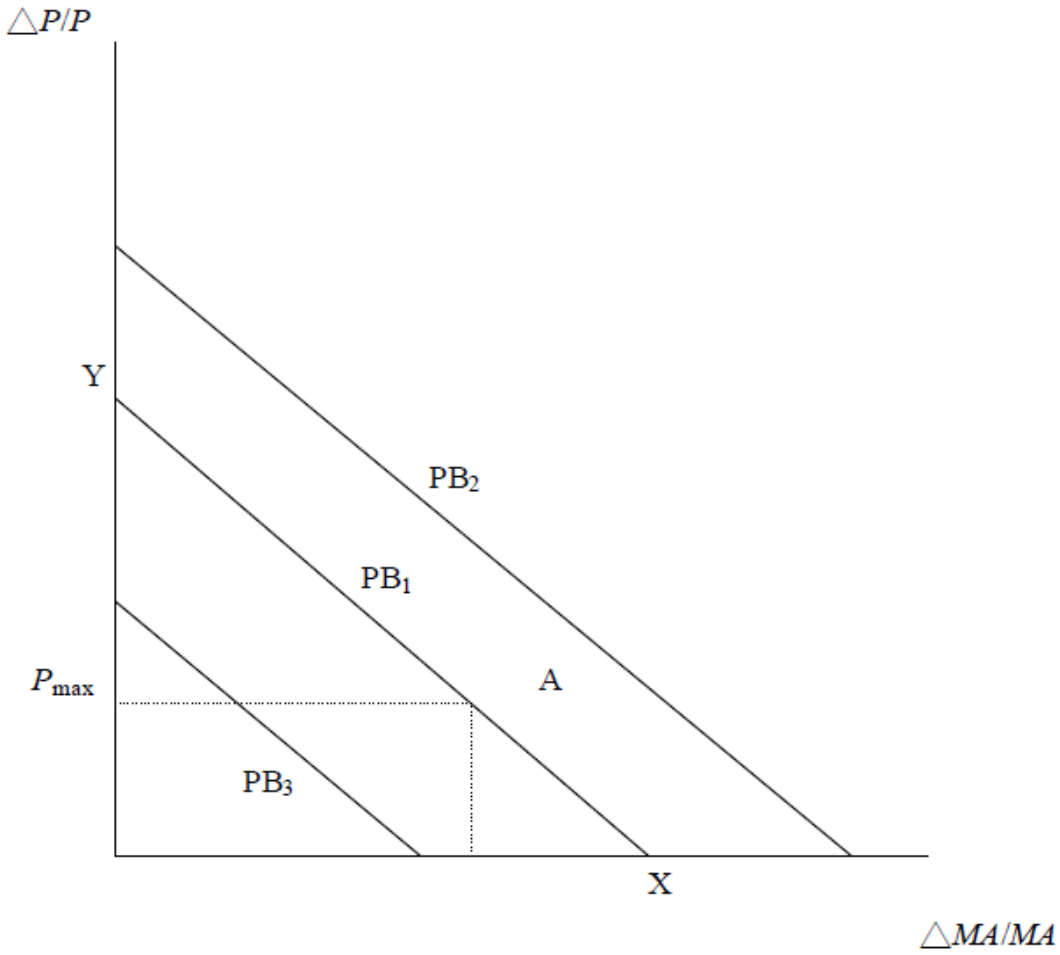
Pre-reform Considerations

Even leaving aside the problems of structural instability, the idealized view of the official employment of the classical quantity equation has been contested even for the situation under the pre-reform regime, as it assumes that market disequilibrium was not a serious problem, or that it could be neglected in the long-run. Price stability was no doubt a paramount consideration for the planners. However, as Peebles [1983, 1987] has argued, Chinese planners did have to adjust prices to overcome what he calls "purchasing power imbalances" and 100% stability was either not an objective or not achievable.

In a socialist country, the issue of money is often influenced by a large number of economic and political factors, particularly when the government is responsible for the lion's share of providing the population with purchasing power: wage payments to the city workers, agricultural procurements from farmers and the financing of the operation of the state enterprises etc. Much as the government wants to constrain it, this kind of distribution often has its own logic and cannot be totally compromised for the sake of macroeconomic stability. For example, the nominal amounts of procurement from farmers are very difficult to predict, and refusal to increase purchases in times of bumper harvest might lead to serious political difficulties,

The adjustments in prices are somewhat less direct. People's purchasing power will be "eroded", "taken back", but it is more difficult for any party to claim itself to be a direct target of official discrimination. Having said that, it does not mean that the socialist government in the pre-reform regime would resort to price adjustments as an easy way out.

All in all, it seems appropriate to theorize that the socialist government would try its best to keep M within targets, but then price adjustments would be used, with some reluctance and as a remedial measure, to do the balancing act. There is however a ceiling on price increases, and rationing may have to be implemented when demand still exceeds supply. An eye must be kept, moreover, on the stock of involuntary monetary accumulation.



The dilemma confronting the monetary authority can be graphically illustrated by figure 1, which is a modified version of figure 3 in Peebles [1987]. $\triangle P/P$ is the rate of price increase and $\triangle MA/MA$ the rate of monetary accumulation. PB1 therefore represents a trade-off between inflation and involuntary saving. The latter is forced upon the population through rationing when purchasing power exceeds the supply of goods and services. The higher the general price increase, the less would the growth rate of monetary overhang be. Hence the curve is downward-sloping. To completely wipe out the overhang, Y% of inflation rate is called for. On the other hand, if the authority puts top priority on price stability, a zero inflation rate would imply X% of monetary accumulation. Because of a subjective ceiling on tolerable inflation, only AX may in reality be the feasible set of trade-offs. In any case, any monetary accumulation could only be solved in the future by one or several of the following measures: price increases, monetary contraction or above-normal output.

Note that PB1 is drawn for a given excess supply of money. The curve will shift outwards if the excess is even higher (e.g. to the position of PB2) or inwards (say, to PB3) if it is lower. Obviously, the amount of money in circulation in any particular period will be determined by, among various factors, the monetary overhang (if any), the ex post money supply and the further trade-off that planners are prepared to choose. For example, if distribution of purchasing power was excessive in the past periods and the monetary overhang (as a result of opting for trade-offs involving very small price changes) is regarded as dangerous, the authority may tighten the money supply in this period, thus shifting the PB curve inwards, and regardless of the success or failure of that effort, choose a trade-off with larger price increases. So M/y may fall while P rises, defying the prediction of simple quantity theory. In general, the degree of shortage (rationing) and the ratios M/y and M/P may move in various directions, depending on the history of the past few periods and the general political and economic situation in the present period. Moreover, there is no inherent tendency for market-clearing equilibrium to be achieved. The classical quantity theory, even as a long-run proposition, simply cannot capture the complexity of such a situation.

The wider the definitions of money, prices and expenditure are, the less sustainable the proposition of proportionality will become. Deposits, particularly those by enterprises, came under much stricter control in China, so did the production of intermediate and producer goods. Free markets that had been developed for the latter were also subject to greater interference. Hence, effective supply in those markets was severely hindered. Demand for their output (e.g. iron and steel, cotton, electricity, bicycles and tractors, etc.), however, turned out to be price-inelastic because very few, if any, substitutes existed. So both the supply and demand curves would have been very steep in those markets, and their intersection point might have been outside the feasibility region of economics as well as politics. Producers or agents charging extraordinarily high prices in the secondary markets faced tremendous risks, while demanders (including many farmers who had little access to any form of credit) who could not afford it had to revert to the queue. For state-owned enterprises facing soft budget constraint, moreover, the marginal cost of failing to acquire the required material and producer goods in the uncontrolled sector was anything but significant, particularly in the pre-reform period before 1979. Joining the queue was the natural choice.

Reform-related Considerations

For the situation during the reform period, the question of the relevance of the quantity theory becomes more complicated, as the economy undergoes some unprecedented transformations and changes. Since price control has been liberalized to a certain extent, inflation has become more open. So Chow's argument of proportionality between M and P seems to have more weight. However, a great deal of control measures, restrictions and interference still exist and the events from 1988 onwards showed how easily decentralized decision-making power could be recentralized. The expectations of the Chinese population have nevertheless been raised significantly as a result of the reform process and the open-door policy. The problems of the aggravated investment thirst of local units, which have been given greater autonomy, and the "over-matured" consumption patterns of many households and social organizations have been widely reported and discussed. There is therefore little reason to believe that aggregate equilibrium is more likely during the reform than the period before. I have elsewhere [Tsang, 1989] analyzed the aggregate consumption goods market in China using the Burkett [1988] version of the Portes-Winter disequilibrium model. The results show that shortage (excess demand) actually worsened during the economic reform period up to 1987, compared with the second half of the seventies.

The reform has also generated important effects on both the supply and the demand sides of the economy which would have seriously undermined the predictive power of any simple model based on the quantity theory of money [Tsang, 1990]. In the loan-deposit circuit, the monopolization of the People's Bank was ended in 1983 and a system of specialized banks has since been established. These banks have been given more autonomy and incentives in collecting deposits and in lending to enterprises and rural units, increasing the possibility of excessive supply of money. As the reform raises living standard and affects the preferences of the population, their spending and saving patterns are also bound to change. This will affect the stability of the parameters in any formulation of the quantity equation. That stable long-run relations in the forms of money demand function and price equation as suggested by the classical quantity theory have been formed in the first ten years of Chinese economic reform seems to be a highly speculative proposition. That the same relations exist before and after the launching of the reform is even harder to believe.

The most important factor that affects the stability of the parameters in any quantity formulation is the so called "commoditization" (or, in Western terminology,

"monetization") of the economy, which is a direct consequence of the reform. The proportion of direct transfer and allocation of materials, goods and services in the overall economic process has dropped markedly. Most (but by no means all) transactions are now mediated with money. Secondly, the improvement in the national living standard as a result of the economic reform means that the propensity to save may rise. Since currency in hand and deposits with banks and credit co-operatives are the major forms of saving in China, given the still backward state of other financial instruments and markets, the demand for money in all its definitions will probably increase. This factor is reinforced by the change in government policy to rectify the past "Stalinist" tendency of emphasizing accumulation at the expense of consumption. To rally the people to the cause of the economic reform, the government has deliberately carried out measures to raise the income and consumption levels of the population, examples being the large increases in the procurement prices for agricultural produces in the first stage of reform (1979-1984), and the freedom given to enterprises in the cities to raise wages and consumption funds in the second stage which started in late 1984. However, a counter argument may be equally convincing: since consumption has been so repressed in the past and the prospect of the reform being continued is never certain, it may be more advisable for the Chinese to enjoy life "while the good days last". Hence total (voluntary and forced) saving may actually decline in the reform period. The impact on money demand will therefore be much quite uncertain.

Thirdly, the increasing importance of transactions mediated by cash, due to the fact that banking service in China has not been growing as fast as the real economy itself, also implies that the velocity of circulation would fall and demand for money would increase if cash changes hands more slowly than transfer across bank accounts. There are however doubts on this point because cash may actually change hands more quickly than bank transfers, given the reality of an underdeveloped financial system and different forms of administrative interference in China.

The above considerations can be presented more formally. Let us start with the simple quantity equation:

$$M.V = P.T \qquad (1)$$

where M represents the total demand for money, V velocity, P the price level and T the total amount of transactions on goods and services.

A socialist economy under economic reform witnesses a changing degree of monetization, which we denote as z, and a varying propensity to save, S, which is split between savings in the form of cash, Sc, and in the form of deposits, Sd. Assume also that because of the relative underdevelopment of financial services compared with the growth of the economy, a rising %, q, of transactions is in cash.

We can divide total demand for money into two components: demand for currency, Mc, and demand for deposits, Md; each with a different velocity, Vc and Vd.

(i) Demand for Cash

After a portion has been set aside for savings, the amount of currency left must be able to sustain transactions mediated by cash:

$$(Mc - Sc.Mc)Vc = q.z.Y \qquad (2)$$

where Y is nominal output, which replaces $P.T$ for simplicity. Denoting $(1-Sc)Vc = Vc'$, we obtain

$$Mc = \frac{1}{Vc'}(q.z.Y) \qquad (3)$$

(ii) Demand for Deposits

Like-wise, the amount of deposits left after a portion has been set aside for saving should be able to sustain transactions mediated by payments through banks:

$$(Md - Sd.Md)Vd = (1-q)z.Y \qquad (4)$$

Let $(1-Sd)Vd = Vd'$, then

$$Md = \frac{1}{Vd'}(1-q)z.Y \qquad (5)$$

(iii) Total Demand for Money

Aggregating the two types of demand, we obtain:

$$M = Mc + Md = \frac{1}{Vc'}(q.z.Y) + \frac{1}{Vd'}(1-q)z.Y \qquad (6)$$

and letting $V' = \dfrac{Vc'.Vd'}{Vd'.q + Vc'(1-q)}$,

we have finally the modified quantity equation:

$$M = (1/V')z.Y \qquad (7)$$

It can easily be checked that the partial derivatives of *M* with respect to *z*, *Sc* and *Sd* are all positive, and the partial derivative of M with respect to q is positive if *Vd* > *Vc*. It is reasonable to assume that *z, Sc, Sd* and *q* have all changed significantly in China since 1979. However, there is little ground to suppose that they have changed almost instantly and then moved onto new and stable magnitudes, given the twists and turns of the reform. Whether *Vd* has been greater than *Vc* is also in doubt. So it is difficult to believe that the quantity theory holds for the reform era and that the same formulation of the theory could provide consistent explanations of money demand or the price level in China over the whole period of 1952-88.