## Section 9.10 Limited Monetarism Versus the Quantity Theory (QT) Approach

**This** section is meant to both characterize and clarify the difference between the Quantity Theory and what can be called **limited monetarism.**[9]

The QT was discussed in Sec. 4.5 of EGI. To more fully the limitations of QT entails analyzing the banking system, not possible here. Excerpts are reproduced below from Bond Financing and Debt Stability: Theoretical Issues and Empirical Analysis for India, Development Research Group Study No. 19 (Sec 1.4, pp. 14-16), RBI June 2000 (Moorthy, Singh & Dhal).

**Numerical** simulations in Section I.4 correspond to two scenarios: tight and easy money respectively. The novel feature of this model is that although it is based upon a monetarist approach, the inflation rate in this model is not determined by the QT, even in the long run. Rather, inflation is determined by an expectations-augmented aggregate demand - aggregate supply output gap approach (ADAS for short). The ADAS approach is the output equivalent of the Phillips curve embedded in a natural rate of unemployment equation.

**These** simulations show that **monetarist** conclusions about the desirability of bond financing need not be predicated on stable money demand, i.e. a QT approach. The meaning of 'monetarist' in the above statement needs precise clarification. The following five tenets largely encompass monetarism and the QT:

(i) The natural rate hypothesis: despite a short run trade-off, there is no long-run trade-off between growth and inflation, from which it follows that zero inflation should be the final goal of policy.

(ii) The Fisher equation, with the nominal interest rate equals to the real rate plus expected inflation. The real rate of interest is **exogenous in the long run** and not amenable to long-run control by the central bank

(iii) Friedman's (1967) monetarist paradox: an easy money policy leads to high interest rates, which can be deduced as a corollary to the first two tenets.

(iv) A stable/predictable money demand function in a QT framework. Stable does not imply velocity is constant but that it can be fairly well predicted by real income and the nominal interest rate.

(v) Money supply is exogenous and can be largely controlled by the central bank.

**There is** an enormous amount of confused and confusing literature on what (limited) monetarism

[9] It should be noted that what was called monetarism in the study excerpted here is more accurately called **limited** monetarism, to distinguish it more precisely from general use of the term 'monetarism'.

does and does not imply. The study finds it not just useful but necessary to distinguish **between** monetarism and the QT, two approaches that are often mistakenly treated as identical. Many important conclusions in macroeconomic theory and monetary policy hinge upon clarifying and sorting out this distinction. The first three tenets, i.e. the **natural rate hypothesis**, the **Fisher equation and the monetarist paradox can be regarded as (limited) monetarism.** The QT entails the **additional tenets** (iv) and (v), that money demand is predictable, money supply is controllable by the central bank, and therefore inflation is well predicted by money growth.

**Monetarism as defined here is a subset of the QT.** The former can hold while the latter may not. Empirical evidence suggests that the Fisher effect is very strong while money demand is quite unstable, contrary to tenet (iv) listed above. Simple cross-country tests reveal this **wide empirical disparity** between the Fisher equation and the QT. For instance, for 14 OECD countries with relatively free debt markets, during 1993 an OLS regression of the (annual average) ten-year government bond rate on the current CPI inflation rate yields $R^2$ of 0.70, a coefficient of 0.81 and a t-statistic of over 5. A similar regression of inflation on M1 or M2 growth yields $R^2$ of under 0.01 and insignificant t-values. Using five-year averages of inflation on money growth **does not** change the results. (Also see the regression that follow comparing Fisher effect versus the Quantity Theory). As pointed out earlier, cross-country regressions are a particularly good source for inference since the cross-section data embody structural, long run effects in the **current** observation, which time series regressions often do not reveal.

**The fifth** tenet listed above pertains to exogeneity of the money supply. Since total money supply includes not only high-powered money but also the liabilities of the banking system, the validity of this fifth tenet (that underlies the QT) can be, and is often, empirically questioned. Thus monetarism and the Fisher equation have held up empirically while the QT and stable money demand functions have not. It is not surprising that major central banks have pragmatically moved away from money growth targeting and increasingly engage in direct inflation targeting, a policy implicitly based on an ADAS approach to inflation.

**The approach** described here as monetarism could perhaps just be called classcial to distinguish it from the QT. However, it is very common to describe (i) (ii) and (iii) as monetarist, because they were first clearly enunciated by Friedman in December 1967, along with the QT tenets (iv) and (v) and jointly used by him to recommend a money growth rule to achieve price stability. In a lighter but definitely illuminating vein, monetarism as defined here could be instead labelled **realism,** to connote the realistic and pragmatic view that central bank cannot (favourably) affect most **real variables** in long run. In particular, it cannot boost real output growth by lowering real interest rates.

Section 9.10.1 The Fisher effect versus Quantity Theory

As Evidence for 1995 for developed countries with low inflation rates indicated a remarkably robust Fisher equation. The highest inflation rate in this sample is Italy (5.8%) while the lowest is Japan ( minus 0.3%) with corresponding highest(10.62%) and lowest interest rate (0.56%) respectively. The Table for the Fisher effect from Sec 1.3 is repeated below, with narrow (M1) and broad (M2) money growth added to make the relevant comparison with the QT.

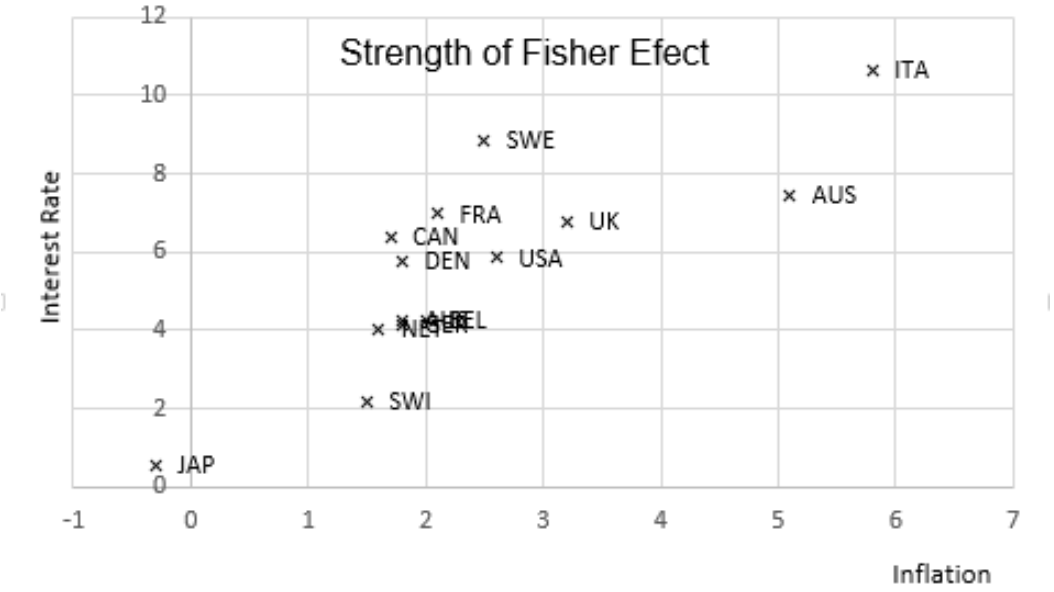
| Country | **Code** | **OctLibor** | **Inflation** | M1Growth | **M2Growth** |
|---|---|---|---|---|---|
| Australia | AUS | 7.43 | 5.1 | 8.7 | 9.15 |
| Austria | AUS | 4.23 | 1.8 | 11.95 | 5.25 |
| Belgium | BEL | 4.25 | 2 | 3.15 | 3.85 |
| United Kingdom | UK | 6.78 | 3.2 | 8.78 | 9.35 |
| Canada | CAN | 6.37 | 1.7 | 8.35 | 7.1 |
| Denmark | DEN | 5.75 | 1.8 | 1.6 | -1.9 |
| France | FRA | 6.97 | 2.1 | 6 | 8.65 |
| Germany | GER | 4.13 | 1.8 | 6 | 3.55 |
| Netherlands | NET | 4.01 | 1.6 | 7.65 | 3.1 |
| Italy | ITA | 10.62 | 5.8 | 2 | 1.95 |
| Japan | JAP | 0.56 | -0.3 | 8.65 | 2.95 |
| Sweden | SWE | 8.87 | 2.5 | | 1.75 |
| Switzerland | SWI | 2.2 | 1.5 | 5.05 | 4.4 |
| USA | USA | 5.85 | 2.6 | -0.4 | 2.9 |
| **Adding** | | | | | |
| **India** | IND | 14.45 | 9.9 | 19.25 | 15.65 |
| **Bangladesh** | BAN | 14 | 8.5 | 20.5 | 15.8 |
| **Pakistan** | PAK | 12.49 | 12.3 | 13.9 | 15.6 |
| **Israel** | ISR | 20.22 | 10.9 | 11.4 | 23.2 |
| China (Not Included in Chart). | CHI | 10 | 16.9 | 22.5 | 30.5 |

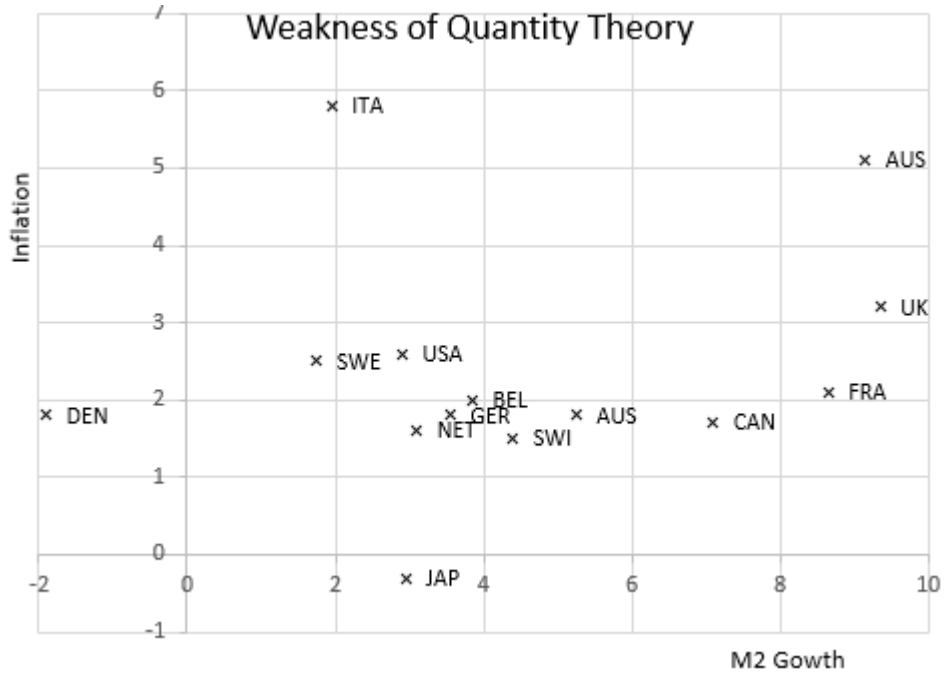
Source: Business Line, 20th October 1995 and Economist, IFS data. Inflation rate is CPI over a year ago.

**By 1995** the the inflation rates of the European countries were coming close to convergence in sync with their upcoming common currency the Euro which was adopted in stages, starting end 1998. Nevertheless there is sufficient variation in the inflation rates in this sample due to non Euro zone countries with higher inflation (Australia, Sweden) to robust statistical evidence for the Fisher equation. Besides from Euro zone itself Italy had the highest inflation rate, and highest interest rate of all.

**The comparison** of these two Charts indicate how strong the Fisher effect and thus limited monetarism is, while how weak the Quantity Theory at these **low** inflation rates.

The regression equation for the interest rate Oct95Libor = 2.23 + 1.41(Inflation)
(t -values in parentheses) Rsq 0.68 (2.84)* (5.01)**

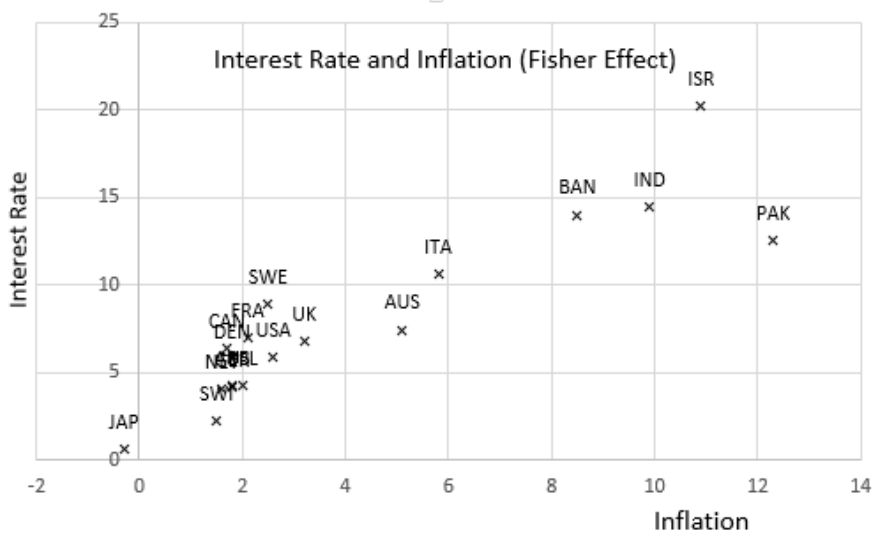



Inflation = 2.42 – 0.01(M2Growth)
R sq 0.00 (3.18)** (-0.08)
By comparison, the utter failure of the Quantity Theory can be seen in the above charts.

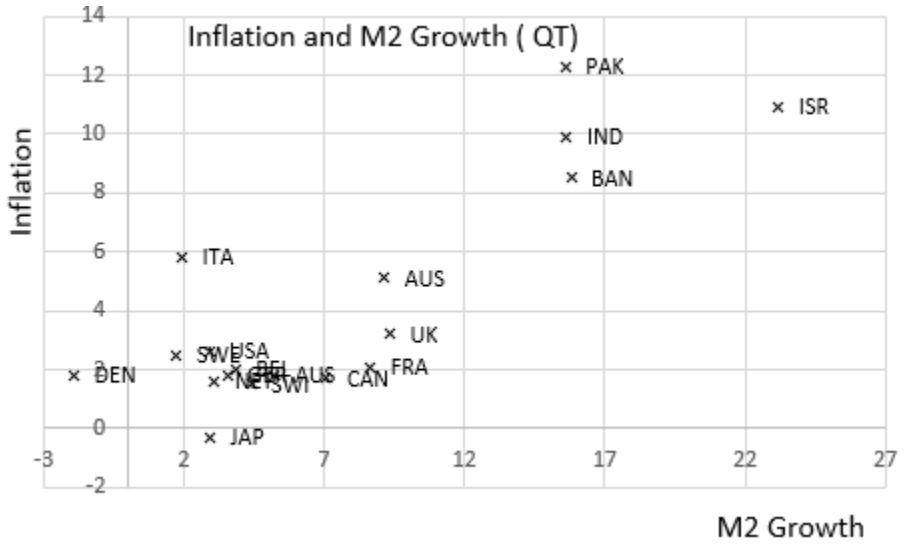
**For too** long, economists have defended the Quantity Theory by stating it holds in the long run. Since the 1980s, sophisticated cointegrating time series techniques have been used to capture these long run effects. These regressions are highly questionable, since the long run is built into the current observation (interest rate on 20th October 1995). Cross-country ordinary least squares regressions used here provide robust inferences. It must be kept in mind that the Fusher effect is also a long run realtionship.

Expanding the sample to include four moderate inflation countries (India, Pakistan, Bangladesh and Israel), the Fisher effect remains strong, as can be seen below.




Interest Rate = 2.65 + 1.16(Inflation)
R Sq 0.77 (3.54)** (8.28)**

However the Quantity Theory also holds up at these higher inflation rates, as seen below.

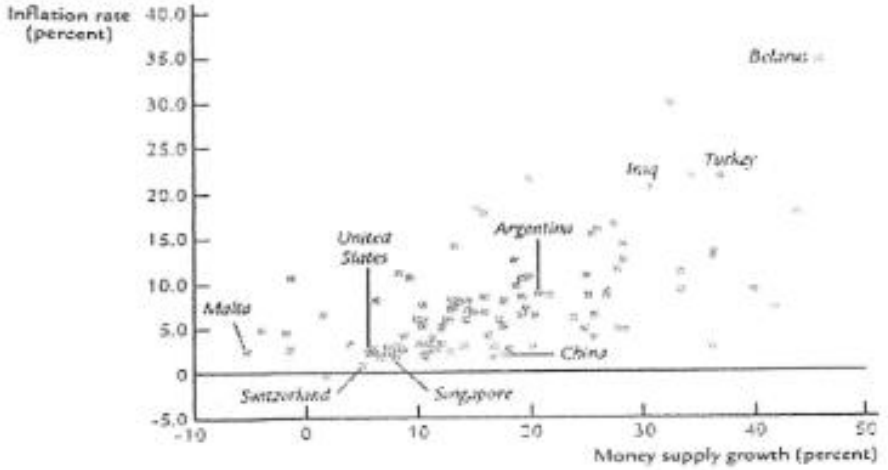



Thus the QT is not so much just a theory of the long run *per se*, as generally stated in textbooks, but of high inflation. With very high inflation rates (well over 20% this is evident from the charts on the next Page. As to why this is the case, the short answer is that the correlation at high inflation rates may be spurious. It does not necessarily imply money demand transmission underlying the Quantity Theory.[10] Nevertheless insofar as the correlation holds at higher inflation rates, policy can be based upon the QT.

[10] In the Indian context. noted academic and former RBI Governor Rangarajan has been a proponent of the Quantity Theory, evident in his Speech . His Presidential Address to the Indian Economic Association in 1988 was on Monetary Targeting in India, based on the Quantity Theory.

Fisher Effect and Quantity Theory at High Inflation rates: Performance of latter improves greatly

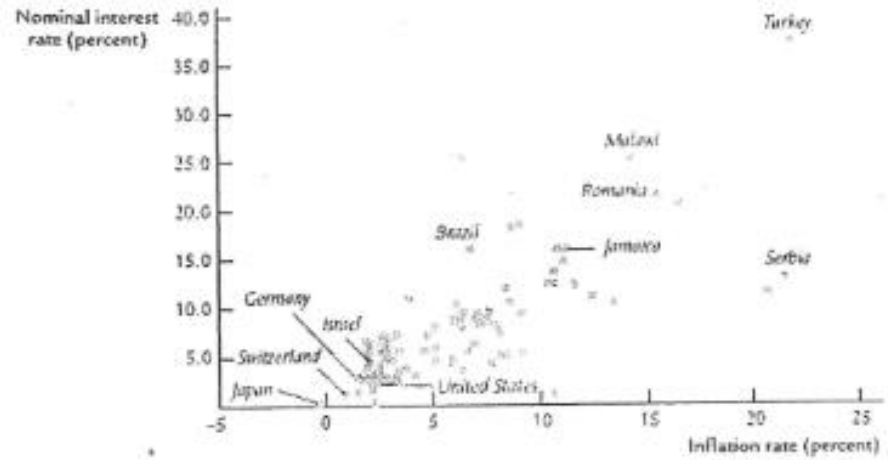
FIGURE




**International Data on Inflation and Money Growth**
In this scatterplot, each point represents a country. The horizontal axis shows the average growth in the money supply (as measured by currency plus demand deposits) during the period 2000 to 2010, and the vertical axis shows the average rate of inflation (as measured by the CPI). Once again, the positive correlation is evidence for the quantity theory's prediction that high money growth leads to high inflation.

*Source:* International Monetary Fund.

FIGURE




**Inflation and Nominal Interest Rates Across Countries**
This scatterplot shows the average nominal interest rate on short-term Treasury bills and the average inflation rate in almost 100 countries during the period 2000 to 2010. The positive correlation between the inflation rate and the nominal interest rate is evidence for the Fisher effect.

*Source:* International Monetary Fund.

Source: Charts from Mankiw's text