

# **THE MONETARY TRANSMISSION MECHANISM IN THEORY AND PRACTICE**

**Palle S. Andersen**

## **A. Theory**

### **(a) Model**

Before turning to the main transmission channels, I should note that the transmission mechanism is theory or model dependent:

If you believe in the real business cycle theory, so popular in the 1980s, the transmission mechanism is an irrelevant issue since money plays no role in that theory;

Similarly, if you believe that prices and wages are completely flexible (old classical theory and some branches of the rational expectation hypothesis), monetary policy can only affect nominal values but not real values such as output and employment;

Also, if the country has a fixed exchange rate target, there is not much interest in the transmission mechanism. Unless, there is low substitutability between domestic and foreign assets, the policy interest rate has to follow that of the target currency country.

Consequently, the following is based on three assumptions:

prices and wages are rigid in the short run;

capital and credit markets have frictions (information asymmetries and agency costs);

the economy is open with a floating exchange rate and no capital controls.

*(b) Principal transmission channels (Graph 1):*

Change of policy rate via money market or reserve operations:

Interest rate channel

Change in short-term nominal market rates;

Change in short-term real rates via sticky prices;

Change in long-term nominal and real rates via expectation hypothesis of the term structure;

Changes in aggregate demand (consumer durables, housing, inventories, investment) depending on interest elasticities.

Income or cash flow channel:

Changes in net interest income of creditors (household sector), including distributional effects;

Changes in net interest income and cash flow of debtors (companies).

Asset price or wealth channel

Changes in equity and house prices;

Changes in private consumption (wealth effect) and investment (cost of capital, Tobin's q).

Narrow and broad credit channels

Changes in banks' ability to lend via lower reserves or insufficient capital;

Changes in banks' willingness to lend via changes in collateral values ("financial accelerator effect");

Changes in business investment with differential effects for large and small firms. In particular, large firms often have access to international markets whereas smaller firms are highly dependent on bank credit.

Exchange rate channel:

Induced by change in interest rate (uncovered interest parity condition);

Induced by change in monetary base or broader aggregates;

Relative price, income as well as balance sheet effects (contractive devaluations).

Monetarist channel (Meltzer):

Changes in relative quantities of assets that are imperfect substitutes;

Changes in relative asset prices;

Illustration of asset and money market equilibrium (Graph 2);

Liquidity trap.

Expectations channel: Undoubtedly important but virtually impossible to predict, let alone quantify.

Changes in aggregate demand (Graph 3)  $\Rightarrow$

Changes in output growth and the output gap;

Direct (exchange rate) and indirect changes in inflation or the level of prices via the Phillips curve.

Back to the central bank reaction function

Operational targets

MCIs: origin and purpose;

FCIs: mostly used by investment banks (Goldman Sachs) but also considered by SNB;

Advantages and disadvantages.

## *B. Model simulations*

### *(a) ECB (Monthly Bulletin, October 2002)*

Over the last two years, the ECB has held several conferences and published a series of working papers on the monetary transmission mechanism in the euro area. The results can be summarised under three headings:

*Effects of monetary policy changes on output and inflation.* A primary objective of the ECB is to ensure price stability over the medium term. Hence, it is important for them to know how much to change monetary policy and when to do so if expected inflation deviates from the target. Table 1 shows the results of simulations on three different models on the additional assumptions that a temporary (2 years) 100 bp increase of the policy rate raises long-term rates by 20 bp while the exchange rate is assumed to appreciate by 2%. The broad features of the results are that:

real GDP declines in response but eventually returns to the initial level. In other words, monetary policy is neutral in the long run;

consumer prices respond with a longer lag, but the effect is permanent;

the effectiveness of monetary policy highly dependent on the structural characteristics of wage and price setting (Graph 4).

### *The channels of monetary policy changes.*

The main effects are via changes in investment with consumption taking second place. Exchange rate effects on net trade seem to be very small (Table 2);

Some weak evidence that changes in interest rates and liquidity affect banks' ability to supply loans while the demand for loans is mostly determined by the cost-of-capital. In other words, little evidence of a credit channel even though banks still play a major role in providing external finance.

### *Differences in monetary policy effects*

according to business cycle: more effective in recession;

by sector: most effect on producers of durable goods and capital intensive sectors;

by country: no robust results.

### *(b) United Kingdom (Report prepared by the Monetary Policy Committee)*

Response to a one percentage increase in policy rate lasting for one year:

GDP: After 5 quarters a decline of 0.2-0.35% and then return to base;

Inflation: After 9 quarters a decline of 0.2-0.4 percentage points and the effect goes well beyond 3 years.

## *C. Practical experience*

### *(a) Japan*

1989 - 1995 (Graph 5): In late 1988, the BoJ started to increase its policy rate to break the rise in equity and land prices. With a lag of about 9 months, equity prices started to decline and, by early 1992, had fallen more than 50%. Land prices showed a similar decline. In response to the decline in asset prices as well as to a weaker economy, the BoJ began to lower its policy rate already in mid-1990 and it has since been reduced to virtually zero. However, equity prices have continued falling.

Recent period (Graphs 6a and b): With interest rates at zero, prices falling and the economy weakening, the BoJ introduced a policy of quantitative easing in early 2001. As the graph shows, this led to a 30% increase in the monetary base but:

The growth of the broad money aggregate remained constant around 2-3%;

Bank credit to the private sector declined;

Equity prices declined contrary to the predictions of the monetarist channel;

The exchange rate strengthened contrary to what UIP would predict;

Prices have continued to decline and GDP is basically flat;

What lessons can we draw with respect to the monetary transmission mechanism?

Weak banks;

Fragile financial system;

Zero bound on nominal interest rate.

### *(b) United States*

Recent changes in the transmission mechanism (Federal Reserve Bank of New York Conference):

The reserves market (Graph .7): The Fed's policy rate (the Federal Funds rate) is the overnight interest rate in the reserves market. The Fed announces but does not set its target. Nonetheless, despite a significant decline in banks' demand for reserves in recent years, the actual rate follows the target rate very closely. Will this continue?

Shifts in the output response to changes in interest rates (Table 3 and Graph 8): Two changes are apparent: First, output seems to have become less responsive to monetary policy changes in the later period. Output only starts to decline in the third quarter after the change and the cumulative decline after two years is only 0.65% compared with 0.95 for the earlier period. Second, the positive correlations for output changes prior to the change in monetary policy have increased substantially, suggesting that the Fed has become more forward-looking or pre-emptive. This may, of course also explain the weaker response ex post.

Somewhat surprisingly, there is no evidence that the wealth channel has become more important. Even in the United States, it has always been weak (3-5 cents change in consumption for one dollar change in wealth) and it even seems to have weakened during the 1990s.

The net effect of changes in financial intermediation on the transmission mechanism is uncertain. For instance, changes in bank lending standards are found to lead output changes, but banks have become less important and monetary policy does not seem to influence lending standards. Mortgage rates have become more responsive to changes in policy rates but because of securitisation residential construction has become less sensitive to changes in mortgage rates. At the same time, a new and effective channel has emerged: refinancing of mortgages (explain).

There has been much discussion about a potential capital channel; ie banks changing their lending behaviour if they get close to their capital adequacy requirement. Not yet much evidence, but it may change with Basle II.

US experience during 2001-2002 (Graph 9):

Fed funds rate reduced from 6.5% to 1.75% in just 1 year;

10-year bond rate did not start coming down until early this year; discuss episode in late 2001 and early 2002;

Spreads on corporate bonds (not shown) actually widened; ie the external finance premium rose rather than declined;

Mortgage rates declined slightly but this was enough to start a refinancing boom;

Equity prices have mostly fallen, with an accelerated rate of decline this year;

The dollar initially strengthened slightly and only declined in the spring-summer of this year. Are exchange rates determined by interest rate differentials or expected growth differentials?

All in all, a FCI rose slightly during 2001 despite the aggressive rate cuts and did not ease until the exchange rate and the long-term bond rate started to come down this year;

Does this mean that the various headwinds prevented the monetary easing from having any effects?

Should a central bank attempt to stabilise output growth?

#### (c) Emerging market countries

Equity and other financial markets typically thin and underdeveloped⇒ asset price and wealth effects weak while volatility is high.

Another sign of underdeveloped financial markets is a high degree of self-financing which is not very sensitive to changes in borrowing conditions.

Banking sector may be dominated by oligopolistic conditions⇒ slow response of lending and deposit rates.

Bank lending response may also be weak because of bad loans.

Ceilings on interest rates or credit growth⇒ credit availability effects become important.

In countries with an unfavourable inflation history, financial contracts have short duration⇒ relatively quick pass-through of new conditions.

Countries with an unfavourable inflation history typically also have indexed (CPI, short-term interest rate, exchange rate) debt contracts (take Brazil as an example).

tends to dampen swings in nominal rates and thus in cash flow;

the implied real rate may serve as a useful signal of the stance of monetary policy;

for public debt the government takes over the exchange rate risk.

A high degree of informal dollarisation or eurorisation makes monetary policy less effective.

Four major issues or uncertainties:

Weak but uncertain link between changes in monetary policy, long-terms rates and asset prices;

The scope for an independent and effective monetary policy in countries with fragile financial systems (Mexico 1994, Japan now, perhaps China later);

How to evaluate the stance of monetary policy (operational indicators);

Monetary policy effectiveness in countries with high inflation (perhaps not so relevant any more).