

The Transmission Mechanism of Monetary Policy

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INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Outline

- The monetary transmission mechanism (MTM)
- Various channels of the MTM
- The simultaneity problem
- MTM in a model of a small closed economy MTM in a model of a small open economy with floating exchange rate regime
- MTM in a model of a small open economy with a fixed exchange rate regime
- Conclusions





The Monetary Transmission Mechanism

Definition promoted by J. Taylor (1995):

„...the process through which monetary policy decisions are transmitted into changes in real GDP and inflation“

Source: „The Monetary Transmission Mechanism: An Empirical Framework“, Journal of Economic Perspectives 9, 11-26

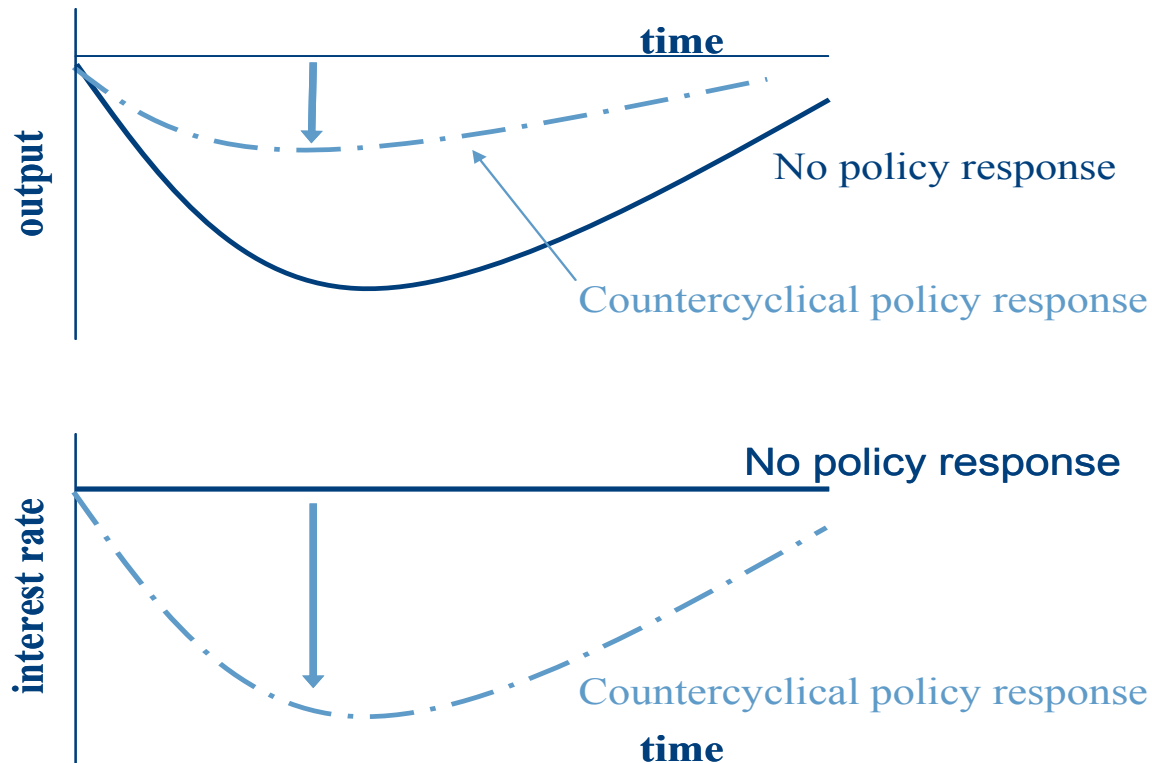
Various Channels of the MTM

- The Interest Rate Channel 
- The Exchange Rate Channel 
- Expectational Channel 
- The Credit Channel 

The Simultaneity Problem

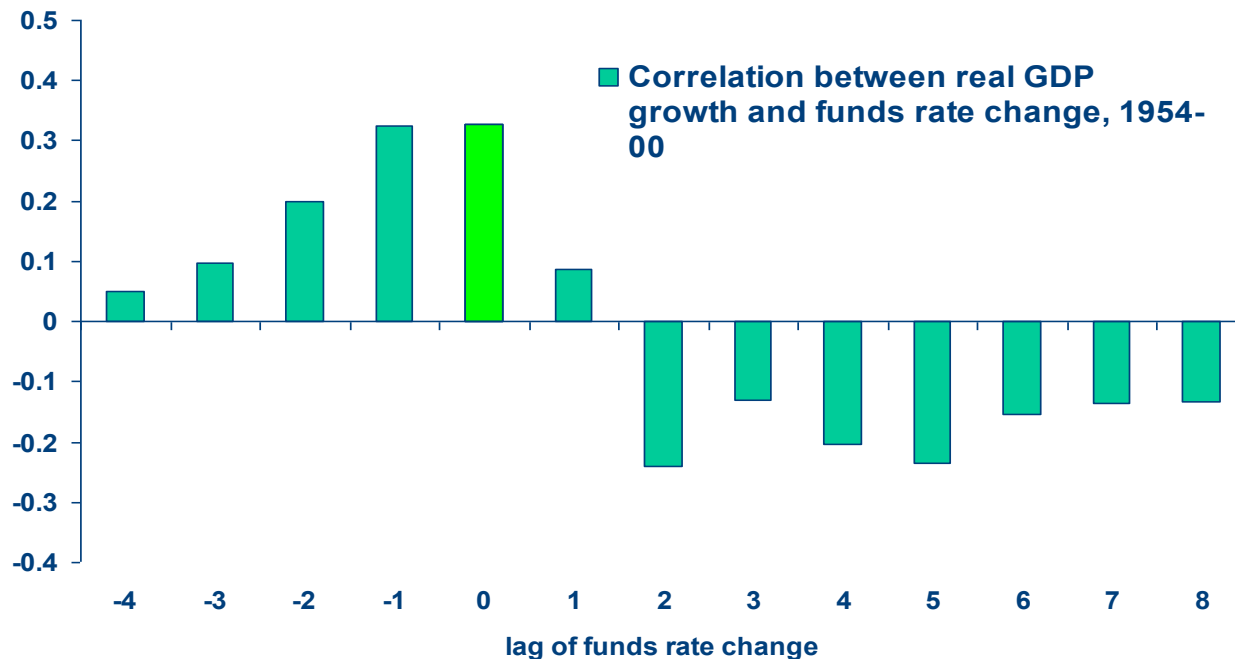
- *Simultaneity*: the endogenous response of policy to the economy makes it hard to measure policy's effects.
- Because various transmission channels operate at the same time, it is hard to isolate the effect of any particular channel.
- The simultaneity problem in theory and practice
- Estimation versus calibration

The Simultaneity Problem in Theory



With countercyclical policy, the interest rate and output both fall.

The Simultaneity Problem in Practice



- The contemporaneous correlation between real GDP growth and funds rate change is *positive*.
- Are rate hikes therefore *expansionary*?

MTM in a Model of a Small Closed Economy

A simple three-equation model:

IS-Curve:

$$y_{\text{gap}} = 0.8 * y_{\text{gap}}(-1) - 0.15 * r_{\text{gap}};$$

$$\text{where: } r_{\text{gap}} = i - \pi(+1) - r_{\text{eq}}$$

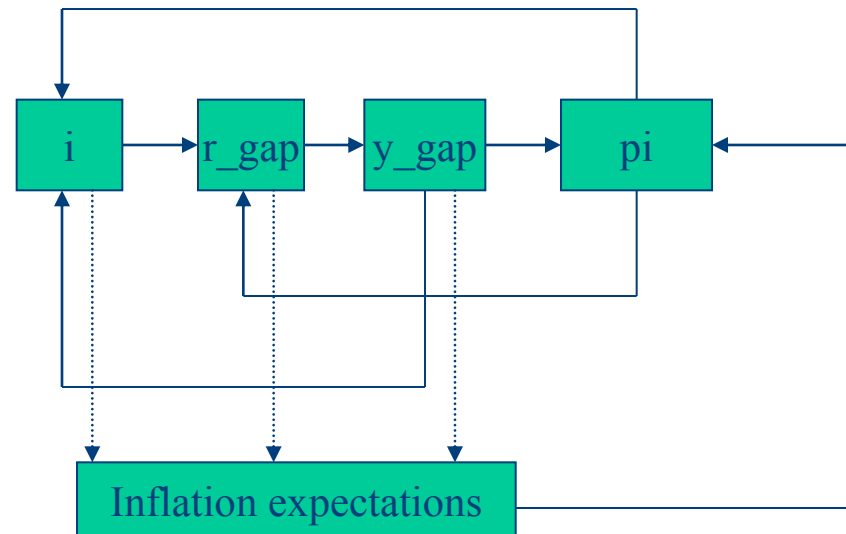
Phillips-Curve:

$$\pi = 0.5 * \pi(+1) + (1 - 0.5) * \pi(-1) + 0.2 * y_{\text{gap}};$$

The Policy Rule (Taylor-Rule)

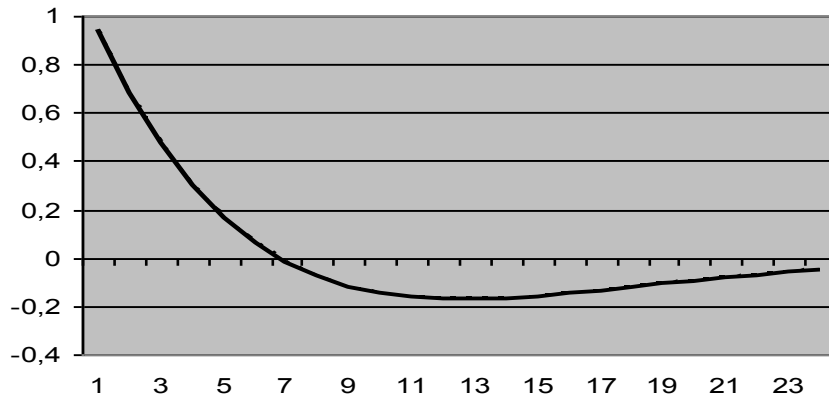
$$i = i_{\text{eq}} + 1.5 * (\pi - \pi_{\text{tar}}) + 0.5 * y_{\text{gap}};$$

The Transmission Mechanism in a Closed Economy

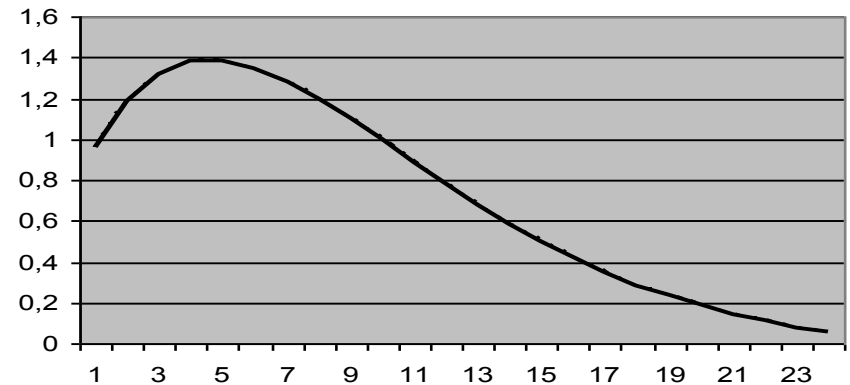


Demand Shock in a Closed Economy

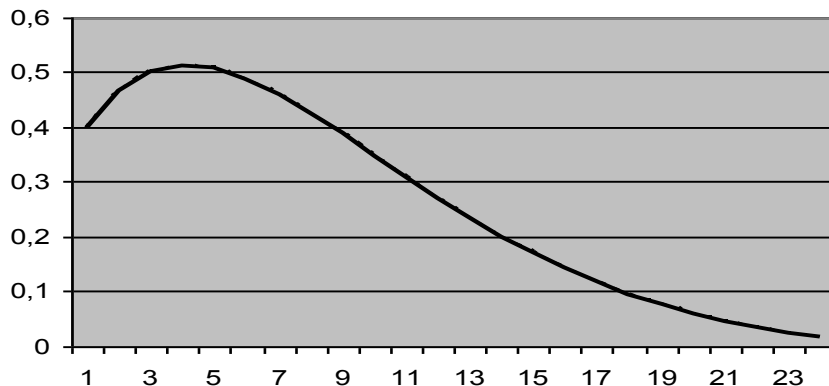
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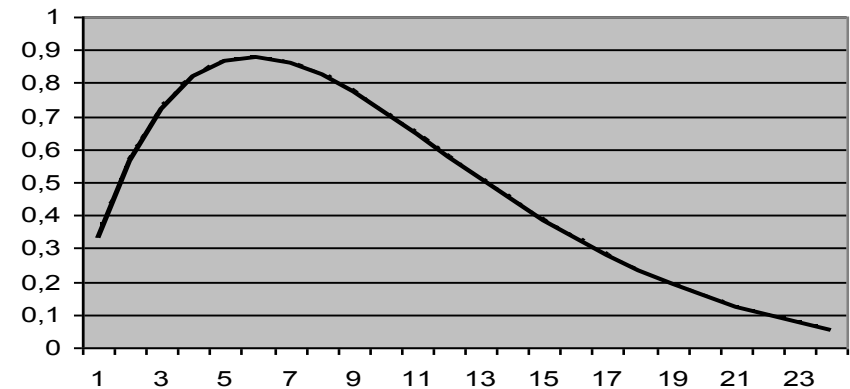
Nominal Interest Rate



Real Interest Rate



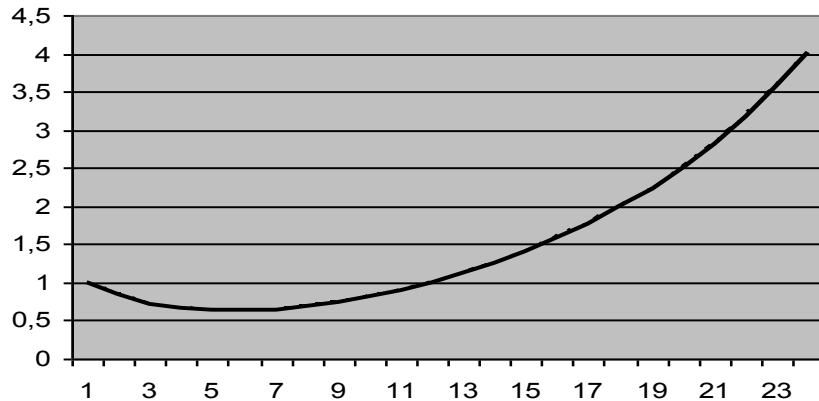
Domestic Inflation



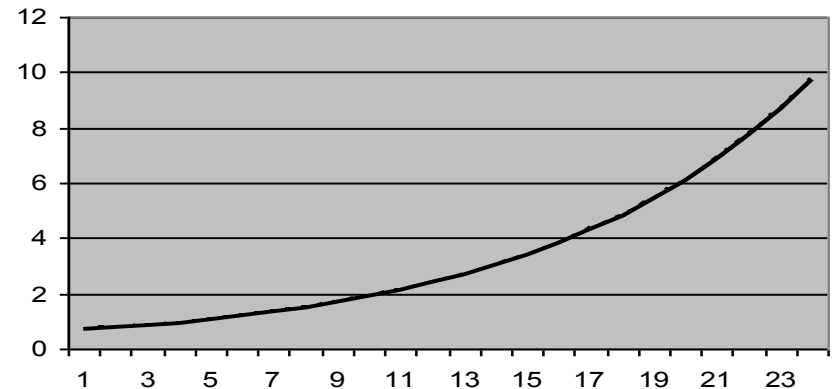
The Stabilizing Role for Monetary Policy

Change in the Policy Rule

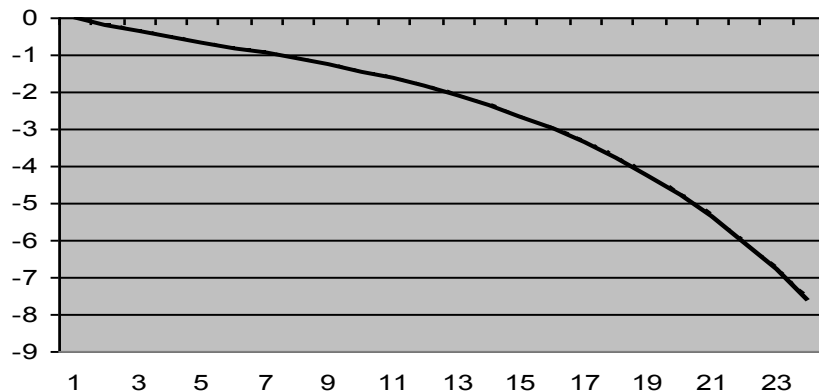
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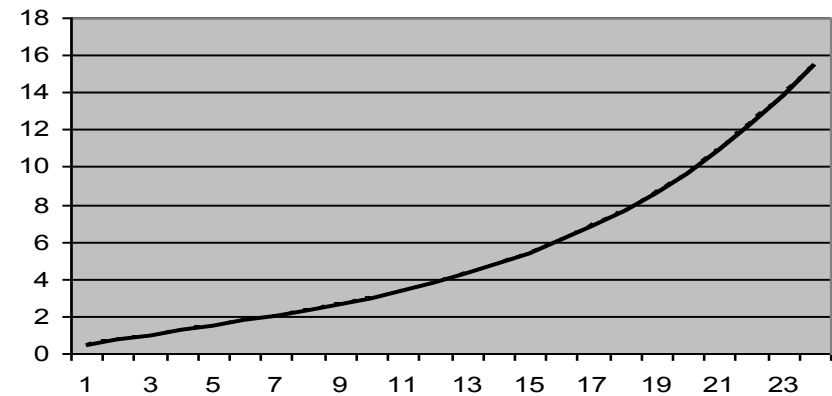
Nominal Interest Rate



Real Interest Rate



Domestic Inflation



MTM in a Model of a Small Open Economy

IS-Curve:

$$y_gap = 0.8y_gap(-1) - 0.15r_gap + 0.1q_gap;$$

$$\text{where: } r_gap = i - \pi^4_cpi - r_eq$$

$$q_gap = q - q_eq$$

Phillips-Curve:

$$\pi_d = 0.25\pi_d(+1) + (1-0.25)\pi_d(-1) + 0.2y_gap;$$

$$\pi_cpi = 0.8\pi_d + (1-0.8)(e - e(-1))$$

UIP + Real Exchange Rate:

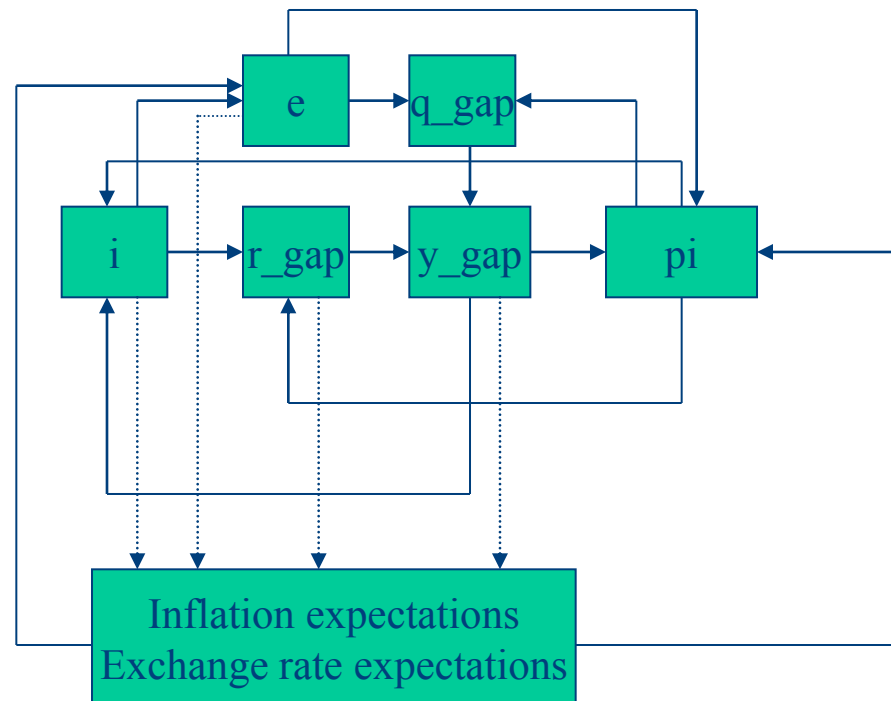
$$e = 0.6e(+1) + (1-0.6)e(-1) - (i - i^*)/4$$

$$q = e - p_d \text{ where } p_d = \pi_d + p_d(-1)$$

The Policy Rule (Taylor-Rule)

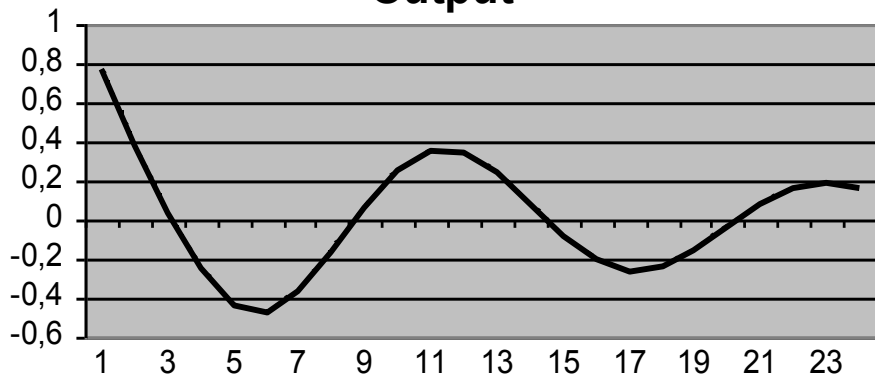
$$i = i_eq + 1.5(\pi^4_cpi - \pi_tar) + 0.5y_gap;$$

The Transmission Mechanism in an Open Economy

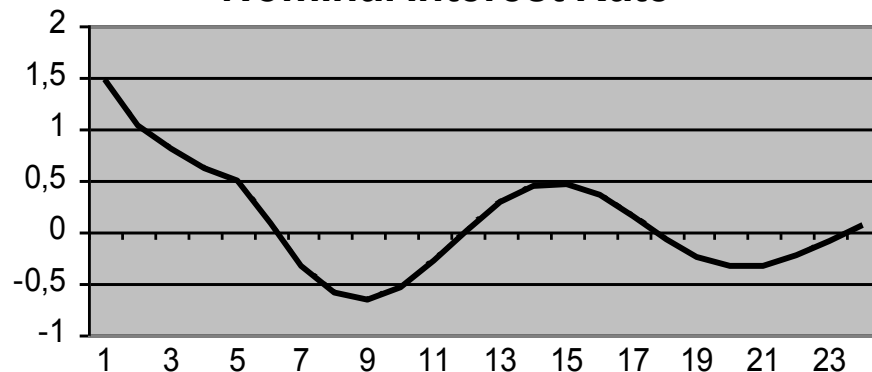


Demand Shock in an Open Economy (I.)

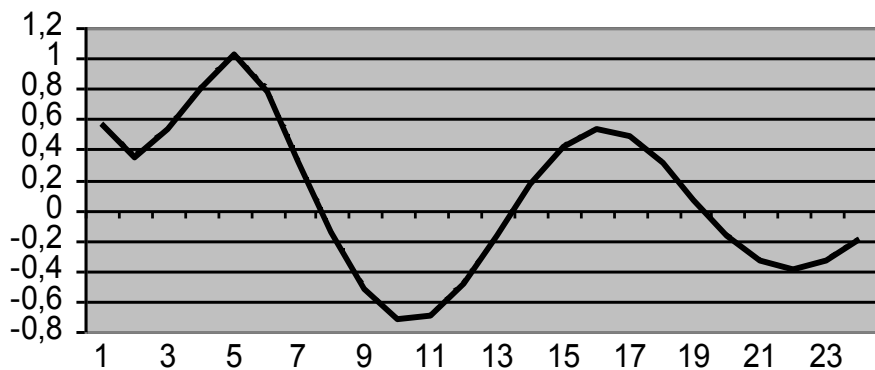
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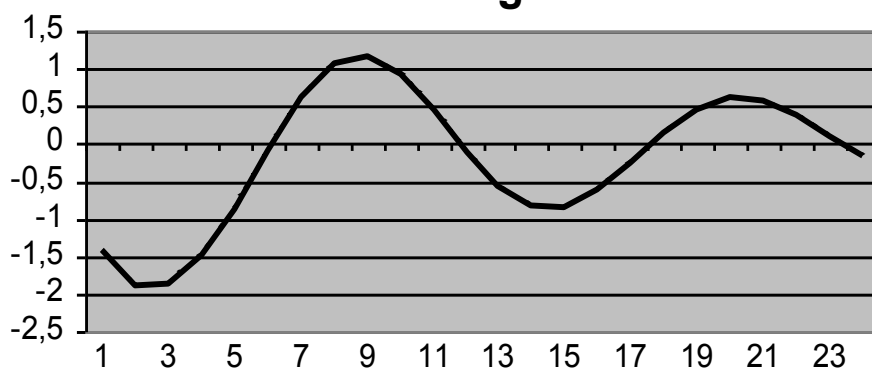
Nominal Interest Rate



Real Interest Rates

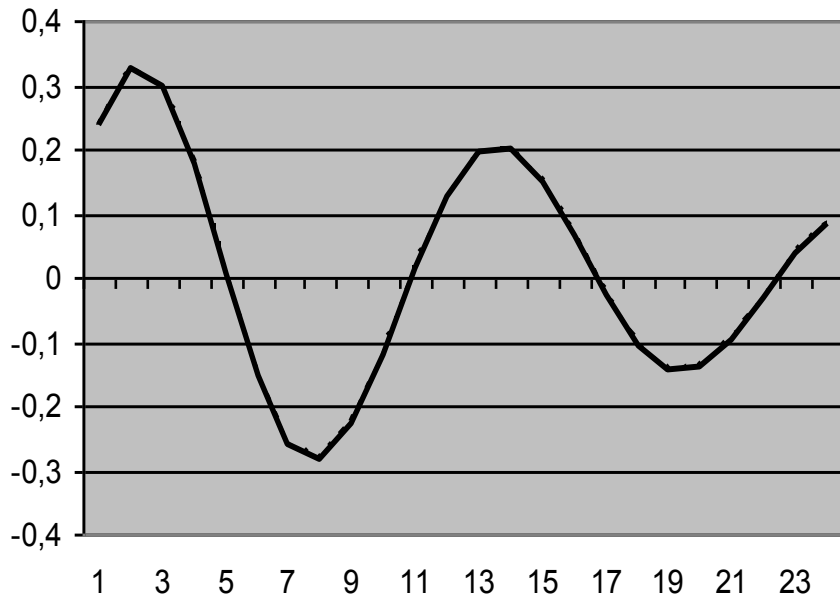


Real Exchange Rate

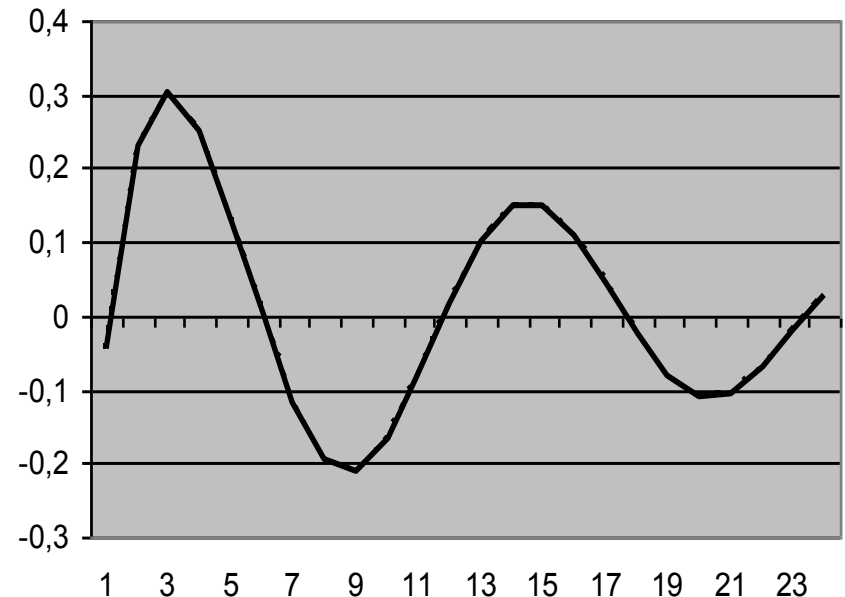


Demand Shock in an Open Economy (II.)

Domestic Inflation



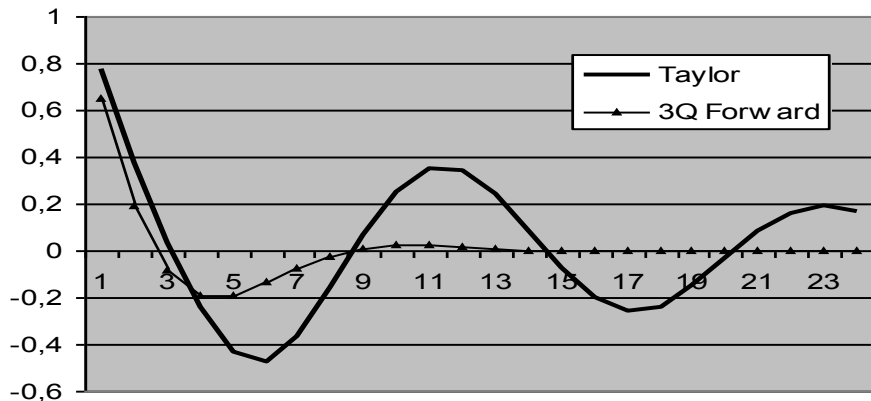
CPI Inflation



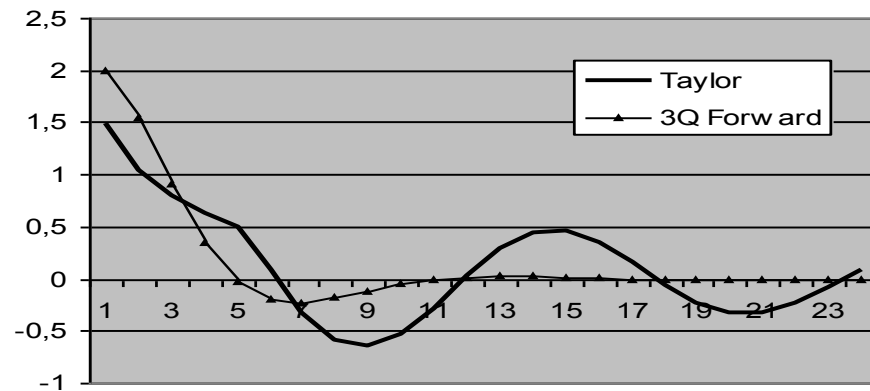
The Stabilizing Role for Monetary Policy I.

The Case for a Forward-Looking (3Q) Policy Reaction

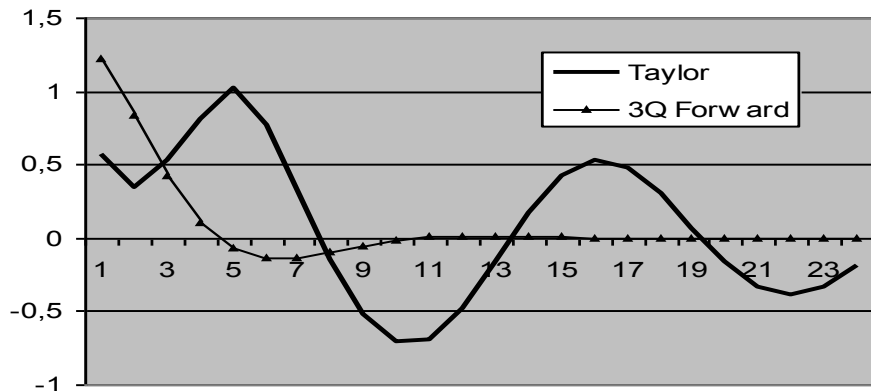
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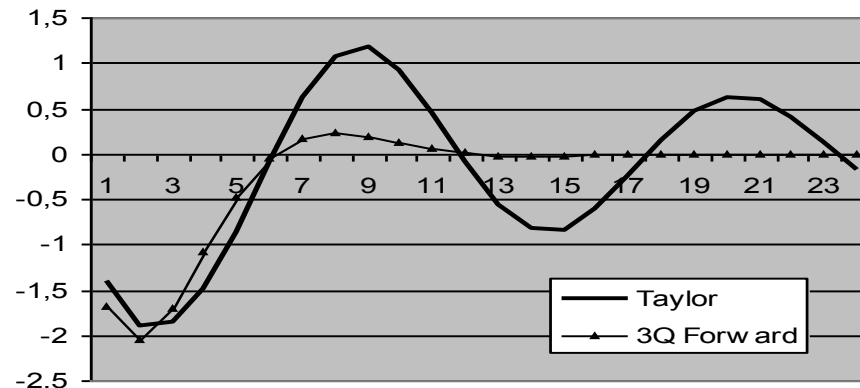
Nominal Interest Rate



Real Interest Rate



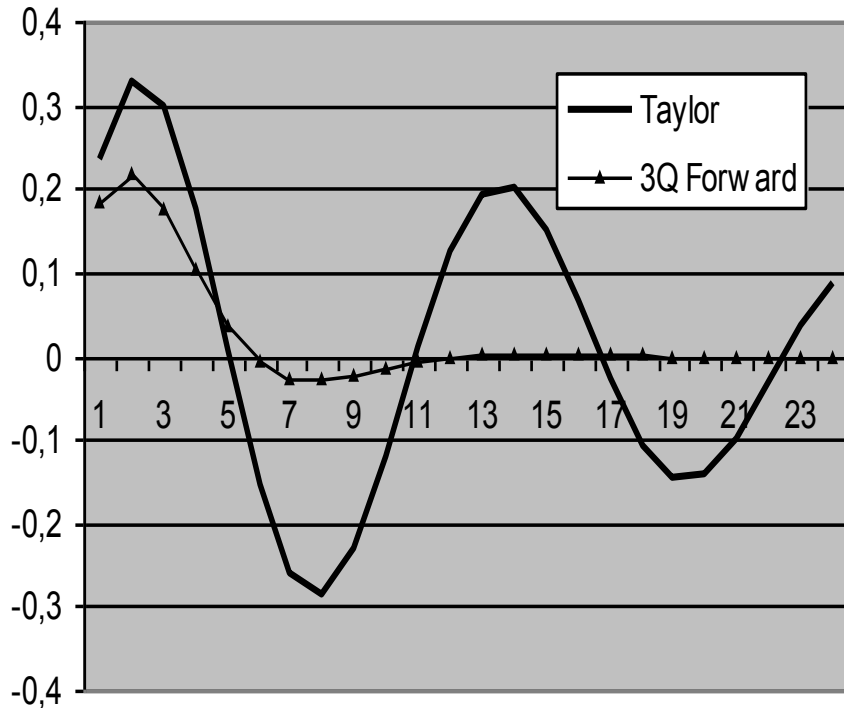
Real Exchange Rate



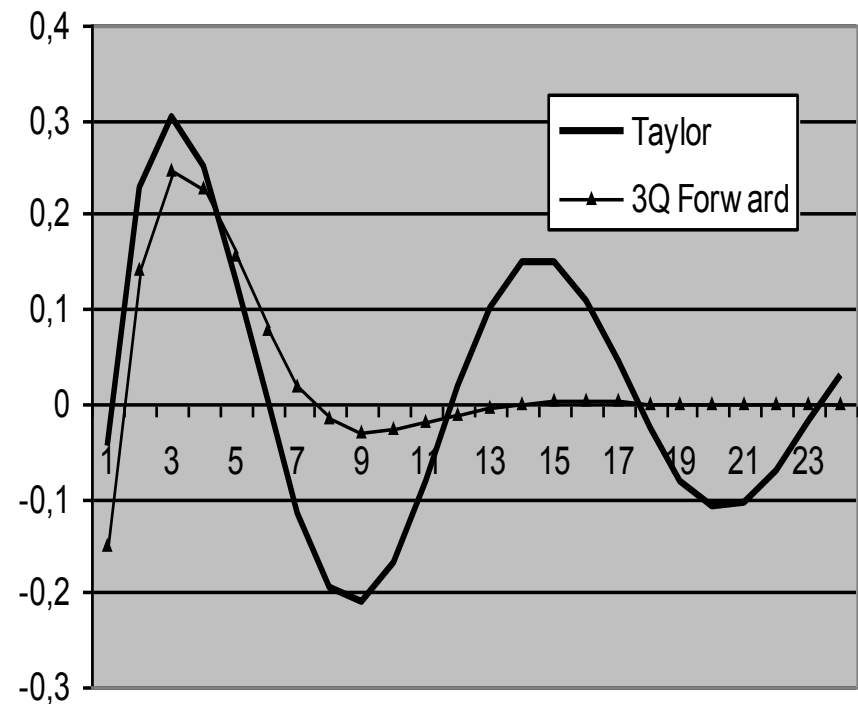
The Stabilizing Role for Monetary Policy II.

The Case for a Forward-Looking (3Q) Policy Reaction

Domestic Inflation



CPI Inflation



MTM in a Model of a Small Open Economy With Fixed Exchange Rate

IS-Curve:

$$y = 0.8 * y(-1) - 0.1 * r(-2) + 0.2 * q + g;$$

$$g = 0.5 * g(-1) - 0.08 * y(-1);$$

$$wr = 0.2 * wr(+1) + (1 - 0.2) * wr(-1) + 0.15 * y_gap(-1);$$

$$w = wr + p_cpi;$$

$$p_d = 0.5 * w + (1 - 0.5) * w(-1);$$

$$pi_d = p_d - p_d(-1);$$

Phillips-Curve:

$$pi_cpi = 0.7 * pi_d + (1 - 0.7) * (e - e(-1))$$

Exchange Rate:

$$e = e_tar \text{ or } e = 0.5 * e(+1) + 0.5 * e(-1) - i/4$$

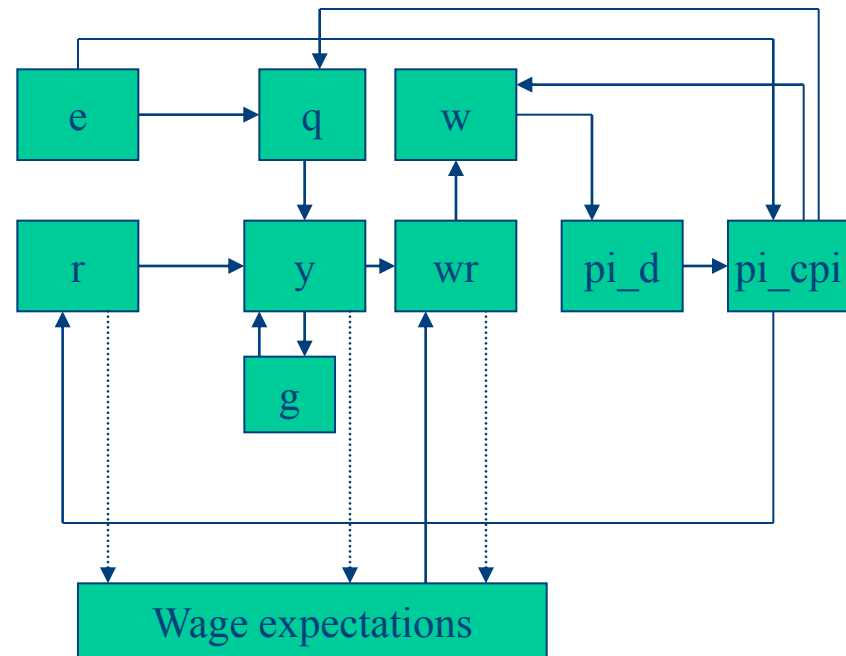
$$q - q(-1) = e - e(-1) + pi_d * pi_d$$

The Policy Rule (Taylor-Rule)

$$i = i^* + prem \text{ or } i = 1.5 * pi_4_cpi(+4) + 0.5 * y;$$

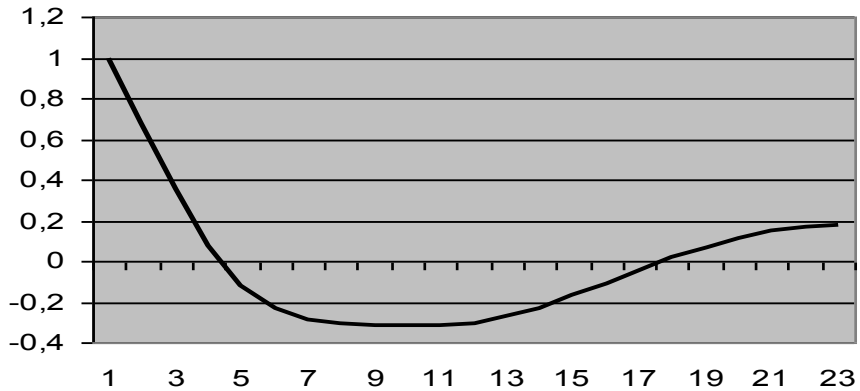
$$r = i - pi_4_cpi;$$

The Transmission Mechanism in a Fixed Exchange Rate Regime

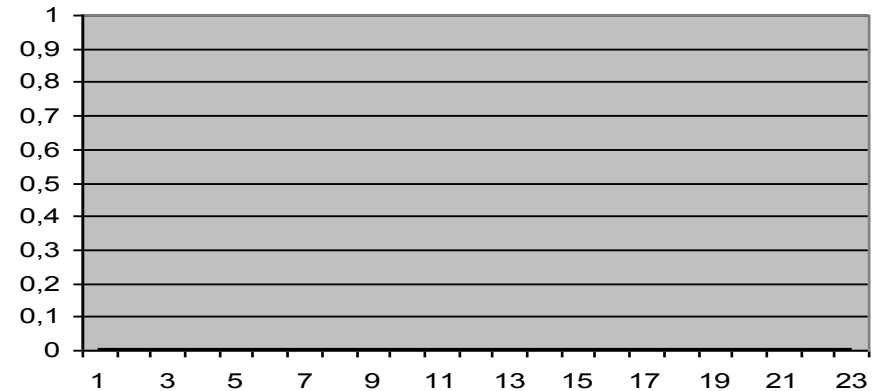


Demand Shock in a Fixed Exchange Rate Regime (I.)

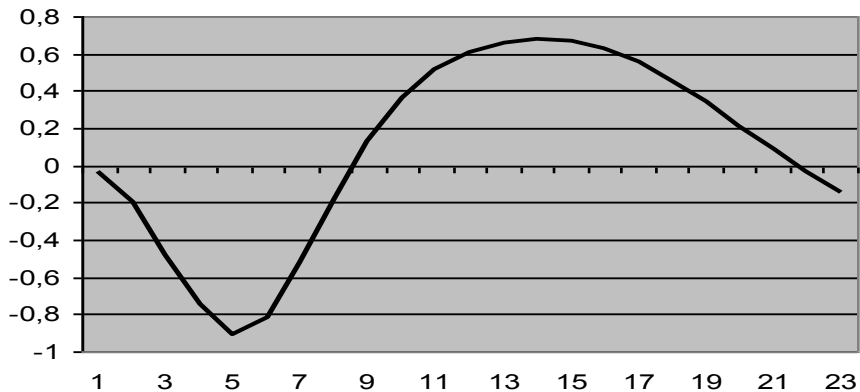
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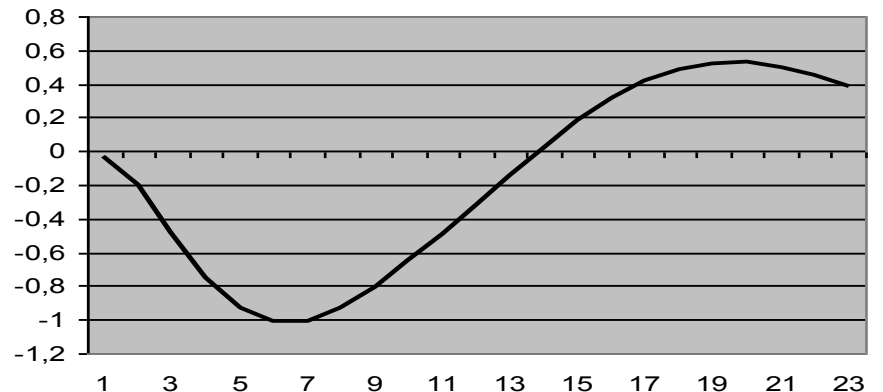
Nominal Interest Rate



Real Interest Rate

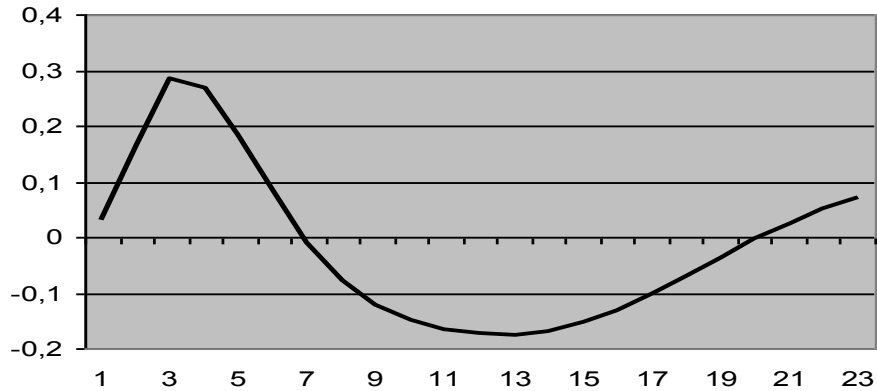


Real Exchange Rate

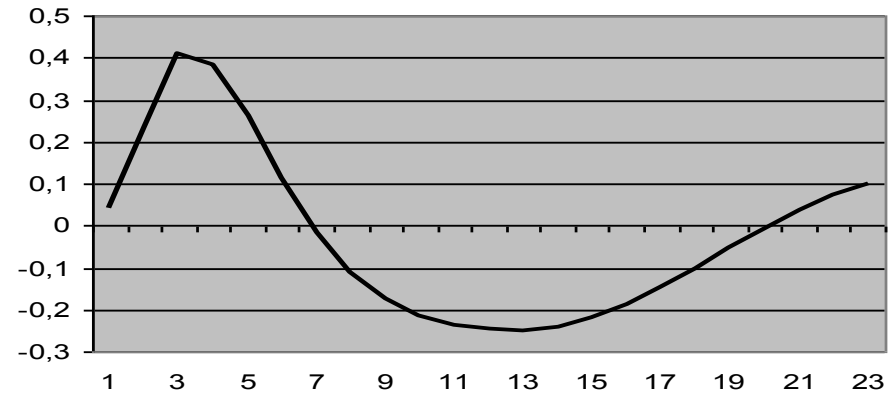


Demand Shock in a Fixed Exchange Rate Regime (II.)

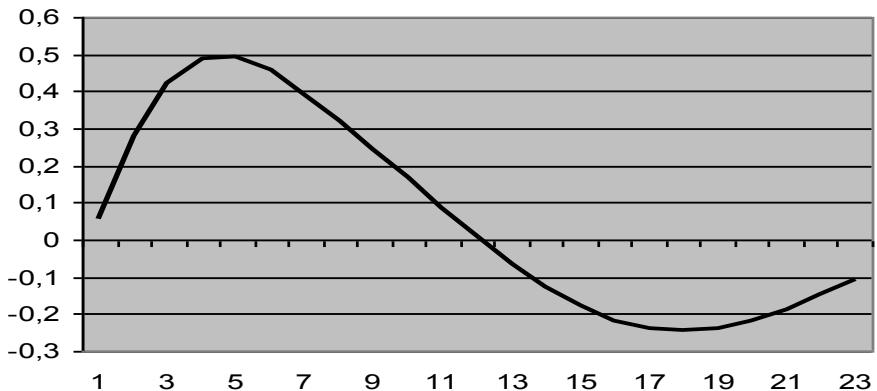
CPI Inflation



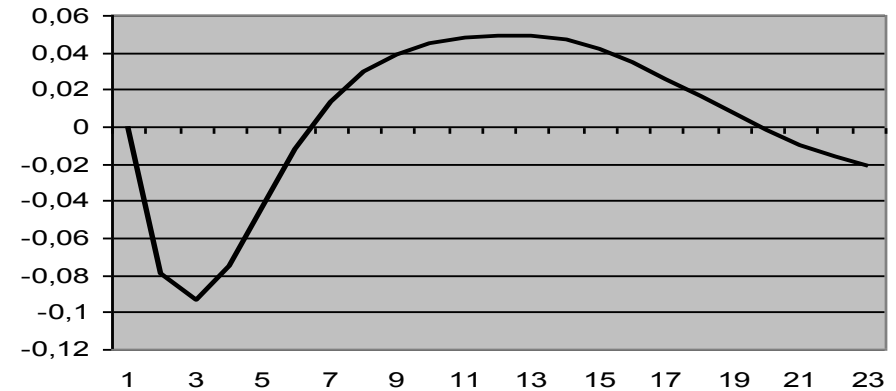
Domestic Inflation



Real Wages

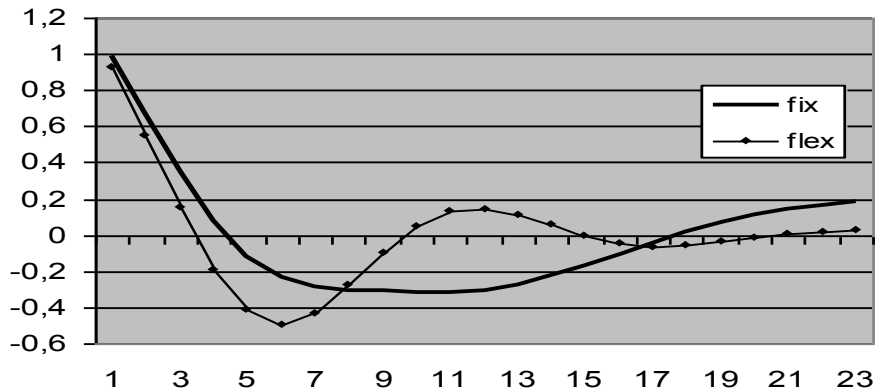


Government Consumption

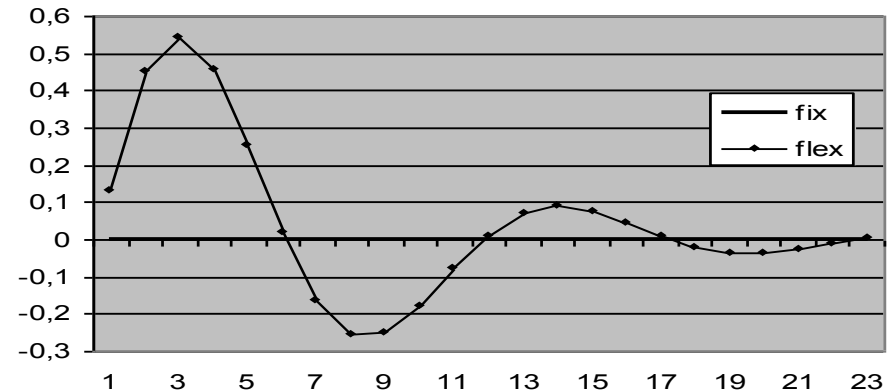


Comparing the Impact of a Demand Shock in a Fixed and Floating Exchange Rate Regime (I.)

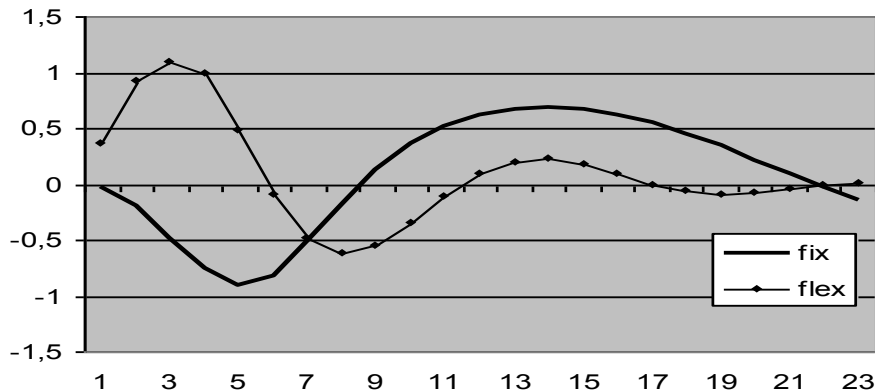
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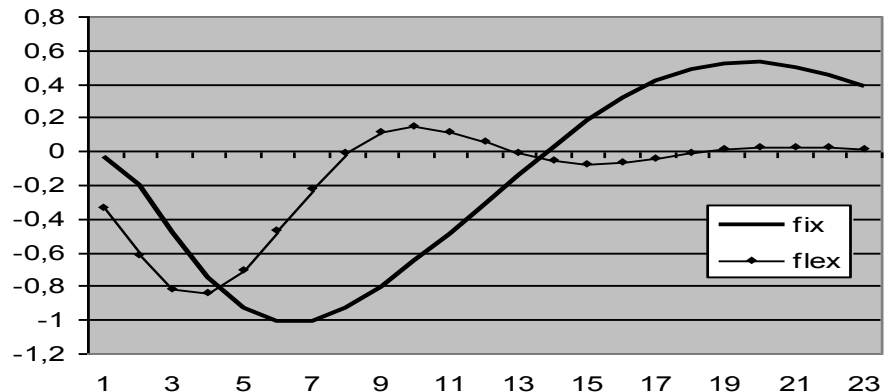
Nominal Interest Rate



Real Interest Rate

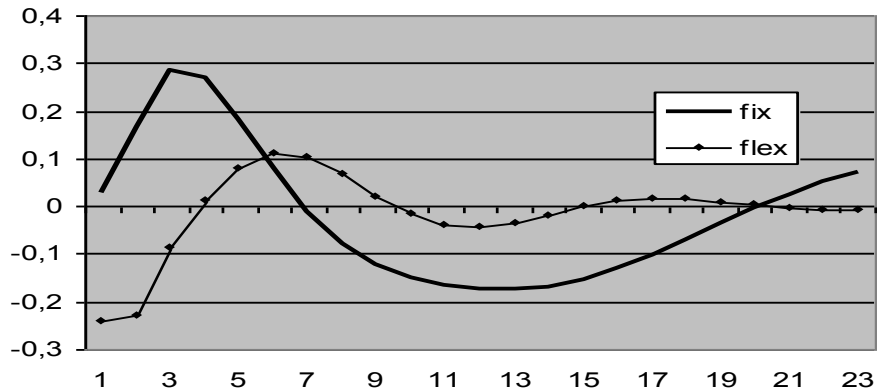


Real Exchange Rate

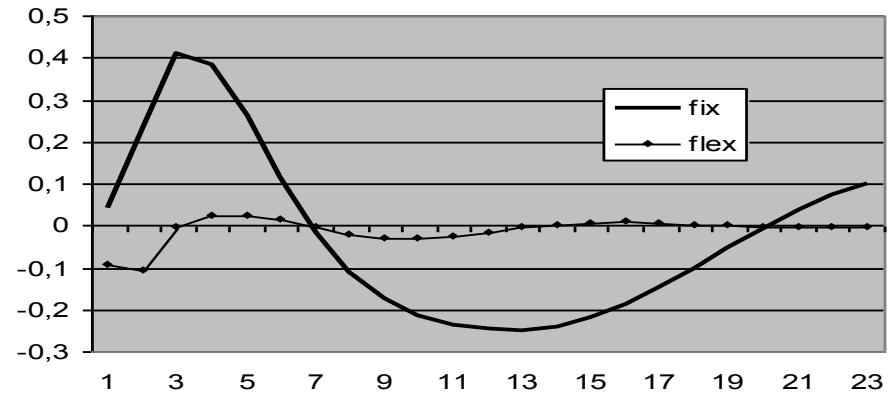


Comparing the Impact of a Demand Shock in a Fixed and Floating Exchange Rate Regime(II.)

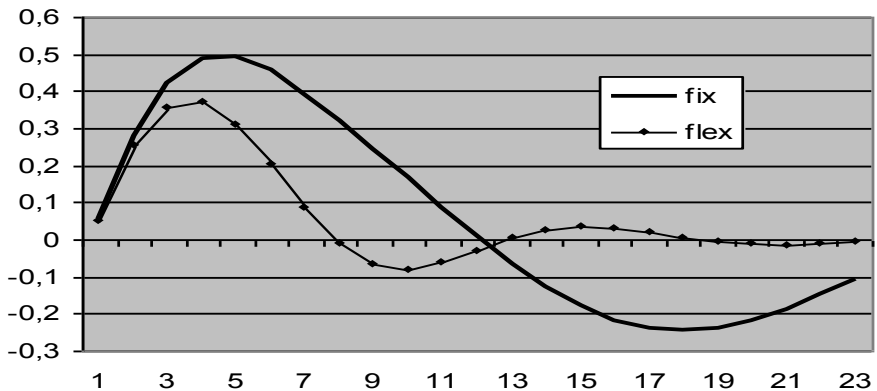
CPI Inflation



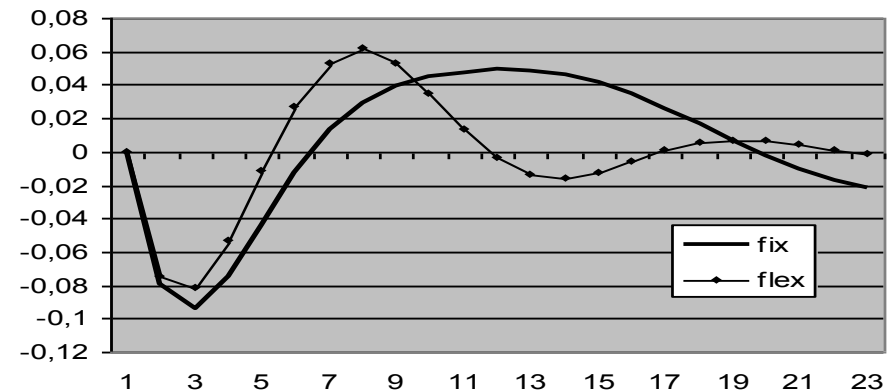
Domestic Inflation



Real Wages



Government Consumption



Conclusions

- There is no *single* transmission mechanism, but there are several (legitimate) alternative approaches to quantify the main channels of the MTM.
- The way how the central bank reacts to shocks in a floating exchange rate regime is crucial for stabilising the economy: forward - looking monetary policy might - compared with a myopic MP behaviour - significantly mitigate the potentially negative impact of shocks on the economy.
- In a fixed exchange rate regime only fiscal and structural policies can improve the economy's response to shocks.

The Interest Rate Channel

- Higher interest rates lead to:
 - a reduction of **household consumption** due to
 - increased savings (postponed consumption);
 - the fall in asset prices (shares, long-term bonds, etc.);
 - decrease in **investment** due to higher financing costs;
- The decline in consumption and investment results in a deceleration of **domestic demand**.
- Lower demand pressures lead to lower resource utilization, which in turn, mitigates wage and price pressures in the economy (Phillips curve relationship)



The Exchange Rate Channel

- The increase in short-term interest rates makes domestic assets more attractive than investments into other currencies → capital inflows and increased demand for domestic currency → appreciation of the XR
- Two important channels of the exchange rate appreciation:
 - **Direct import price channel:** the exchange rate appreciation makes foreign goods cheaper compared with domestically produced goods. Since imported goods enter directly into the consumer price index, the exchange rate appreciation leads to a fall in CPI inflation.
 - **Indirect demand channel:** due to nominal and real rigidities the nominal exchange rate appreciation leads to real XR appreciation. The change in price competitiveness results in a decline in exports and increase in imports. Lower demand for domestic goods dampens subsequently inflationary pressures.



The Expectational Channel

- The probably most important expectational channel relates to **inflationary expectations**.
- If economic agents believe that inflation will be kept low, they will - for instance in the case of a temporary shock – consider changing their pricing strategy less often than in an opposite case.
- Similarly, low inflationary expectations result in moderate wage increases.
- Other important expectational channels to mention: **expectations on financial markets** (exchange rate expectations, yield curve, etc.)
- Example: changes in the slope of the yield curve after changes in short-term interest rates



The Credit Channel

- The credit (or balance sheet) channel is actually not an alternative view to the MTM. It is a set of factors that propagate the conventional interest rate channel.
- **The credit channel:** refers to the way in which MP affects demand via banks and other credit institutions. When market rates rise, lending rates will (probably) rise too. This reduces the availability of credit for certain borrowers esp. for small and medium-size businesses. Subsequently expected profitability of firms decline → lower demand → companies' ability to service their debt decreases further.
- At the same time, banks can mitigate the effects of monetary policy by deciding not to rise their lending rates for their most trusted customers. This behavior can weaken but does not lead to a closing off of the credit channel since there are always borrowers with less established bank relationships.



Change in the Slope of the Yield Curve

