Discussion of Beck and Wieland

Money in Monetary Policy Design

by Mathias Hoffmann

2007 Konstanz Seminar in Monetary Theory and Policy

22-25 May, 2007
Very interesting paper(s)

Short and crisp

A brief discussion
One of the first serious attempts to formalize the notion of the second pillar in an otherwise standard theoretical framework.
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What’s it about / background

- One of the first serious attempts to formalize the notion of the second pillar in an otherwise standard theoretical framework
- where standard means: moneyless model of MP
- 1st paper: formalization of cross-checking

Assenmacher & Gerlach (2006 a,b, c ....z)

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Empirical motivation: renewed interest in and lots of empirical evidence for the low frequency link between money and inflation Assenmacher & Gerlach (2006 a, b, c ....z)
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Unlike in Gerlach’s 2PPC setup, here money does not enter directly into structural relations.
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Unlike in Gerlach’s 2PPC setup, here money does not enter directly into structural relations.

Apparent advantage: no worry about justifying $\Delta m$ here.
Theoretical framework again

\[ \Delta v_t = -\Delta m_t + \Delta p_t + \Delta y_t \]

with standard money demand equation

\[ m_t - p_t = \gamma_y y_t - \gamma_i i_t + \varepsilon_{t}^{md} \]

leads to

\[ \Delta p^* = \Delta m^* - \gamma_y \Delta y_t^* \]

capture lowfrequency-movement of some variable \( x \) as

\[ x_{t}^f = x_{t-1}^f + \lambda(x_{t-1} - x_{t-1}^f) \]

B&W use

\[ \mu_{t}^f = \Delta m_{t}^f - \gamma_y \Delta y_{t}^f \]
\[ \pi_t = \pi_{t+1}^e + \alpha_y (y_t - y_t^*) + \varepsilon_{\pi,t} \]

\[ y_t - y_t^* = (y_{t+1}^e - y_{t+1}^{*e}) - \beta_r (i_t - \pi_{t+1}^e - r_t^*) + \varepsilon_{y,t} \]

Expectation formation is backward looking:

\[ \pi_{t+1}^e = \pi_{t-1} \]

\[ (y_{t+1}^e - y_{t+1}^{*e}) = y_{t-1} - y_{t-1}^* \]

And CB minimizes

\[ E_t \sum_{s=t}^{\infty} \delta^{s-t} (\pi_t - \pi^*_t)^2 \]

which leads to the Taylor-rule

\[ i^{opt} = r^* + \pi_{t-1} + \frac{1}{\alpha_y \beta_r} (\pi_{t-1} - \pi^*) + \frac{1}{\beta_r} (y_{t-1} - y_{t-1}^*) \]

B&W introduce misperception through persistent bias in output gap:

\[ i^{opt} = r^* + \pi_{t-1} + \frac{1}{\alpha_y \beta_r} (\pi_{t-1} - \pi^*) + \frac{1}{\beta_r} (y_{t-1} - y_{t-1}^* - bias_{t-1}) \]
ECB-style cross-checking vs. 2PPC

2PPC:

\[ \pi_t = \alpha \mu \mu_t^f + \alpha \pi \pi_{t-1} + \alpha_y (y_t - y_t^*) + \varepsilon_{\pi,t} \]

CC:

\[ i_t^{CC} = i_t^{opt} + i_t^{MA} \]

and

\[ i_t^{MA} = \begin{cases} 
i_t^{MA} + \frac{\mu_{t-1} - \pi^*}{\alpha_y \beta_r} & \text{if } |\mu_{t-1} - \pi^*| \text{ too large for too long} \\
i_{t-1} + 0 & \text{otherwise} \end{cases} \]
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In standard, money free model money can only be made relevant if it carries additional information. But under RE both the CB AND the public should then use it.
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- In standard, money free model money can only be made relevant if it carries additional information. But under RE both the CB AND the public should then use it.
- But that means it MUST ultimately enter a structural relation.
- Under a full RE solution, the very fact that CB may do cross-checking (and be it for purely statistical reasons) in the first place may provide the theoretical underpinnings for putting $\mu$ into a structural relation!
baseline model with bias:
\( \sigma(\Delta p) = 1.1, \ \Delta p = 3.1 \)

2PPC model with bias:
\( \sigma(\Delta p) = 1.4, \ \Delta p = 3.2 \)
baseline model with bias and CC:  
\[ \sigma(\Delta p) = 1.3, \quad \overline{\Delta p} = 2.09 \]

2PPC model with bias and CC:  
\[ \sigma(\Delta p) = 1.4, \quad \overline{\Delta p} = 2.09 \]

Under Cross-checking, the no-money and the 2PPC model are indistinguishable!
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Is cross-checking done because we are uncertain about inputs into model or about the model itself?