Comments on “Structural and Cyclical Movements of the Current Account in the U.S.: 1976-2007” by Yoichi Matsubayashi

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This paper

- Analyzes the U.S. CA using Matsubayashi's (2006) method without any modification.
  - Derives the IS balance with a general equilibrium model.
  - Estimates the IS equations.
  - Predicts the U.S. CA.
- Investigates the relationship between the REER and the CA.
  - Regresses the predicted/unpredicted CA on REER.
  - Regresses the REER on the predicted CA.

Intertemporal Approach to Current Account

Budget constraint: $C_t + B_{t+1} + I_t + G_t = Y_t + (1+r)B_t$

$$(1+r)B_t = C_t + I_t + G_t - Y_t + B_{t+1}$$

Intertemporal budget constraint:

$$(1+r)B_t = \sum_{s=t}^{\infty}\left(\frac{1}{1+r}\right)^{s-t}(C_s + I_s + G_s - Y_s) + \lim_{s\to\infty}\left(\frac{1}{1+r}\right)^{s-t} B_{s+1}$$

Assumptions:

$$\lim_{T\to\infty}\left(\frac{1}{1+r}\right)^{T} B_{t+T+1} = 0$$

$$\beta = 1/(1+r)$$

Intertemporal Approach to Current Account (cont.)

From the assumptions,

$$C_s = \frac{r}{1+r}\sum_{s=t}^{\infty}\left(\frac{1}{1+r}\right)^{s-t}(Y_s - I_s - G_s) + rB_t$$

Now, we define $\tilde{X}_t = [r/(1+r)]\sum[1/(1+r)]^{s-t} X_s$

$$C_t = \tilde{Y}_t - \tilde{I}_t - \tilde{G}_t + rB_t$$

Using this equation, we rewrite CA as

$$CA_t = Y_t - C_t - I_t - G_t + rB_t$$

$$= (Y_t - \tilde{Y}_t) - (I_t - \tilde{I}_t) - (G_t - \tilde{G}_t)$$

Present Value Model (PVM)

Define net output as $Z_t = Y_t - I_t - G_t$.

$$CA_t = -\sum_{s=t+1}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} E_t(\Delta Z_s)$$

If we set $\mathbf{y}_t = [\Delta Z_t, CA_t]'$ to estimate the expected value of Z, we have $\mathbf{y}_t = \mathbf{\Psi}\mathbf{y}_{t-1} + \mathbf{u}_t$ and $E_t(\mathbf{y}_s) = \mathbf{\Psi}^{s-t}\mathbf{y}_t$.

This leads to

$$\text{Predicted } CA_t = -[1 \quad 0]\left(\frac{1}{1+r}\hat{\mathbf{\Psi}}\right)\left(\mathbf{I} - \frac{1}{1+r}\hat{\mathbf{\Psi}}\right)^{-1}\begin{bmatrix}\Delta Z_t \\ CA_t\end{bmatrix}$$

$$\equiv [\hat{\phi}_{\Delta Z} \quad \hat{\phi}_{CA}]\begin{bmatrix}\Delta Z_t \\ CA_t\end{bmatrix}$$

Simple Version of Matsubayashi's (2006) Method

Budget constraint: $S_t = Y_t + rB_t - C_t$

$$= Y_t + rB_t - (\tilde{Y}_t - \tilde{I}_t - \tilde{G}_t + rB_t)$$

$$\frac{S_t}{Y_t} = 1 + \frac{rB_t}{Y_t} - \frac{\tilde{Y}_t - \tilde{I}_t - \tilde{G}_t + rB_t}{S_t}$$

Now, we return $\tilde{X}_t = [r/(1+r)]\sum[1/(1+r)]^{s-t} X_s$ into this eq.

$$\frac{S_t}{Y_t} = 1 + \frac{rB_t}{Y_t}$$

$$- (1-\beta)\frac{(1+r)B_t + \sum[1/(1+r)]^{s-t} E_t(\tilde{Y}_s - \tilde{I}_s - \tilde{G}_s)}{Y_t}$$

Matsubayashi's (2006) Method (cont., 2)

- Estimation model:

$$\frac{S_t}{Y_t} = \alpha_0 + \frac{rB_t}{Y_t} + \alpha_1 \left(\frac{\text{Permanent } Y_t}{Y_t} \right)$$

- Method: Nonlinear Least Squares estimator

$$\min_{\alpha_0, \alpha_1} \sum \left[\frac{S_t}{Y_t} - \alpha_0 - \frac{rB_t}{Y_t} - \alpha_1 \left(\frac{\text{Permanent } Y_t}{Y_t} \right) \right]^2$$

Matsubayashi's (2006) Method (cont., 3)

Substituting S into CA, we have

$$\text{Structural}\ \frac{CA_t}{Y_t} = \frac{\hat{S}_t}{Y_t} - \frac{\hat{I}_t}{Y_t}$$

However, this turns out to be

$$\frac{CA_t}{Y_t} = 1 + \frac{rB_t}{Y_t} - \frac{\tilde{Y}_t - \tilde{I}_t - \tilde{G}_t + rB_t}{Y_t} - I$$

$$= \frac{(\tilde{Y}_t - Y_t) - (I_t - \tilde{I}_t) - (G - \tilde{G}_t)}{Y_t}$$

Therefore, <u>this method is the same as the earlier one!</u>

PVM and Matsubayashi's (2006) method

- Estimation of the expectation of $Z = Y - I - G$
  - VAR: Sheffrin and Woo (1990), Otto (1992), etc.
  - Matsubayashi (2006): Nonlinear (equation-by-equation) structural estimation!
  - SVAR: Nason and Rogers (2002), Kano (2008)
- Matsubayashi's (2006) mothod is a version of PVM!

Matsubayashi's (2006) Model

- Simple Neoclassical Model:
  - Small open economy
  - World interest rate
  - Flexible prices and wages
  - Households/Firms/Government
  - Exogenous labor
  - Investment cost

Comment 1: Model

- Small open economy?
  - Is the U.S. economy “small”?
- Income tax (τ_h) + corporate tax (τ_F) = government tax revenue (T)?
  - These still remain in the structural CA equation.
- The world interest rate (r) is time-invariant?
  - So, $\beta = 1/(1 + r)$? What about the data?

Comment 2: Endogeneity

- Variables in the theoretical model
  - Endogenous: Consumption, bonds, equity, etc.
  - Exogenous: Labor, world interest rate, wage, etc.
- Variables in the estimation model
  - Endogenous: Savings and Investments.
  - Exogenous: All the other variables!
- The GMM should be used, but not equation-by equation NLS.

Comment 3: Specification

- Misspecification?
  - The estimated models are structural.
  - Specification tests should be conducted.
- “Non-structural/cyclical” CA?
  - What does “cyclical” mean?
  - If misspecificated, it’s just an error?

Comment 4: Omitted variables?

- The estimations consist of structural *and non-structural* variables!
  - Is the predicted CA really “structural”?
- This paper also regresses the predicted CA on the REER.
  - Why is the exchange rate included in the structural model?
  - Omitted variable?

Comment 5: Present Value

- This paper estimates the present value of (after-tax) wage income (from time *t* to infinity!).
  - No data appendix! How is it estimated?
  - What about the future sequences?
  - Is the world interest rate constant?