Very Persistent Current Accounts July 2009

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Quick Background

National Saving

= Current account

= (Private Saving – Investment)

+ (Tax Revenue – Government Purchases)

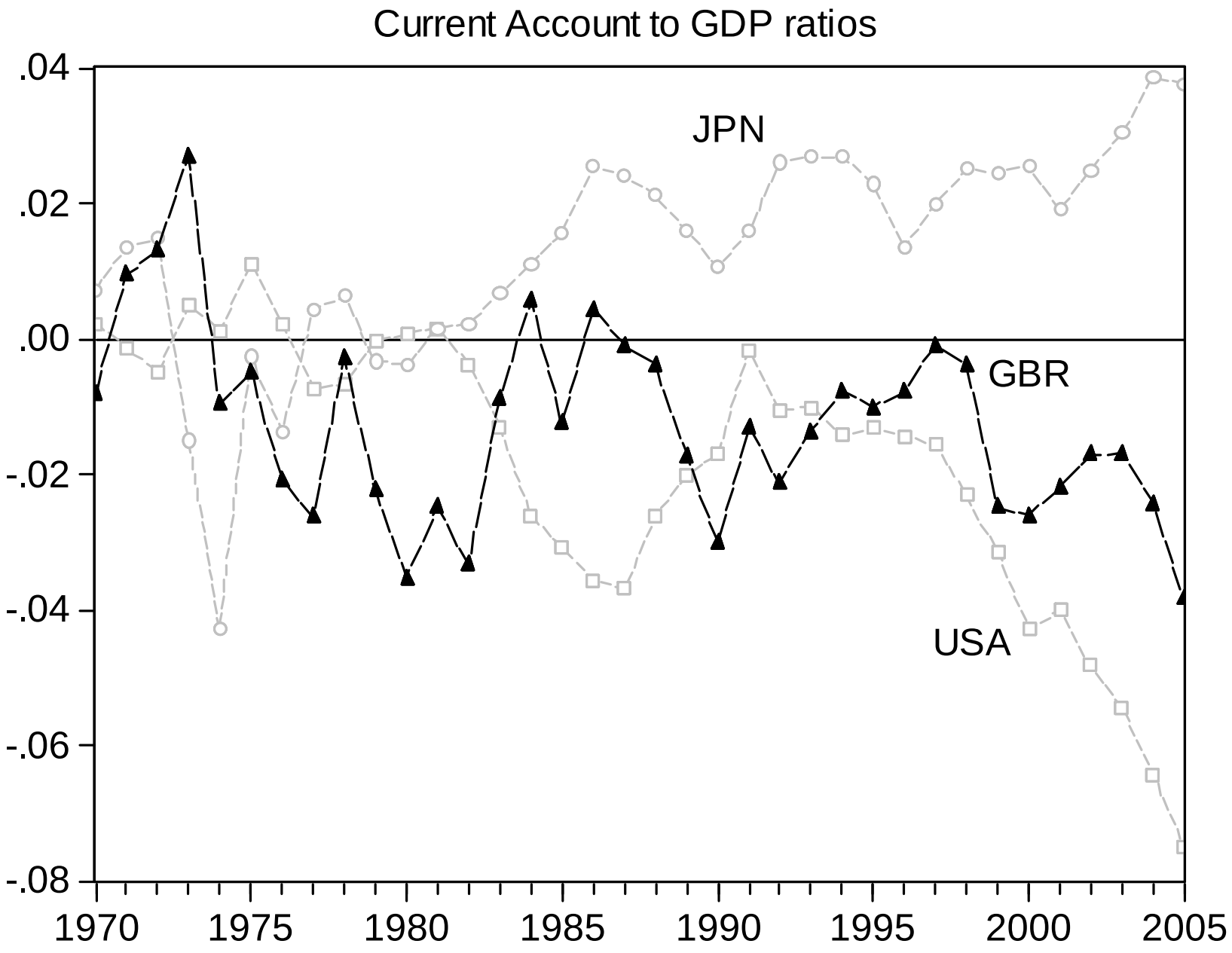
Saving = Income – Consumption

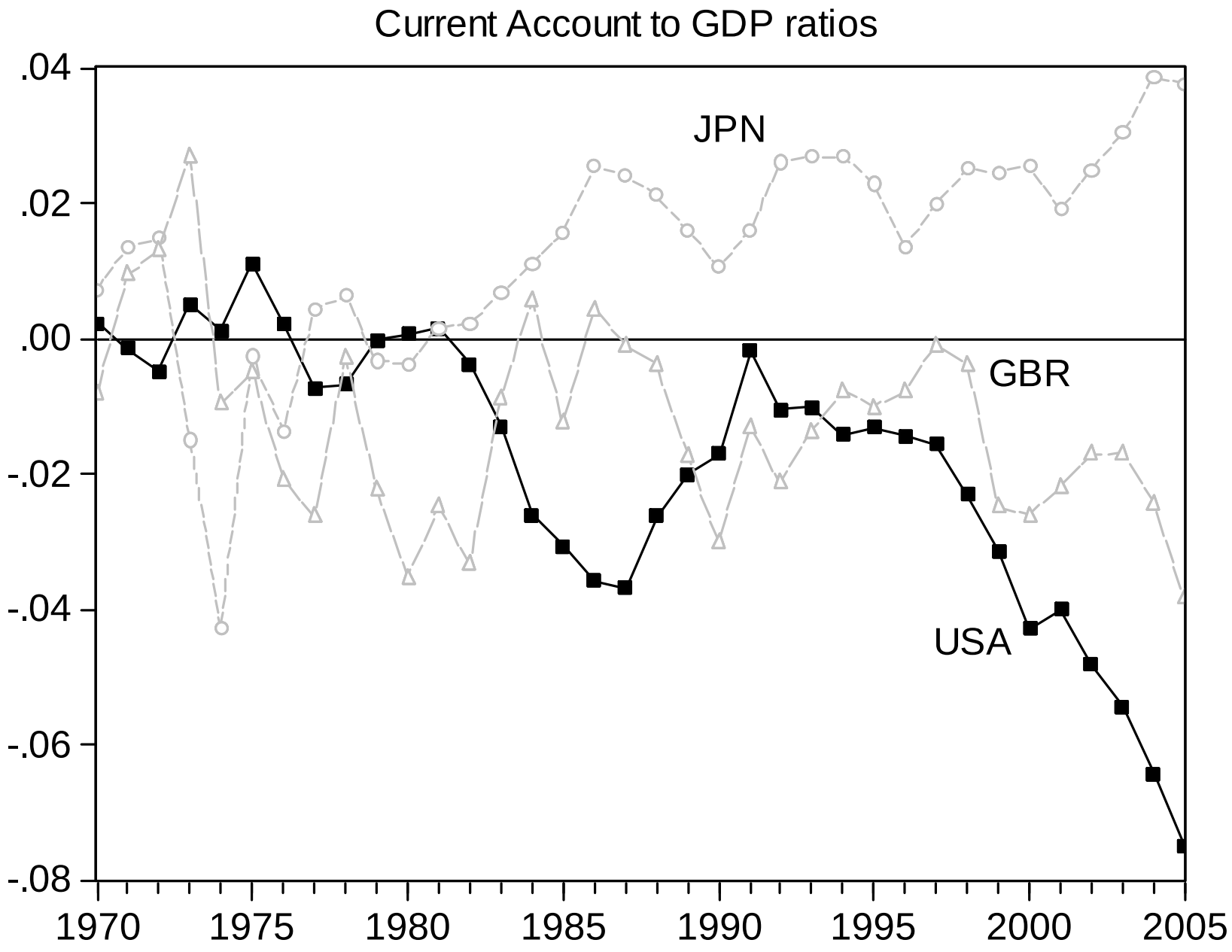
Quick Background

- Standard theory predicts smooth consumption, proportional to permanent income.
- Current account should be a consumption smoothing device.

Motivation of the problem

- While some current accounts (e.g., the UK’s) look like consumption smoothing devices, this is not the case with the US (or Japan)


Current Account to GDP ratios
.04
.02
.00
-.02
-.04
-.06
-.08
1970
1975
1980
1985
1990
1995
2000
2005
JPN
GBR
USA


Current Account to GDP ratios
.04
.02
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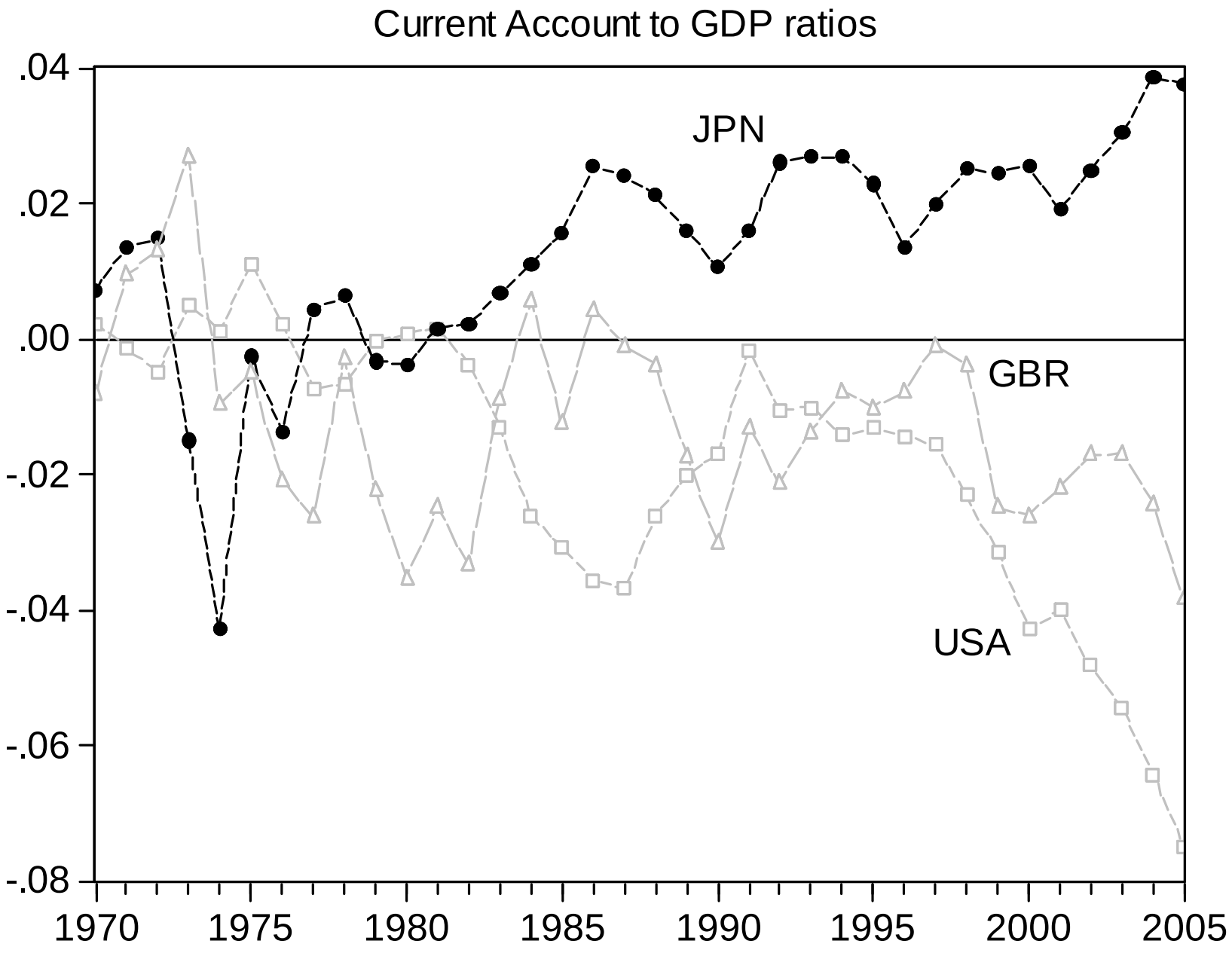
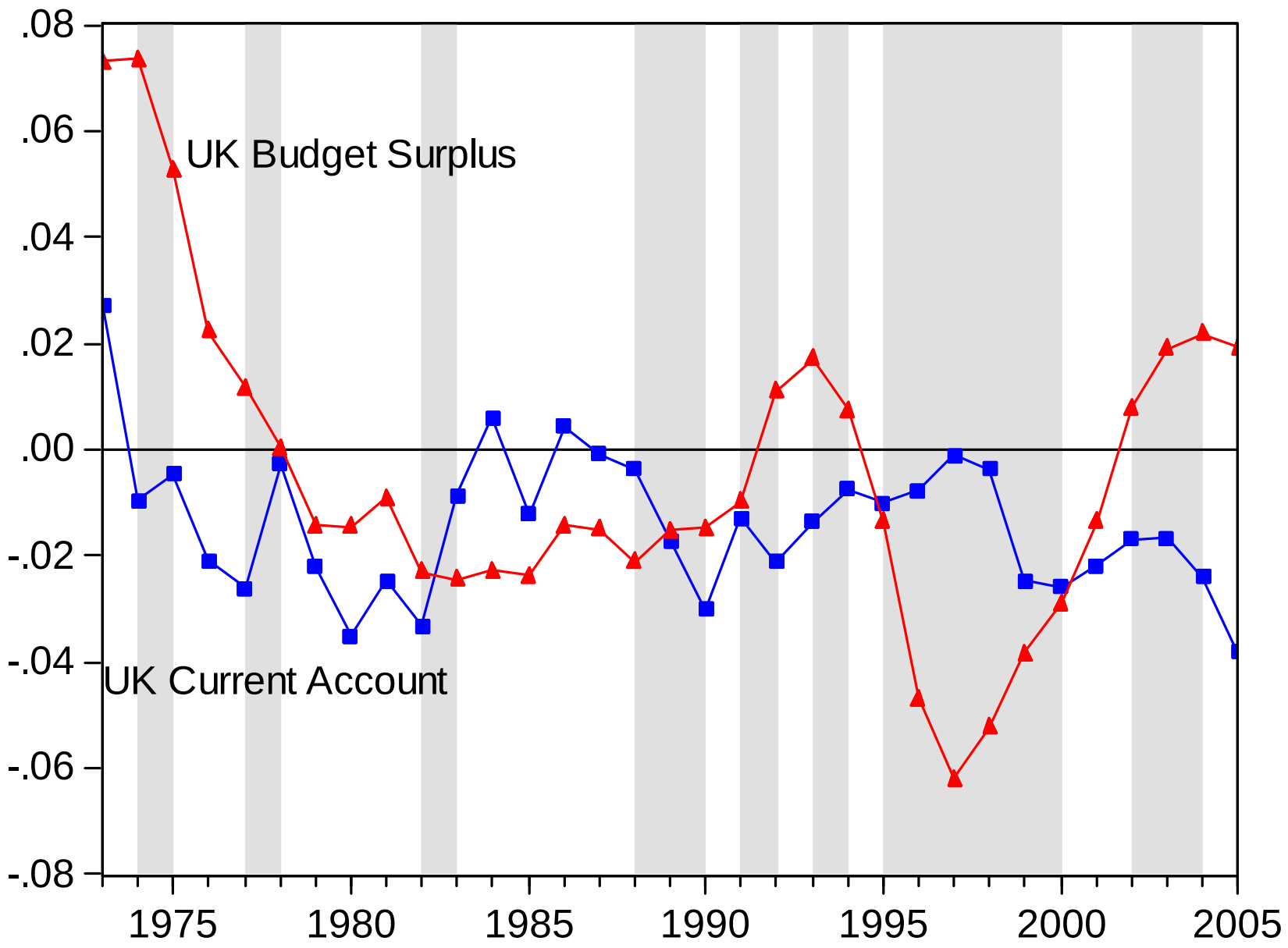
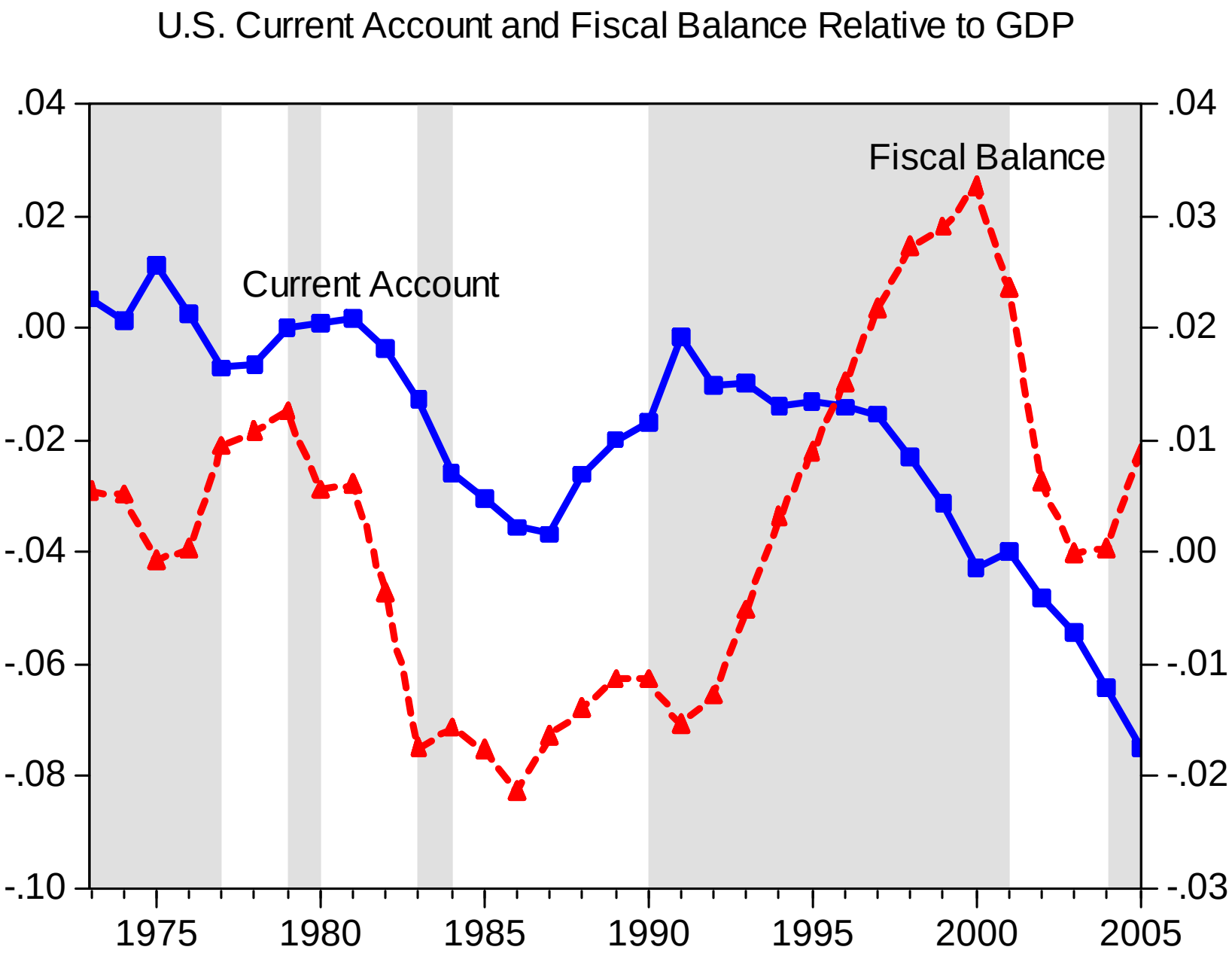
-.04
-.06
-.08
1970
1975
1980
1985
1990
1995
2000
2005
JPN
GBR
USA

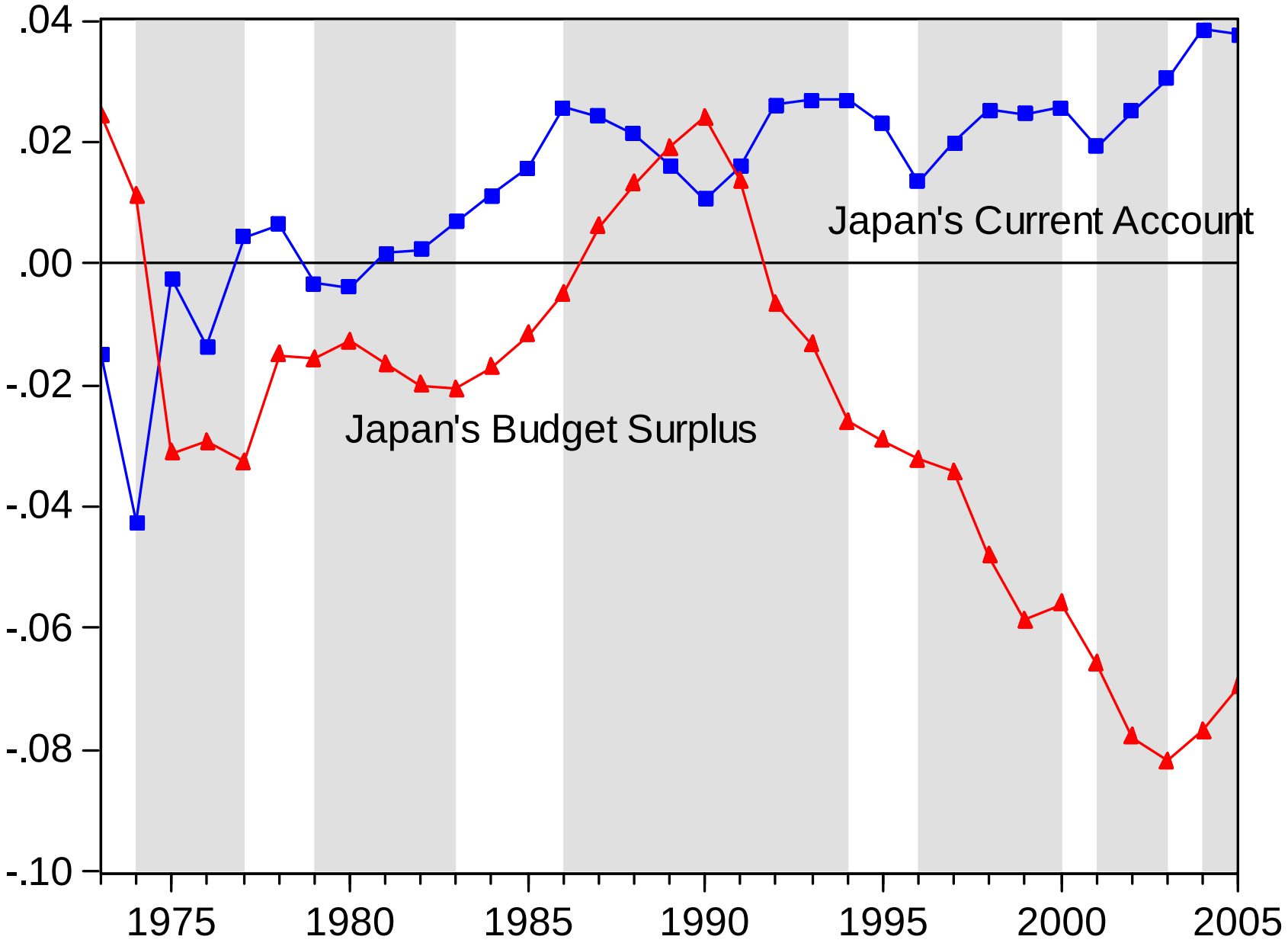

Current Account to GDP ratios
.04
.02
.00
-.02
-.04
-.06
-.08
1970
1975
1980
1985
1990
1995
2000
2005
JPN
GBR
USA

Rule out the twin deficits hypothesis

- Corsetti and Muller (2006)
- Bussiere et al. (2005)
- Gruber and Kamin (2005)
- Bems et al. (2008)

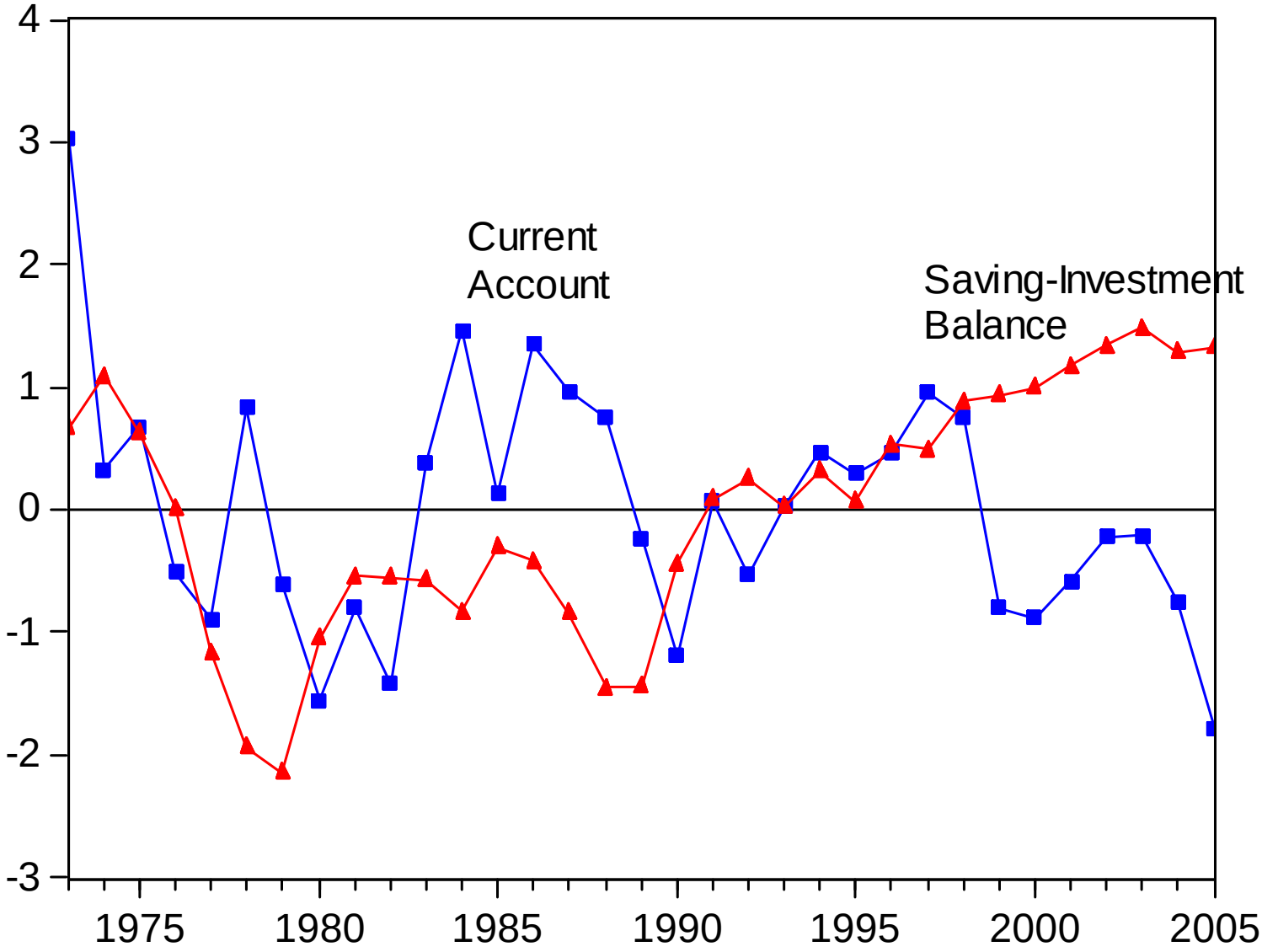

.08
.06
.04
.02
.00
-.02
-.04
-.06
-.08
UK Budget Surplus
UK Current Account
1975
1980
1985
1990
1995
2000
2005


U.S. Current Account and Fiscal Balance Relative to GDP
Current Account
Fiscal Balance
.04
.02
.00
-.02
-.04
-.06
-.08
-.10
.04
.03
.02
.01
.00
-.01
-.02
-.03
1975
1980
1985
1990
1995
2000
2005

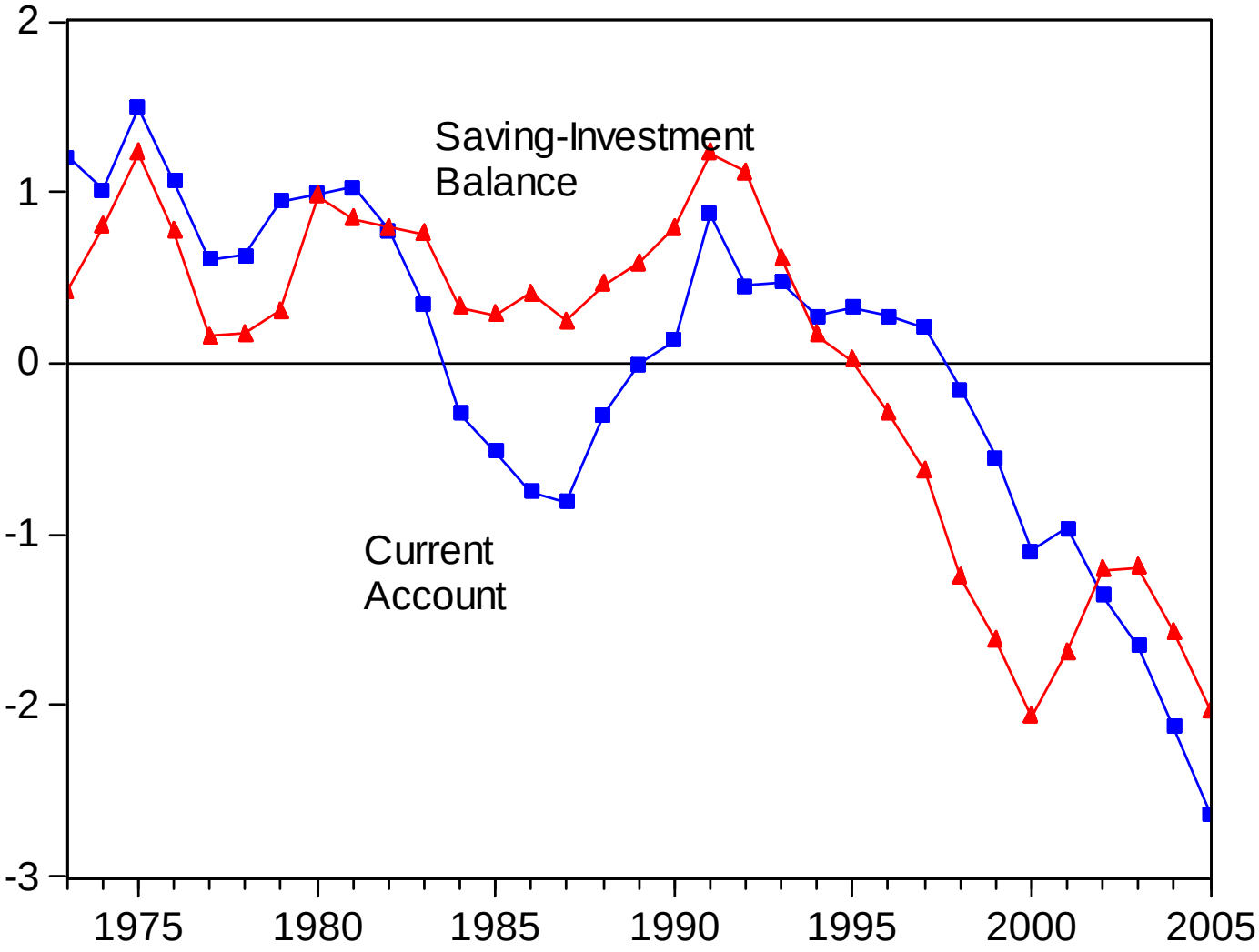

.04
.02
.00
-.02
-.04
-.06
-.08
-.10
1975
1980
1985
1990
1995
2000
2005
Japan's Current Account
Japan's Budget Surplus

This leaves only saving and investment

UK


4
3
2
1
0
-1
-2
-3
1975
1980
1985
1990
1995
2000
2005
Current
Account
Saving-Investment
Balance

USA


2
1
0
-1
-2
-3
1975
1980
1985
1990
1995
2000
2005
Saving-Investment
Balance
Current
Account

Japan

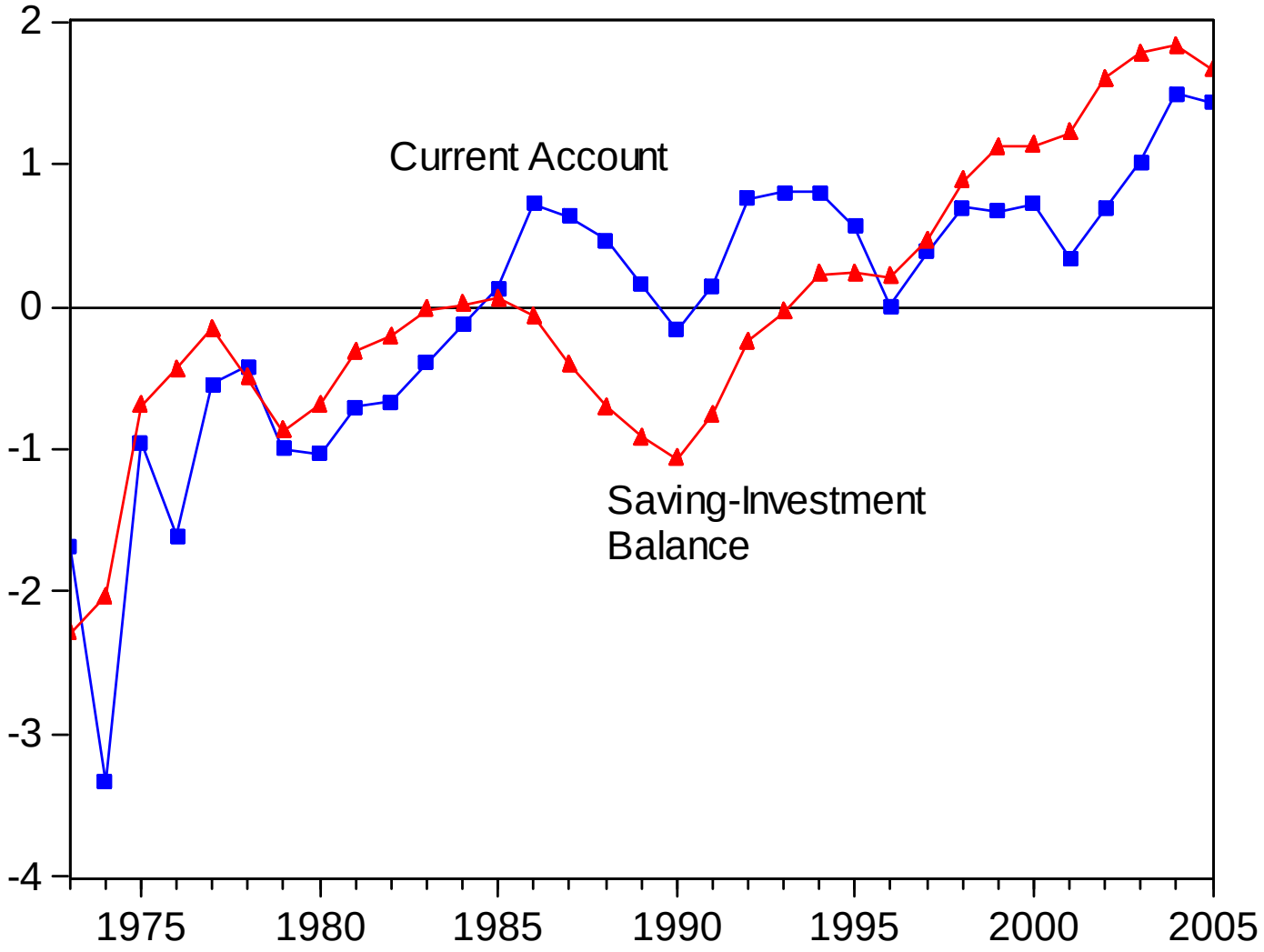

2
1
0
-1
-2
-3
-4
1975
1980
1985
1990
1995
2000
2005
Current Account
Saving-Investment
Balance

Table 1: Determinants of the current account deficit

$$ca = a_0 + a_1 t + b_1 \tilde{y} + b_2 \tilde{c} + b_3 \tilde{x} + b_4 \tilde{g} + \text{error}$$

	No trend					With trend			
a_0	**-15.77**	**-8.857**	**-8.034**	4.789	**-8.887**	**-15.34**	**-11.16**	**-5.162**	-5.003
a_1						-0.005	0.045	**-0.064**	**-0.182**
$\tilde{y}$	**-28.02**					**-27.30**			
$\tilde{c}$		**-20.74**			**-20.17**		**-25.65**		
$\tilde{x}$			**-7.110**		-0.253			**-4.872**	
$\tilde{g}$				11.367					-10.03
$\bar{R}^2$	0.749	0.799	0.609	0.118	0.791	0.740	0.805	0.658	0.561

Note: Bold face indicates significance at the 5 percent level

Role of saving

H. Choi et al. / Journal of International Economics 75 (2008) 30–53

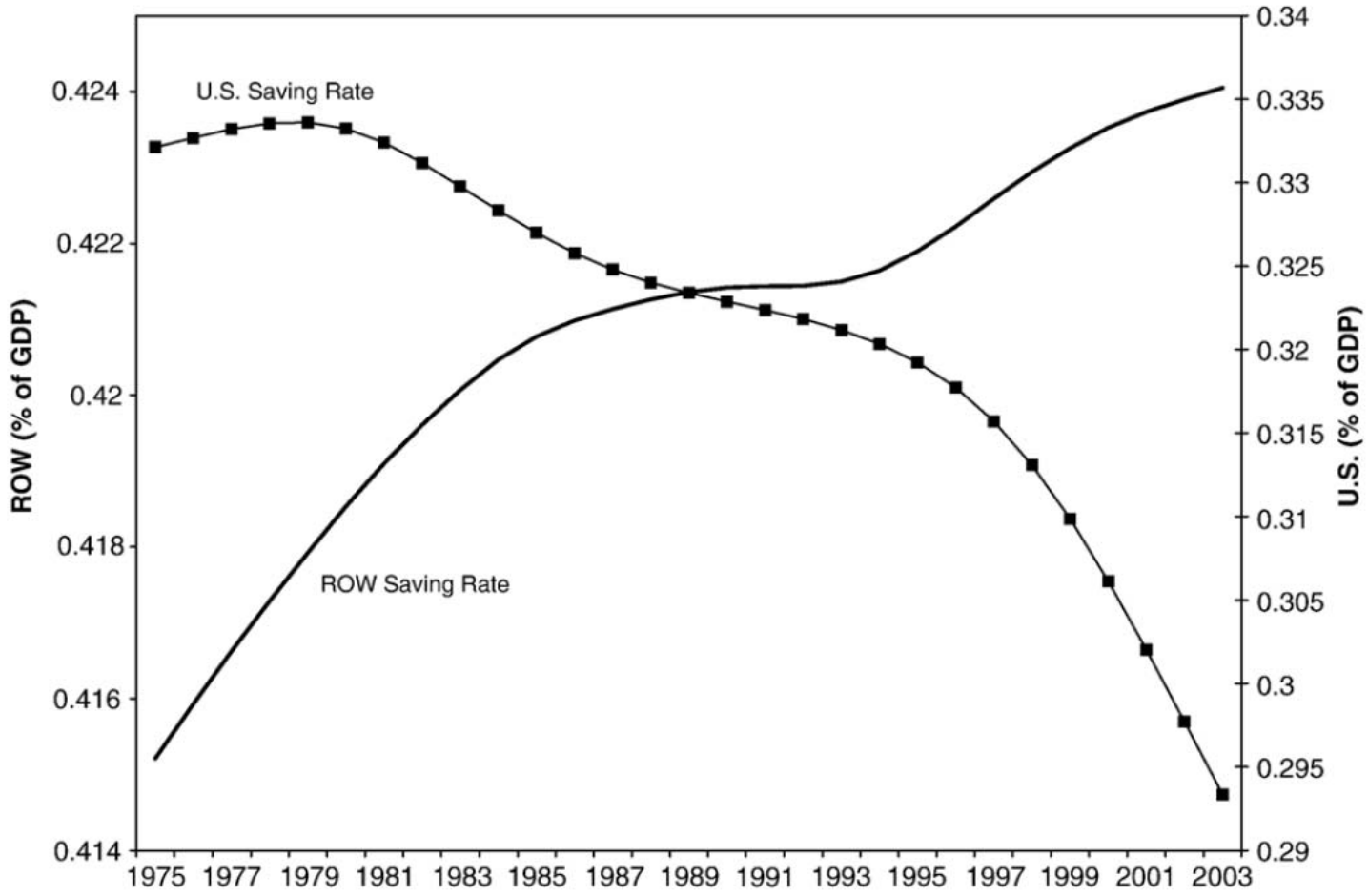


Fig. 2. Saving rate trends.

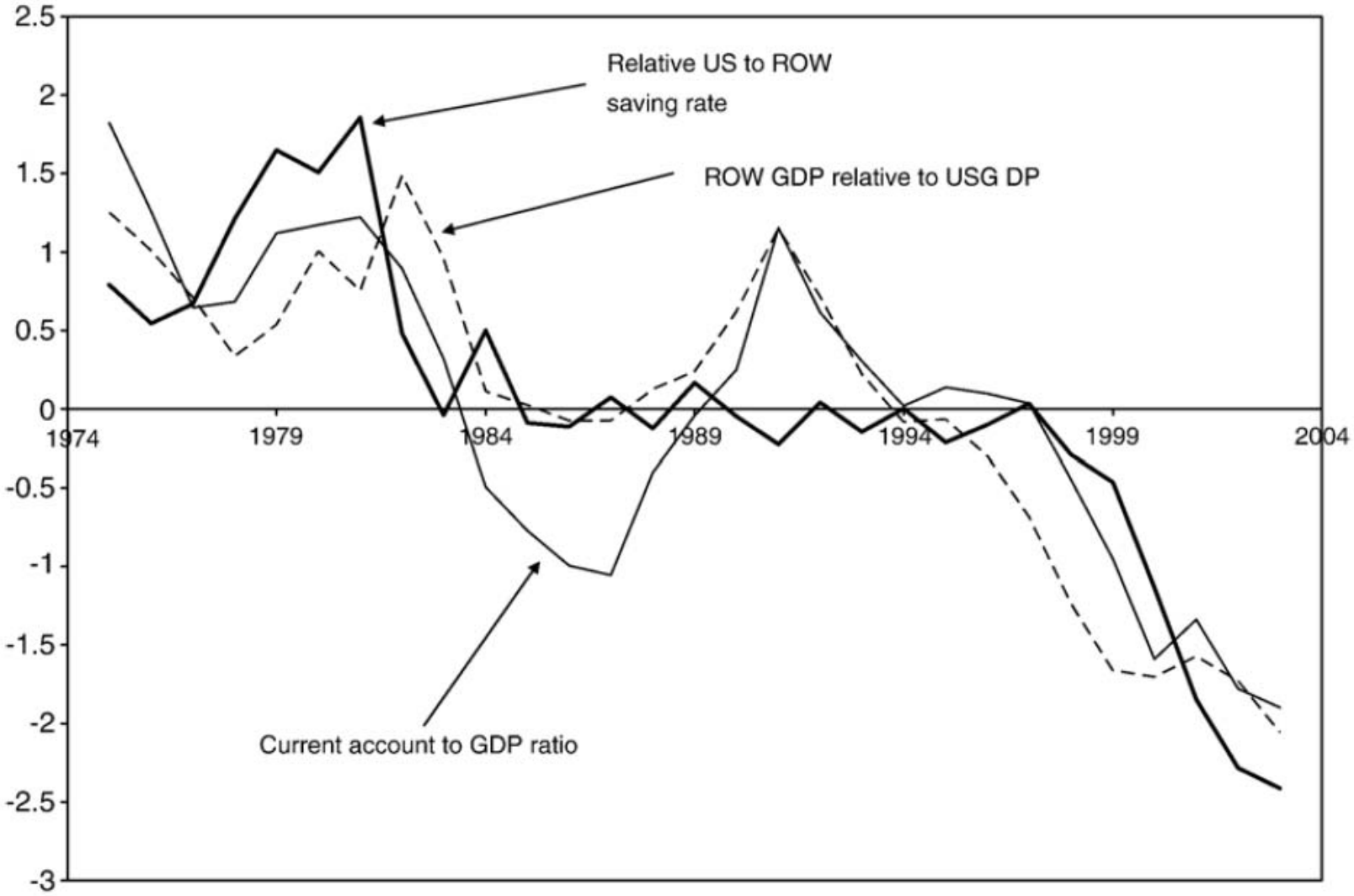


Fig. 3. Standardized current account to GDP ratio, relative household saving rates and income shares.

The problem

- How to get Americans to be endogenously impatient and the ROW (or Japanese) to be endogenously patient so that trending current account to GDP ratios are the outcome of optimal consumption/saving decisions.

The model

- Two countries, one good.
- Production with labor and capital.
- Single non state-contingent reval bond in zero net supply.
- Wasteful government spending.
- EDF (endogenous subjective discount factors)

Household's EDF Preferences

$$E_0 \sum_{t=0}^{\infty} \theta_{j,t-1} N_{j,t} u\left(c_{j,t}, (1-\ell_{j,t})\right),$$

$$u\left(c_{j,t}, (1-\ell_{j,t})\right) = \frac{\left(c_{j,t}\left(1-\ell_{j,t}\right)^{\mu}\right)^{1-\gamma}}{1-\gamma},$$

$$\theta_{j,t} = \theta_{j,t-1}\beta_{j,t} = \theta_{j,-1}\prod_{i=0}^{t}\beta_{j,t-i}, \qquad \psi \in [0, \bar{\psi}),\ \bar{\psi} < \infty$$

$$\eta \in [0,1)$$

$$\beta_{j,t} = \beta_{j,t-1}^{\eta}\left[\beta\left(\frac{\overline{c}_{j,t}}{\overline{c}_{j,t}^{*}}\right)^{-\psi}\right]^{1-\eta}.$$

In equilibrium

$$\sum_{j=1}^{2} N_{j,t} b_{j,t} = 0$$

The EDF

- High (low) societal consumption makes you impatient (patient).
- Societal consumption is external to the household.
- EDF's assumed by Obstfeld (1982), Mendoza (1991), Schmidt-Grohe and Uribe (2003), Kim and Kose (2003), Choi et al. (2008)
- Similar to Uzawa (1978) utility.
- Households look like "buffer-stock" savers in the sense of Carroll (1997)
- Consistent with micro-data empirical studies of Juster et al. (2005) and Berben et al. (2008) where an increase in wealth reduces saving.

The EDF

- Ernst Fehr and Klaus M. Schmidt, A Theory of Fairness, Competition, and Cooperation, QJE, 1999, 114, pp 817-868.
  - Some fraction of people care about fairness. Inequity aversion, to explain why firms may not cut wages in a downturn, why when theory predicts pure self interest people actually cooperate in experiments.
  - Fairness means self-centered inequity aversion.
    - People don’t care about inequity among other people, only for themselves.
    - People are willing to give up something in order to have a more equitable outcome.

The EDF

- How do individuals judge fairness?
  - Compare to a neutral reference outcome which itself is the product of a social comparison process.
    - Relative payoffs affect people's utility and behavior.
    - Comparison income has a large and significantly negative impact on job satisfaction (public salaries at state universities).
- How does this relate to EDF?
  - Steady state is reference outcome. Observe that societal consumption exceeds steady state. You feel that you are left behind. Become impatient and spend.

Other stories about saving

- Demographic changes
- Capital market imperfections create motive for precautionary savings

Firms

$$\max E_0 \sum_{t=0}^{\infty} Q_{j,t} \left(y_{j,t} - w_{j,t} \ell_{j,t} - i_{j,t} \right),$$

$$y_{j,t} = A_{j,t} \left(k_{j,t} \right)^{\alpha} \left(x_{j,t} \ell_{j,t} \right)^{1-\alpha}$$

$$k_{j,t+1} = i_{j,t} + (1-\delta) k_{j,t} - \frac{\xi_K}{2} \left[\frac{i_{j,t}}{k_{j,t}} - (\lambda_Y - 1 + \delta) \right]^2 k_{j,t}$$

Government

$$N_{jt}g_{j,t} = N_{j,t}\tau_{j,t}$$

External Balances

$$tby_t = \frac{y_{1,t} - c_{1,t} - i_{1,t} - g_{1,t}}{y_{1,t}},$$

$$cay_t = tby_t + \frac{(1 - v_t)\, b_{1,t-1}}{y_{1,t}}.$$

(Long-run) Parameter assignments, very conventional

Table 1. Common parameter value settings	
β	0.96
γ	2.0
α	0.34
δ	0.10
ξ_K	0.50

(Short-run) Parameter assignments are estimated values

Table 2: Parameter values for the US–ROW model

	Parameter	Estimate	s.e.	Error variances and covariances	
Technology	ρ_1	0.809	0.094	σ_{11}	$(0.0137)^2$
	ρ_2	0.959	0.075	σ_{22}	$(0.0179)^2$
				σ_{12}	4.8×10^{-5}
Government	ρ_3	0.926	0.037	ω_{11}	$(0.0134)^2$
	ρ_4	0.954	0.049	ω_{22}	$(0.0178)^2$
				ω_{12}	4.7×10^{-5}
		Posterior Mean	Confidence Interval (90%)		
Discount	η	0.977	0.976	0.977	
factor	ψ	0.245	0.242	0.227	

Properties of the model

(+) US technology shock

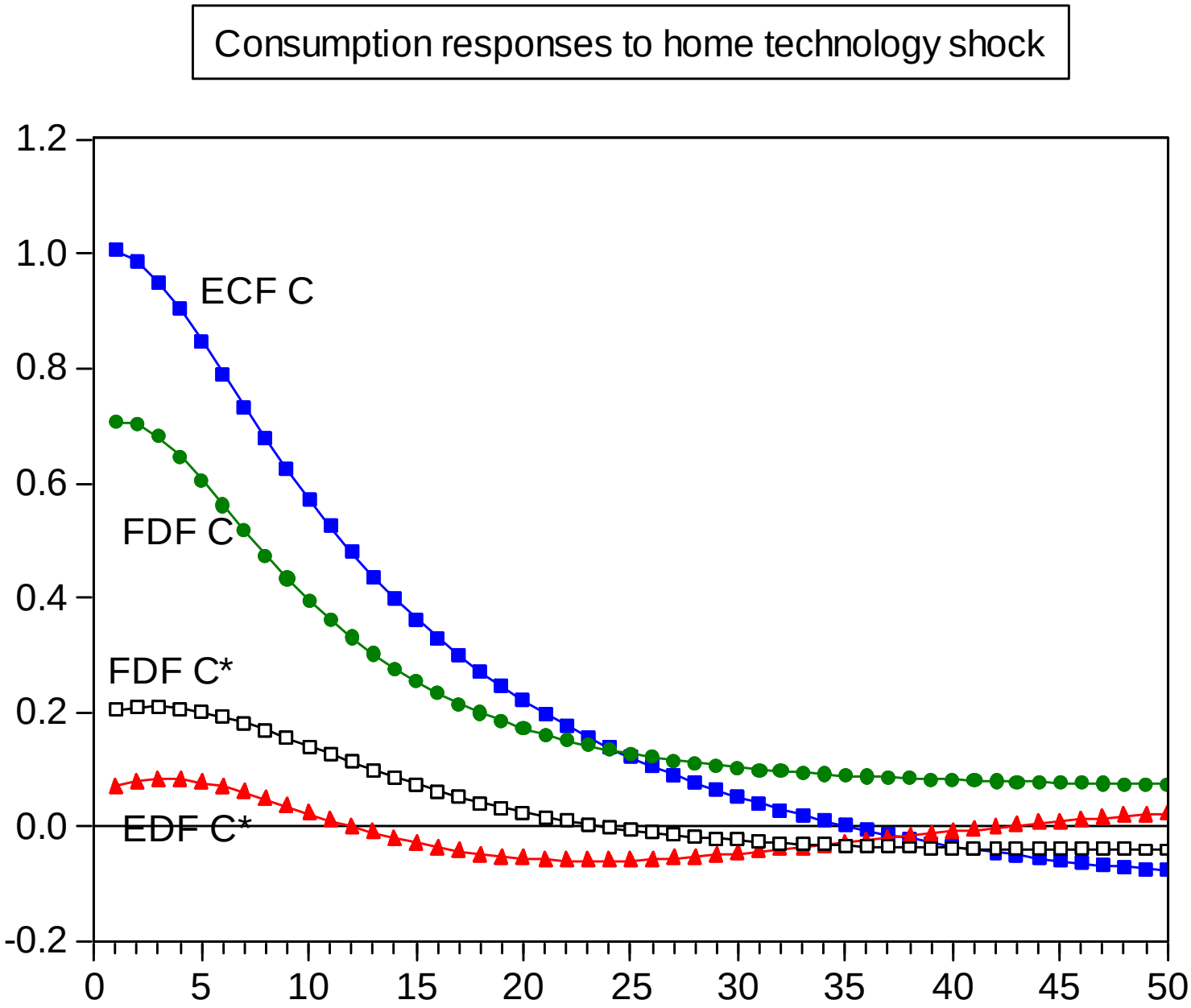
1. In the US:

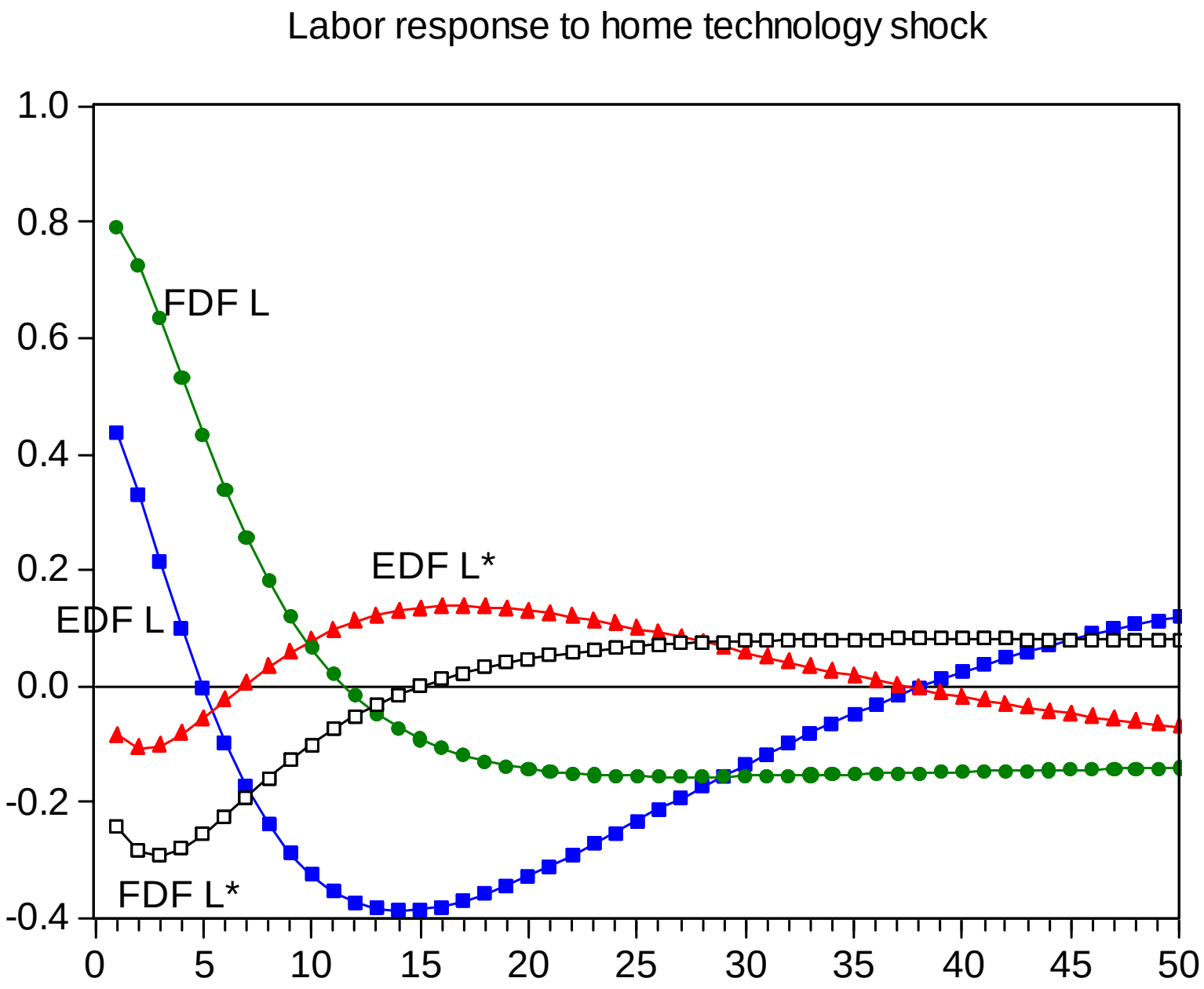
- (+) GDP, MPK, I, r, C, MPL, and L
- EDF C response bigger than FDF response. This attenuates the increase in L.

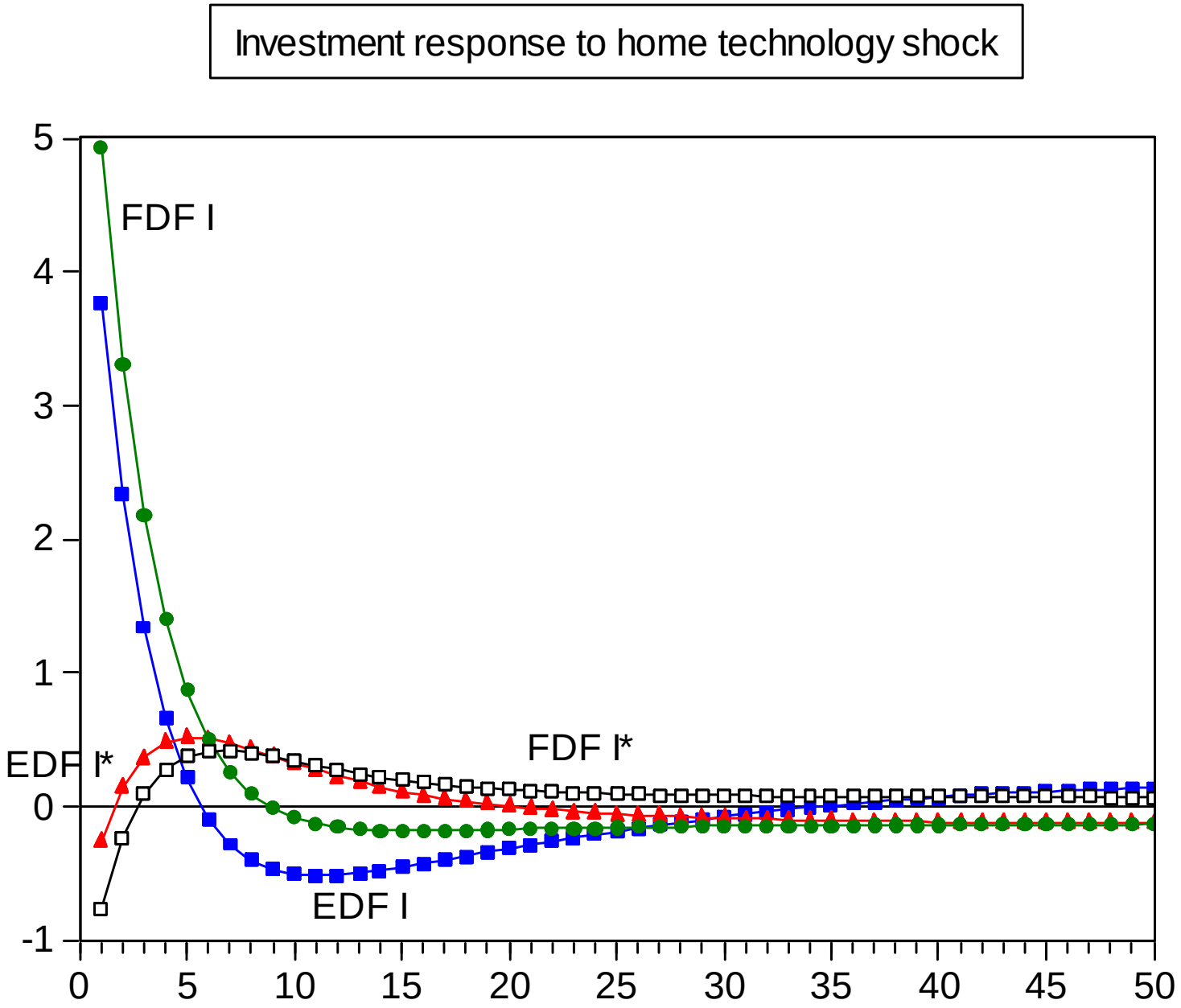
2. In ROW

- (+) C via borrowing. Higher C, lower L, lower MPK, lower I

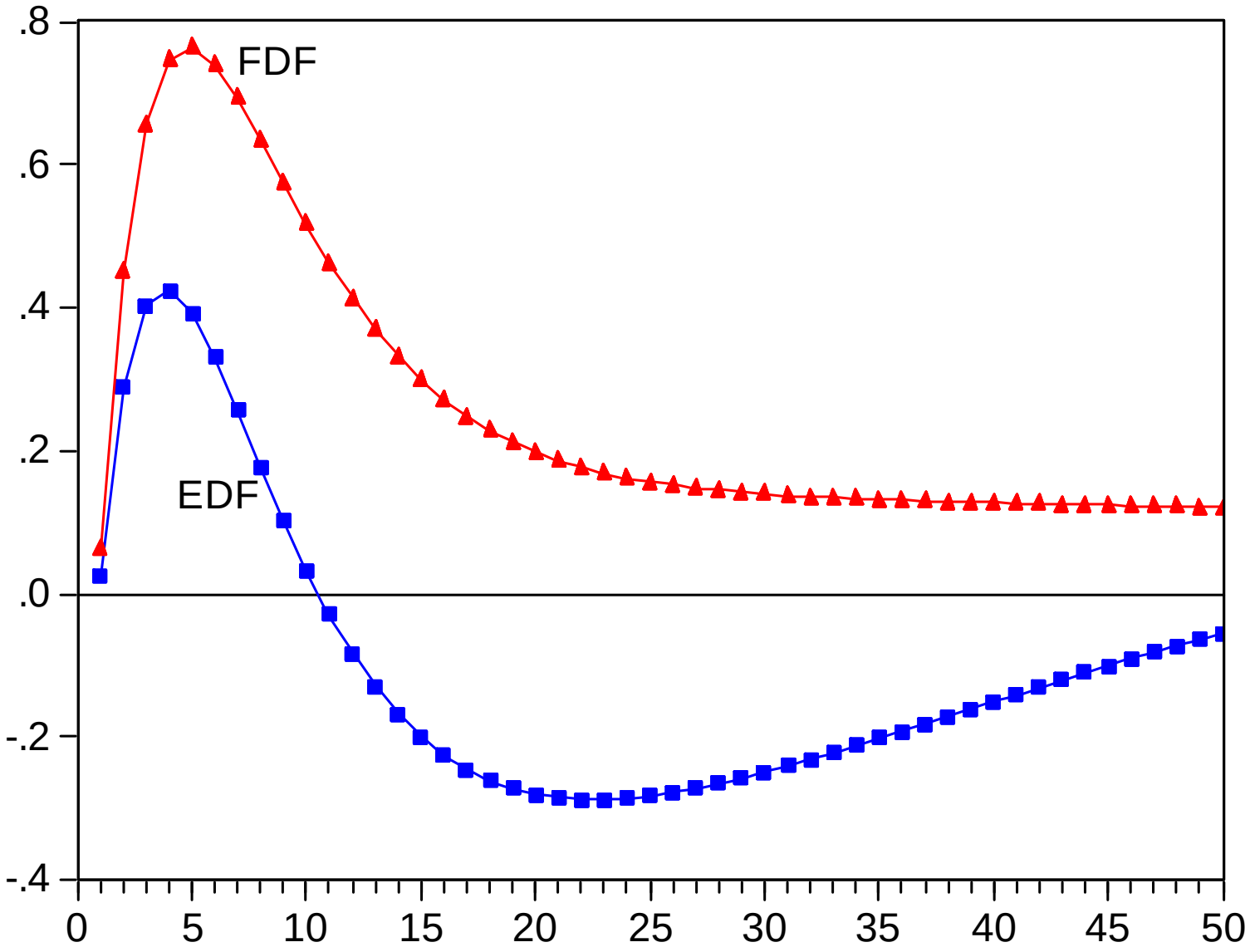
3. EDF attenuates current account surplus
   - Large values of ψ can make CA decline on impact.
   - US impatience increases and lending declines. CA goes into deficit


Consumption responses to home technology shock
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
0
5
10
15
20
25
30
35
40
45
50
ECF C
FDF C
FDF C*
EDF C*


Labor response to home technology shock
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
0
5
10
15
20
25
30
35
40
45
50
FDF L
EDF L*
EDF L
FDF L*

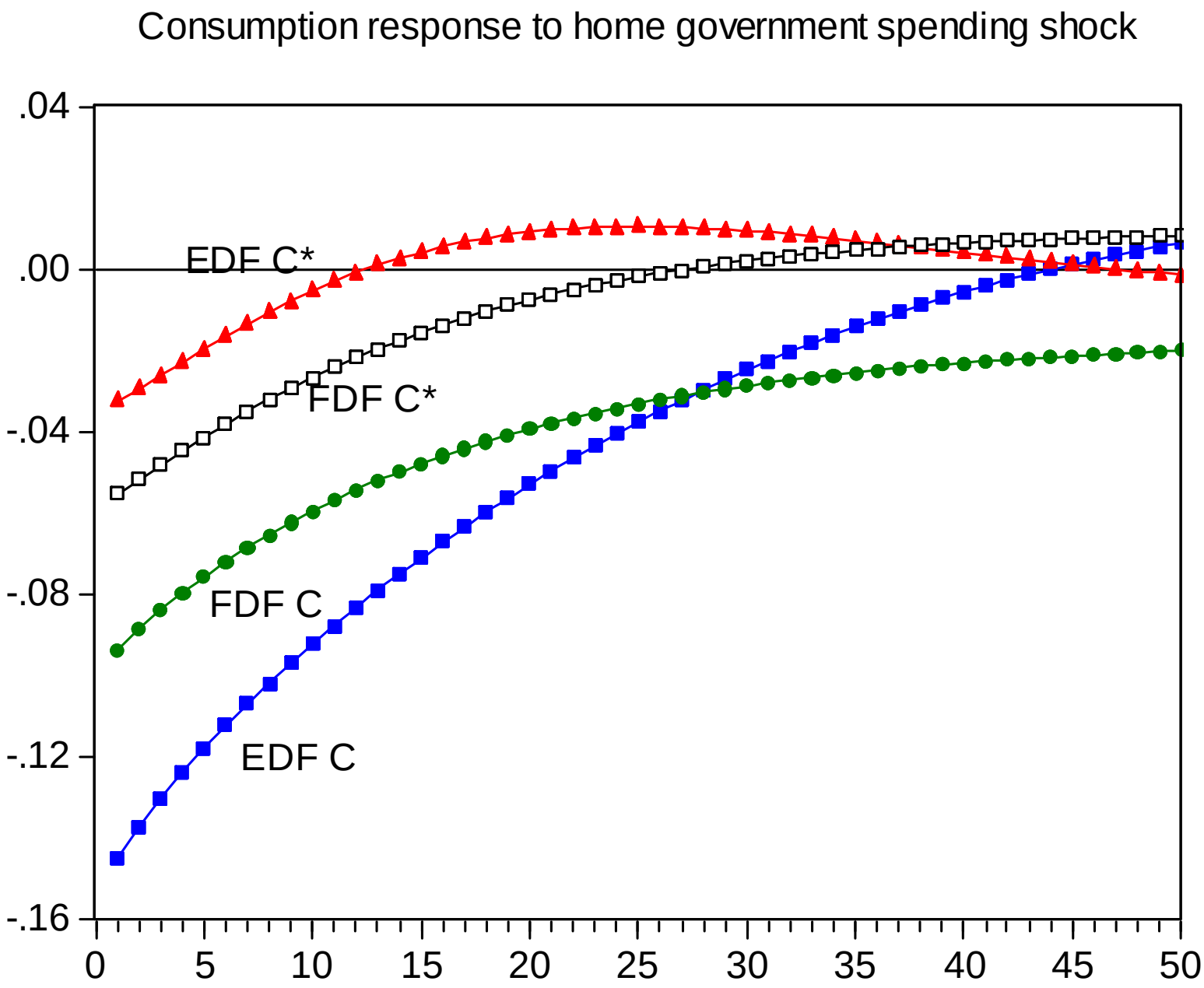

Investment response to home technology shock
FDF I
FDF I*
EDF I*
EDF I
5
4
3
2
1
0
-1
0
5
10
15
20
25
30
35
40
45
50

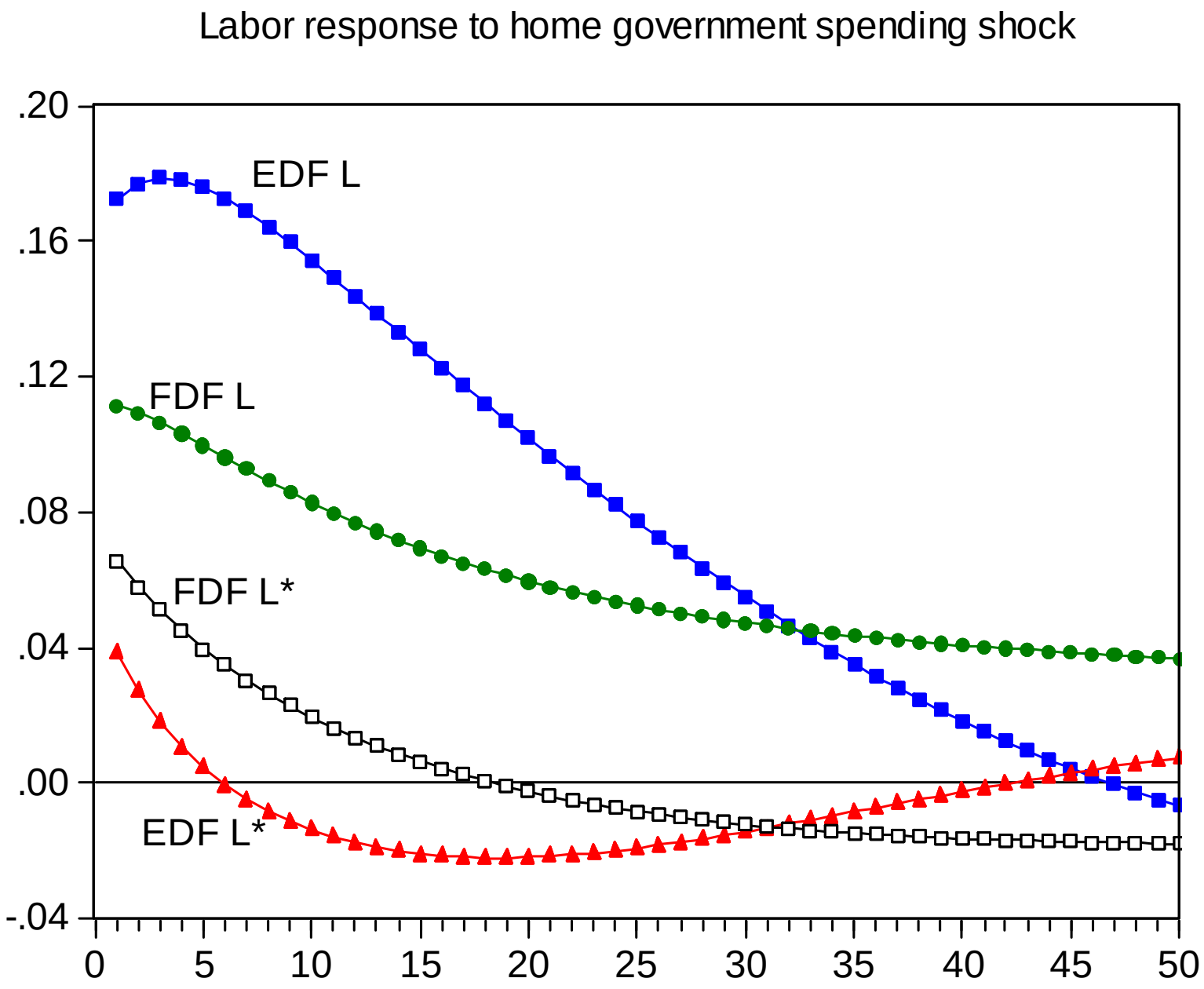
Current account to GDP ratio response to home technology shock

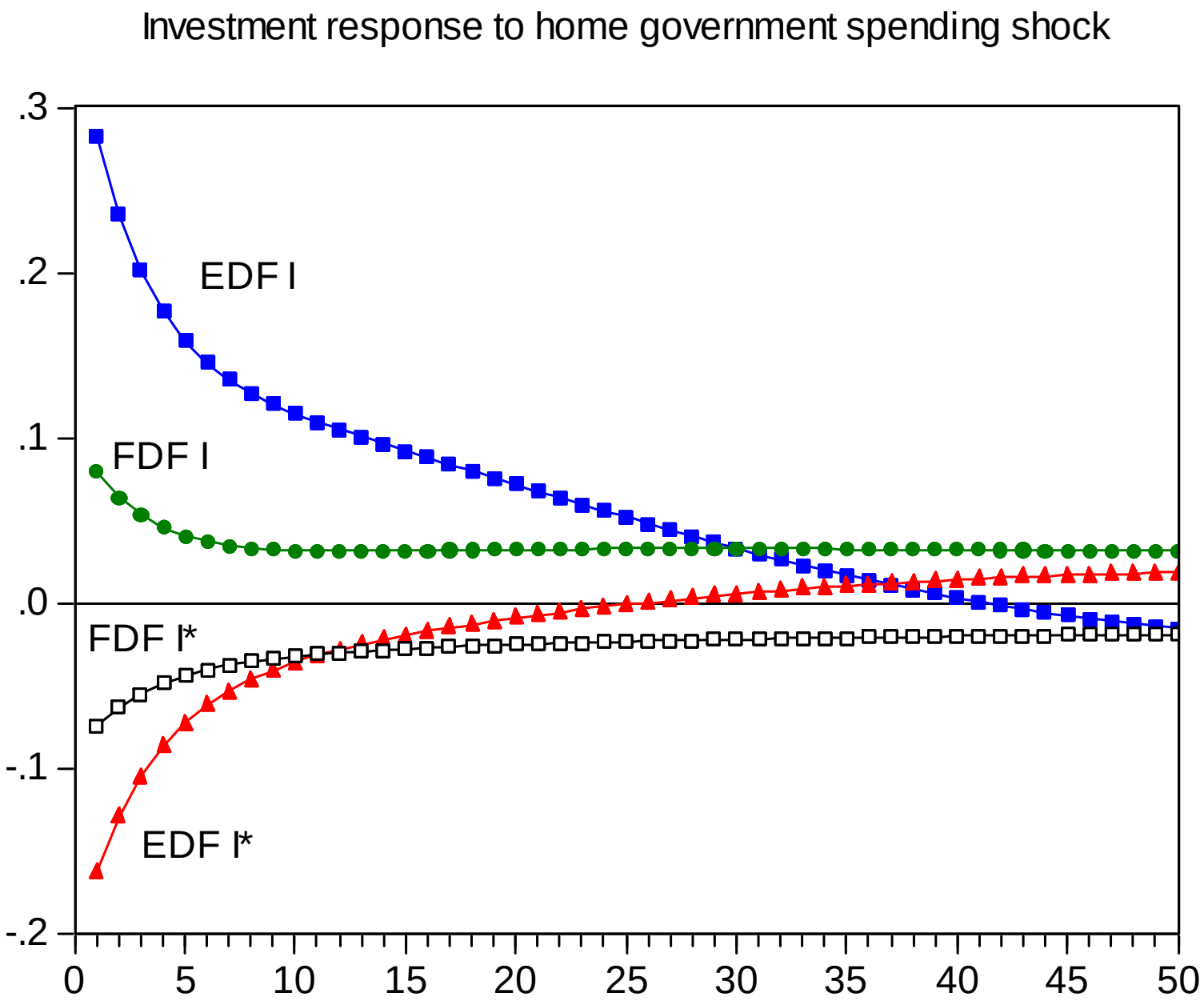


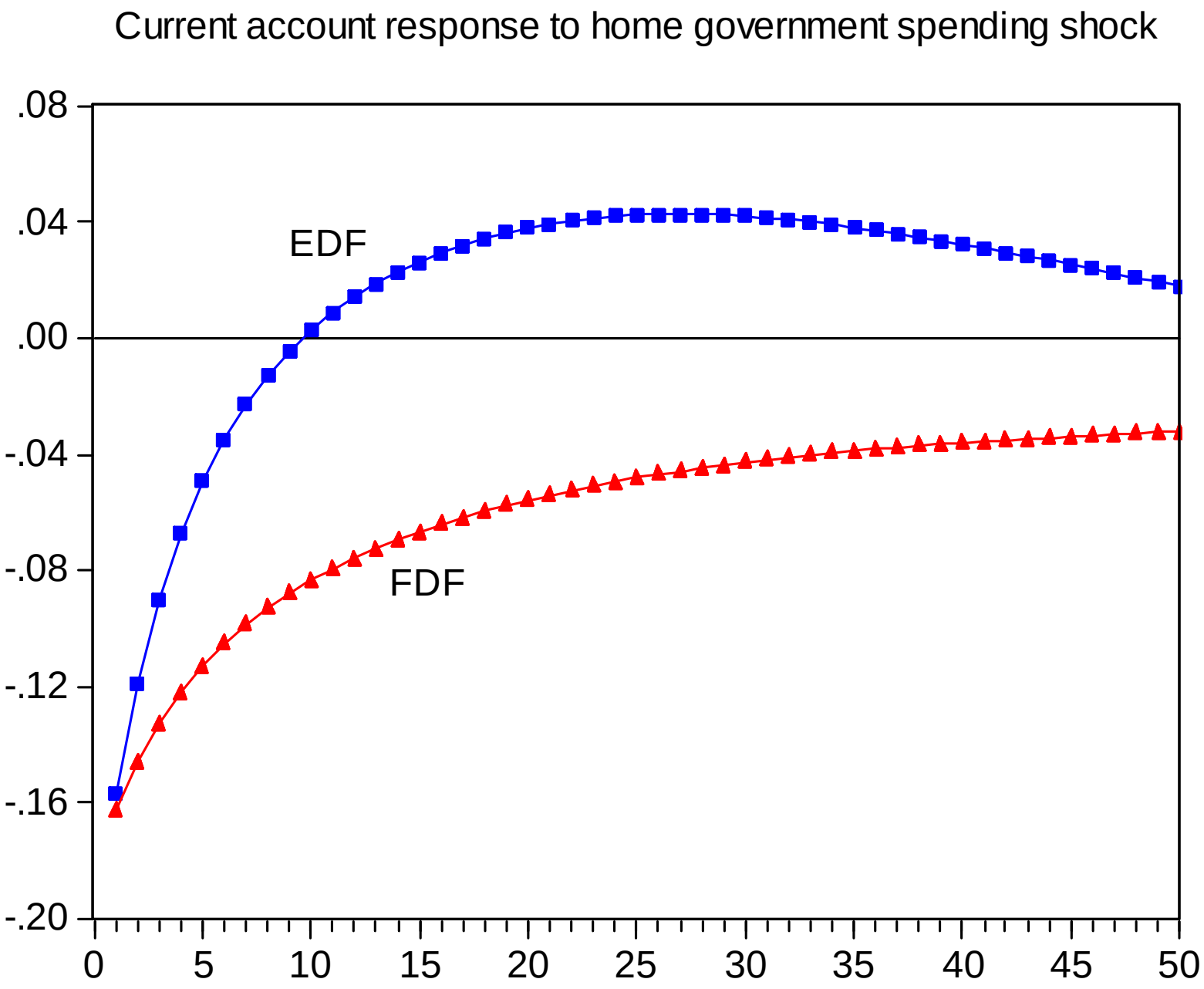
Government spending shocks

- Transient G shock crowds out US consumption (standard result). (-)C, (+)L,(+)MPK,(+) I, (+) r.
- ROW: invests in bond, not ROW capital. (+) r, (-) C, (+) L
- US current account improves


Consumption response to home government spending shock
.04
.00
-.04
-.08
-.12
-.16
0
5
10
15
20
25
30
35
40
45
50
EDF C*
FDF C*
FDF C
EDF C


Labor response to home government spending shock
.20
.16
.12
.08
.04
.00
-.04
0
5
10
15
20
25
30
35
40
45
50
EDF L
FDF L
FDF L*
EDF L*


Investment response to home government spending shock
.3
.2
.1
.0
-.1
-.2
EDF I
FDF I
FDF I*
EDF I*
0
5
10
15
20
25
30
35
40
45
50


Current account response to home government spending shock
.08
.04
.00
-.04
-.08
-.12
-.16
-.20
EDF
FDF
0
5
10
15
20
25
30
35
40
45
50

Explaining the time paths of current account data

- Feed data on technology shocks and government spending into model. Examine implied current account.
- First,…the US.

Table 2: Parameter values for the US–ROW model

	Parameter	Estimate	s.e.	Error variances and covariances	
Technology	ρ_1	0.809	0.094	σ_{11}	$(0.0137)^2$
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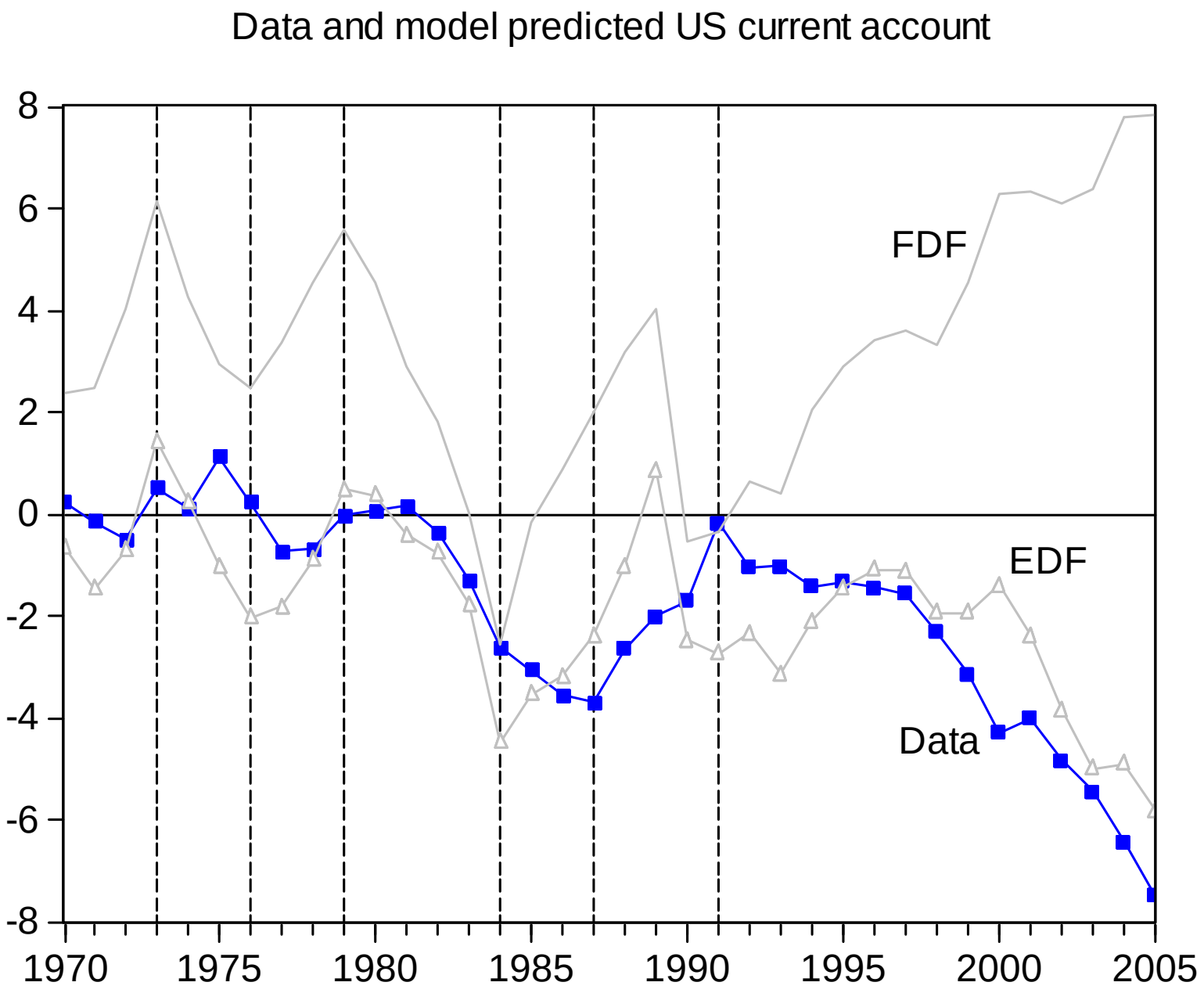
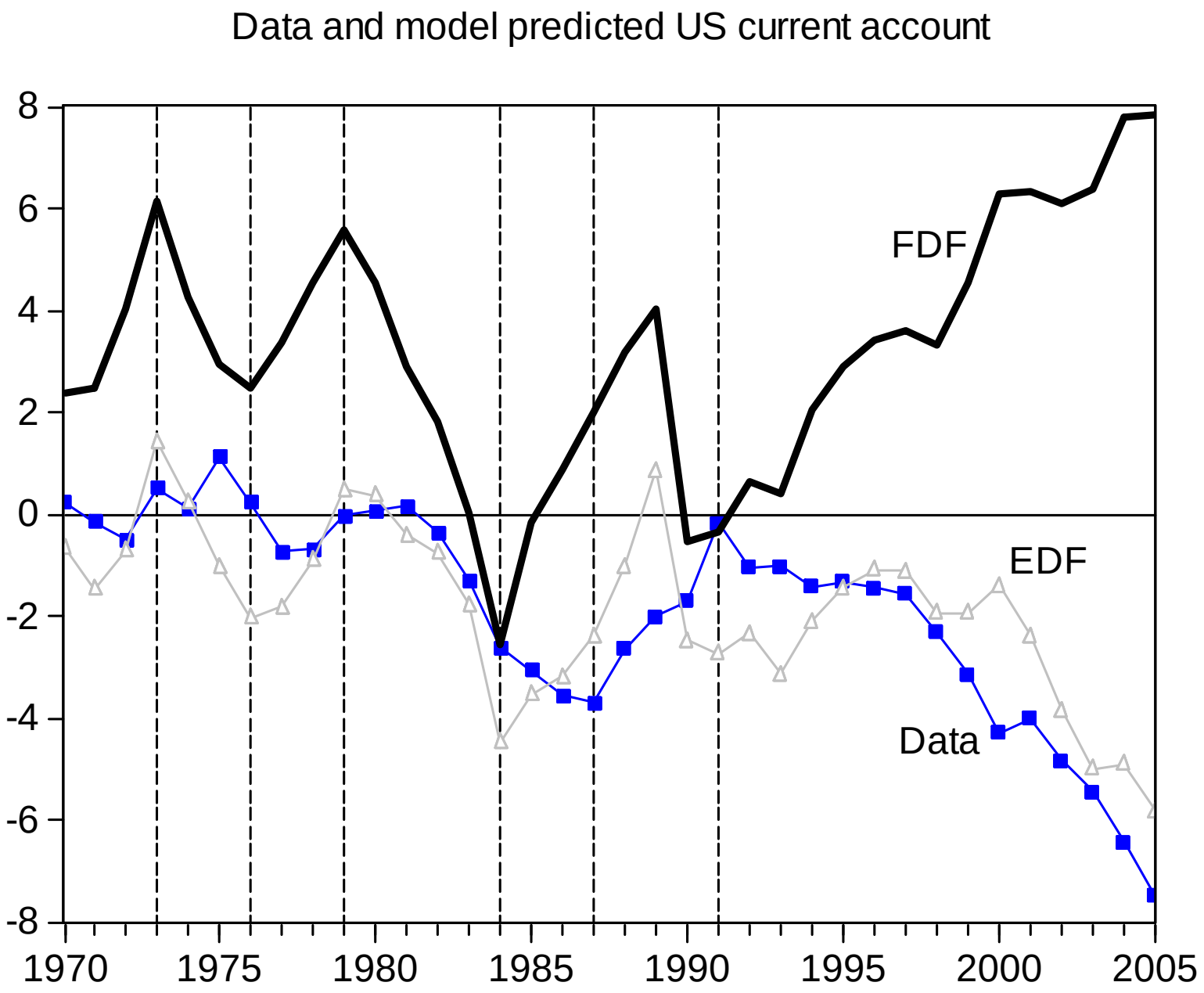
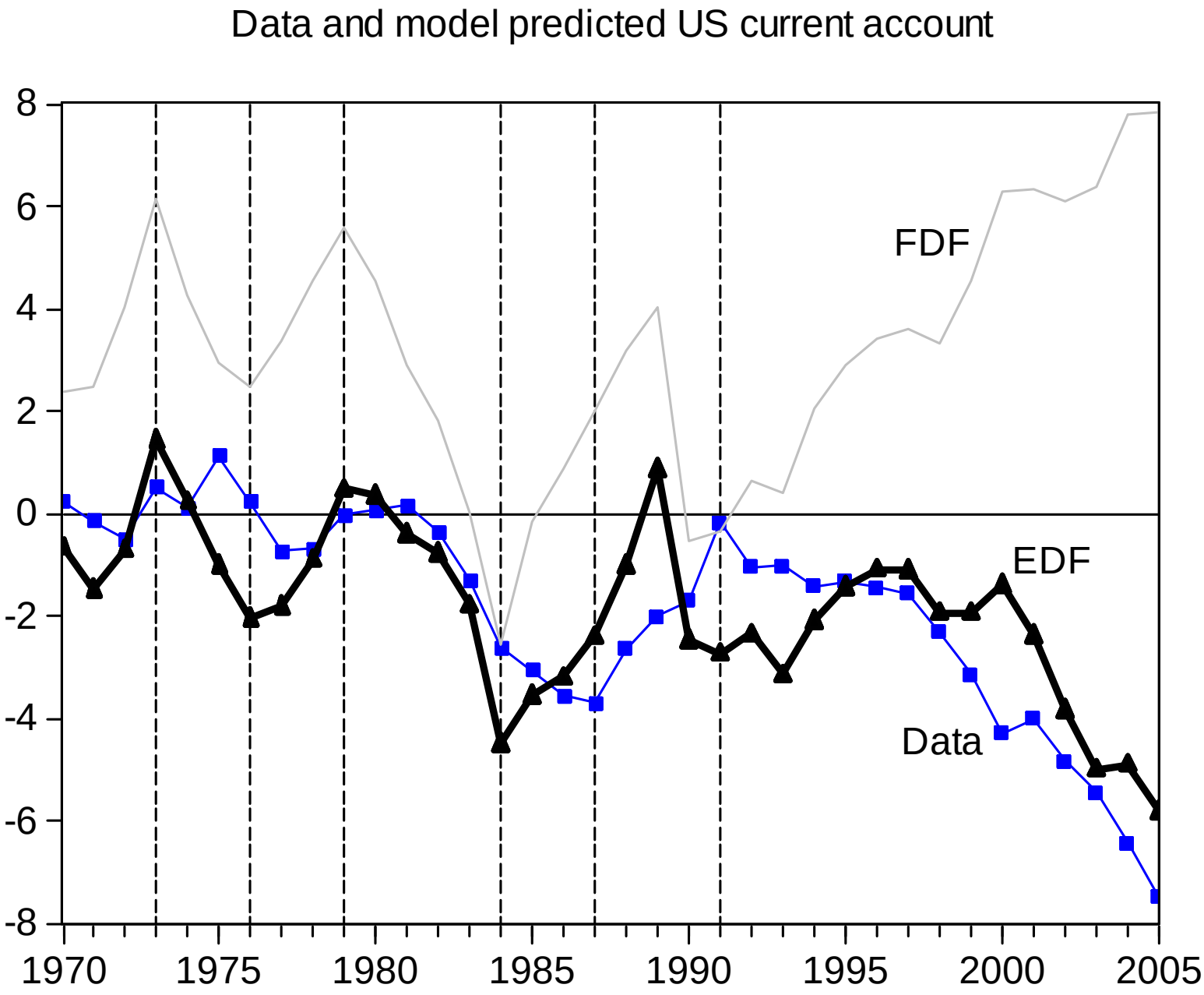
				ω_{12}	4.7×10^{-5}
		Posterior Mean	Confidence Interval (90%)		
Discount	η	0.977	0.976	0.977	
factor	ψ	0.245	0.242	0.227	


Data and model predicted US current account
8
6
4
2
0
-2
-4
-6
-8
1970
1975
1980
1985
1990
1995
2000
2005
FDF
EDF
Data


Data and model predicted US current account
8
6
4
2
0
-2
-4
-6
-8
1970
1975
1980
1985
1990
1995
2000
2005
FDF
EDF
Data

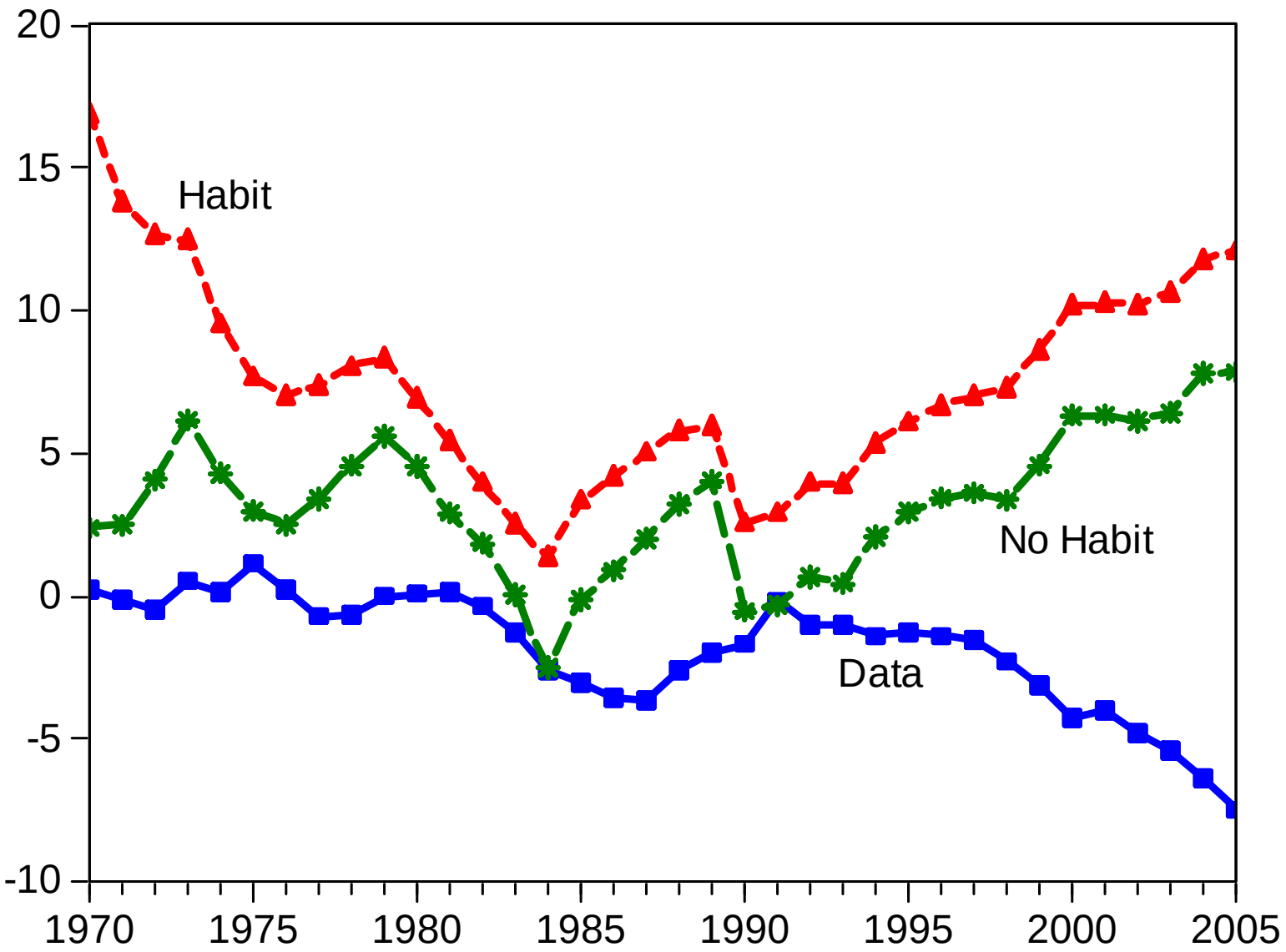

Data and model predicted US current account
8
6
4
2
0
-2
-4
-6
-8
1970
1975
1980
1985
1990
1995
2000
2005
FDF
EDF
Data

Compare to habit

$$h_{j,t} = \rho_h h_{j,t-1} + (1 - \rho_h)\, \bar{c}_{j,t}$$

$$E_0 \sum_{t=0}^{\infty} \beta^t N_{j,t} \frac{\left((c_{j,t} - \theta h_{j,t-1})^{\mu} (1 - \ell_{j,t})^{1-\mu} \right)^{1-\gamma}}{1-\gamma}$$

Fixed Discount Model with and without Habit Persistence
for the U.S.

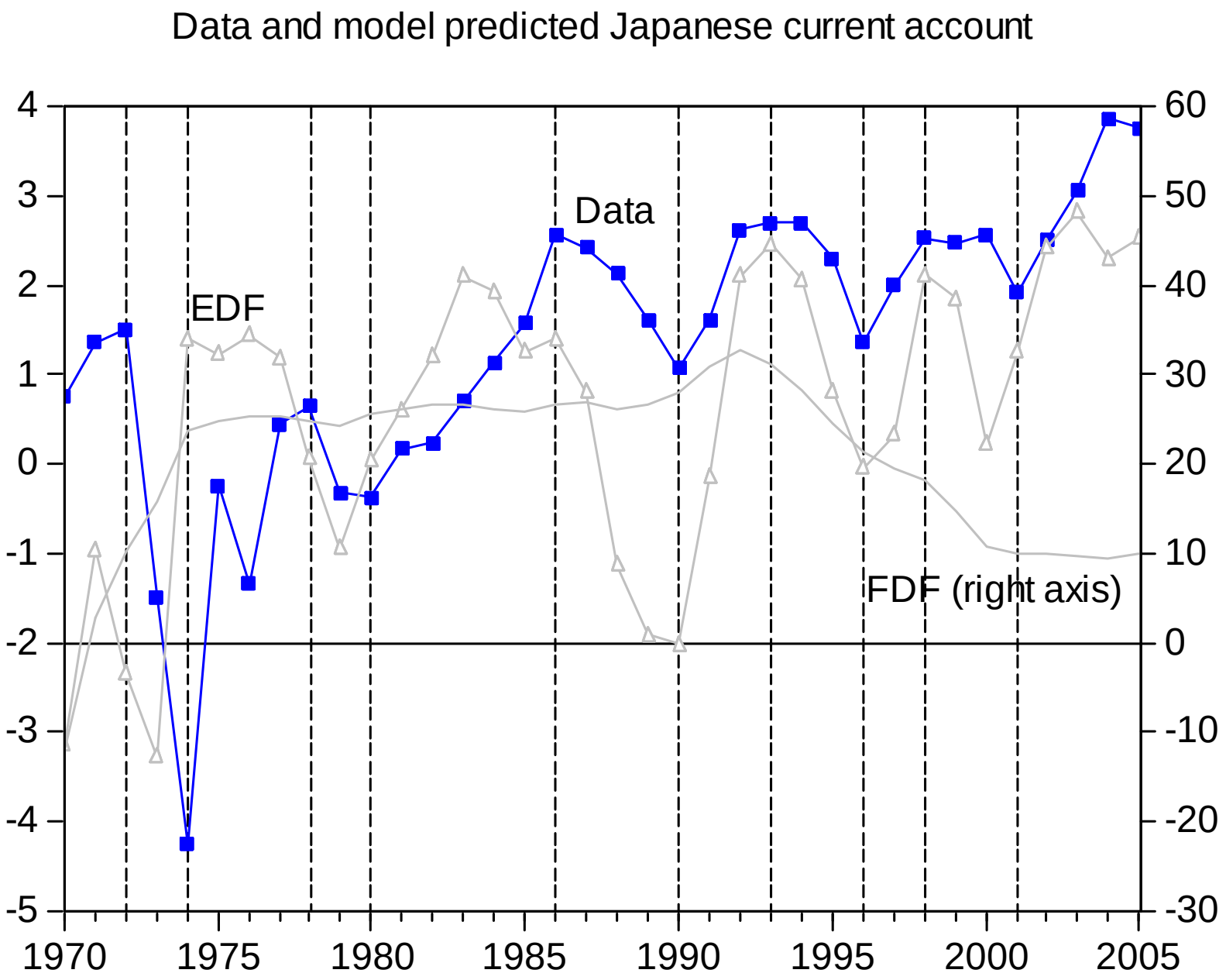


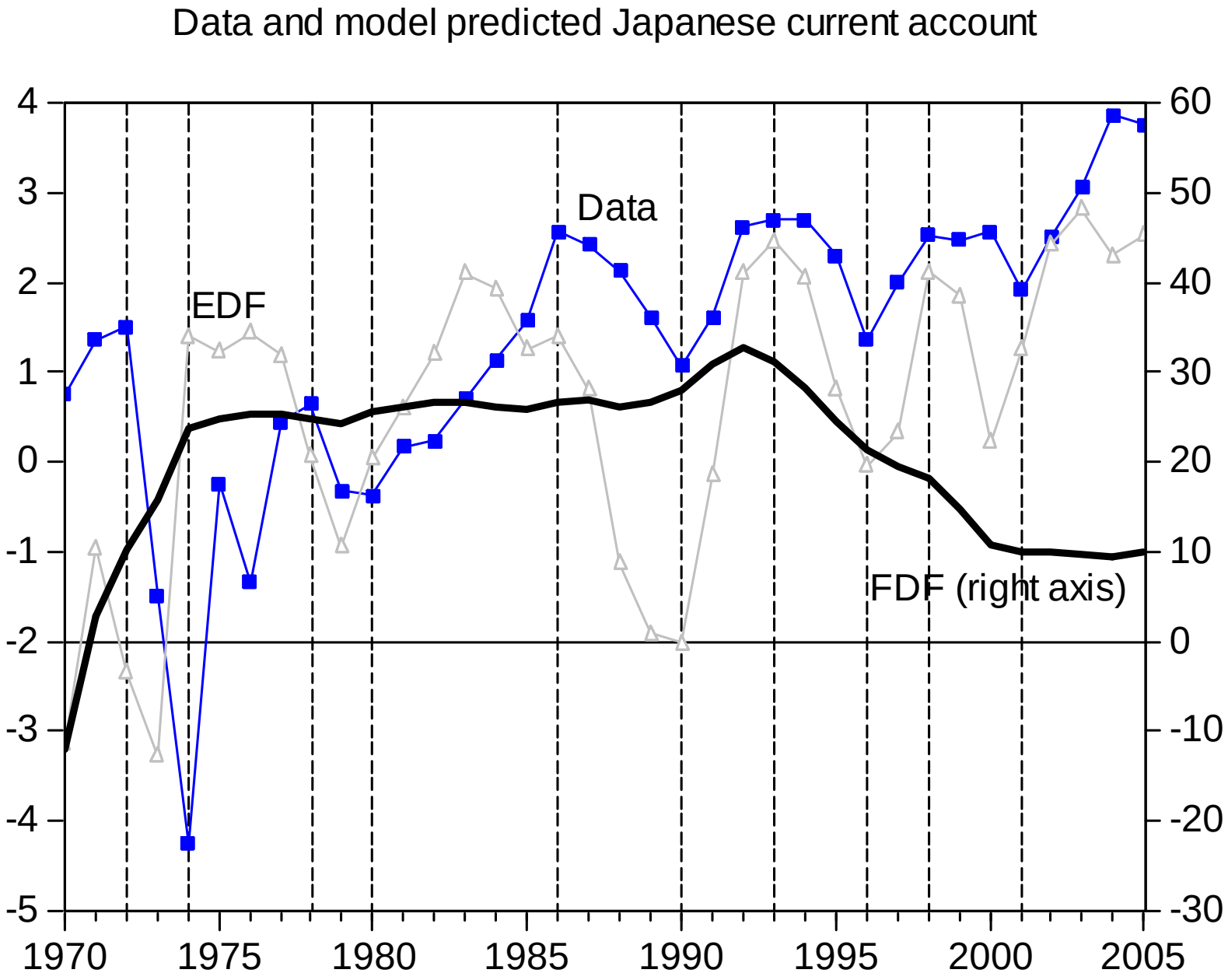
Japan

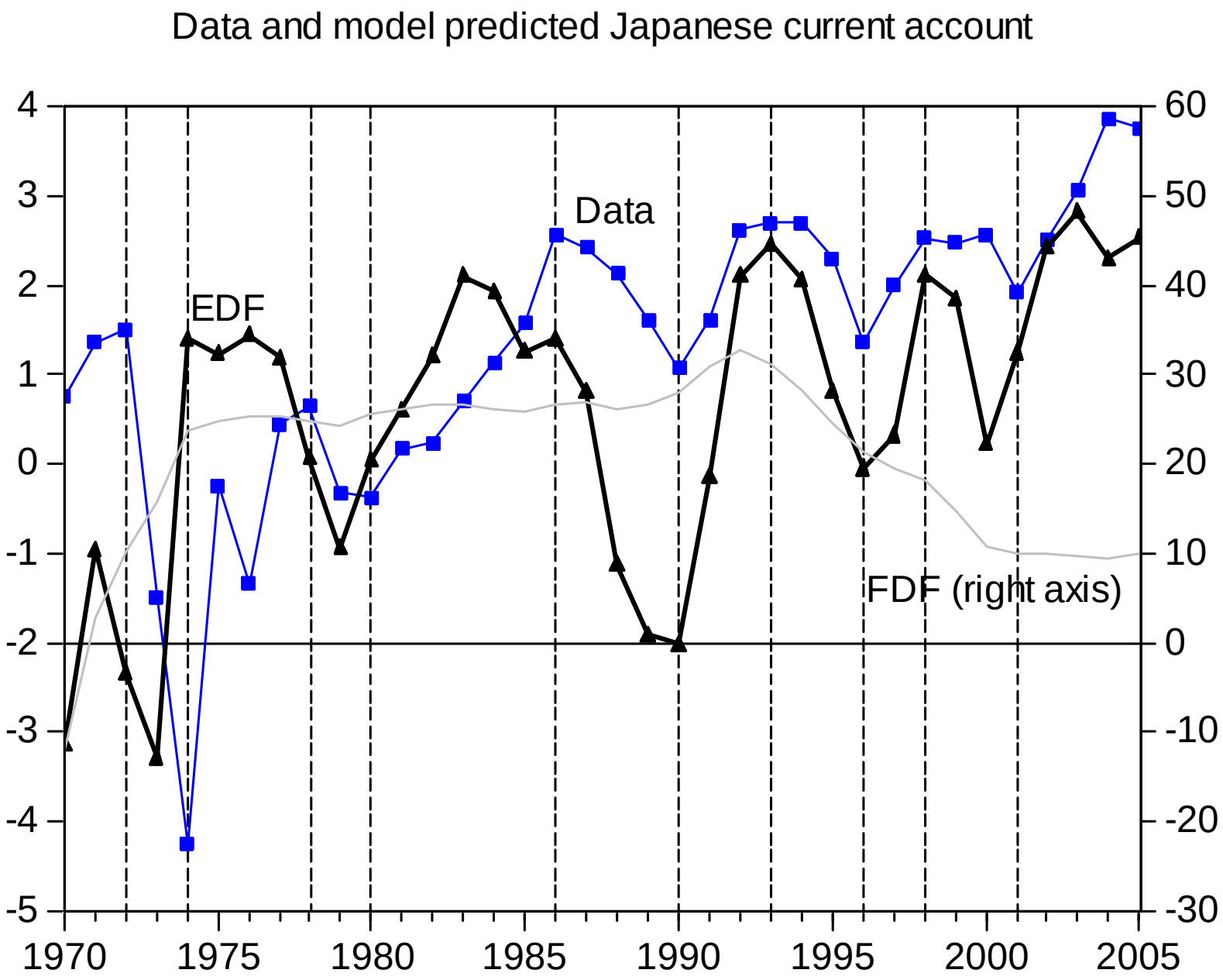
Table 3: Parameter values for the Japanese model

	Parameter	Estimate	s.e.	Error variances and covariances	
Technology	ρ_1	0.896	0.057	σ_{11}	$(0.021)^2$
	ρ_2	0.744	0.116	σ_{22}	$(0.017)^2$
				σ_{12}	8.302×10^{-5}
Government	ρ_3	0.936	0.0168	ω_{11}	$(0.017)^2$
	ρ_4	0.929	0.0541	ω_{22}	$(0.015)^2$
				ω_{12}	-1.094×10^{-6}

		Posterior mean	Confidence interval (90%)	
Discount	η	0.792	0.778	0.809
factor	ψ	0.246	0.238	0.255


Data and model predicted Japanese current account
4
3
2
1
0
-1
-2
-3
-4
-5
60
50
40
30
20
10
0
-10
-20
-30
1970
1975
1980
1985
1990
1995
2000
2005
Data
EDF
FDF (right axis)


Data and model predicted Japanese current account
4
3
2
1
0
-1
-2
-3
-4
-5
60
50
40
30
20
10
0
-10
-20
-30
1970
1975
1980
1985
1990
1995
2000
2005
Data
EDF
FDF (right axis)

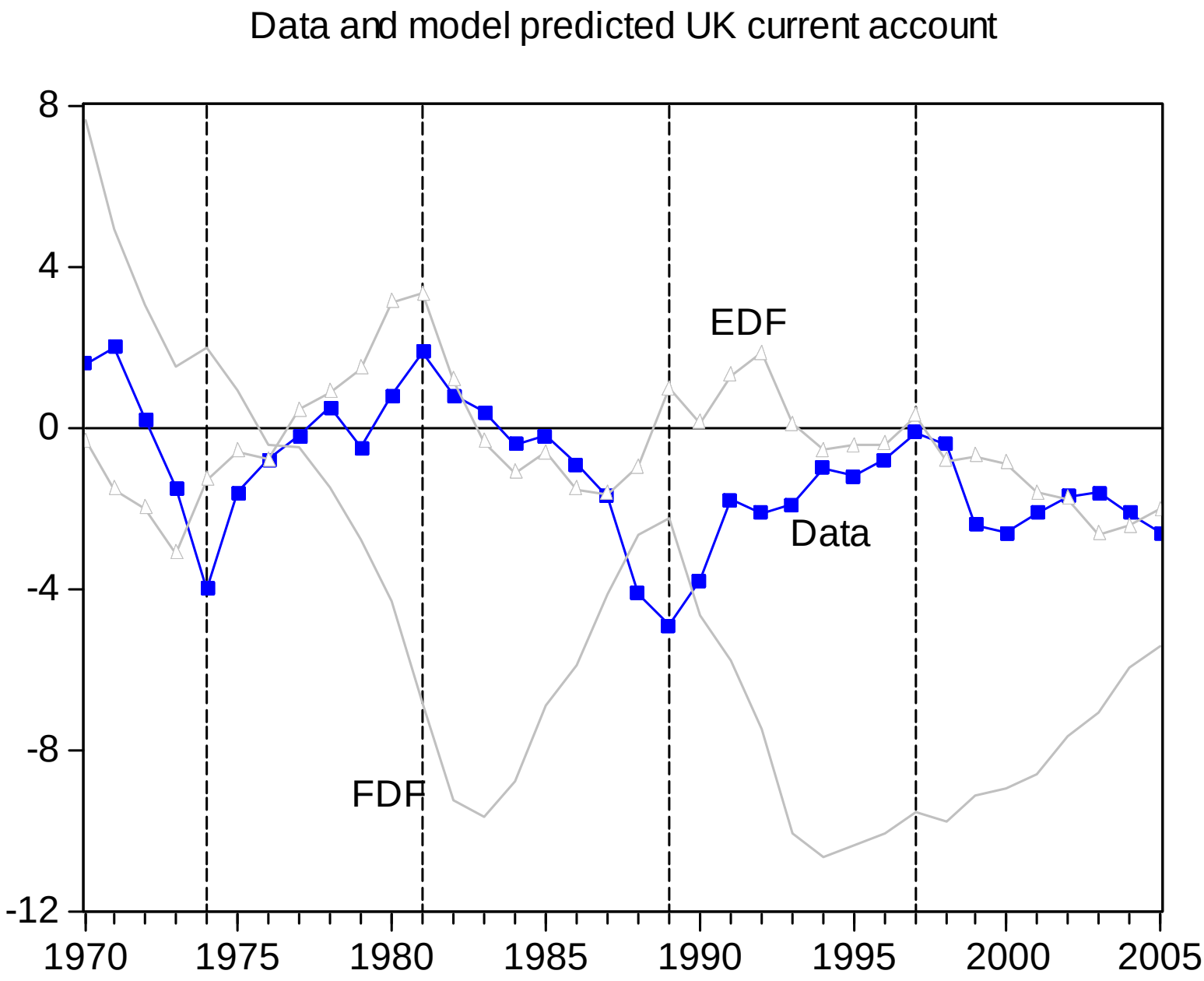

Data and model predicted Japanese current account
4
3
2
1
0
-1
-2
-3
-4
-5
60
50
40
30
20
10
0
-10
-20
-30
1970
1975
1980
1985
1990
1995
2000
2005
Data
EDF
FDF (right axis)

UK

Table 4: Parameter values for the UK model

	Parameter	Estimate	(s.e.)	Error variances and covariances	
Technology	ρ_1	0.844	(0.094)	σ_{11}	$(0.022)^2$
	ρ_2	0.830	(0.102)	σ_{22}	$(0.016)^2$
				σ_{12}	2.174×10^{-4}
Government	ρ_3	0.888	(0.079)	ω_{11}	$(0.015)^2$
	ρ_4	0.935	(0.025)	ω_{22}	$(0.013)^2$
				ω_{12}	5.973×10^{-5}

		Posterior mean	Confidence interval (90%)	
Discount	η	0.429	0.423	0.434
factor	ψ	0.463	0.463	0.464


Data and model predicted UK current account
8
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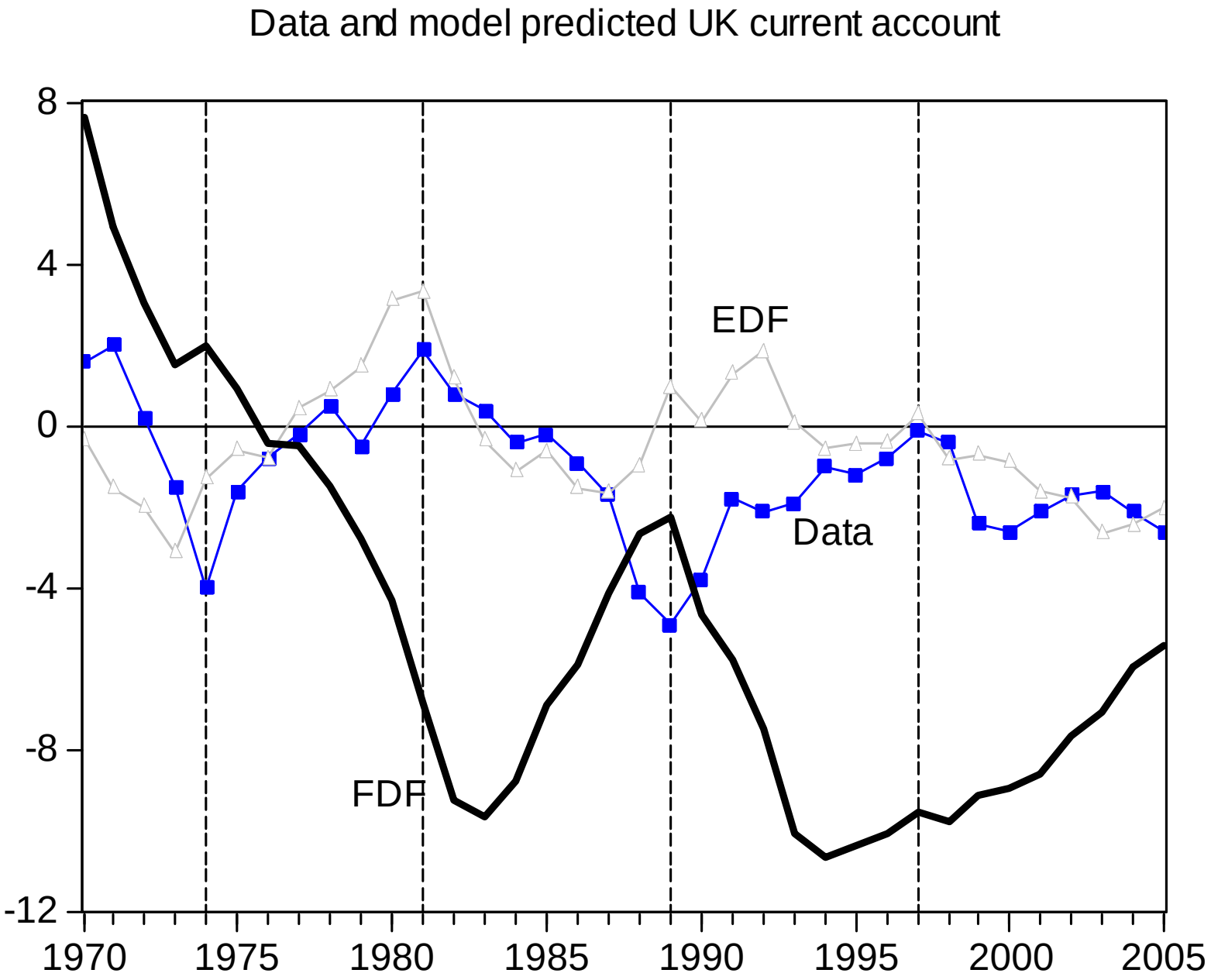
0
-4
-8
-12
1970
1975
1980
1985
1990
1995
2000
2005
EDF
Data
FDF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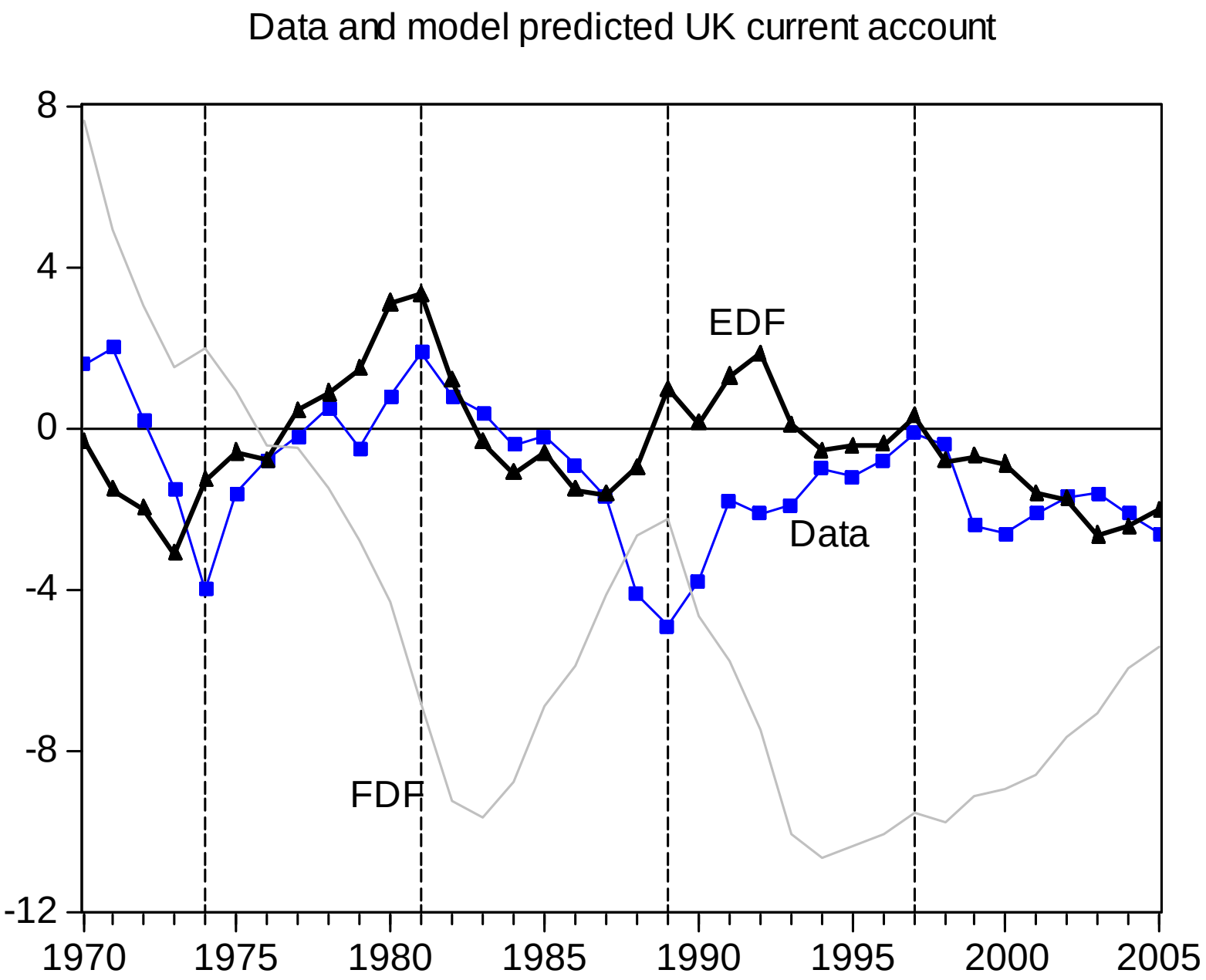
Data and model predicted UK current account
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Data
FDF

Possible ways to balance the US current account in five years

- Take the history through 2005 as given. Shut down future innovations to 3 of the 4 state variables. Fiddle with the 4^{th} state variable to achieve zero current account by 2010.
- Does not necessarily achieve a smooth landing at zero.

Possible ways to balance the US current account in five years

- US productivity grows at 7.08 percent per year.
- ROW productivity grows by 2.7 percent per year.
- US government spending declines by 22 percent per year.
- ROW government spending grows by 26 percent per year

The End

Thank you,…

Thank you very much.