Exchange Rate Regimes in the Asia Pacific Region and the Global Financial Crisis

Warwick J McKibbin

CAMA, Australian National University

& The Brookings Institution, Washington DC

&

Waranya Pim Chanthapun

CAMA, Australian National University

ADB Seminar in Manila, May 21, 2009

Overview

- Goals of the paper
- Alternative Monetary and Exchange Rate Regimes
- The G-Cubed model
- Modeling the GFC
- Results
- Conclusion

Goals

- Summarize literature and recent experience on monetary and exchange rate cooperation in Asia
- Explores the impact of a global financial crisis on the Asian region under current monetary and exchange rate policies using a large scale DSGE model
- Explores the consequences of alternative monetary and exchange rate regimes on short run adjustment in Asia

HMT Rules

$$(6)\quad i_t = i_{t-1} + \alpha(\Pi_t - \overline{\Pi}_t) + \beta([y_t - y_{t-1}] - [\overline{y_t - y_{t-1}}]) - \gamma([e_t - e_{t-1}] - [\overline{e_t - e_{t-1}}])$$

In equation (6) i_t is the short term policy interest rate in period t and i_{t-1} is the policy interest rate in the previous period; Π_t is actual inflation in period t; $[y_t - y_{t-1}]$ is the change in the log of output (or output growth) in period t and $[e_t - e_{t-2}]$ is the change in the log of the nominal exchange rate relative to the $US in period t. Corresponding variables with a bar overhead indicate desired values of these target variable.

Alternative Monetary & Exchange Rate Regimes

- Actual policy summarized in HMT Rules for each central bank
- Asian Currency Union with a single Central bank of Asia following an HMT rule with GDP weights for each country
- US Dollar Peg (except Japan)
- Flexible Exchange rates with each central bank solving for an optimal time consistent closed loop policy rule for interest rates

G-Cubed Model (Asia Pacific)

G-Cubed Model

- Hybrid of a DSGE model (macro literature) and an intertemporal general equilibrium model (CGE literature)
  - Elasticities of substitution estimated
  - Other parameters calibrated like CGE models

- Households maxmize intertemporal utility with 30% continually updating information and 70% following a steady state optimal rule

- Firms in each sector maximize share market value subject to quadratic adjustment costs of capital and evolving technology

- Assume world is on stable path adjusting dynamically towards a steady state (usually takes > 100 years to reach)

Countries

1 United States
2 Japan
3 United Kingdom
4 Euro Area
5 Rest of the OECD
6 Singapore
7 China
8 India
9 Korea
10 Indonesia
11 Malaysia
12 Philippines
13 Thailand
14 Other Developing Countries
15 Eastern Europe and the former Soviet Union
16 Oil Exporting Developing Countries

Sectors

- Energy
- Mining
- Agriculture
- Durable Manufacturing
- Non-Durable Manufacturing
- Services

- Capital producing sector

Modeling a financial crisis

- Housing crisis
- Rise in financial risk
- Loss of confidence by households

Housing crisis

- Fall in the expected return on housing services

Financial Crisis

- Rise in equity premiums across all sectors
  - Some sectors more impacted than others
- Rise in country risk premium

Loss of Confidence by households

- Risk in the risk premium used to discount future income flows

Table 3: Core Shocks to the United States (weighted by Table 4)						
Shocks to US	2009	2010	2011	2012	2013	onwards
Financial Risk:						
equity risk (RISE)						
sector 1 - Energy	8	6	4	4	4	4
sector 2 - Mining	8	6	4	4	4	4
sector 3 - Agriculture	8	6	4	4	4	4
sector 4 - Durable Manufacturing	6	4	2	2	2	2
sector 5 - Non Durable Man	6	4	2	2	2	2
sector 6 - Services	8	6	4	4	4	4
country risk	8	6	4	2	0	0
household risk (RISW)	3	2	1	0	0	0
housing productivity (SHYZ)	-10	-10	-10	-10	-10	-10

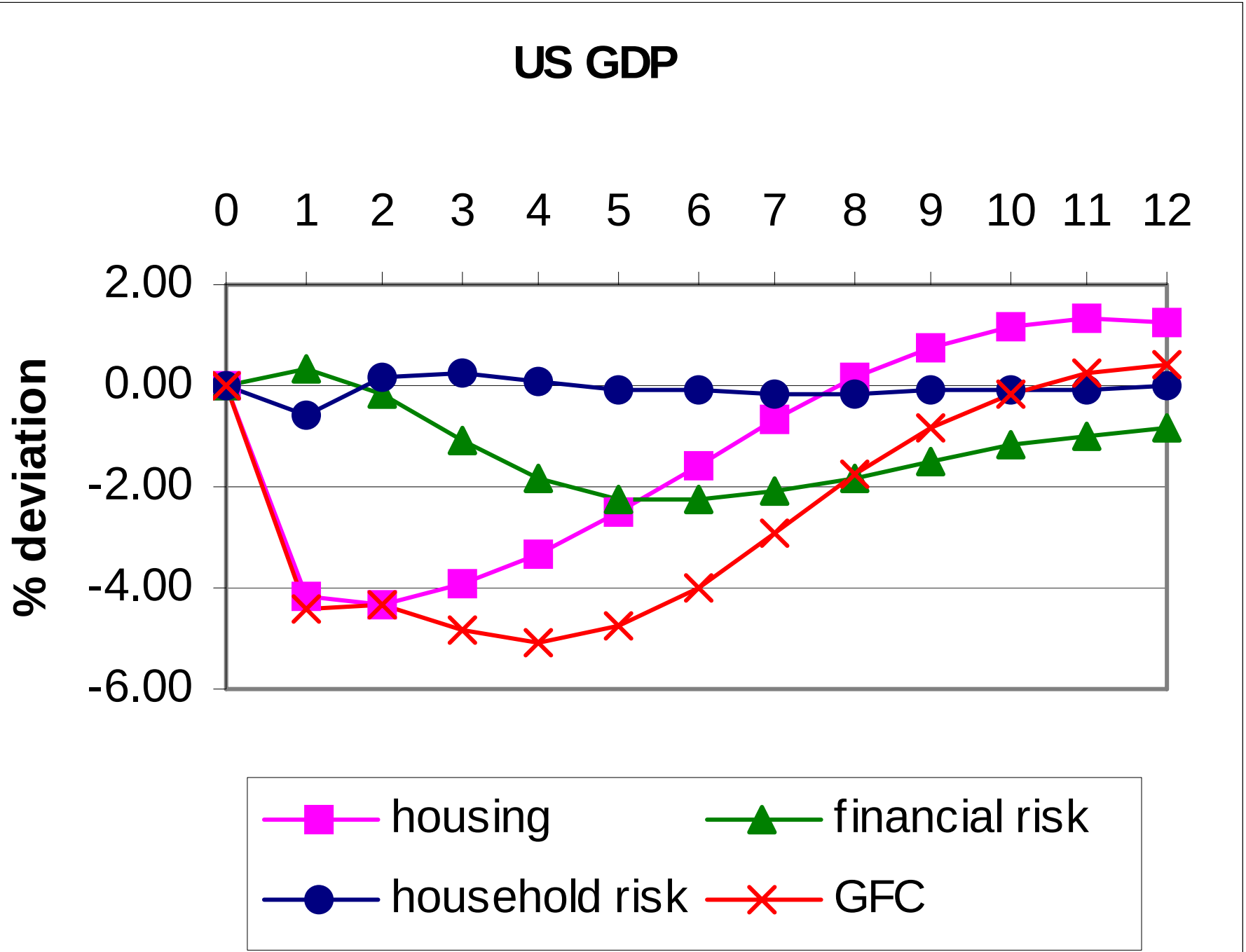
Table 4: Weights on Each Country for Shock Adjustment

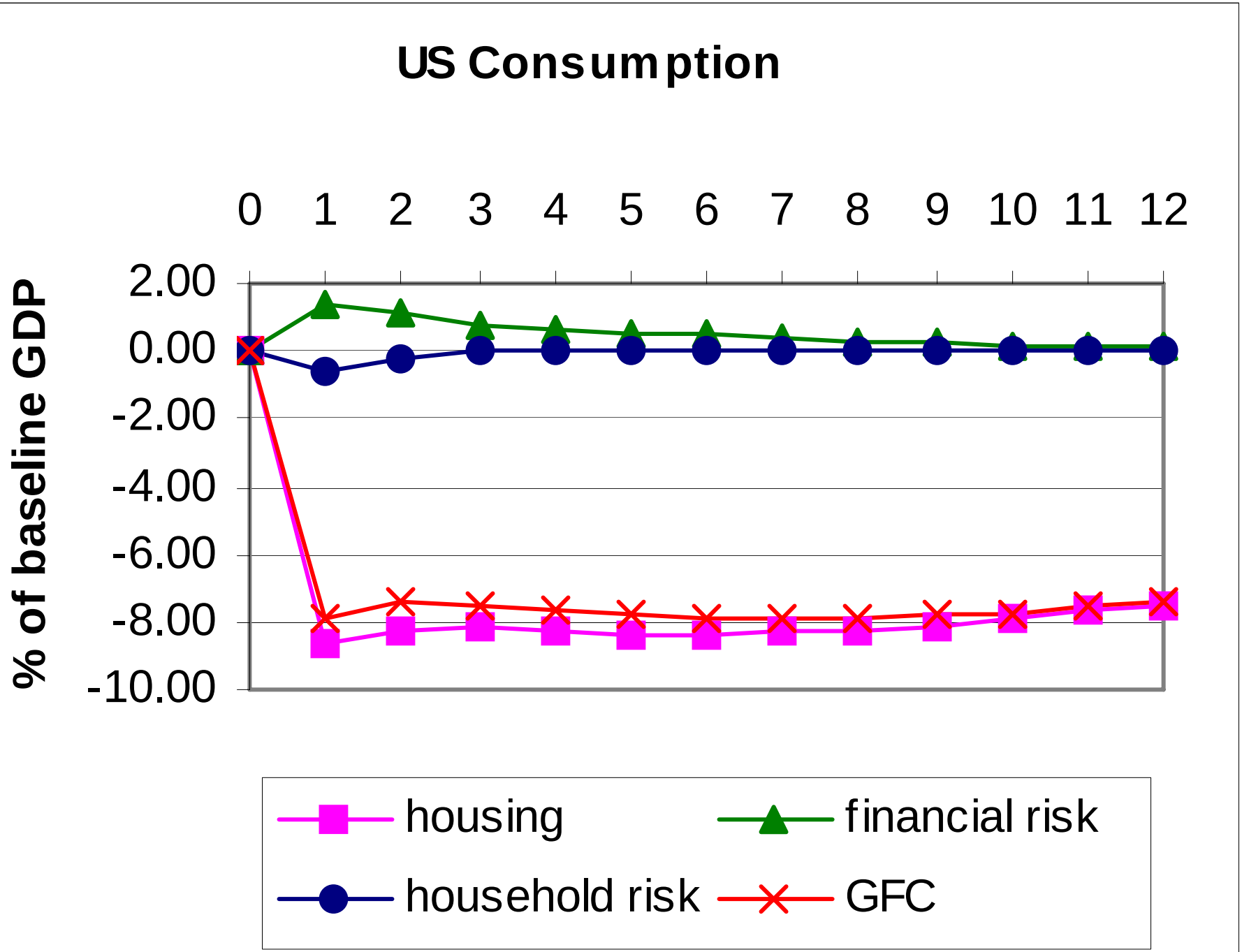
	USA	JPN	GBR	EUR	SNG	CHI	IND	KOR	OEC	INO	MAL	PHI	THA	LDC	EEB	OPC
Financial Risk:																
equity risk (RISE)																
sector 1 - Energy	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
sector 2 - Mining	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
sector 3 - Agriculture	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
sector 4 - Durable Manufacturing	1	1.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
sector 5 - Non Durable Man	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
sector 6 - Services	1	1	1.2	1	1	1	1	1	1	1	1	1	1	1	1	1
country risk	0	0	0	0	0	0	0.4	0.4	0	1	0.4	1	0.75	1	0.4	0
household risk (RISW)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
housing productivity (SHYZ)	1	0.5	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

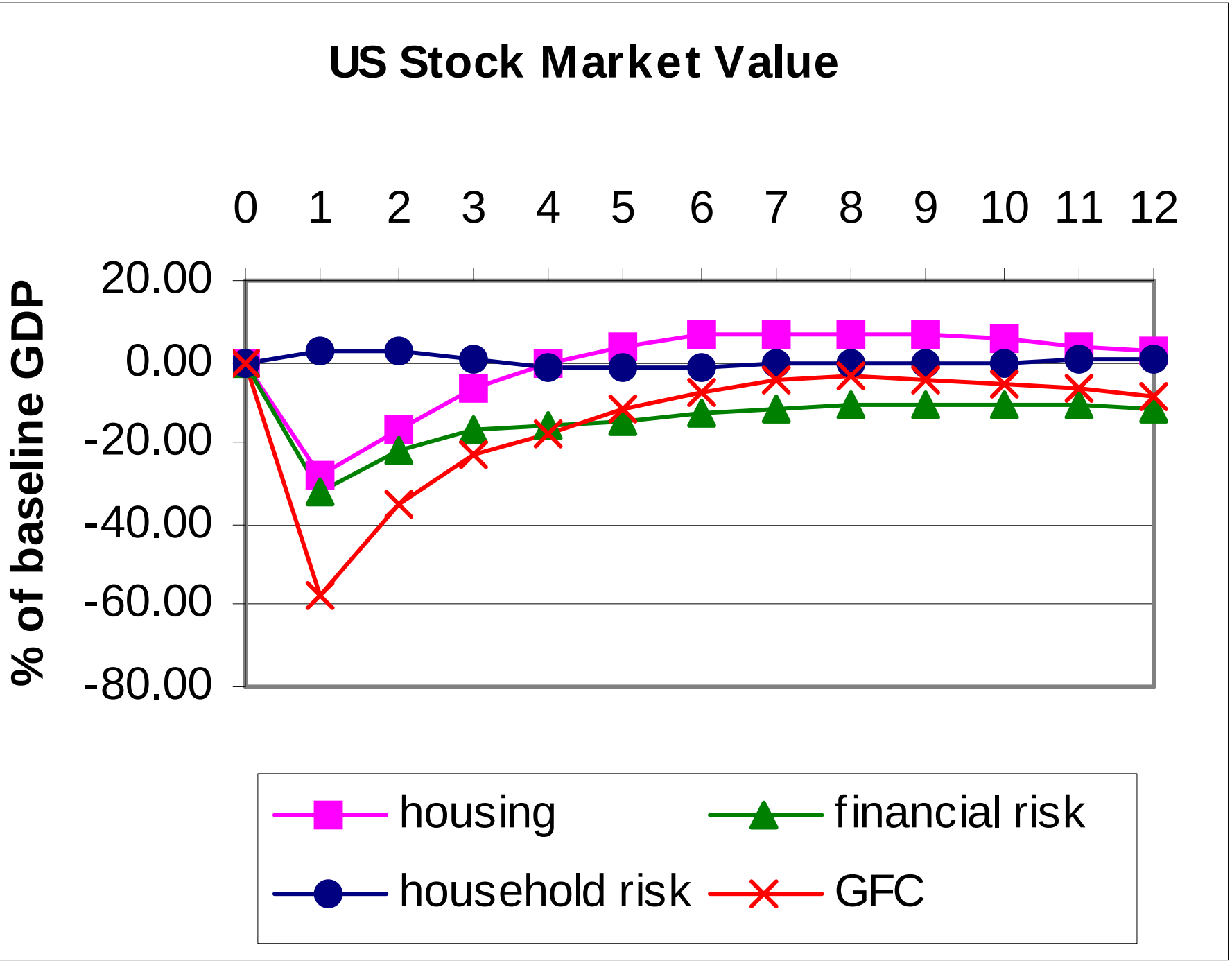
Current Crisis

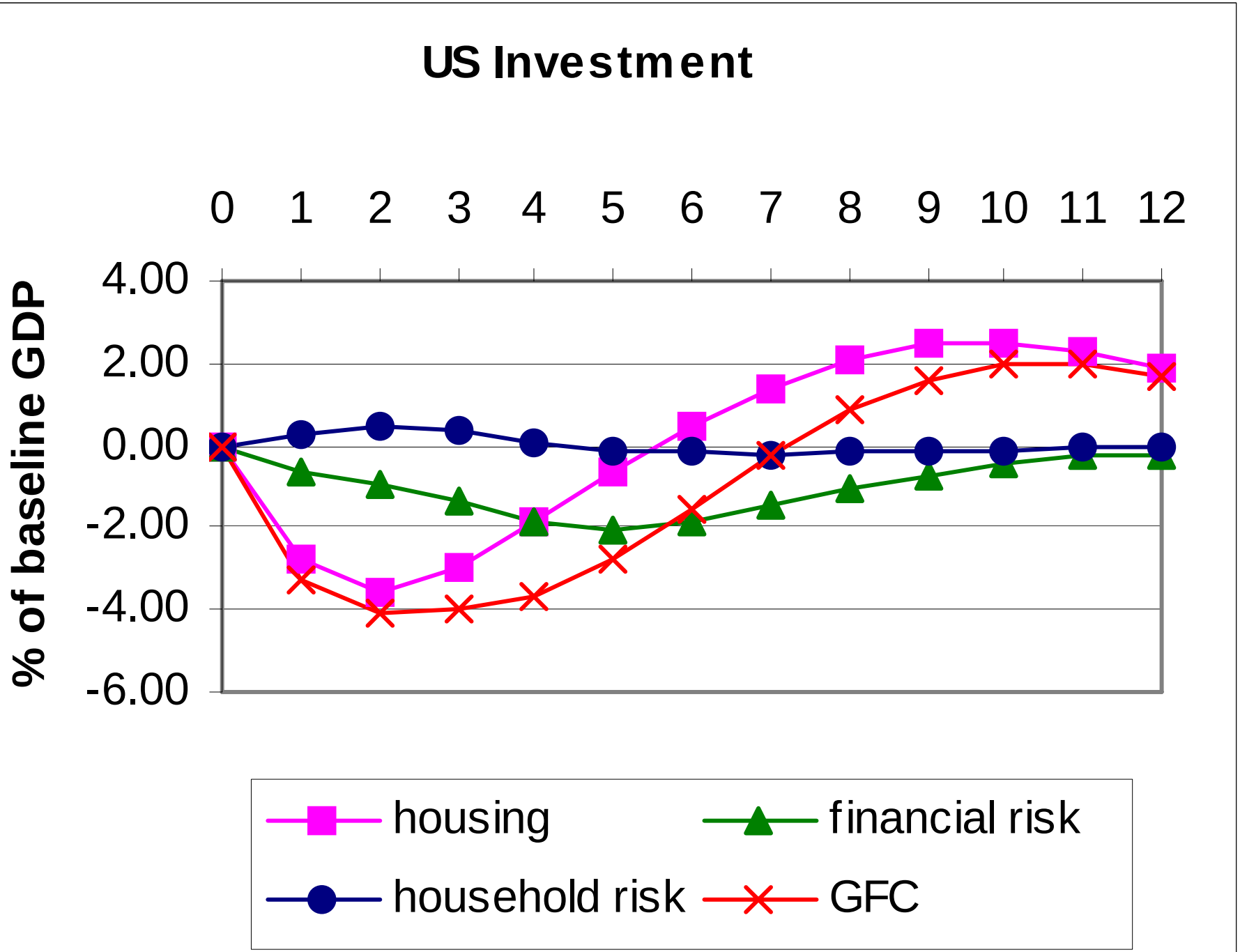
- Financial crisis in US and UK
- Global trade contraction
- Loss of confidence in most economies

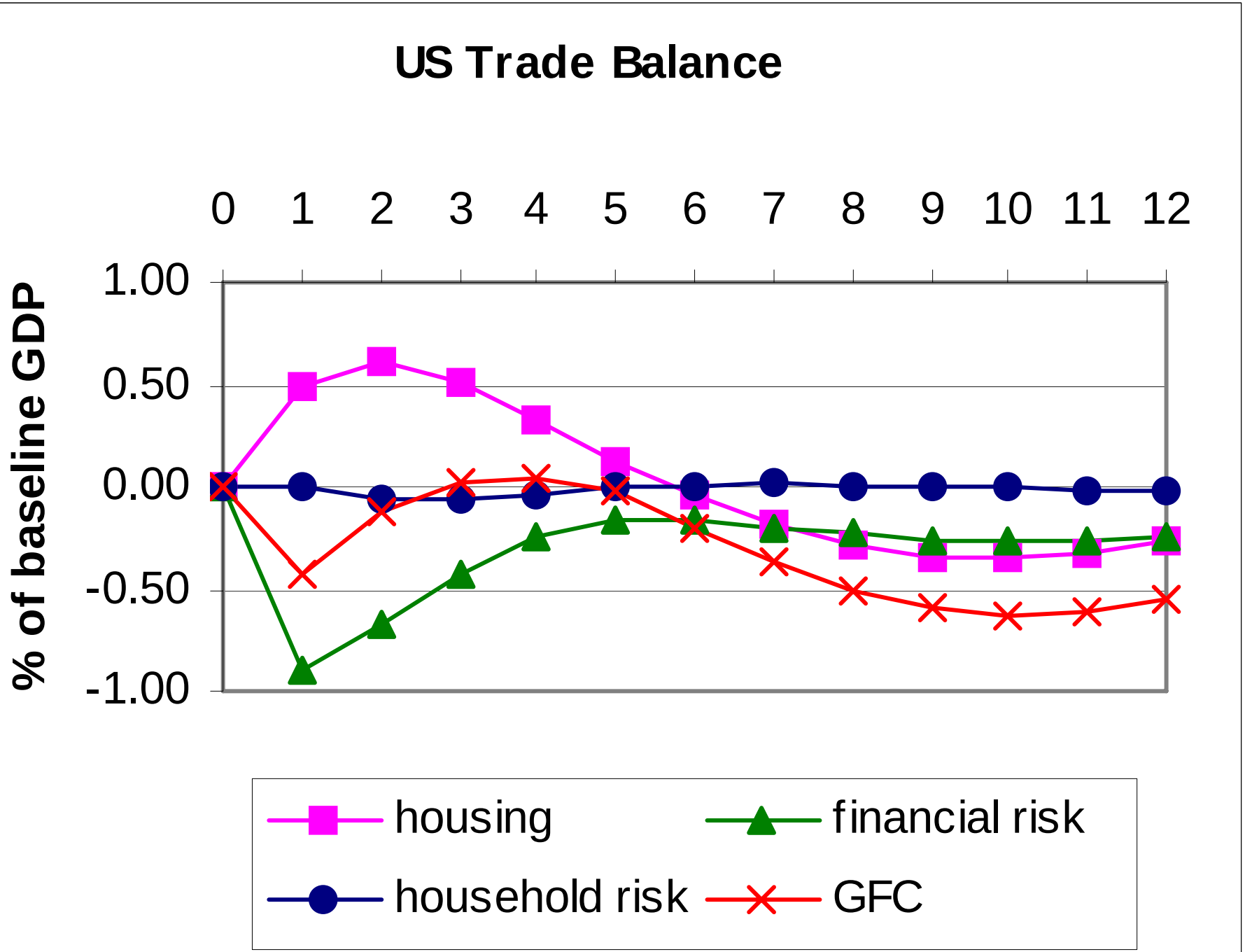
Results

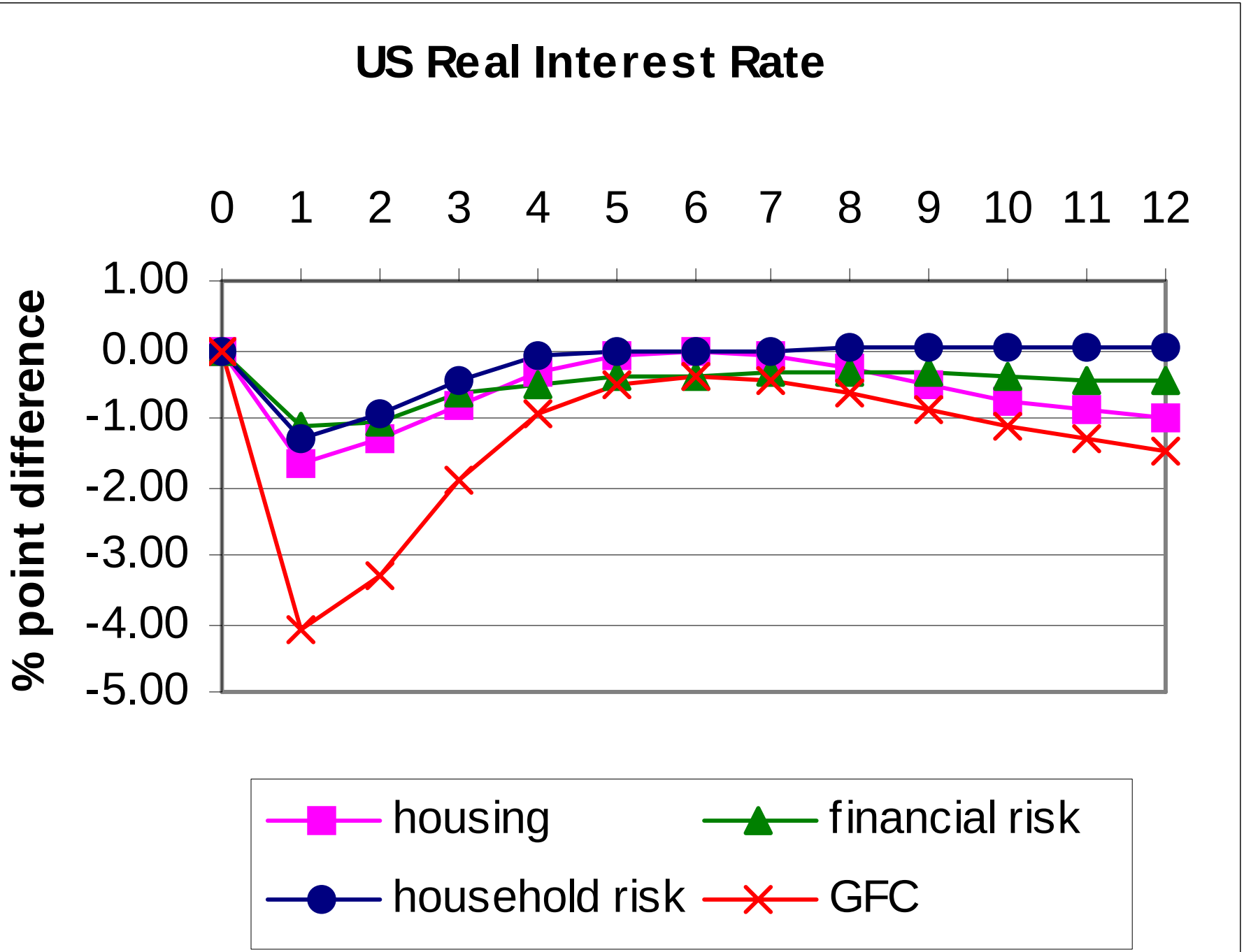

US GDP
0
1
2
3
4
5
6
7
8
9
10
11
12
2.00
0.00
-2.00
-4.00
-6.00
% deviation
housing
financial risk
household risk
GFC

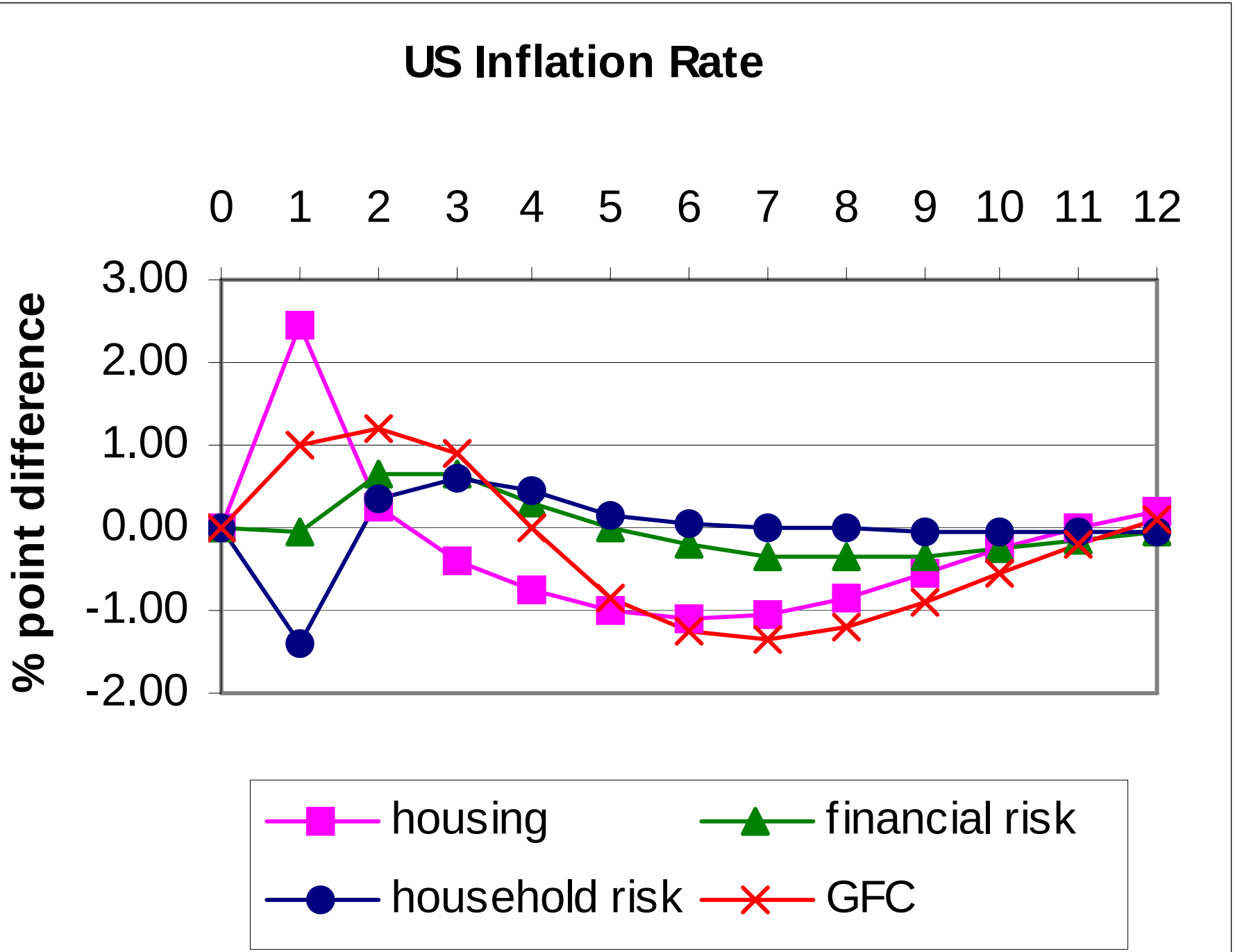

US Consumption
0
1
2
3
4
5
6
7
8
9
10
11
12
2.00
0.00
-2.00
-4.00
-6.00
-8.00
-10.00
% of baseline GDP
housing
financial risk
household risk
GFC

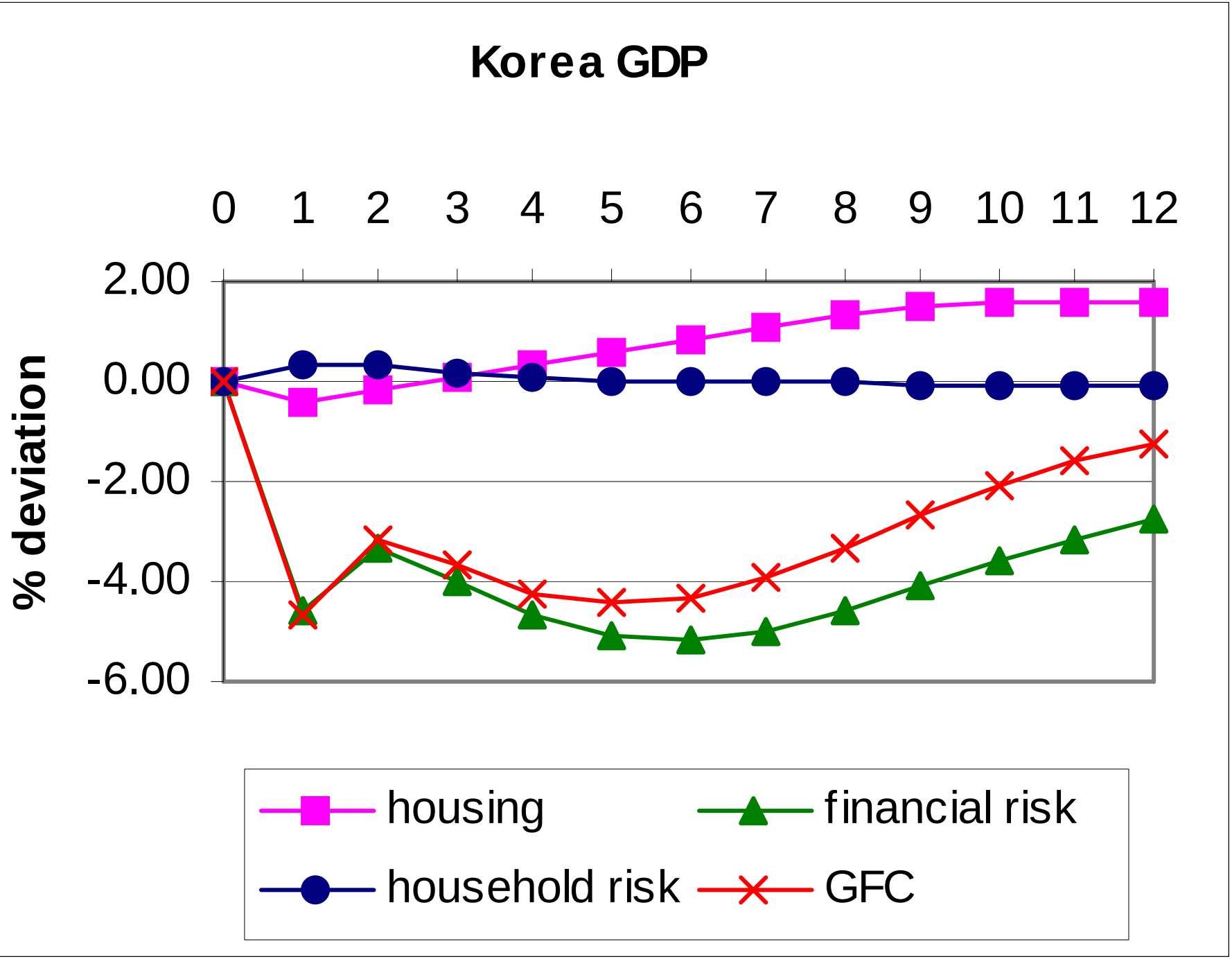

US Stock Market Value
0
1
2
3
4
5
6
7
8
9
10
11
12
20.00
0.00
-20.00
-40.00
-60.00
-80.00
% of baseline GDP
housing
financial risk
household risk
GFC

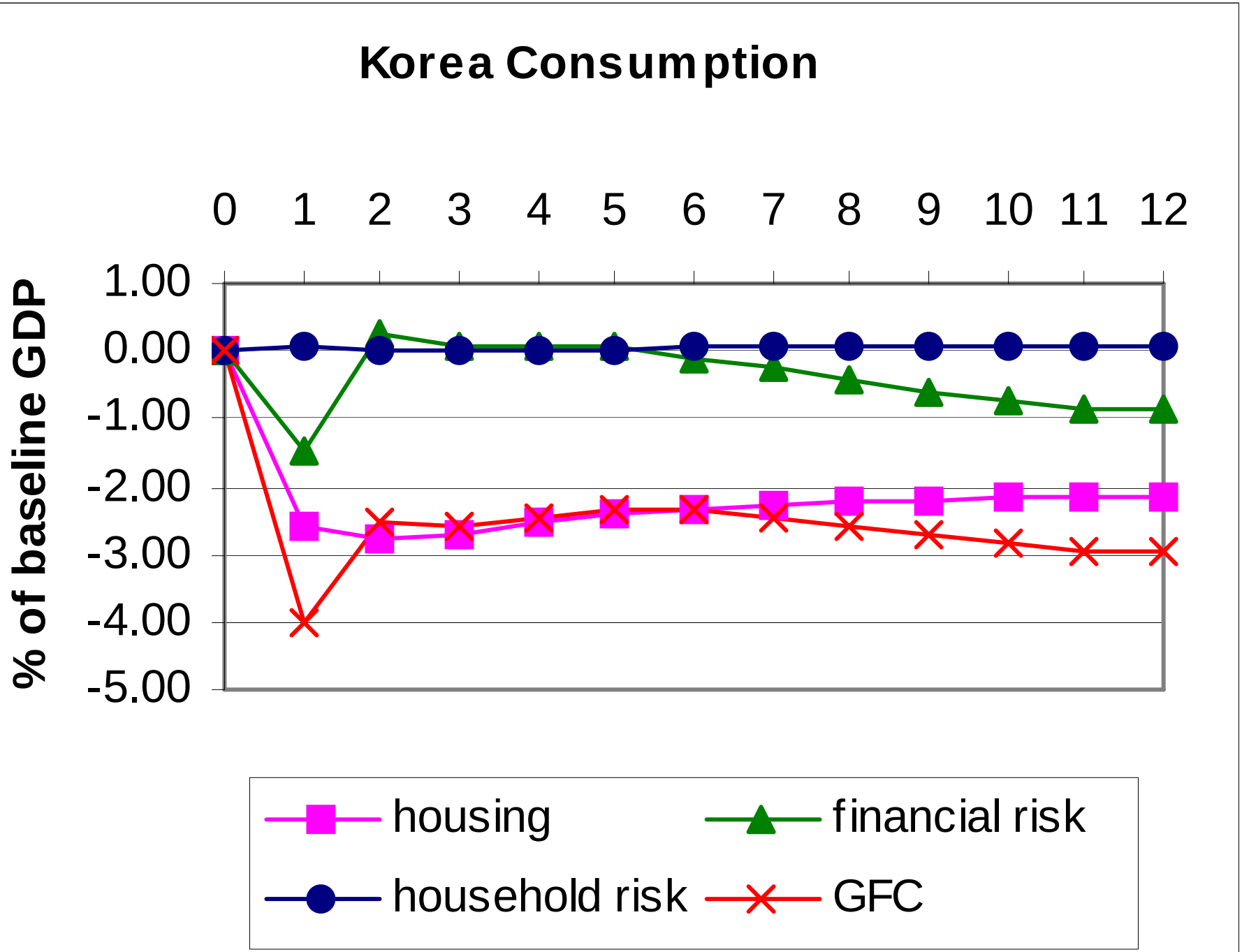

US Investment
0
1
2
3
4
5
6
7
8
9
10
11
12
4.00
2.00
0.00
-2.00
-4.00
-6.00
% of baseline GDP
housing
financial risk
household risk
GFC

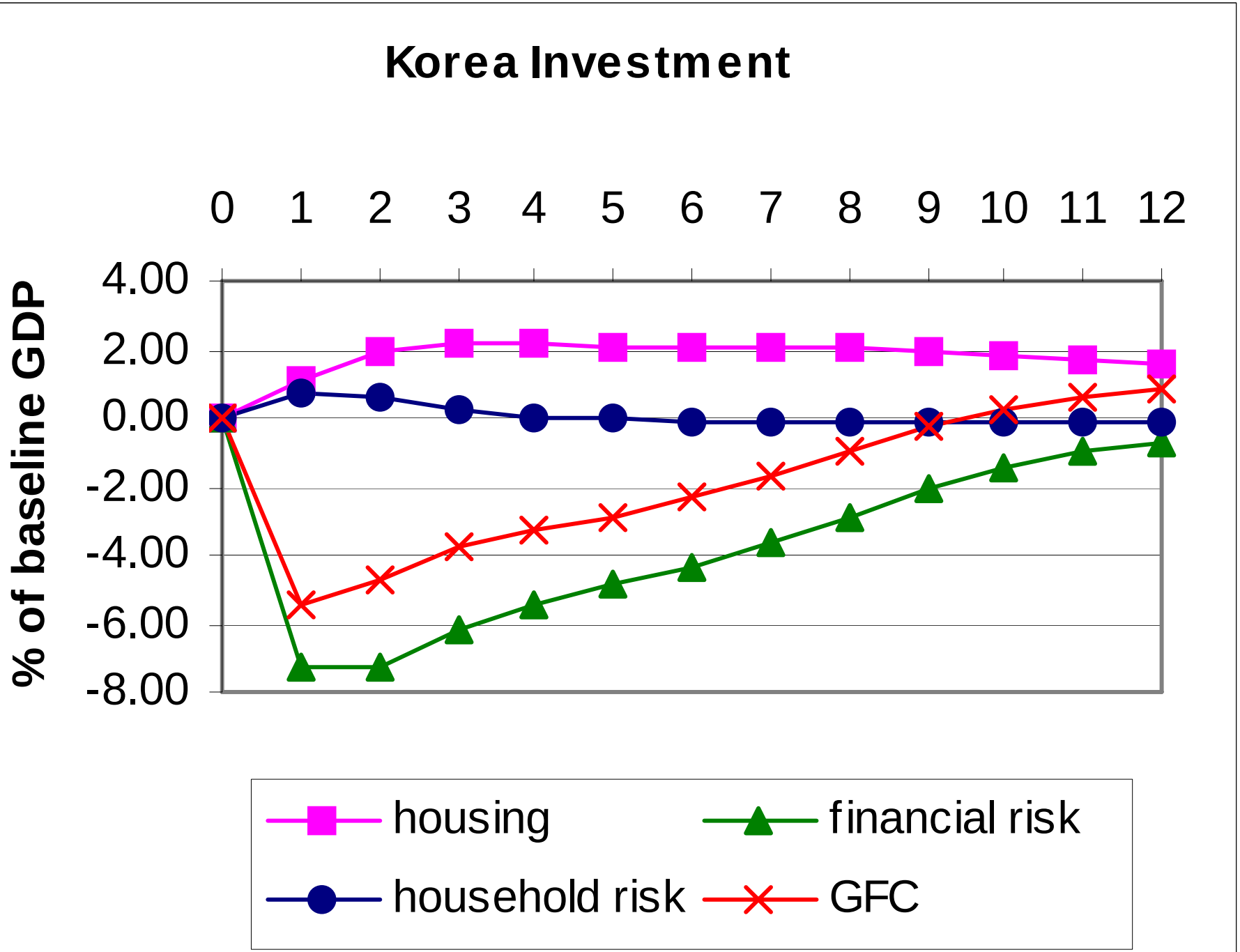

US Trade Balance
0
1
2
3
4
5
6
7
8
9
10
11
12
1.00
0.50
0.00
-0.50
-1.00
% of baseline GDP
housing
financial risk
household risk
GFC

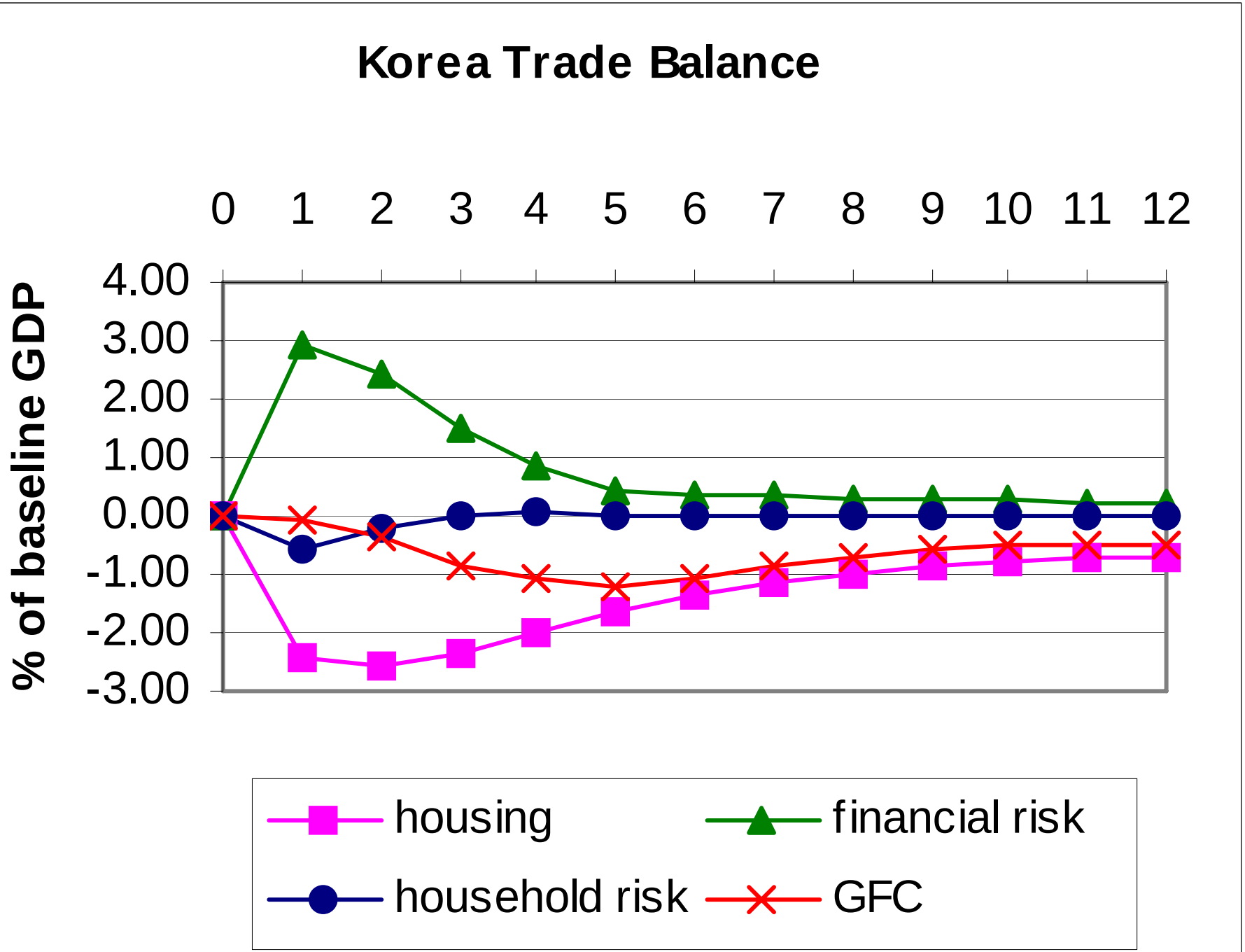

US Real Interest Rate
0
1
2
3
4
5
6
7
8
9
10
11
12
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
% point difference
housing
financial risk
household risk
GFC


US Inflation Rate
0
1
2
3
4
5
6
7
8
9
10
11
12
3.00
2.00
1.00
0.00
-1.00
-2.00
% point difference
housing
financial risk
household risk
GFC


Korea GDP
0
1
2
3
4
5
6
7
8
9
10
11
12
2.00
0.00
-2.00
-4.00
-6.00
% deviation
housing
financial risk
household risk
GFC


Korea Consumption
0
1
2
3
4
5
6
7
8
9
10
11
12
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
% of baseline GDP
housing
financial risk
household risk
GFC


Korea Investment
0
1
2
3
4
5
6
7
8
9
10
11
12
4.00
2.00
0.00
-2.00
-4.00
-6.00
-8.00
% of baseline GDP
housing
financial risk
household risk
GFC


Korea Trade Balance
0
1
2
3
4
5
6
7
8
9
10
11
12
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
% of baseline GDP
housing
financial risk
household risk
GFC

Impacts of different exchange rate Regimes

Table B-1: Impact on GDP (% deviation) in Year 1

United States

	HMT	Optimal	ACU	$Peg
Housing	-4.13	-3.74	-4.13	-4.13
Financial Risk	0.33	0.40	0.35	0.33
Household Risk	-0.61	0.09	-0.61	-0.61
GFC	-4.42	-3.24	-4.38	-4.42

United Kingdom

	HMT	Optimal	ACU	$Peg
Housing	-4.35	-4.97	-4.35	-4.35
Financial Risk	-0.65	-0.34	-0.65	-0.65
Household Risk	-0.74	-0.04	-0.75	-0.74
GFC	-5.73	-5.35	-5.75	-5.73

Japan

	HMT	Optimal	ACU	$Peg
Housing	-0.76	-0.38	-0.92	-0.76
Financial Risk	-1.20	-0.81	-1.34	-1.20
Household Risk	-0.80	-0.08	-0.99	-0.80
GFC	-2.76	-1.27	-3.25	-2.76

China

	HMT	Optimal	ACU	$Peg
Housing	-3.03	-2.17	-2.39	-3.06
Financial Risk	-2.49	-0.19	0.34	-2.61
Household Risk	-0.45	0.06	-0.31	-0.44
GFC	-5.97	-2.30	-2.36	-6.11

Table B-1: Impact on GDP (% deviation) in Year 1

Indonesia

	HMT	Optimal	ACU	$Peg
Housing	0.89	0.42	1.31	0.92
Financial Risk	-4.12	-1.89	-2.64	-4.40
Household Risk	0.42	0.39	0.53	0.44
GFC	-2.81	-1.07	-0.80	-3.03

Malaysia

	HMT	Optimal	ACU	$Peg
Housing	-3.12	-1.98	-2.70	-3.22
Financial Risk	-2.58	-0.68	-0.45	-2.84
Household Risk	0.24	0.52	0.36	0.26
GFC	-5.47	-2.14	-2.79	-5.80

Philippines

	HMT	Optimal	ACU	$Peg
Housing	2.44	2.11	2.66	2.45
Financial Risk	-4.81	-3.28	-3.96	-4.99
Household Risk	0.94	0.89	1.01	0.96
GFC	-1.43	-0.28	-0.29	-1.59

Thailand

	HMT	Optimal	ACU	$Peg
Housing	-0.35	0.01	-0.20	-0.39
Financial Risk	-1.86	-1.05	-1.13	-2.00
Household Risk	0.25	0.32	0.30	0.26
GFC	-1.96	-0.72	-1.02	-2.13

Conclusion

- The choice of monetary and exchange rate regimes in Asia have an impact on the transmission of the global financial crisis
- Pegging to $US tends to be worse than other regimes
- Optimal policy different to simple HMT rule
- ACU performs well for a global shock that is relatively symmetric within Asia but asymmetric relative to the US

Conclusion

- In most cases flexible exchange rates with a simple HMT rule outperforms these fixed exchange rate regimes but not always

www.sensiblepolicy.com