DEBT-DEFLATION TRAPS WITHIN SMALL OPEN ECONOMIES: A STOCK-FLOW CONSISTENT PERSPECTIVE

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Saed Khalil, PMA/U. Bilkent.

WHAT WE DO

WHAT WE DO

<1>Paper takes Ireland's current economic crisis as 'inspiration'.</1>

<2> We build a 2 country stock flow consistent model. </2>

<3> Show effects of a debt-deflation cycle on households, firms, banks, the government, and the central bank in each country. </3>

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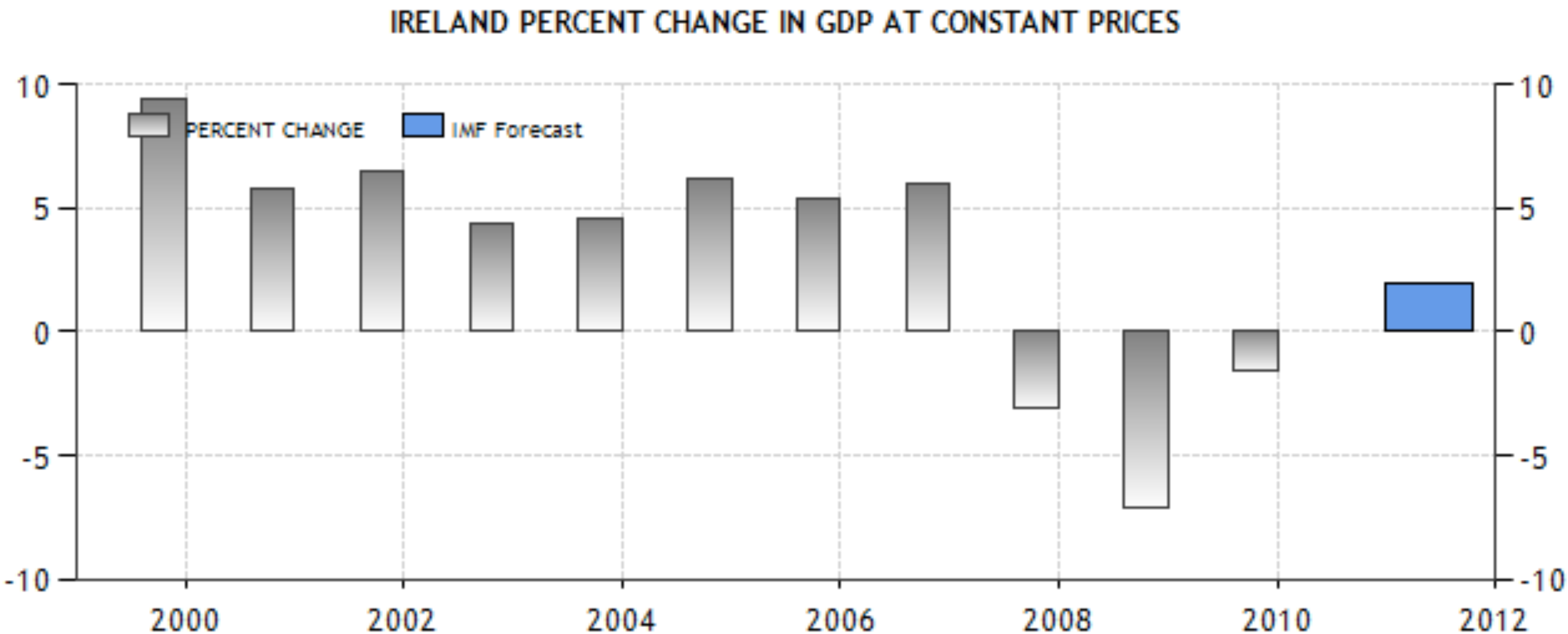
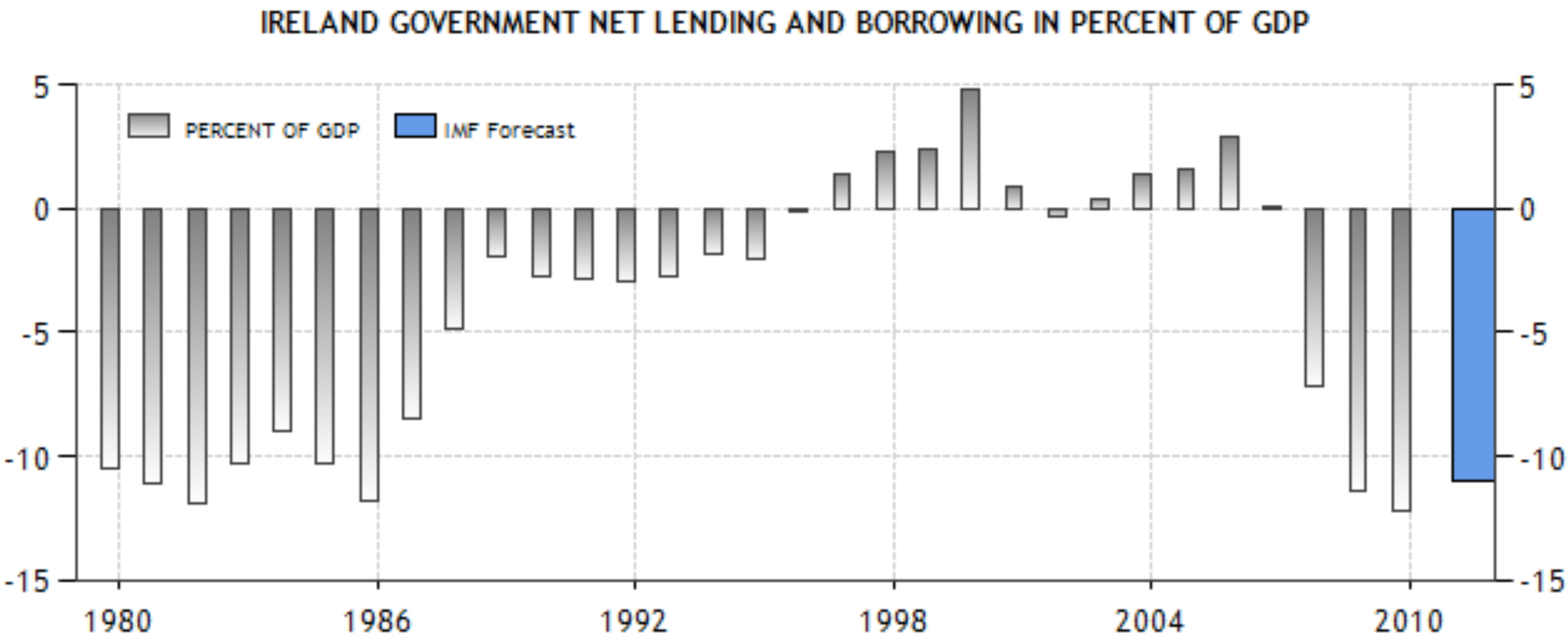
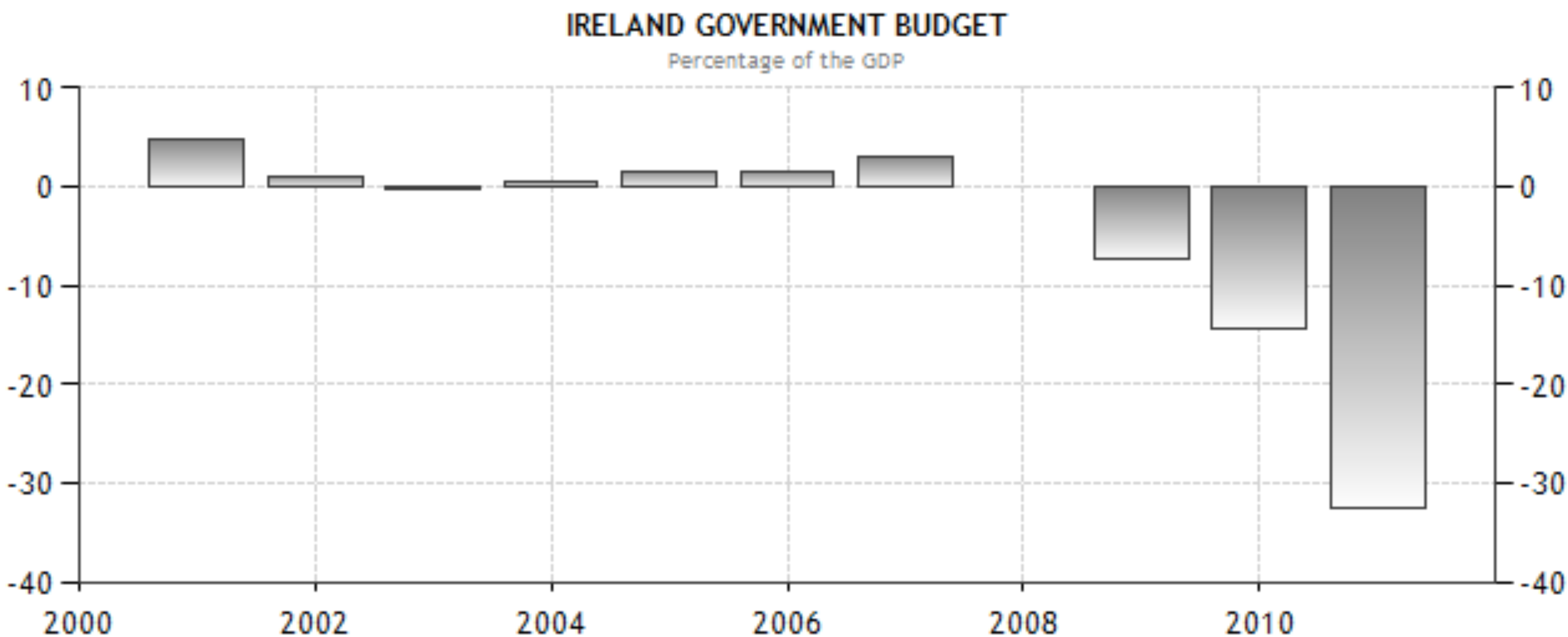
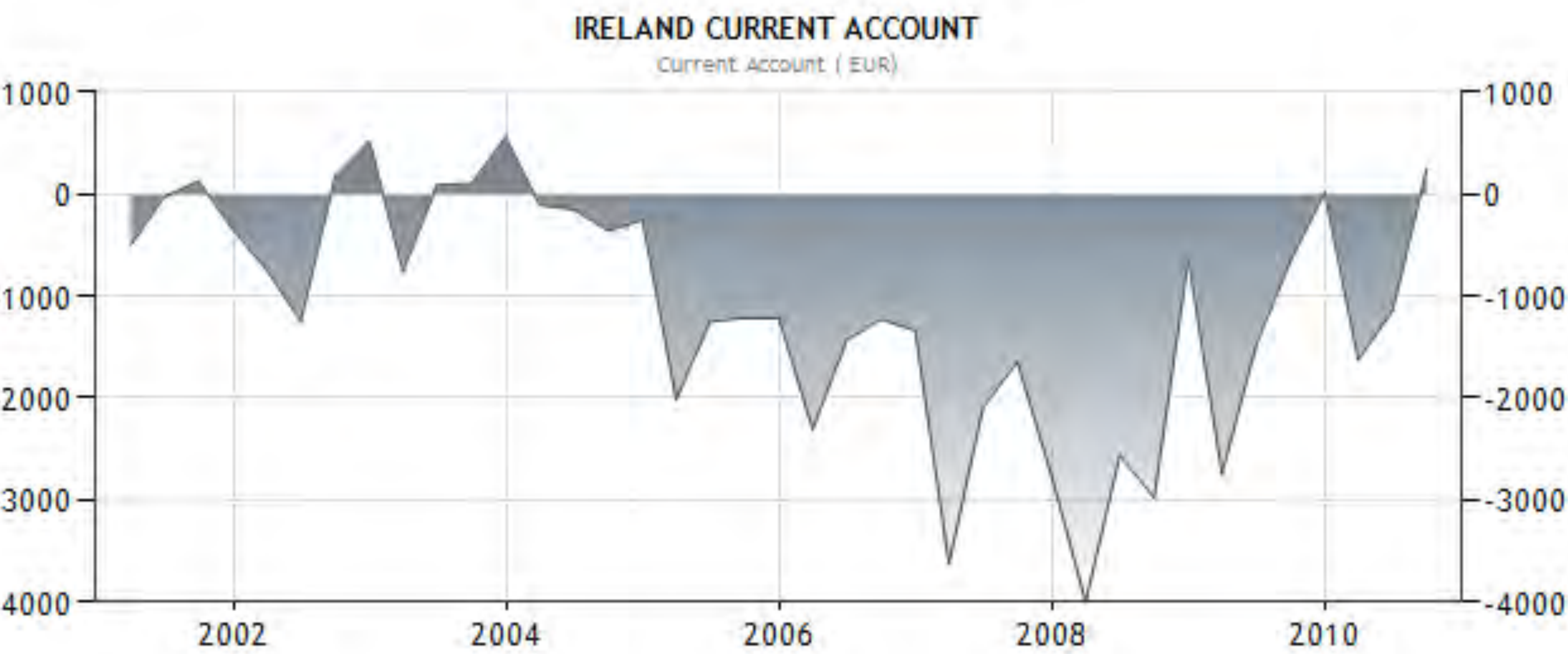
ROMANTIC IRELAND'S DEAD AND GONE.


IRELAND PERCENT CHANGE IN GDP AT CONSTANT PRICES
PERCENT CHANGE
IMF Forecast
10
5
0
-5
-10
2000
2002
2004
2006
2008
2010
2012

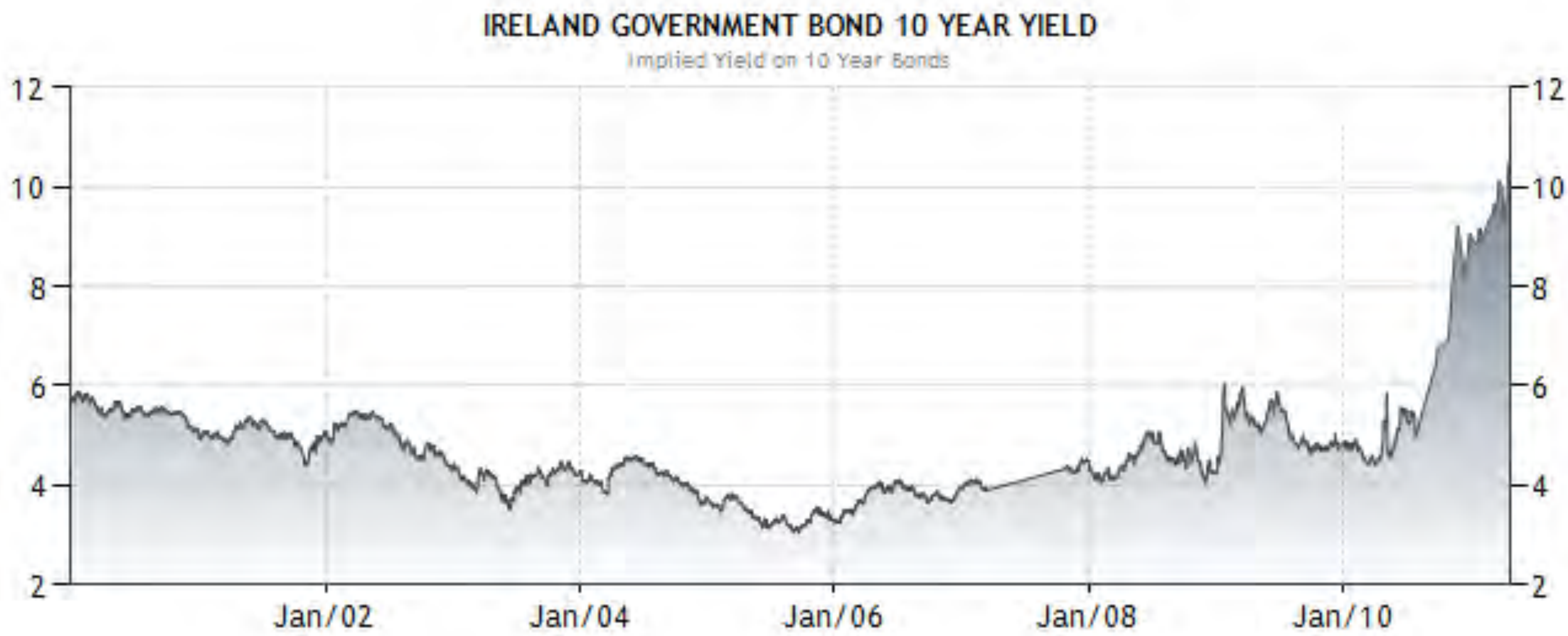

IRELAND UNEMPLOYMENT RATE
Percentage of the Labor Force
16
14
12
10
8
6
4
Jan/08
Jan/09
Jan/10
Jan/11

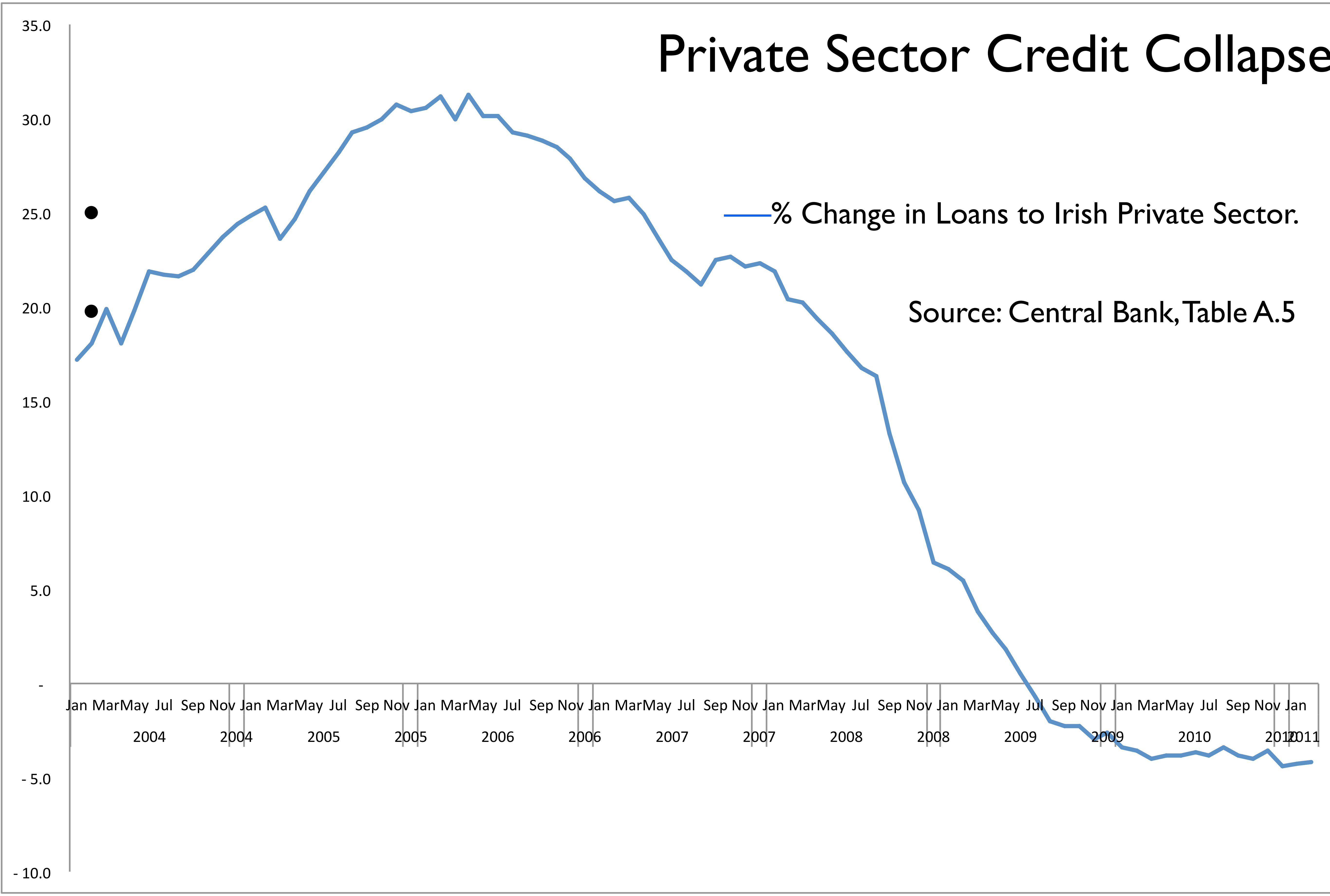

IRELAND GOVERNMENT NET LENDING AND BORROWING IN PERCENT OF GDP
PERCENT OF GDP
IMF Forecast
5
0
-5
-10
-15
1980
1986
1992
1998
2004
2010

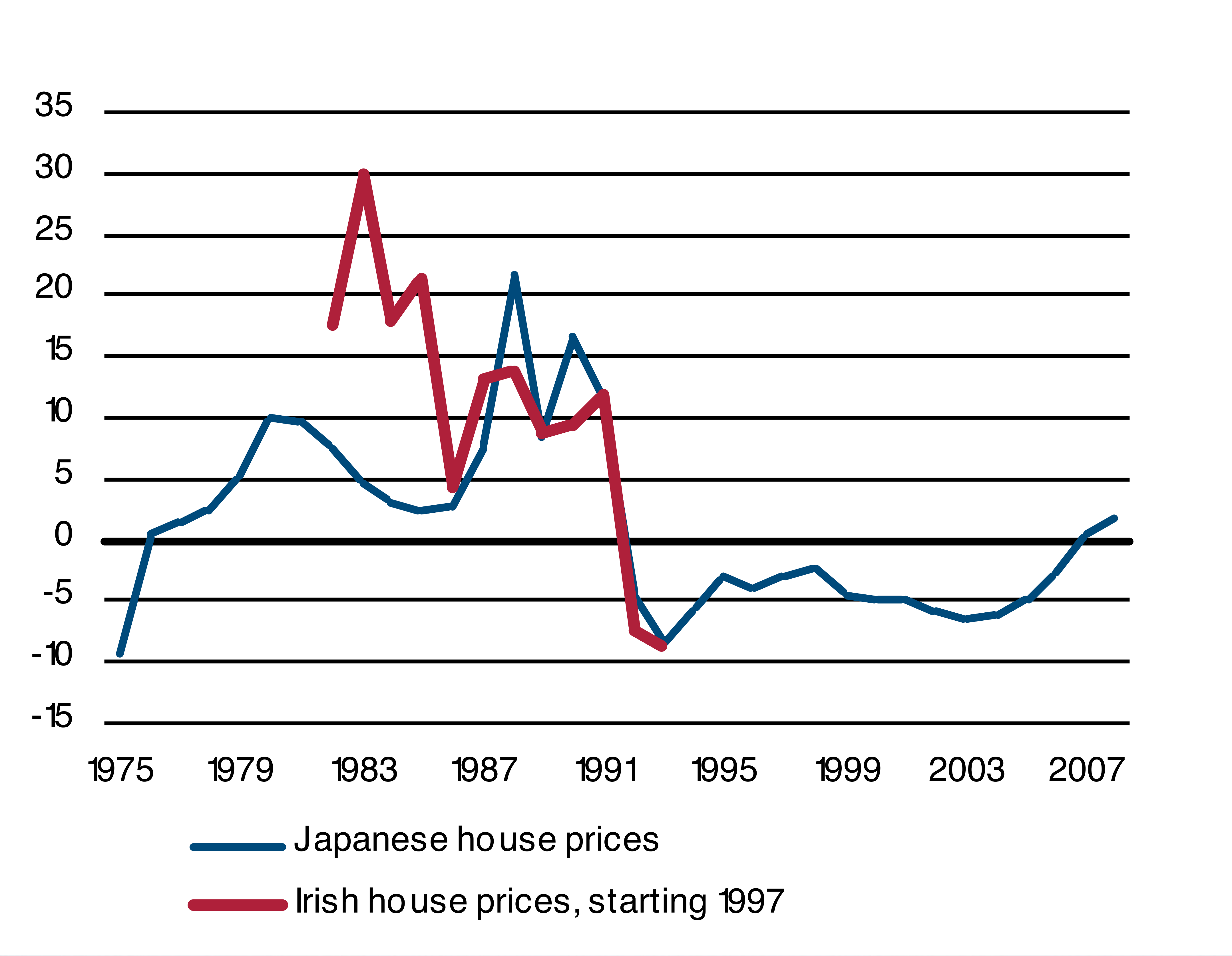

IRELAND GOVERNMENT BUDGET
Percentage of the GDP
10
0
-10
-20
-30
-40
2000
2002
2004
2006
2008
2010



IRELAND CURRENT ACCOUNT
Current Account (EUR)
1000
0
1000
2000
3000
4000
-1000
-2000
-3000
-4000
2002
2004
2006
2008
2010


IRELAND GOVERNMENT BOND 10 YEAR YIELD
Implied Yield on 10 Year Bonds
12
10
8
6
4
2
Jan/02
Jan/04
Jan/06
Jan/08
Jan/10


Private Sector Credit Collapse
% Change in Loans to Irish Private Sector.
Source: Central Bank, Table A.5
35.0
30.0
25.0
20.0
15.0
10.0
5.0
-
- 5.0
- 10.0
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2004 2004 2005 2005 2006 2006 2007 2007 2008 2008 2009 2009 2010 2010 2011



Ireland and Japan: Great Similarities.

Source: Bloomberg

Mortgage Debt as % of GDP, selected countries.

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	2002	2003	2004	2005	2006	2007	%Δ

Mortgage Debt as % of GDP, selected countries.

	2002	2003	2004	2005	2006	2007	%Δ
France	22.5	24.1	26	28.8	32.9	34.9	55

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Greece	14.7	16.9	19.6	23.7	26.8	30.2	105

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Hungary	0	7.7	9.4	10.2	11.9	12.4	61

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Mortgage Debt as % of GDP, selected countries.

	2002	2003	2004	2005	2006	20
France	22.5	24.1	26	28.8	32.9	3
Finland	21.5	24.7	27.3	30.9	32.4	3
Germany	43	43.4	43	42.9	42.3	4
Greece	14.7	16.9	19.6	23.7	26.8	3
Hungary	0	7.7	9.4	10.2	11.9	1
Iceland	88	86.3	88.8	102.1	-	
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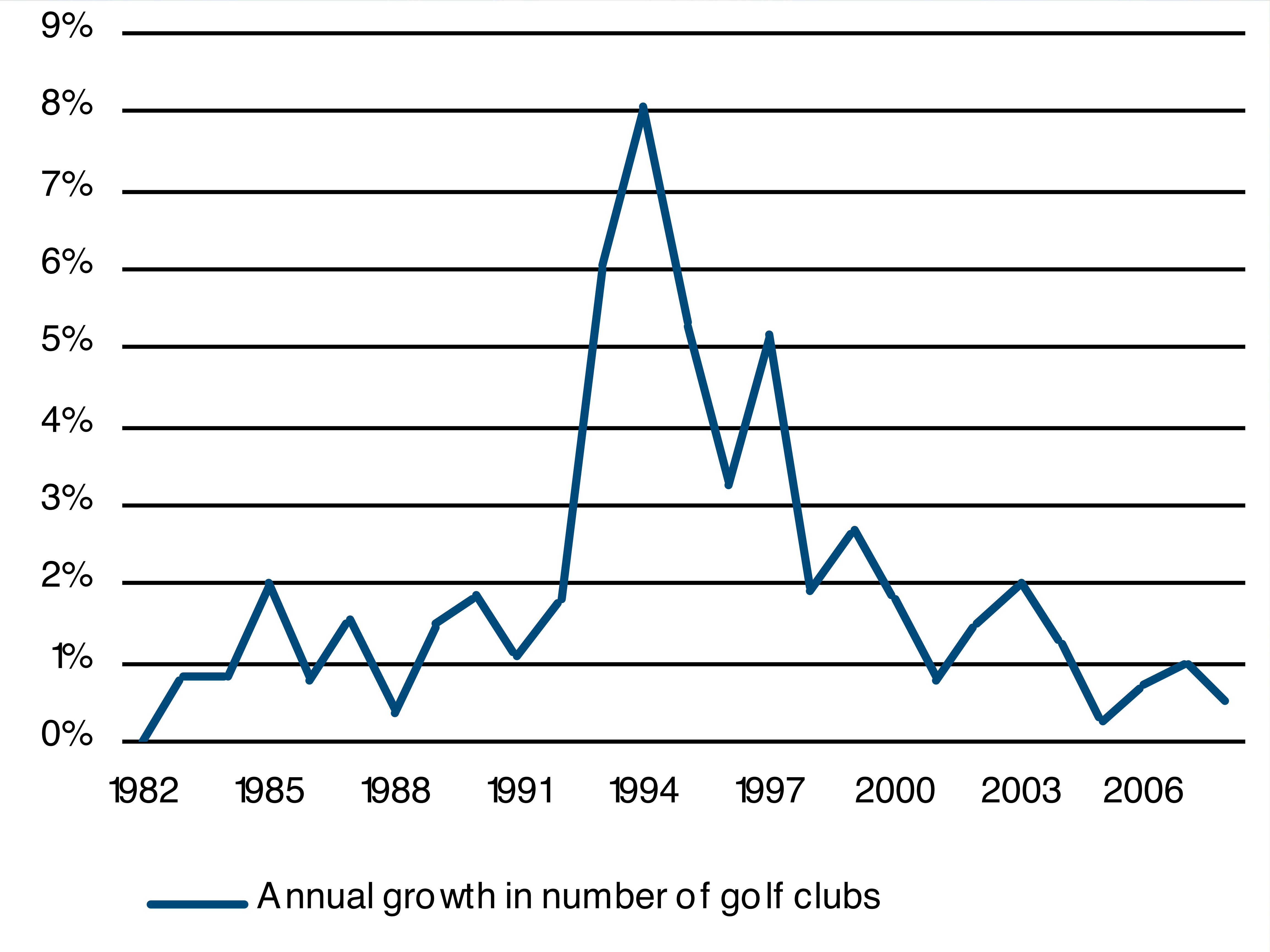
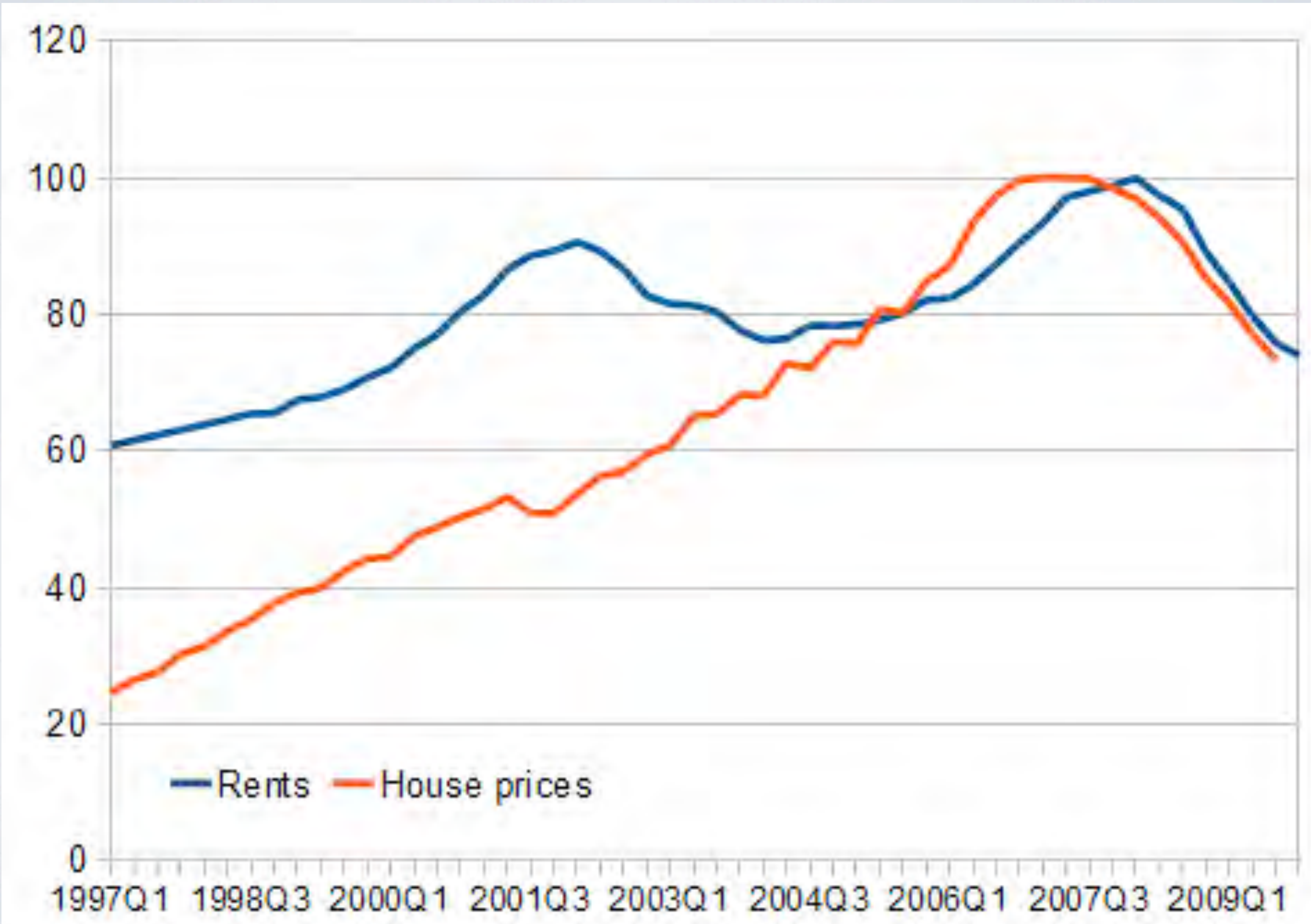
Mortgage Debt as % of GDP, selected countries.



Bubblicious.

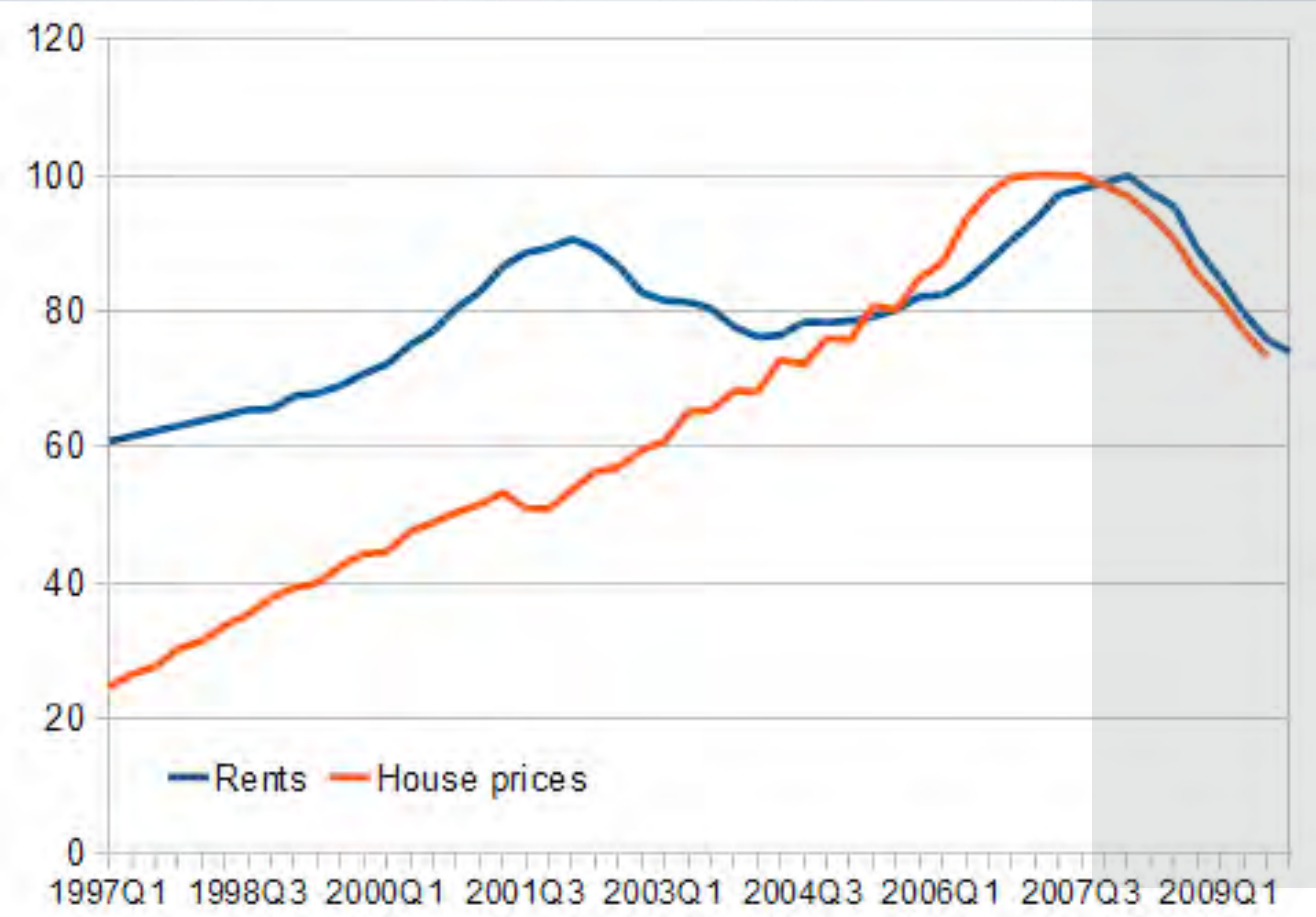
Source: GUI.

ASSET PRICE DEFLATION



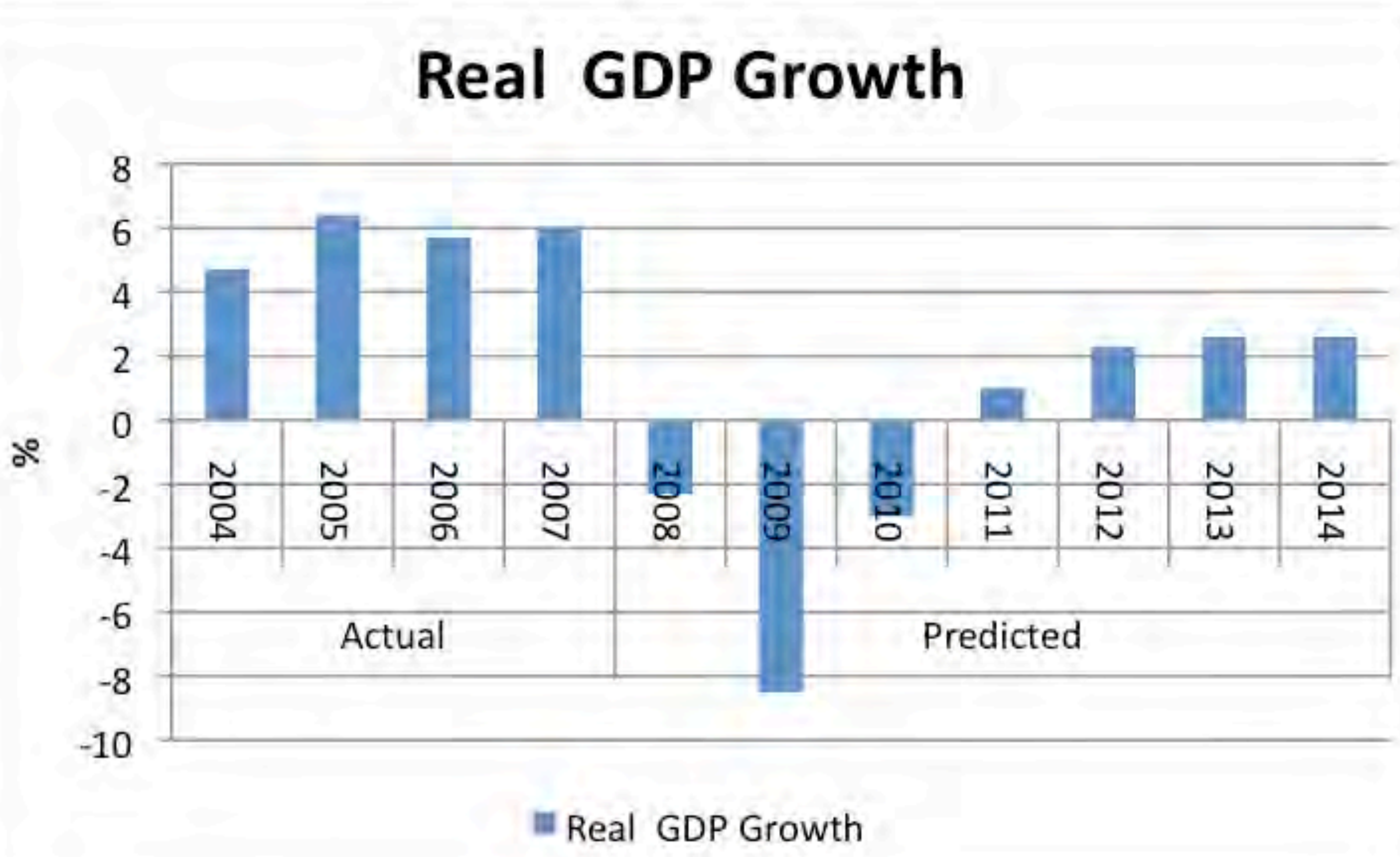
Source: Ronanlyons.com

ASSET PRICE DEFLATION



Source: Ronanlyons.com

COLLAPSE IN AGGREGATE DEMAND



Source: IMF Country Report.

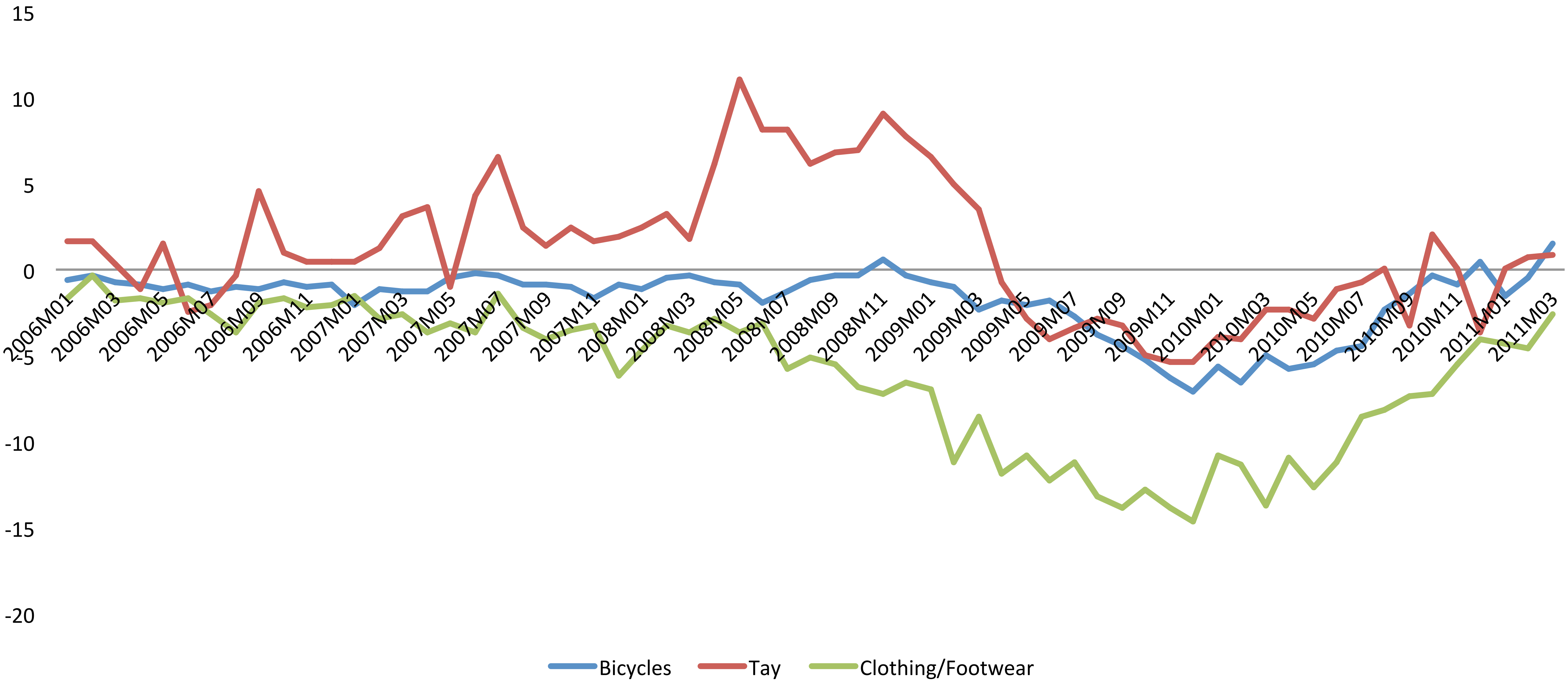
COLLAPSE IN AGGREGATE DEMAND

Source: IMF Country Report.

INFLATION (PRIVATE)

Food, Alcohol, Clothing, Recreation, Culture, Restaurants, Hotels. All still negative.

Consumer Price Index by Detailed Sub Indices, Month and Statistic, % Change from 1 year ago.



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ROMANTIC IRELAND'S DEAD AND GONE.

<2>
DEBT-DEFLATION MODELS

WHAT WE DO

- We build a 2 country stock flow consistent model.
- Show effects of a debt-deflation cycle on households, firms, banks, the government, and the central bank in each country.

SO WHAT?

- We find price collapses across the economy can sustain a downturn, even as other areas of the economy experience a return to growth.
- Within a currency union, with one small country experiencing a deflation, only transfers from the larger country, and increased government expenditure in both, can bring the economy out of a deflationary spiral

TOBIN, 1980

- "When nominal prices and wages are deflated, debt service is a higher proportion of debtors' incomes, and the reduction or elimination of their margins of equity disqualifies them from further access to credit. Bankruptcies and defaults do likewise, and transmit the distress of debtors to their creditors, threatening the solvency and liquidity of individual lenders and financial institutions."

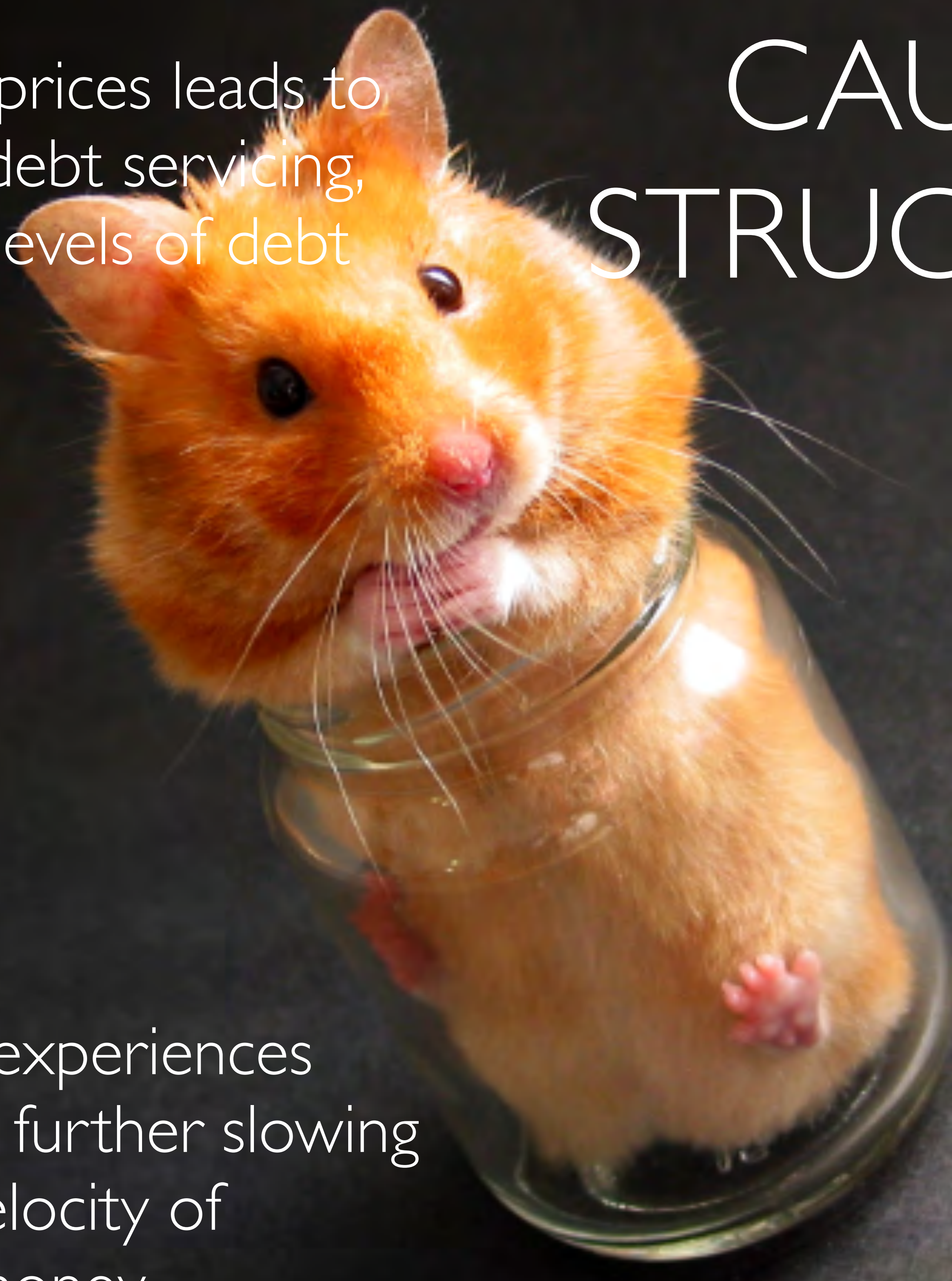
CAUSAL STRUCTURES

A macroeconomic shock occurs following a buildup of debt in the form of *Bills, Bonds*, and *Equities*, which causes debt liquidation, leading to distressed selling

- leads to a contraction of deposit currency and of its velocity
- Economy experiences a fall in the level of prices, and a still greater fall in the net worth of businesses.
- Businesses record falls in their profits.
- There follows a reduction in output, in trade, and in employment of labour, leading to pessimism and loss of confidence.

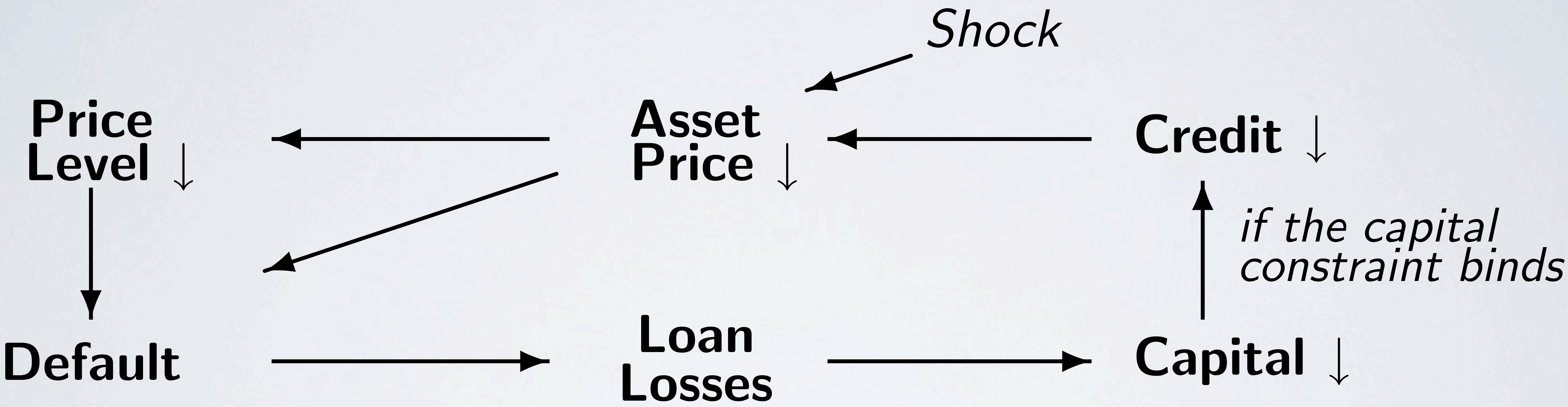
CAUSAL STRUCTURES

- The decline in prices leads to an increase in debt servicing, and this offset levels of debt liquidation

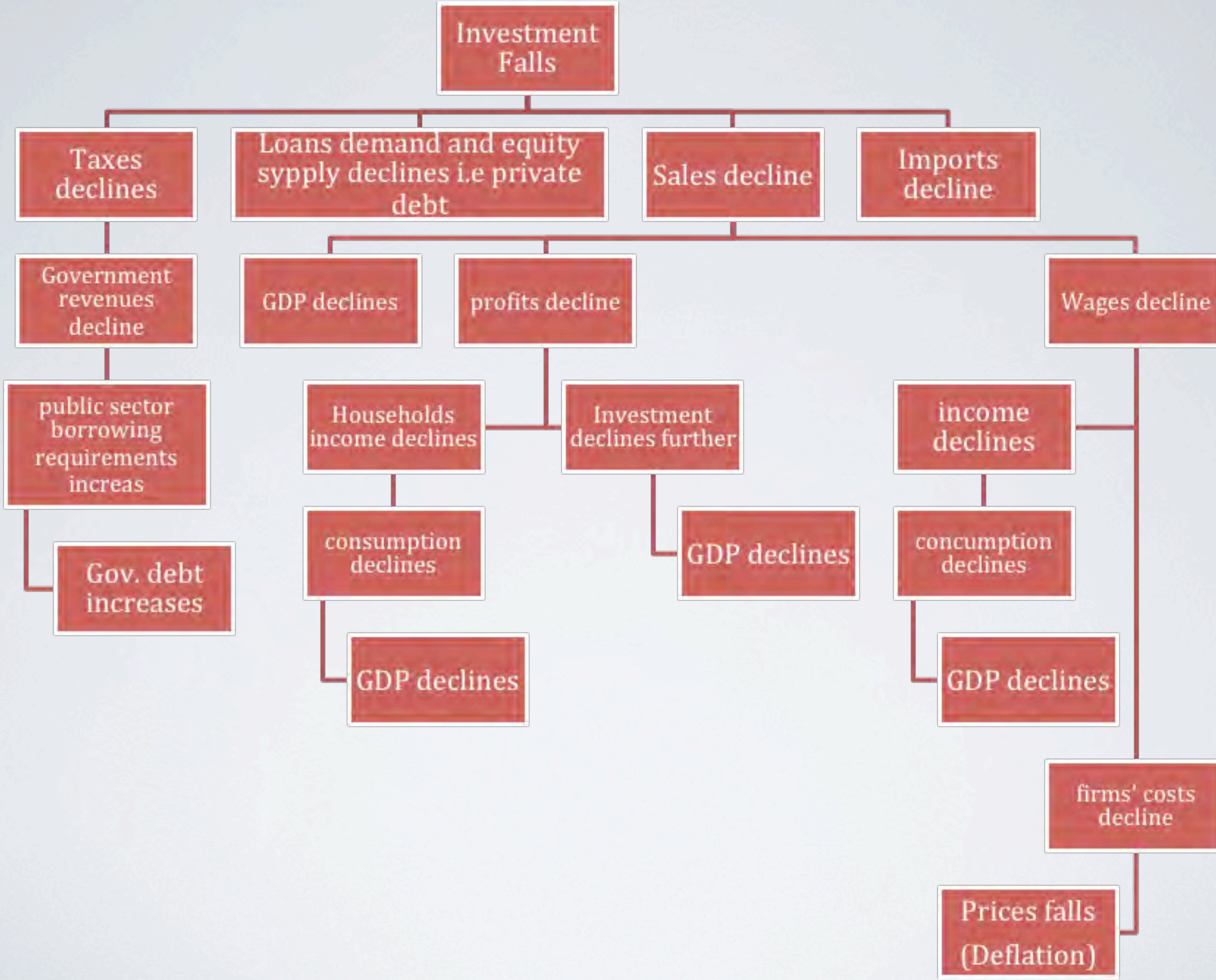


- The economy experiences hoarding and a further slowing down of the velocity of circulation of money

SIMPLE MODEL



LESS SIMPLE, BUT MORE COLOURFUL, MODEL.


Investment Falls
Taxes declines
Loans demand and equity sypply declines i.e private debt
Sales decline
Imports decline
Government revenues decline
GDP declines
profits decline
Wages decline
public sector borrowing requirements increas
Households income declines
Investment declines further
income declines
Gov. debt increases
consumption declines
GDP declines
concumption declines
GDP declines
GDP declines
firms' costs decline
Prices falls (Deflation)

BALANCE SHEETS

- Assume 2 countries, 5 sectors (households, firms, government, private banks, central banks)
- Country 1 is assumed to be large relative to country 2, in terms of population, trade flows, and overall economic output.
- The exchange rate, *E* mediates between the two nations in the usual way.
- We assume a floating exchange rate.
- All assets are in monetary units.
- Households and firms in this model hold several assets: treasury bills, B, bonds, BL, and equities, e.

INVESTMENT SHOCK

- Investment drops 33% in Country 1.
- Compare results for a floating exchange rate & currency union

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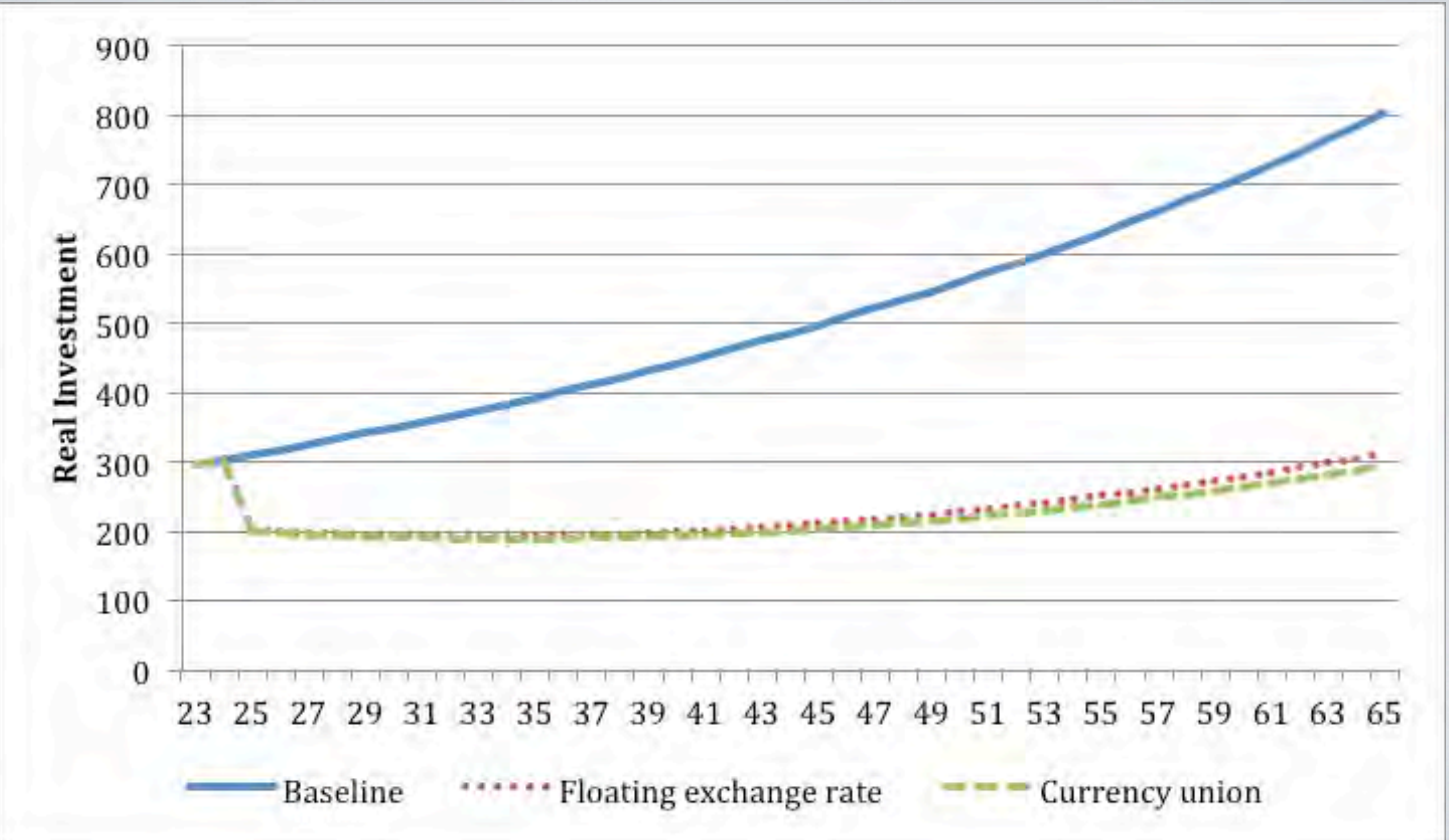
DEBT-DEFLATION MODELS

<3>

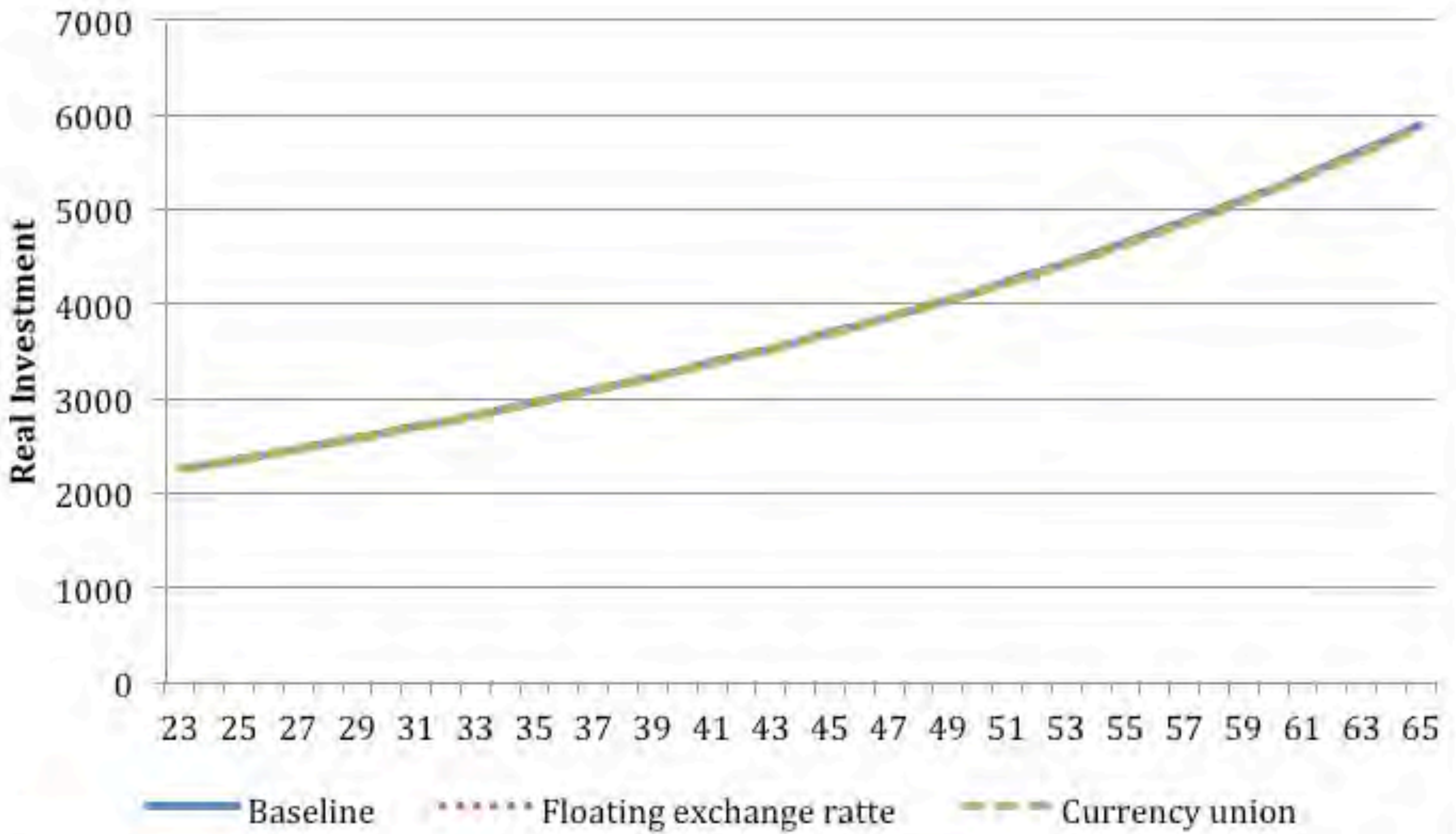
RESULTS

COUNTRY 1



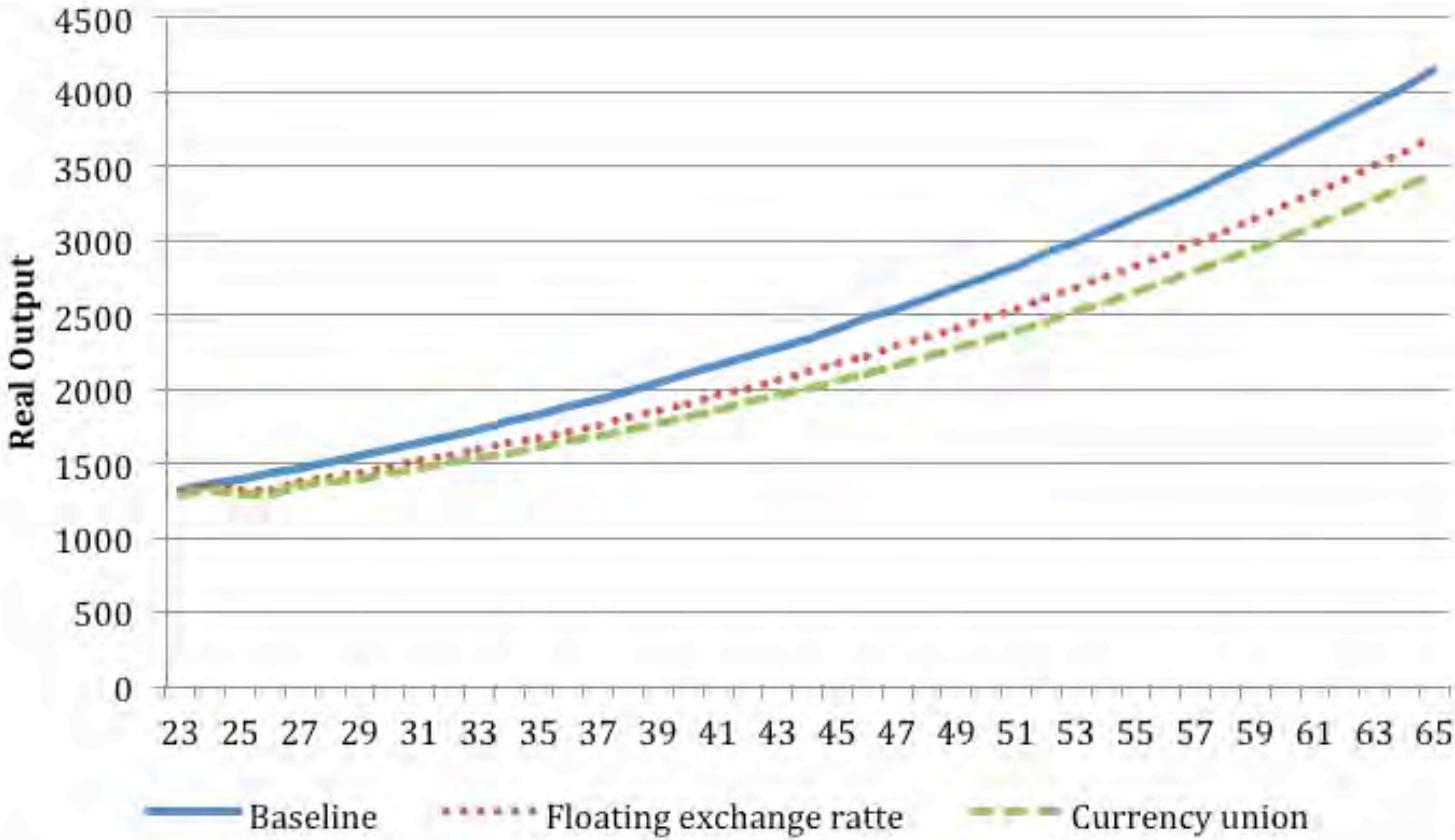
900
800
700
600
500
400
300
200
100
0
Real Investment
23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65
Baseline
Floating exchange rate
Currency union

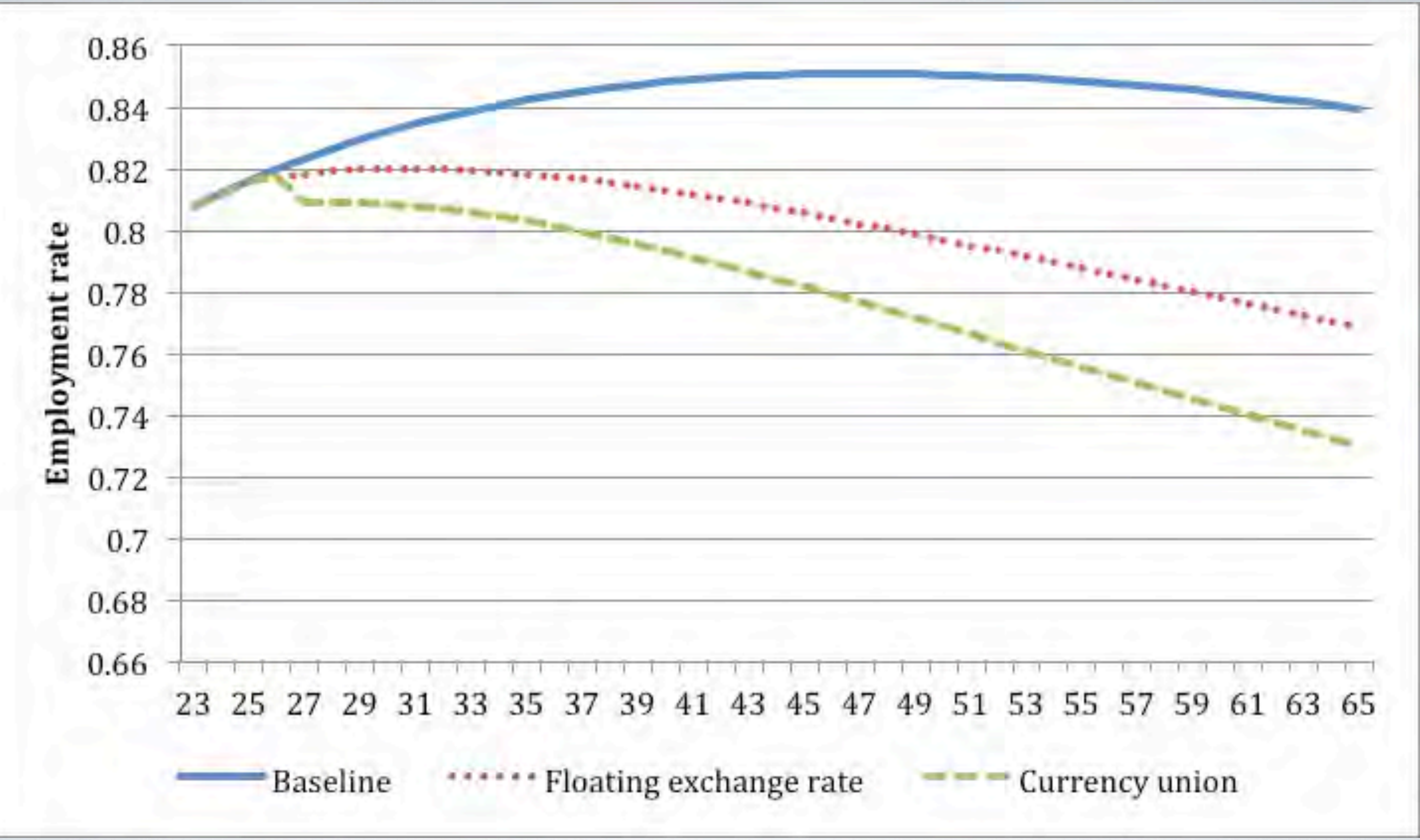
COUNTRY 2

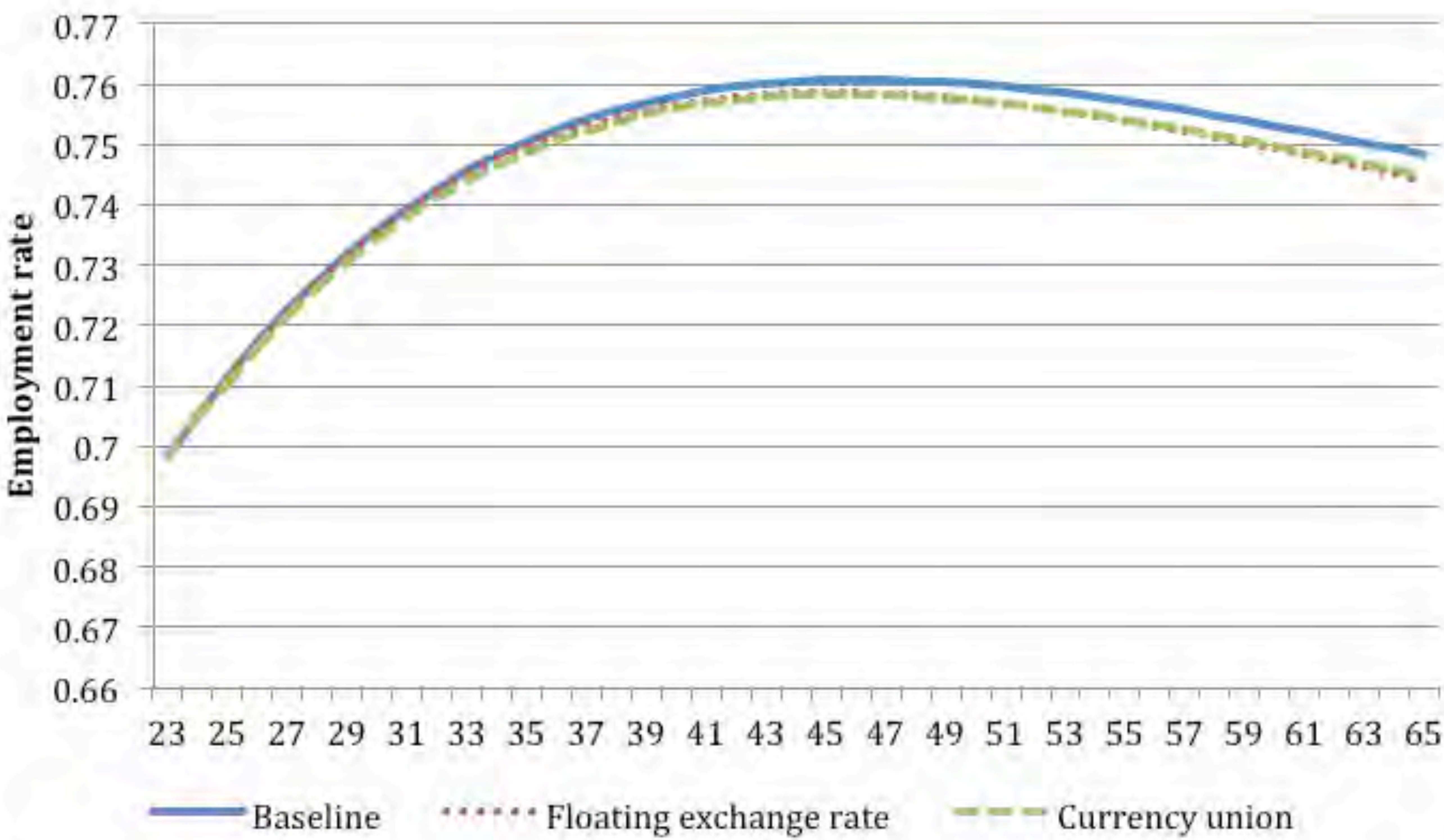


Real Investment
7000
6000
5000
4000
3000
2000
1000
0
23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65
Baseline
Floating exchange ratte
Currency union

REAL GDP IN COUNTRY 1

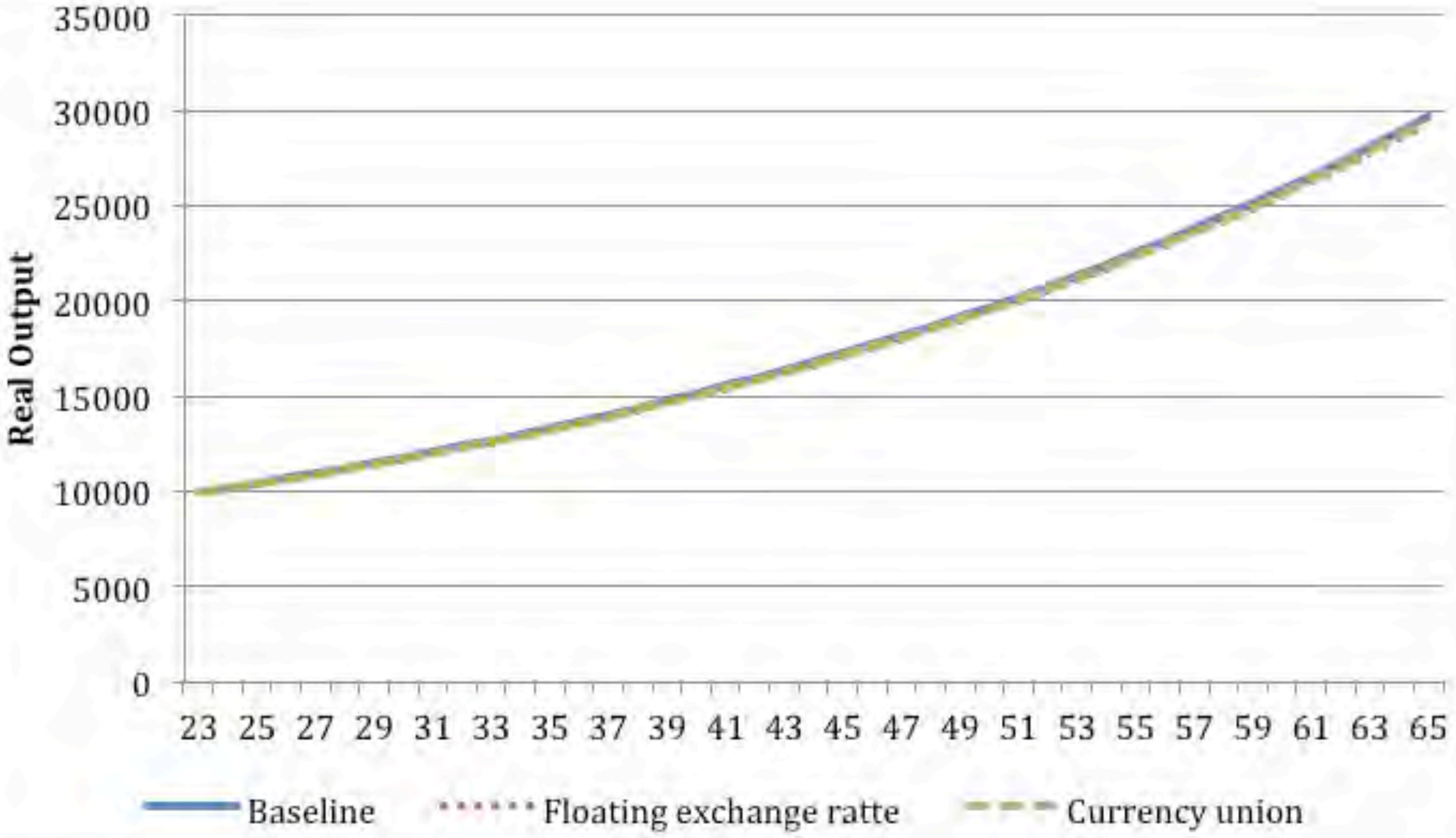



0.86
0.84
0.82
0.8
0.78
0.76
0.74
0.72
0.7
0.68
0.66
Employment rate
23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65
Baseline
Floating exchange rate
Currency union

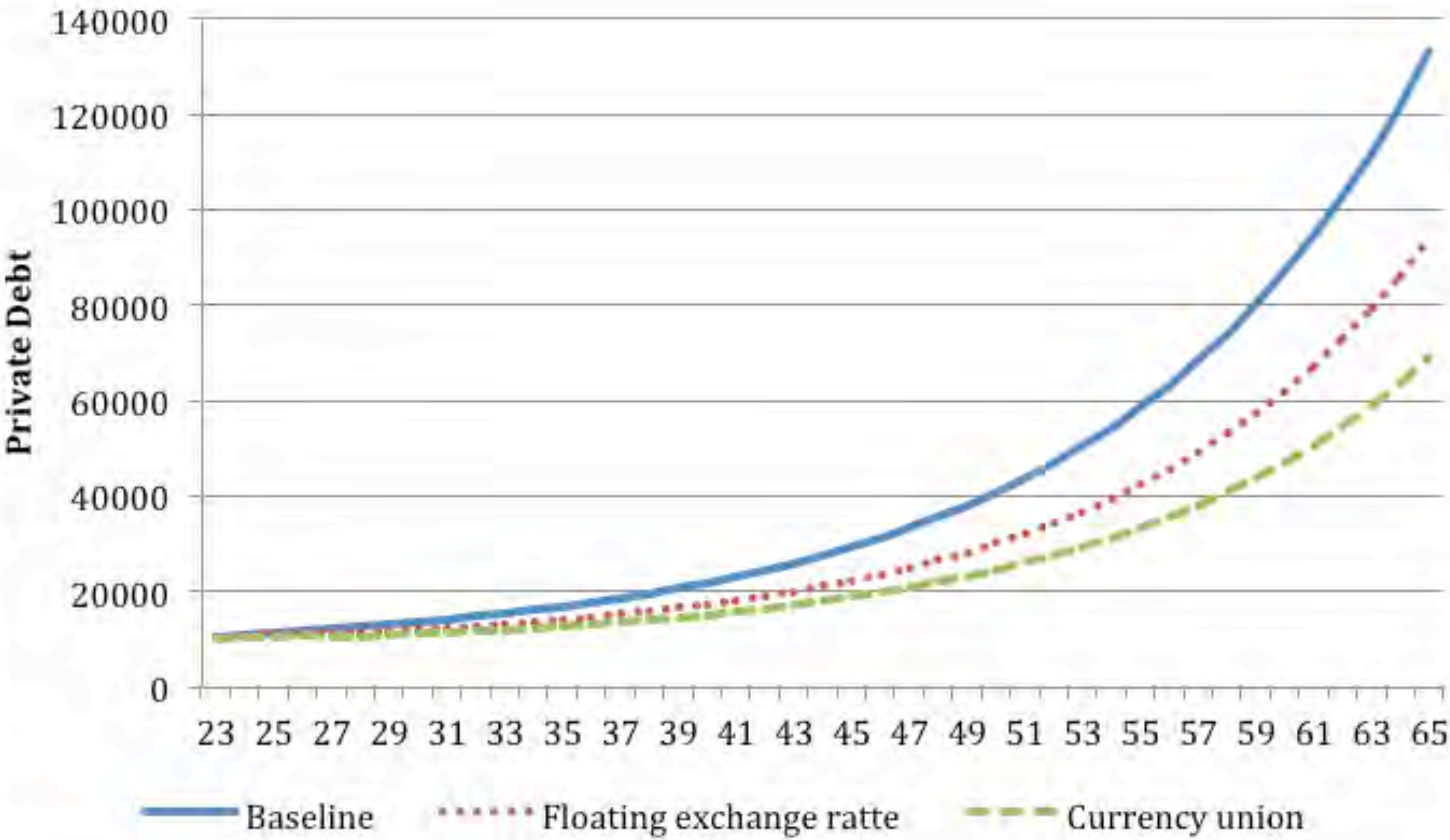


0.77
0.76
0.75
0.74
0.73
0.72
0.71
0.7
0.69
0.68
0.67
0.66
Employment rate
23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65
Baseline
Floating exchange rate
Currency union

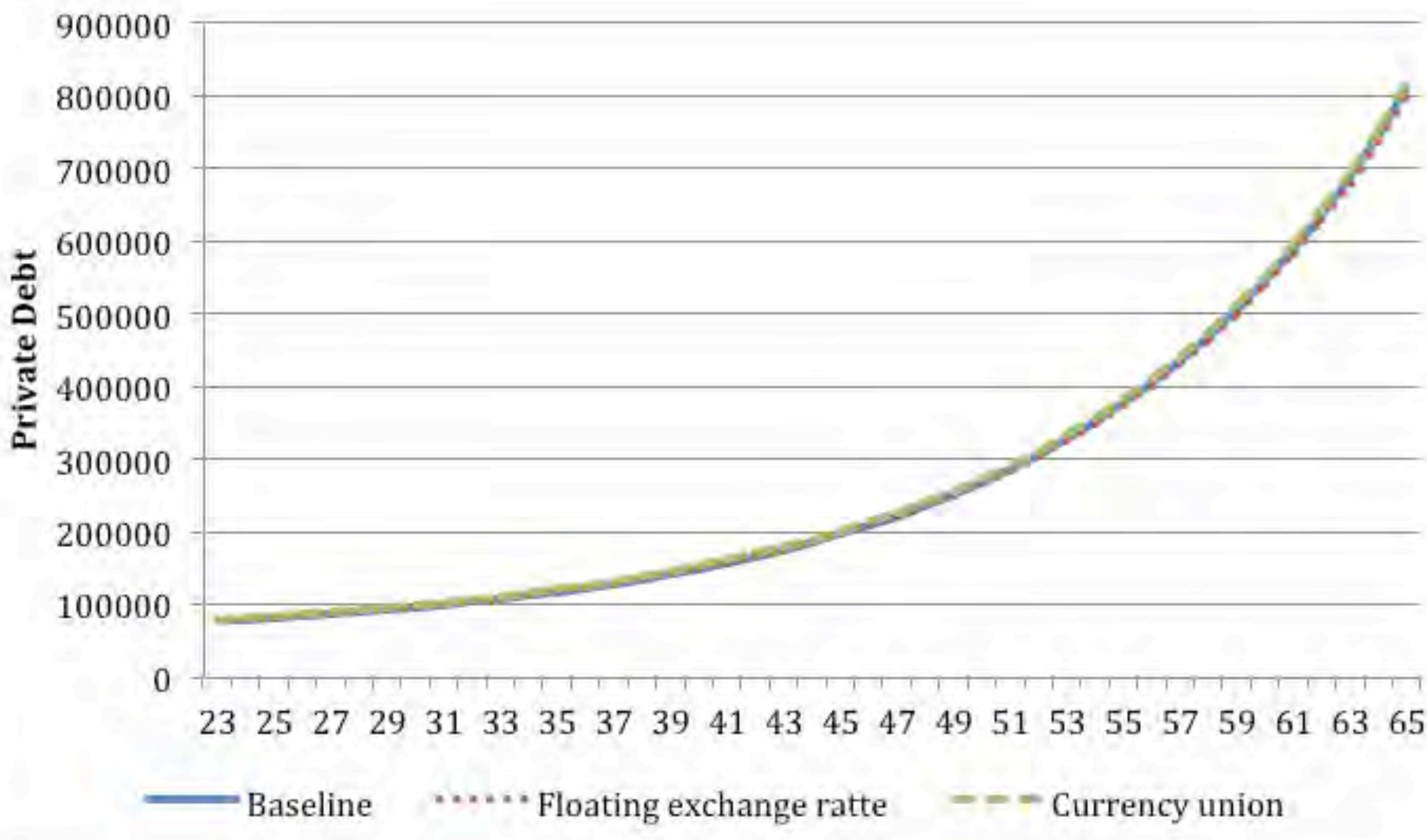
REAL GDP COUNTRY 2



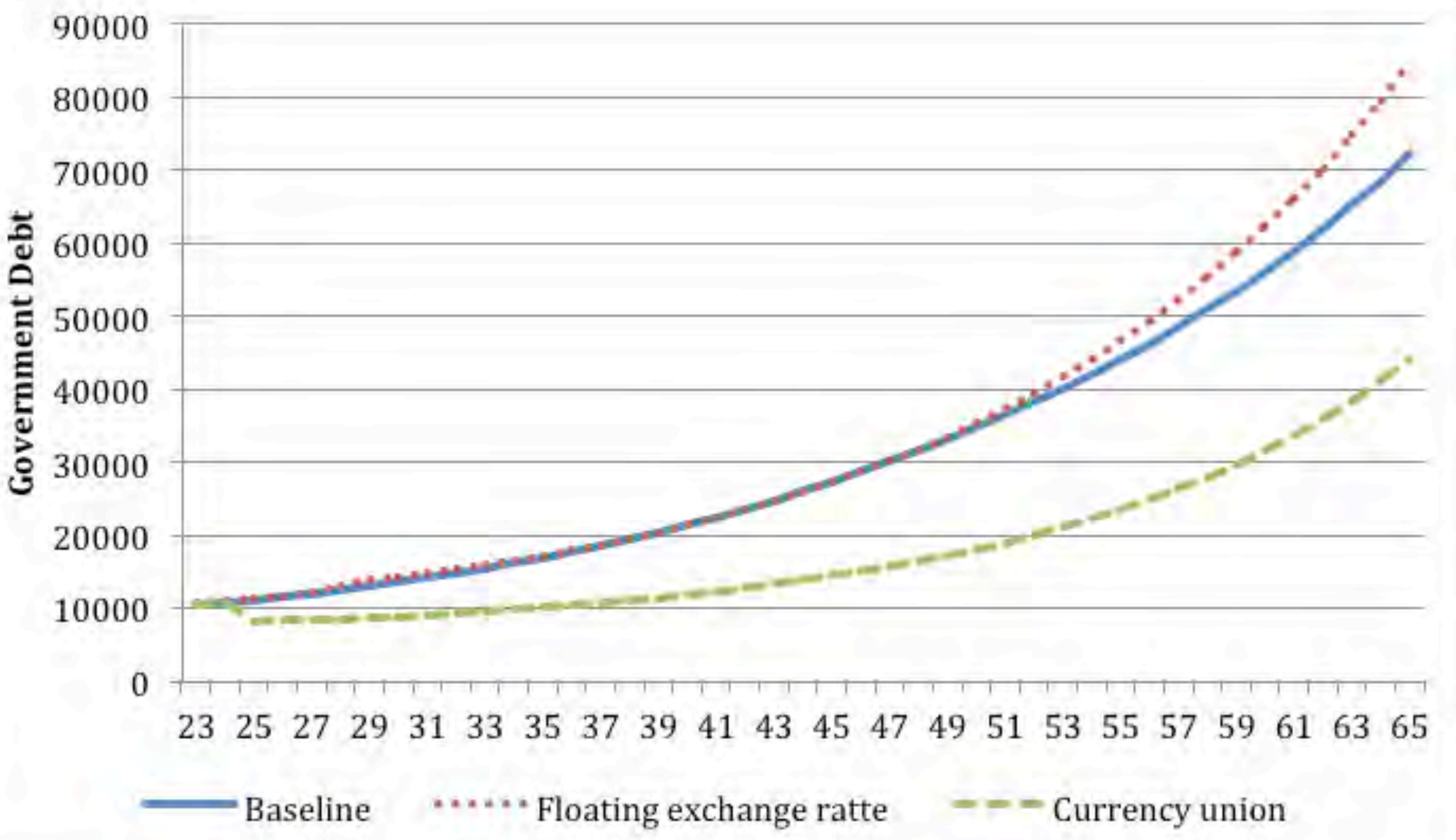
Private Debt Levels Country 1



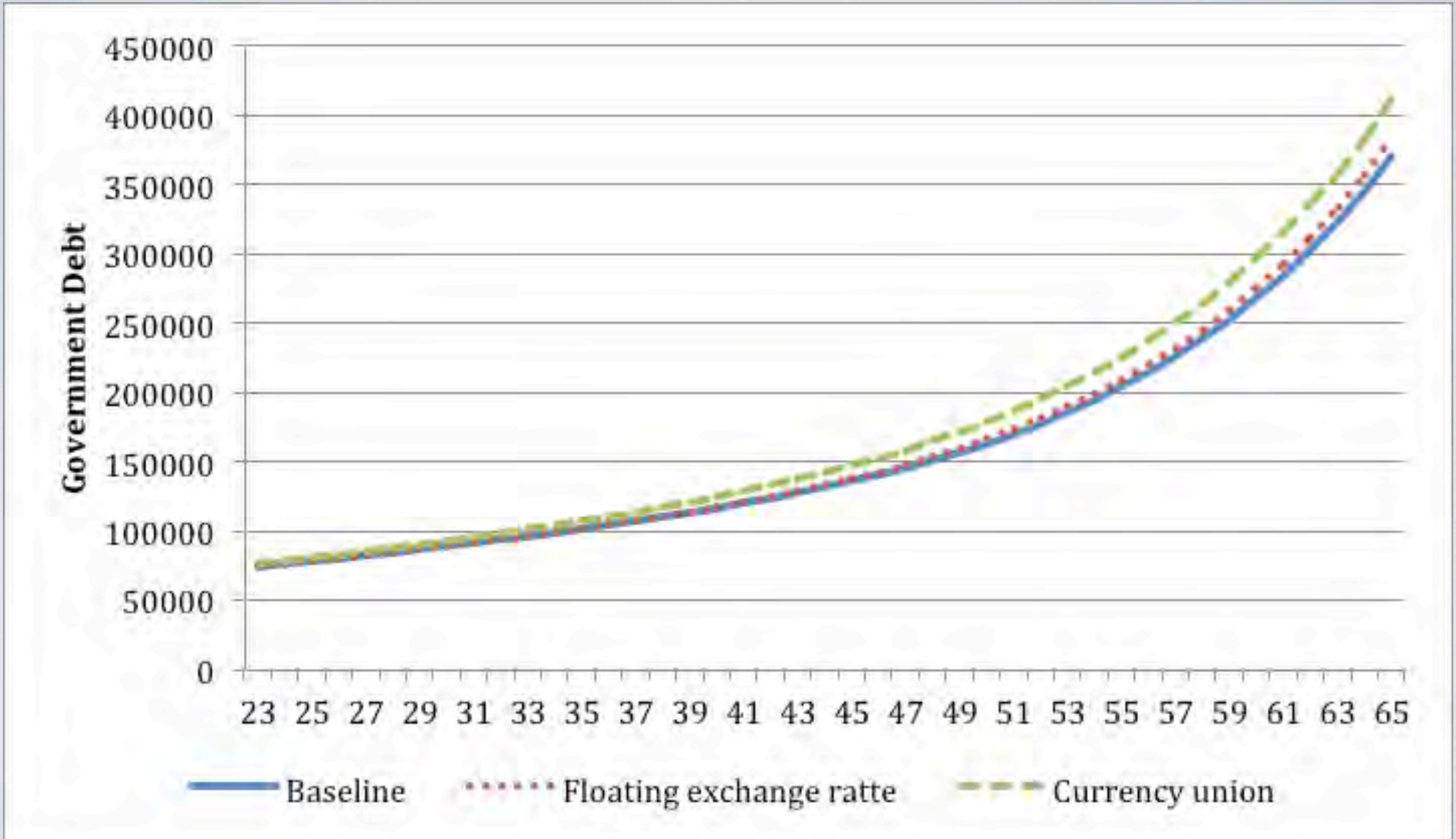
PRIVATE DEBT COUNTRY 2



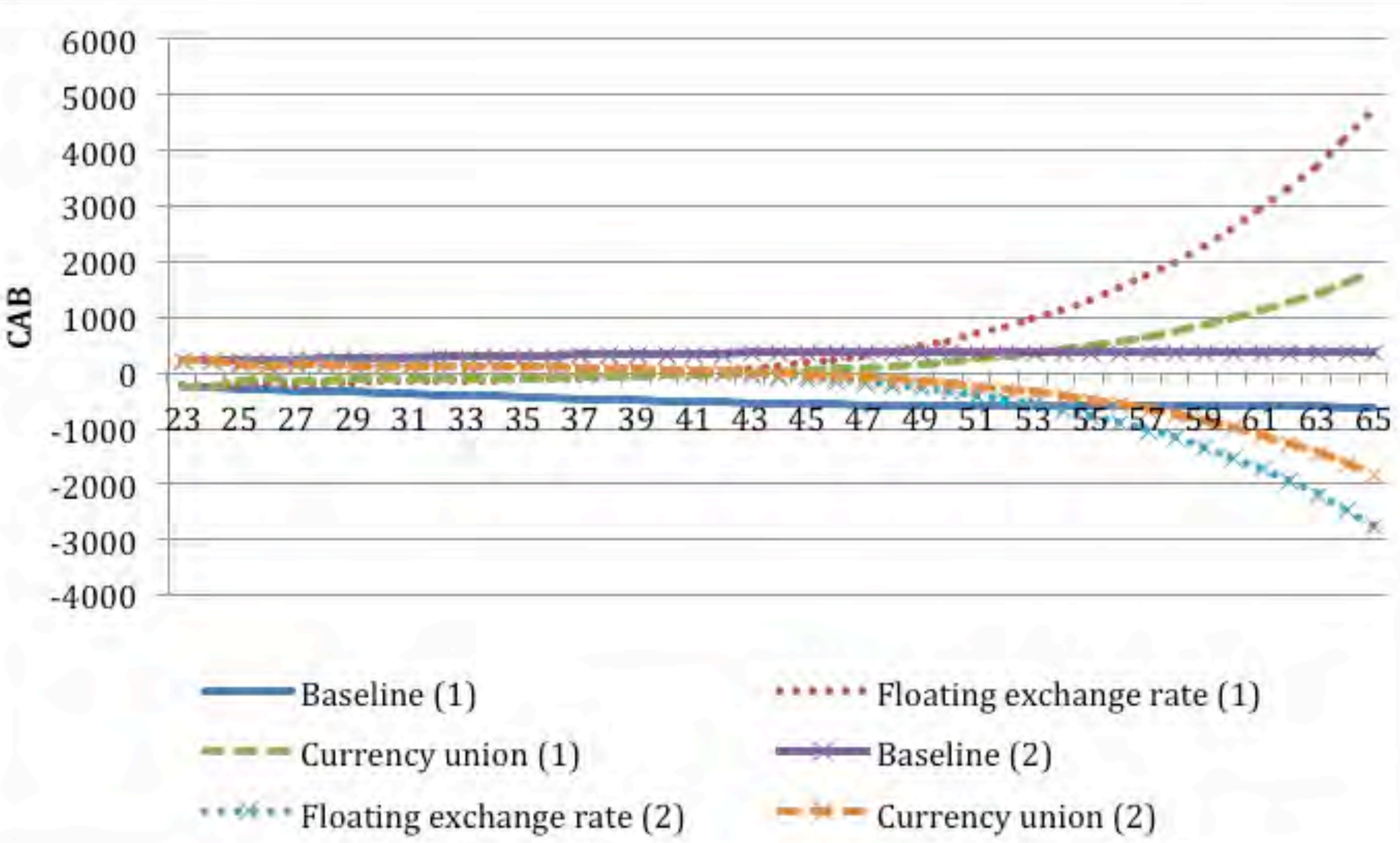
GOVT DEBT LEVEL C 1



GOVT DEBT LEVEL C 2



INVESTMENT SHOCK IN CURRENCY UNION.



</3>
RESULTS

SUMMARY

- Only factor to retain balance is fiscal policy and transfers from the centre.
- An argument for fiscal union?
- Future work: effect of non performing loans on bank behaviour and overall economic output.