

# GMO

North America | Europe | Asia-Pacific

## The Credit Crisis: Thoughts on Deleveraging

March 2009

Presentation to Inquire Seminar, Edinburgh

By

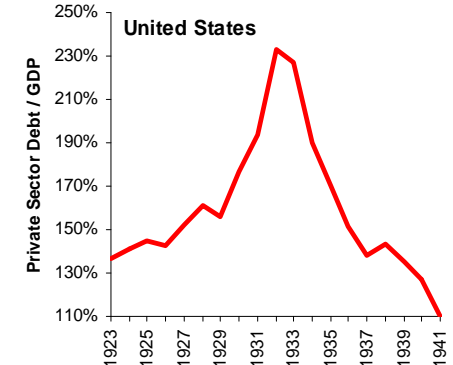
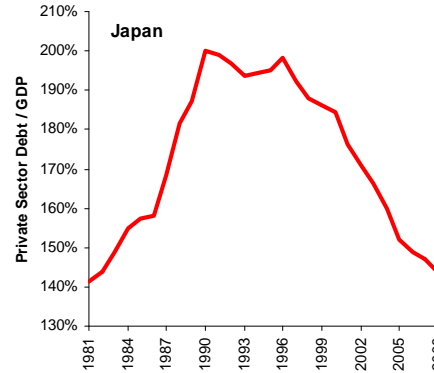
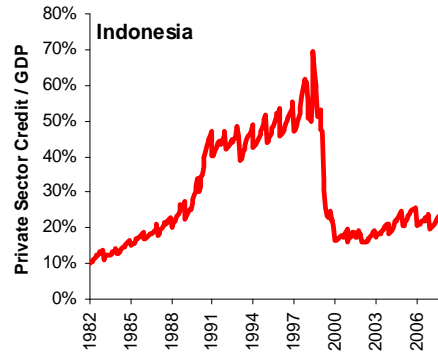
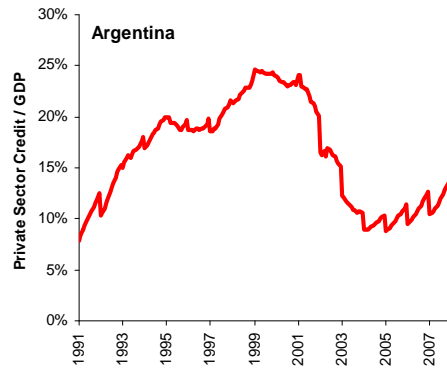
Edward Chancellor

GMO Asset Allocation

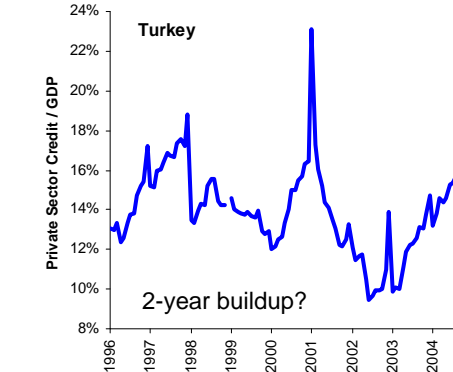
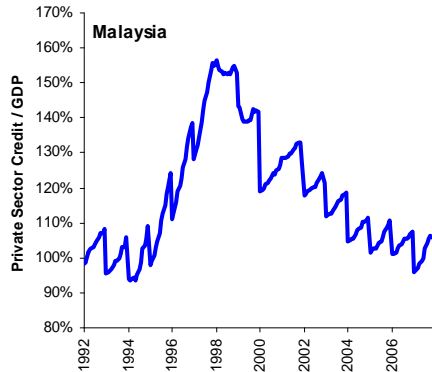
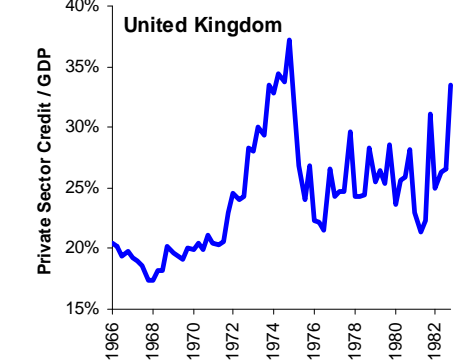
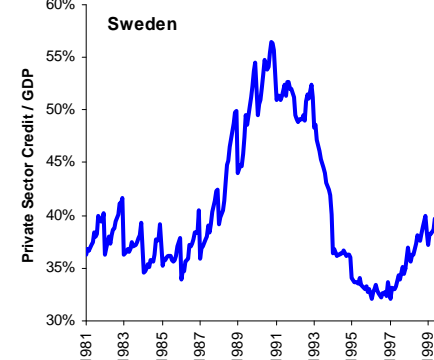
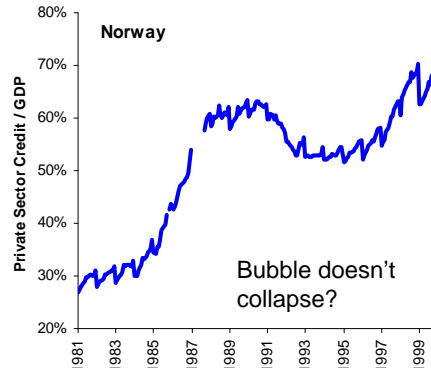
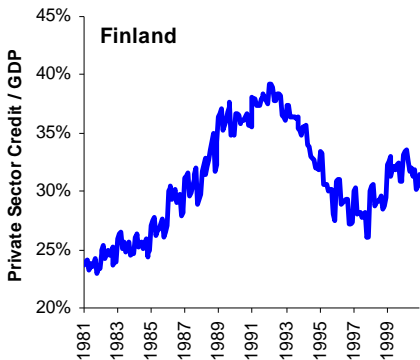
*Presentation*

# Credit bubbles retrace their prior 5- or 10-year buildups

10-year credit boom reversed

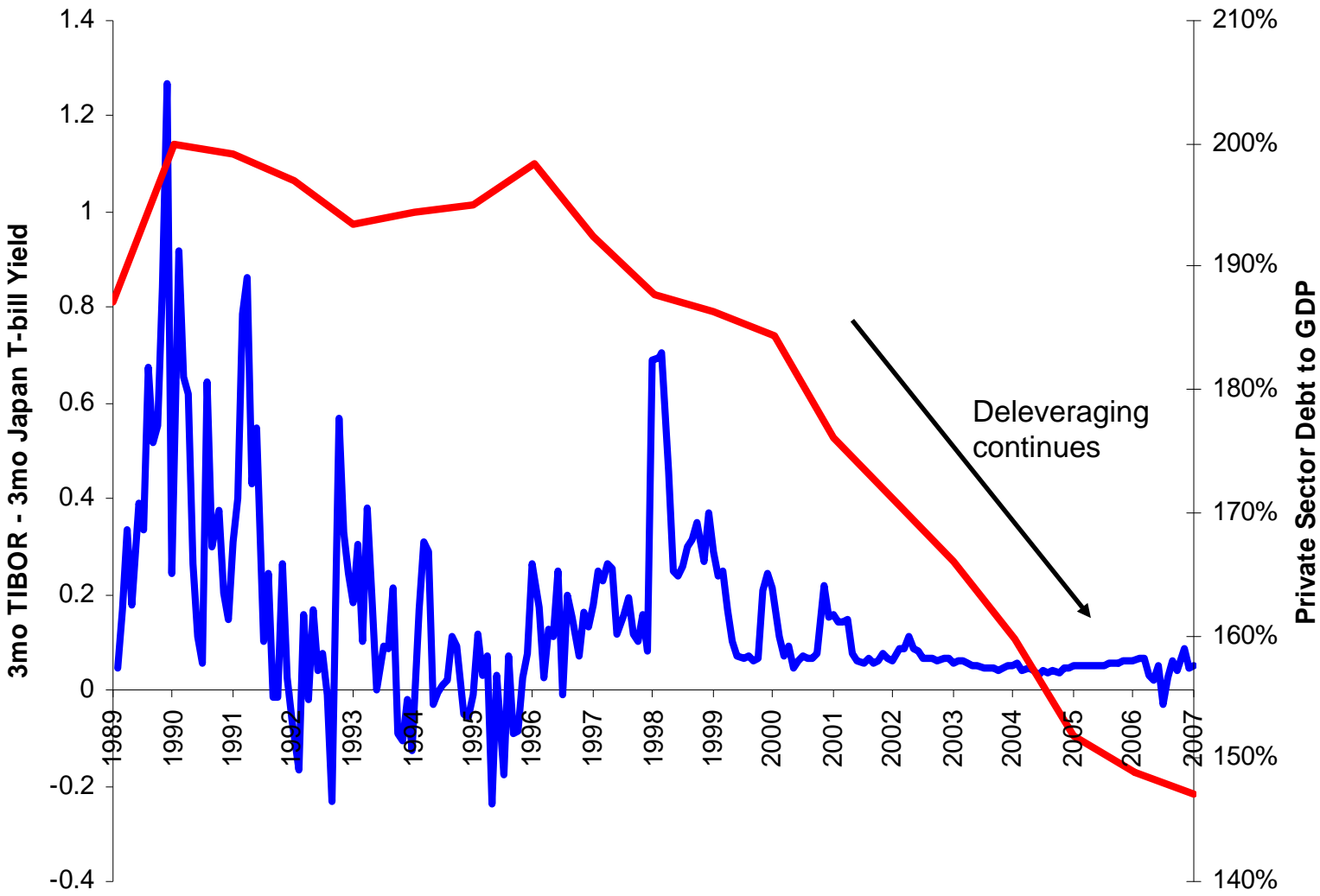


5-year credit boom reversed

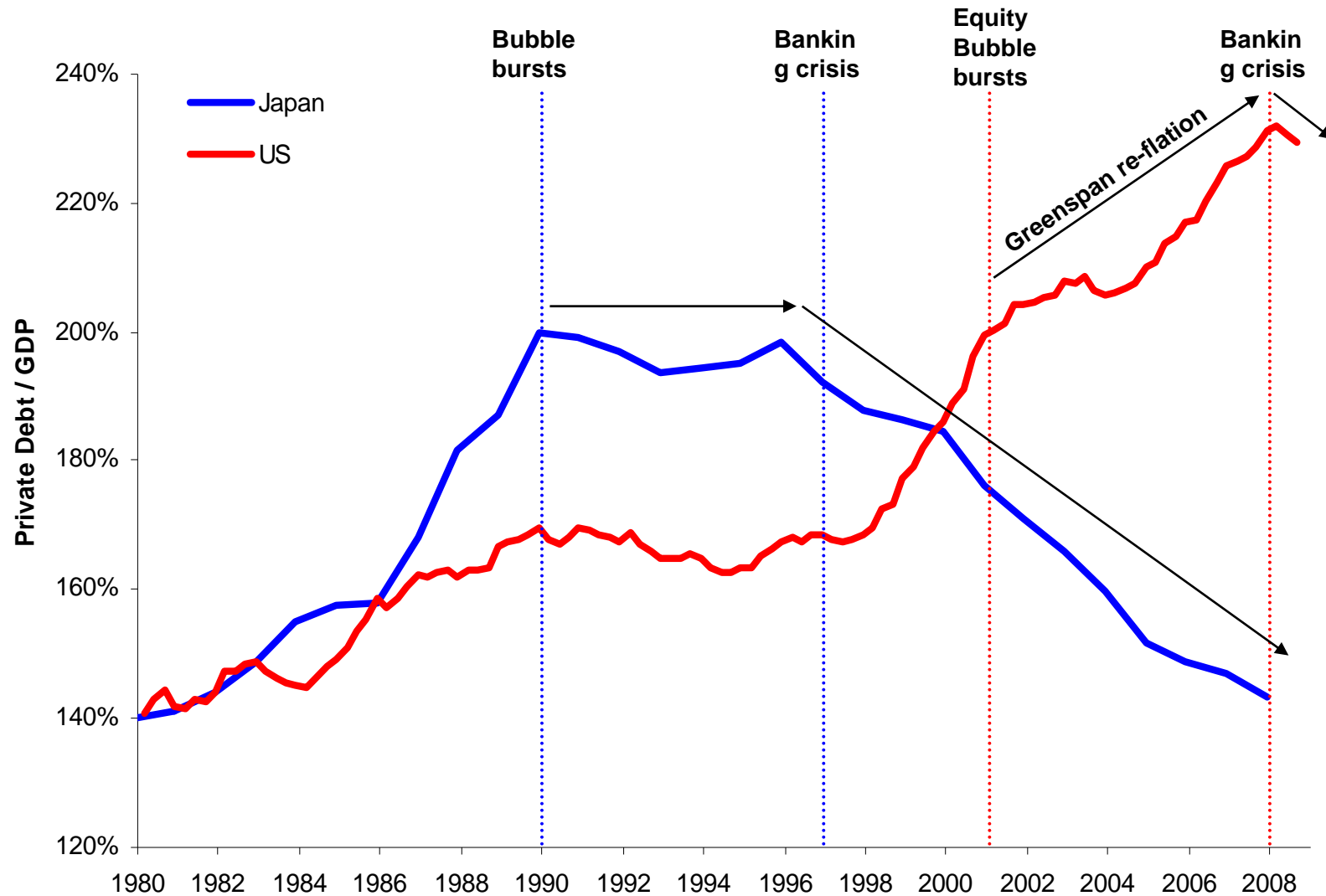


Note: US exhibit is cut off at 1941 due to WW2

# Deleveraging triggered by financial crises...

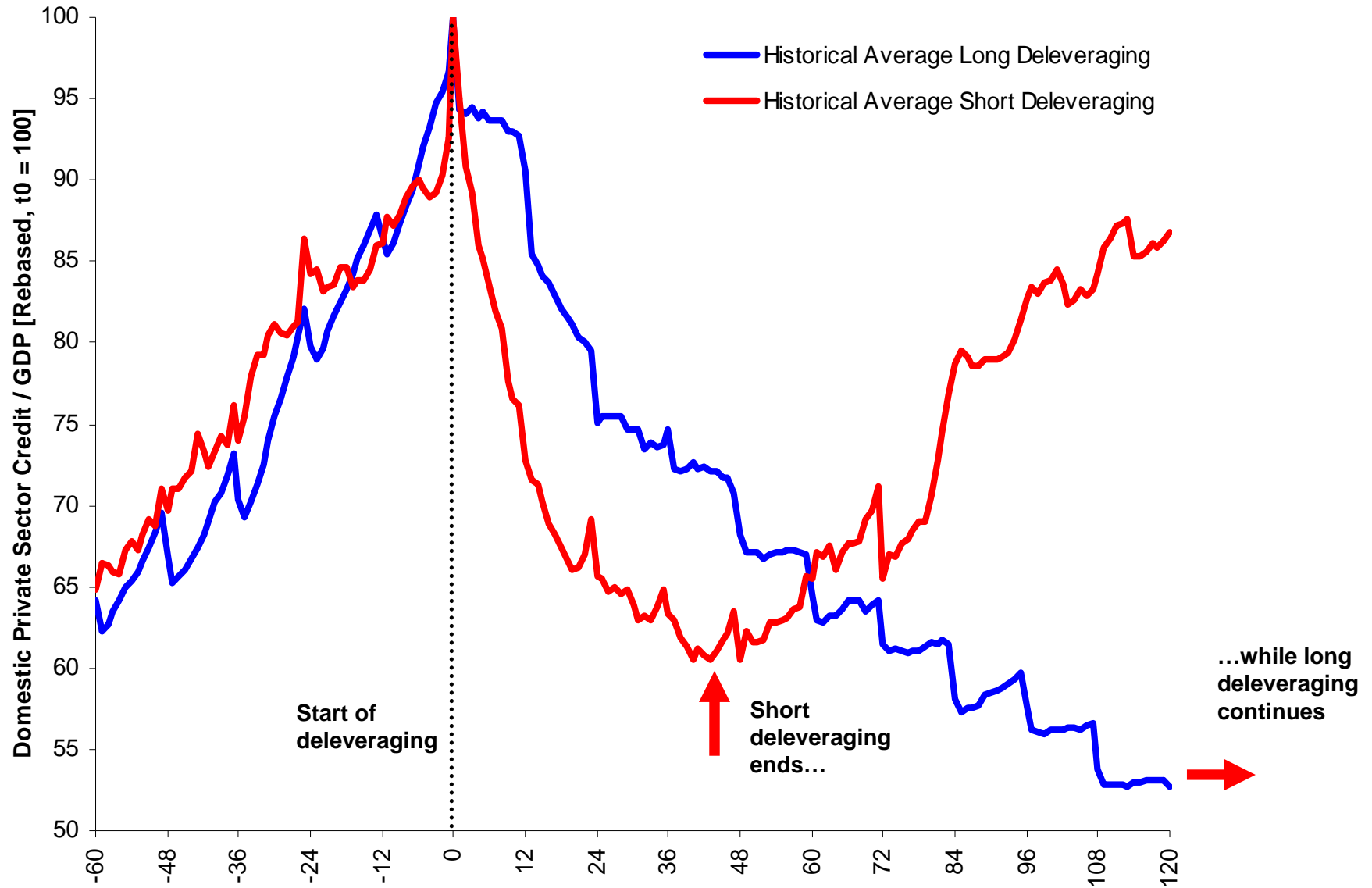


# ...and by the collapse of asset bubbles



\*Private debt is the sum of non-financial business, household, and non-profit debt

# The path of deleveraging: short versus long



Long: JP (1997), MY, MX, TH, US (1932); Short: AG, FN, ID, NW, SD, TK, UK

# Characteristics of long and short deleveraging episodes

## Long (More than 6 years)

10 year median duration

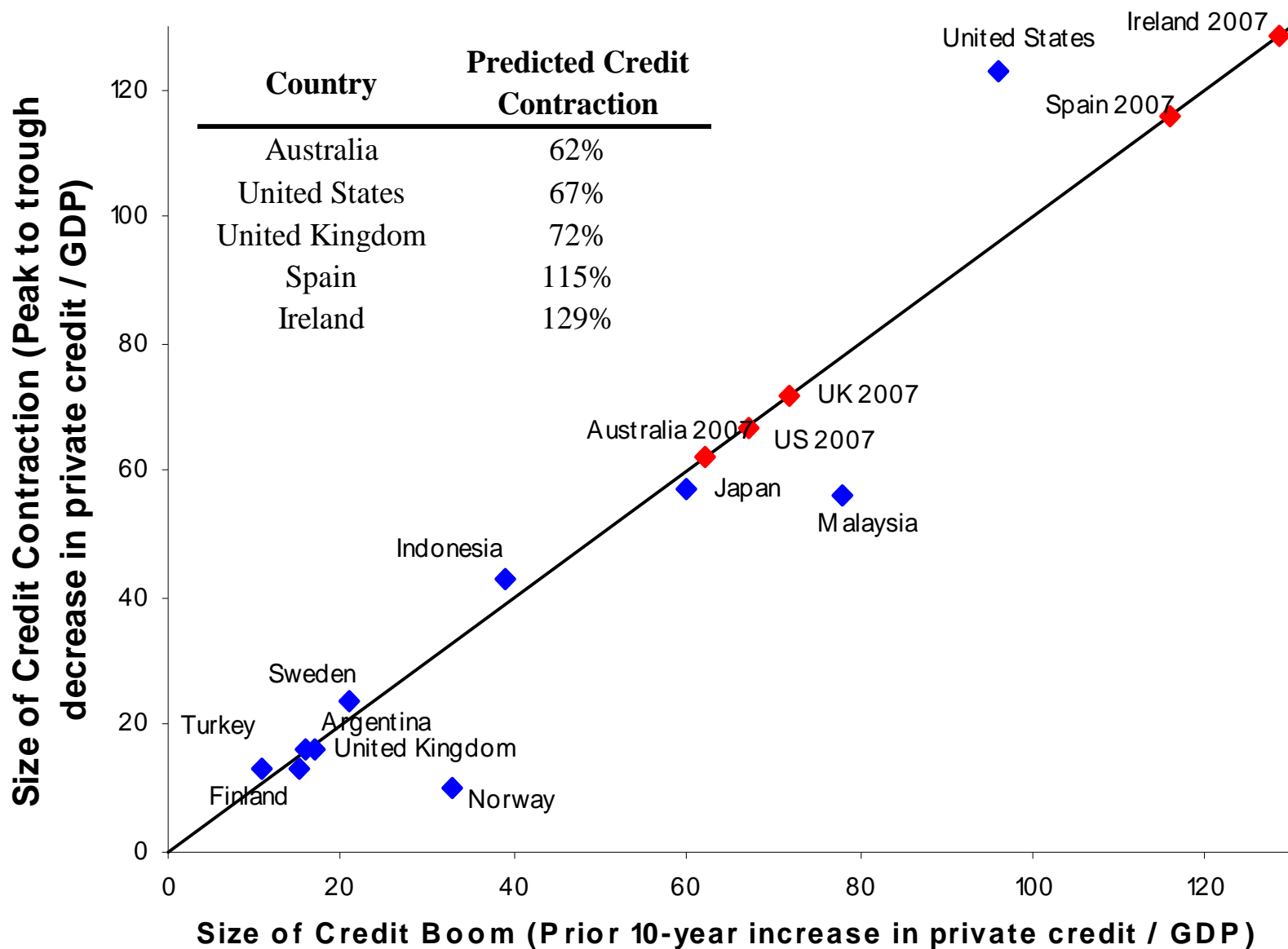
- **Massive credit boom**
- **High initial leverage**
- **Huge housing boom**
- **Severe housing overvaluation**
- **Relatively stable exchange rate**
- **Low inflation**

## Short (Less than 6 years)

4 year median duration

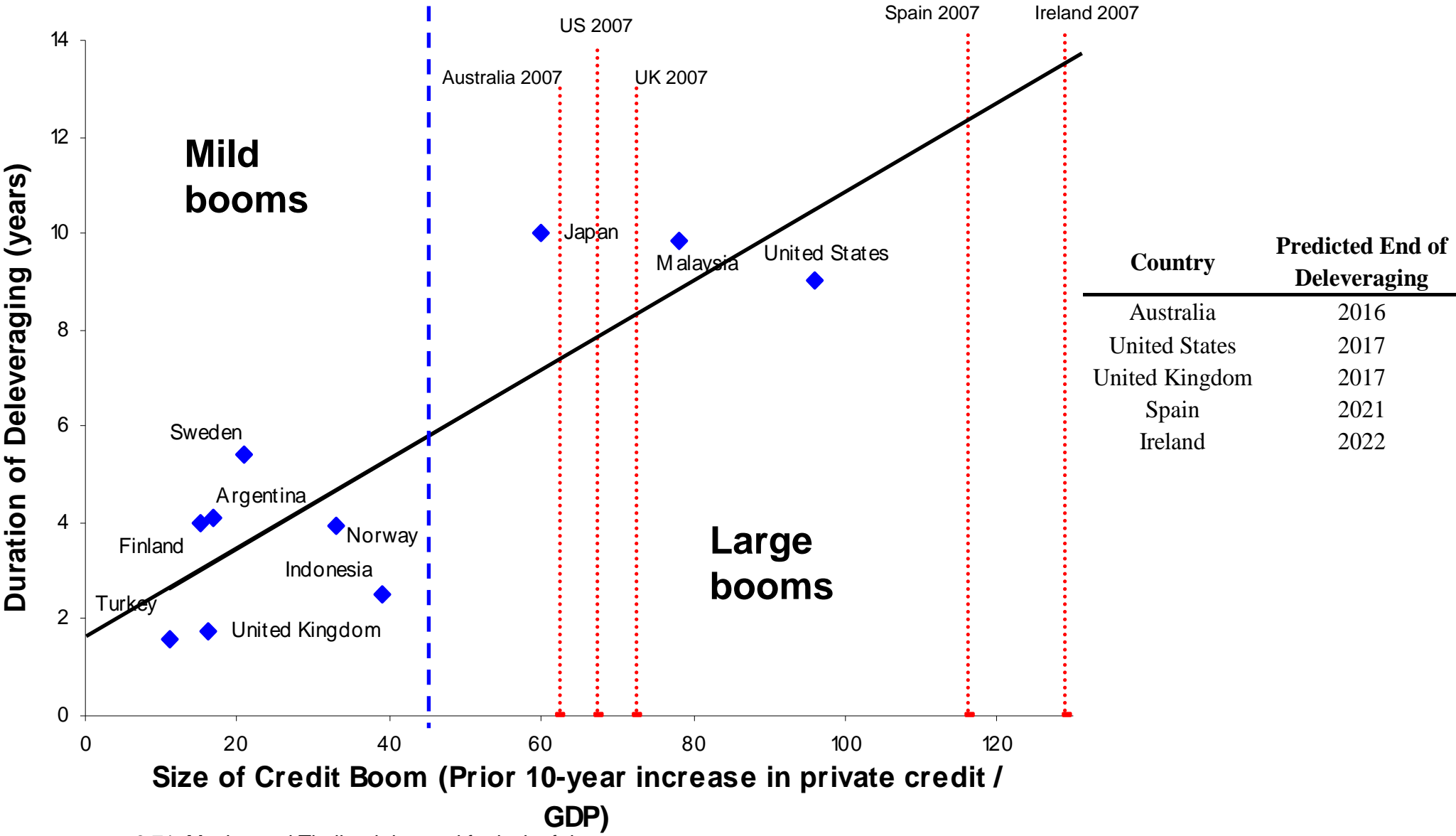
- **Mild credit boom**
- **Low initial leverage**
- **Moderate housing boom**
- **Mild housing overvaluation**
- **Significant currency depreciation**
- **High inflation**

# Extent of deleveraging closely related to prior credit growth

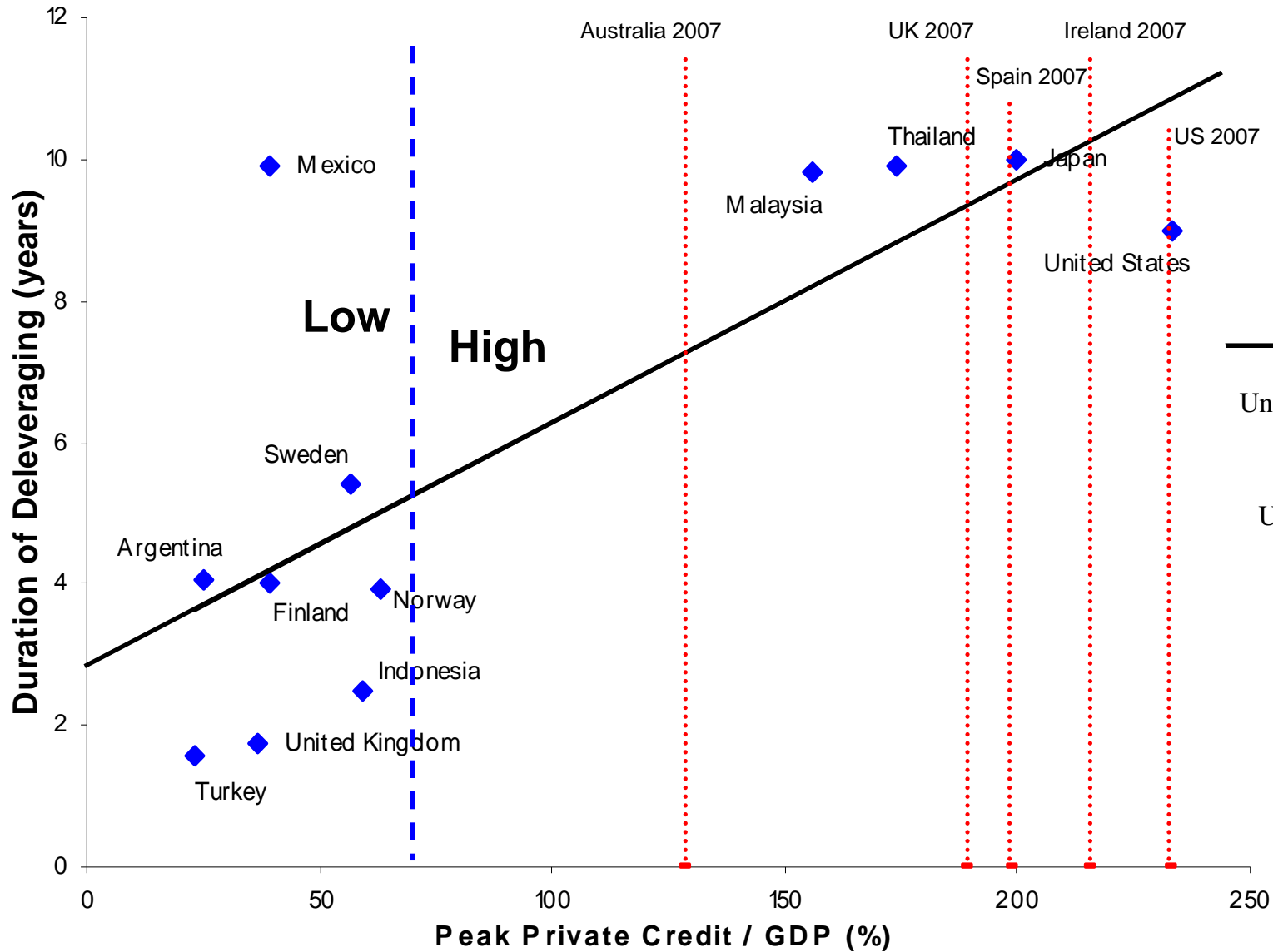


r-sq = 0.85; 45 degree line signifies symmetrical credit bubble

# Great credit bubbles take longer to unwind



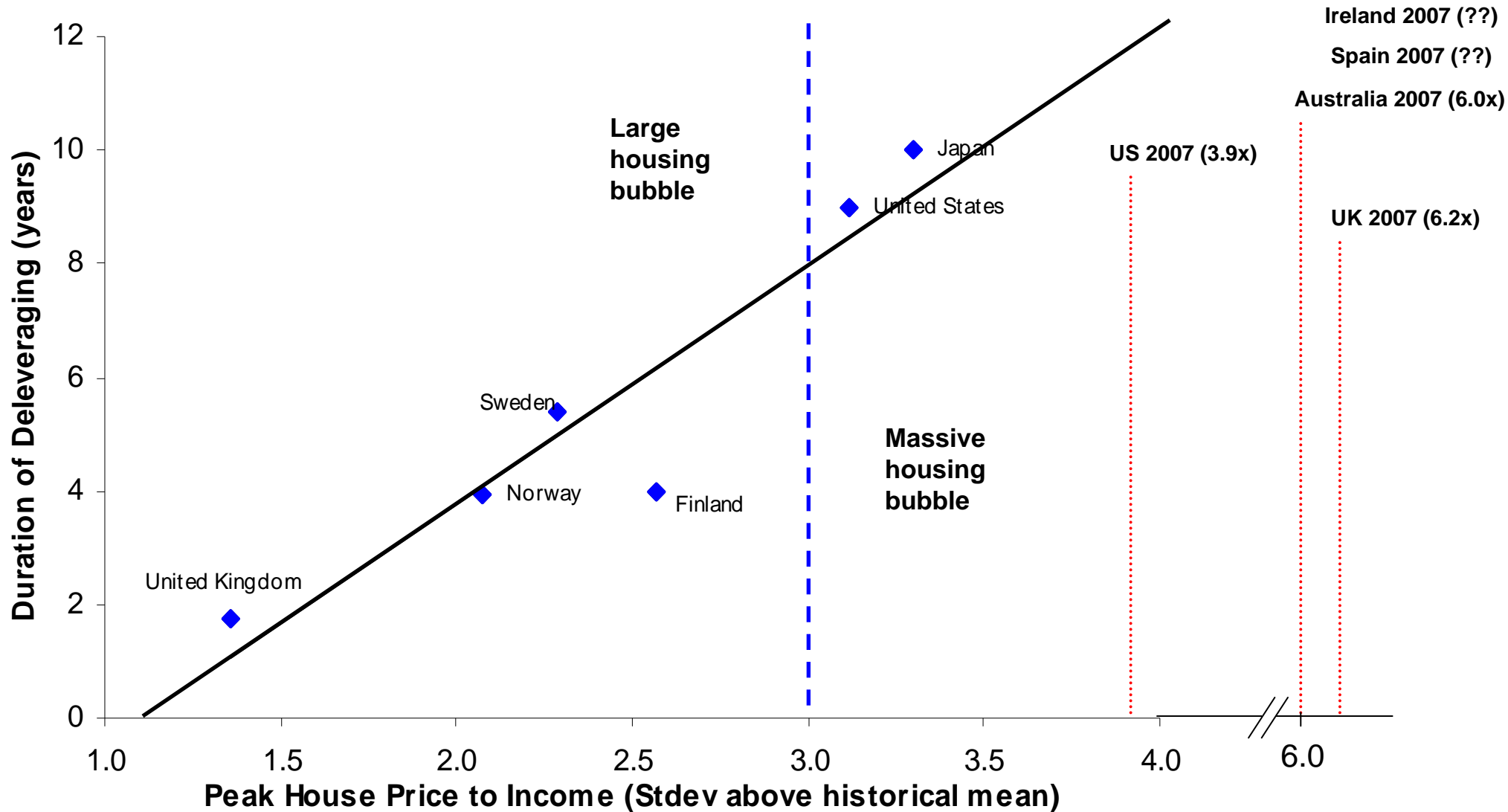
# Deleveraging lasts longer when debt/gdp ratio is high



Country	Predicted End of Deleveraging
Australia	2015
United Kingdom	2017
Spain	2017
Ireland	2018
United States	2018

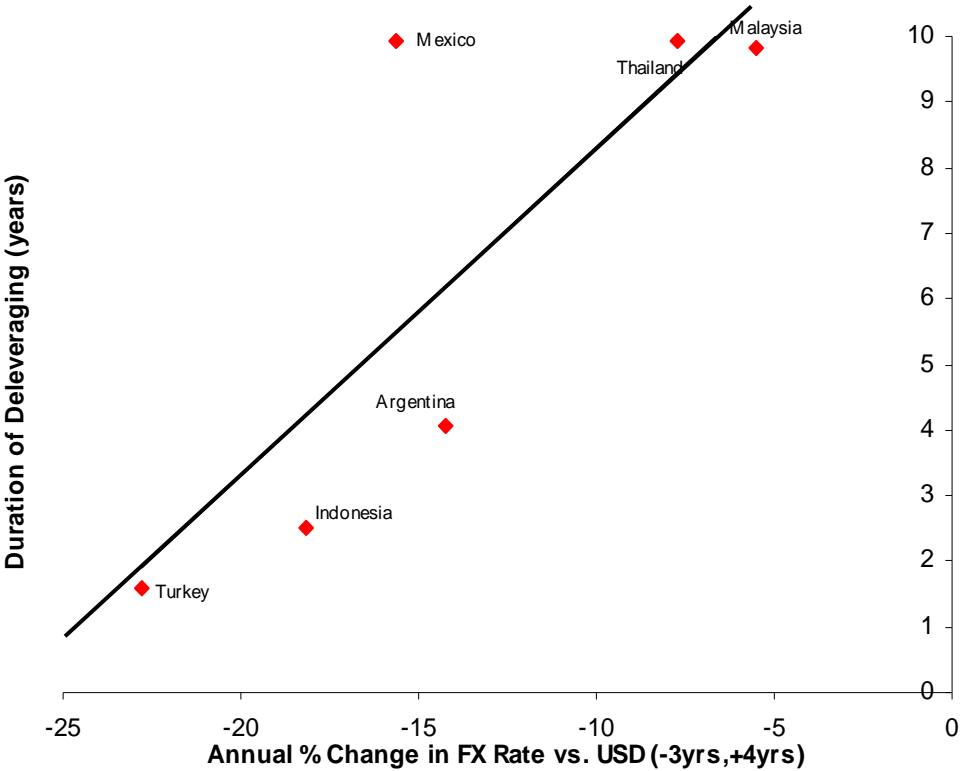
r-sq = 0.57

# Length of deleveraging also related to size of housing bubble

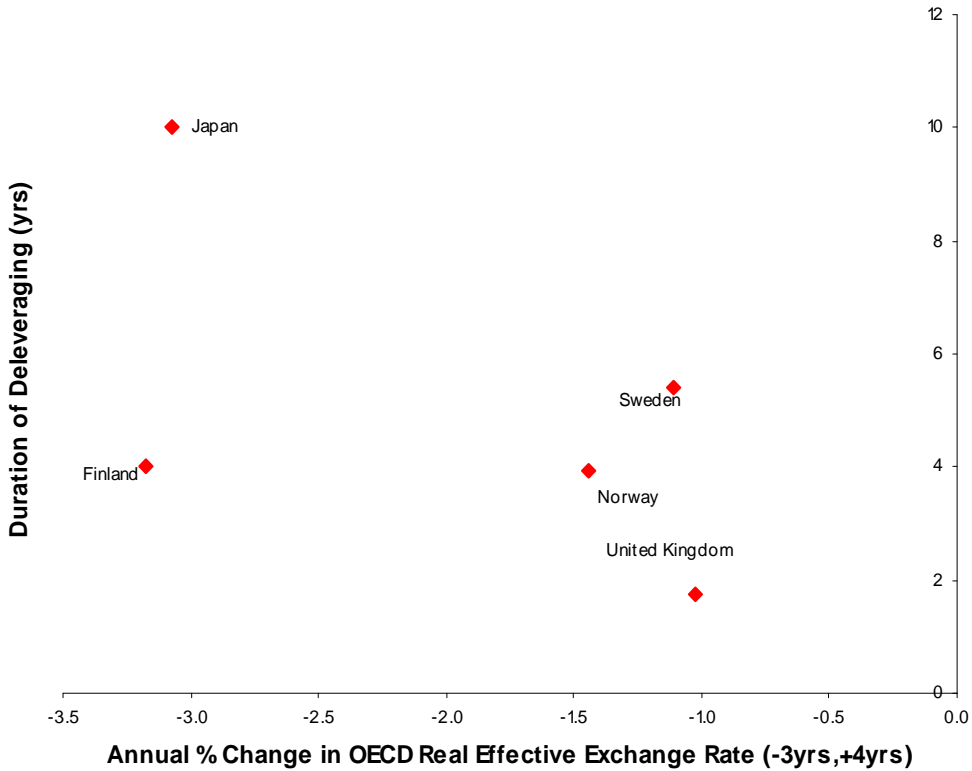


r-sq = 0.88

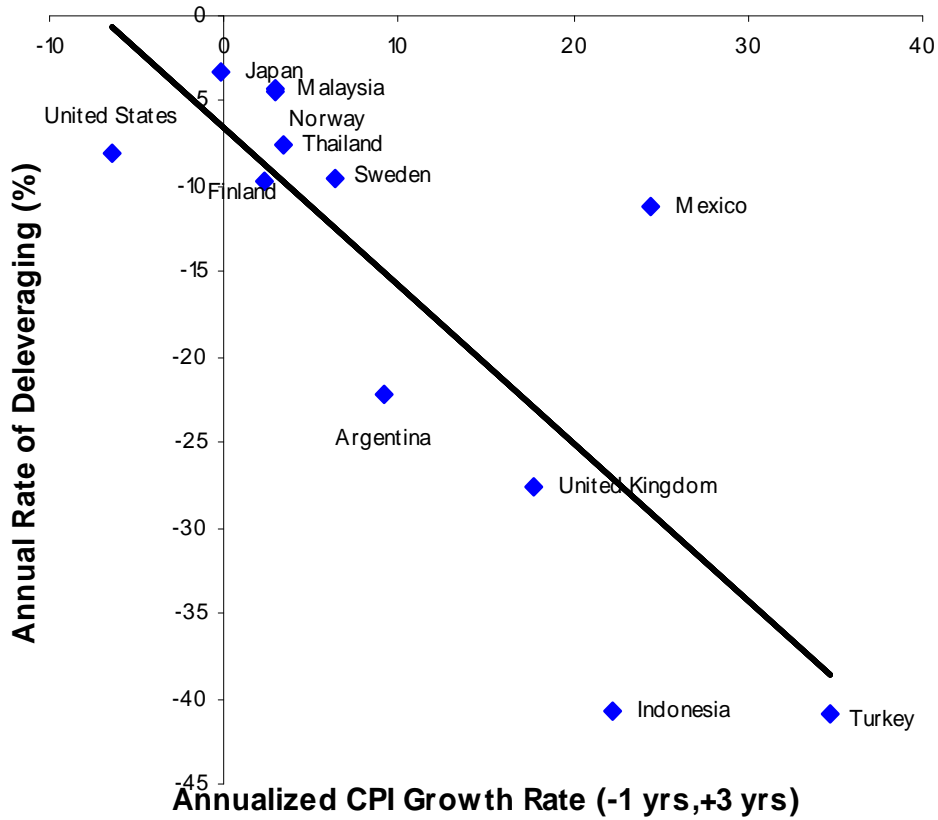
# EM currency collapse speeds up deleveraging



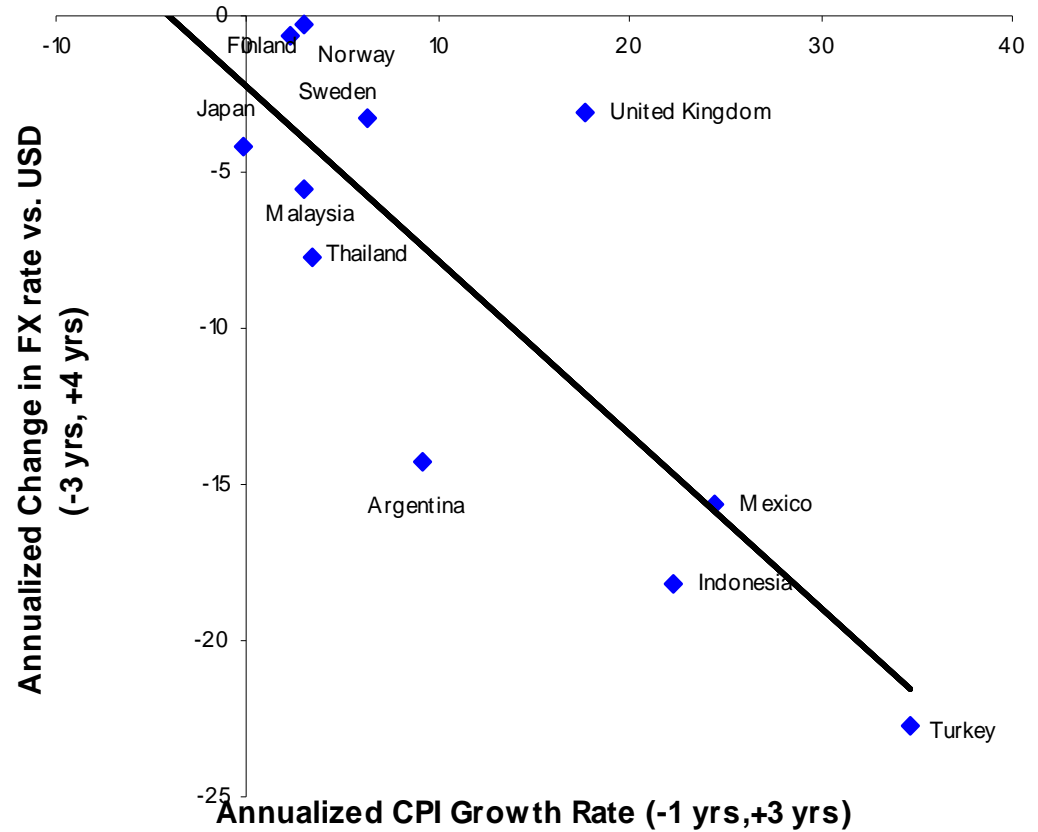
r-sq = 0.65



# Inflation also speeds up deleveraging



r-sq = 0.66

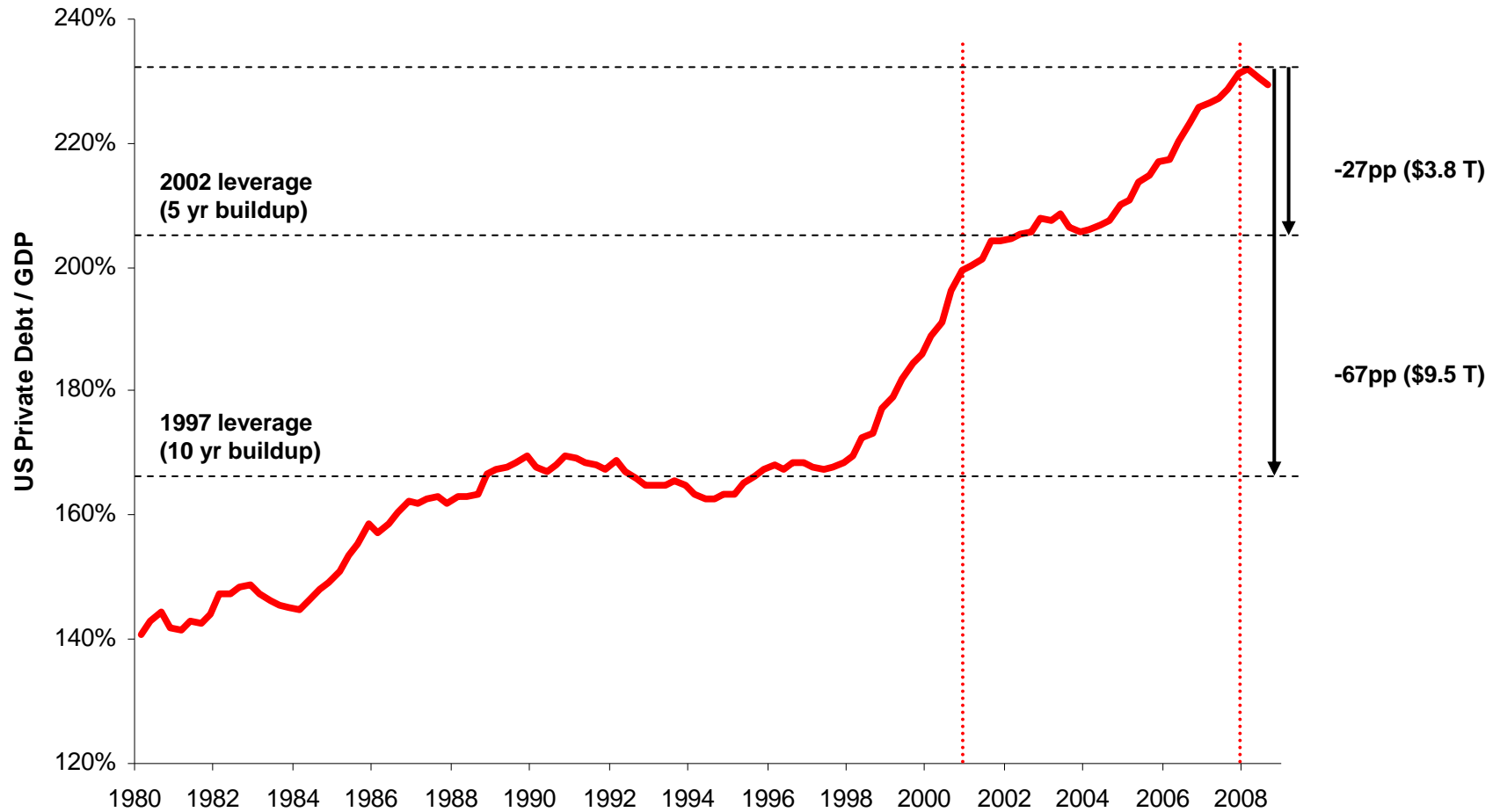


r-sq = 0.68

# Summary of findings

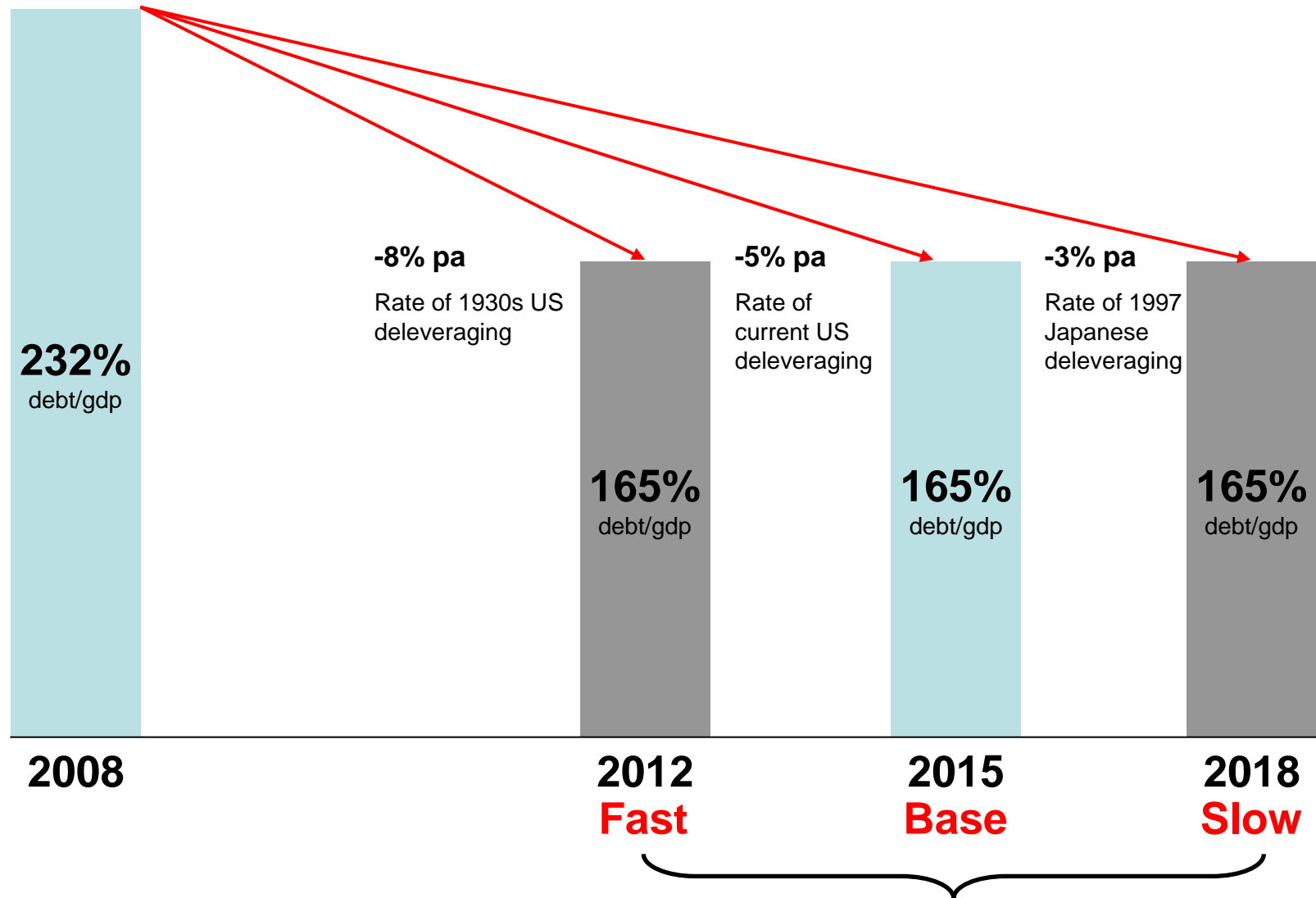
	US	UK	Australia	Spain	Ireland
Massive credit boom	✓	✓	✓	✓✓	✓✓
High initial leverage	✓✓	✓✓	✓	✓✓	✓✓
Large housing boom	✓✓	✓	✓	✓✓	✓✓
Housing overvaluation	✓	✓✓	✓✓	✓✓	✓✓
Low inflation	✓	✓	✓	✓	✓
Prediction	2015	2015	2014	2017	2017

# How much debt must the US private sector shed?



\*Private debt is the sum of non-financial business, household, and non-profit debt

# Our best guess on how long it takes...



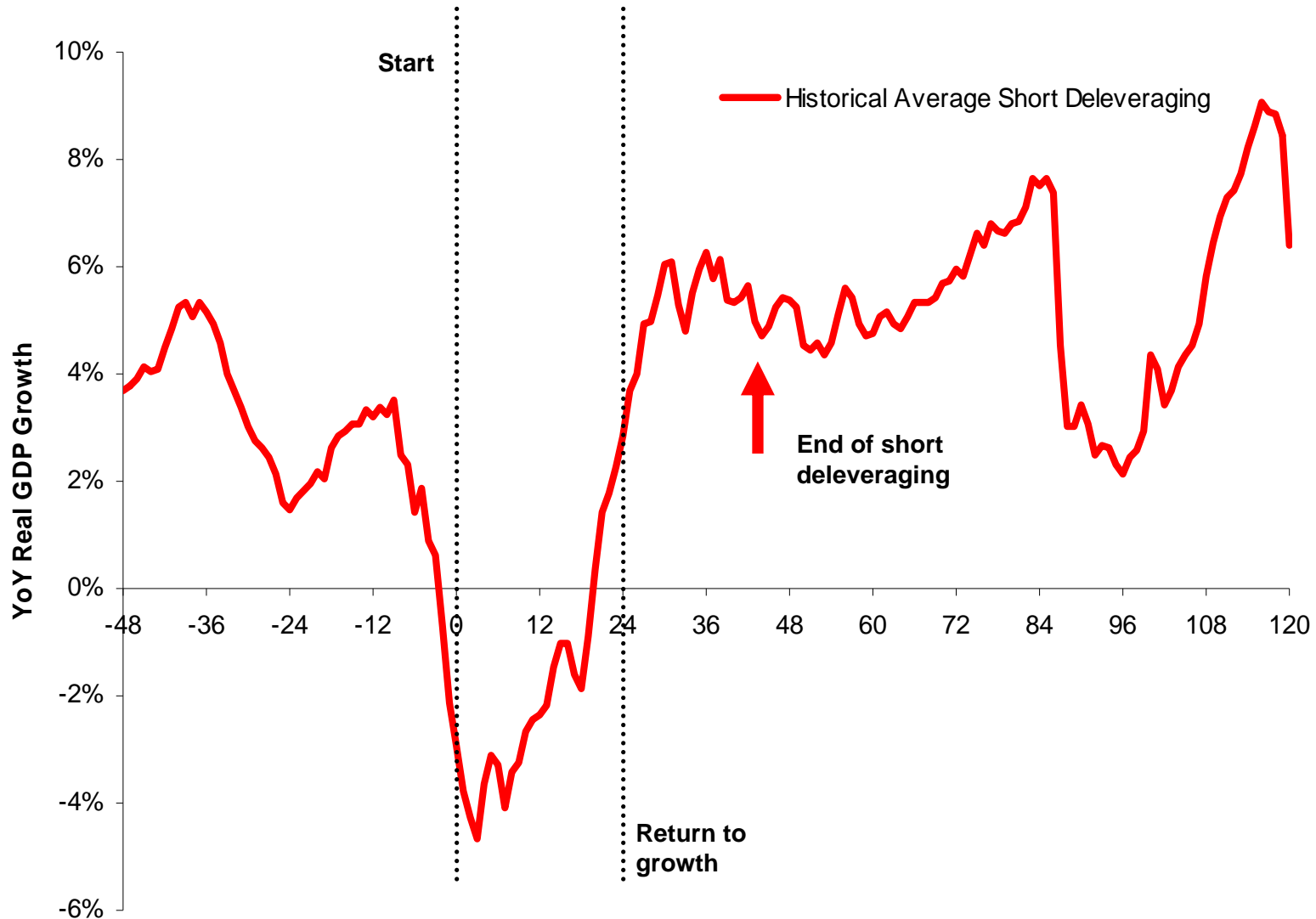
# Macroeconomic Implications

# Macroeconomic Findings

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- Shorter cycles experience ‘V’-shaped economic recoveries
- Longer episodes marked by ‘W’-shaped recoveries
- Investment and consumption fall, while government spending rises
- Economic growth remains volatile until process ends

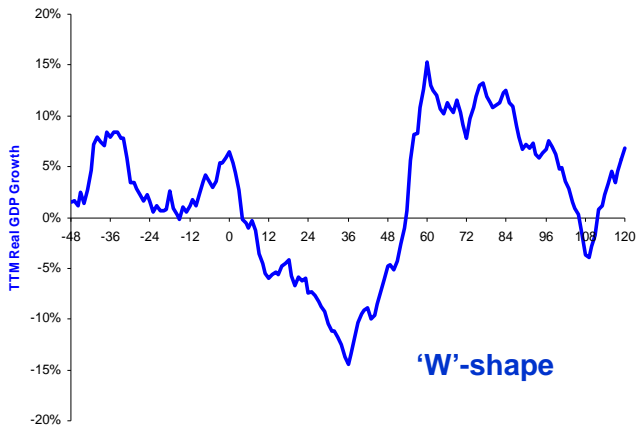
# Shorter cycles experience 'V'-shaped return to growth



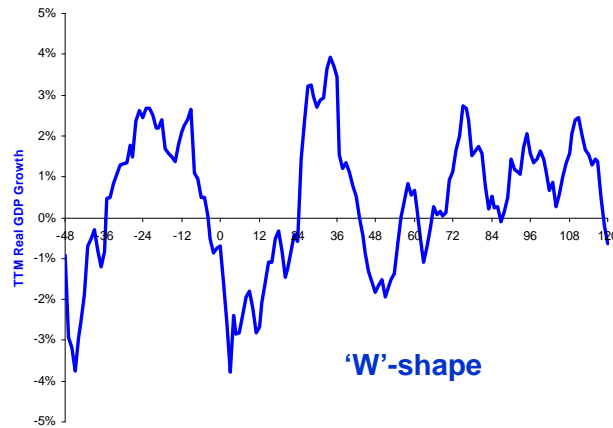
Short: FN, NW, SD, TK, UK

# Longer cycles associated with 'W'-shaped economic growth

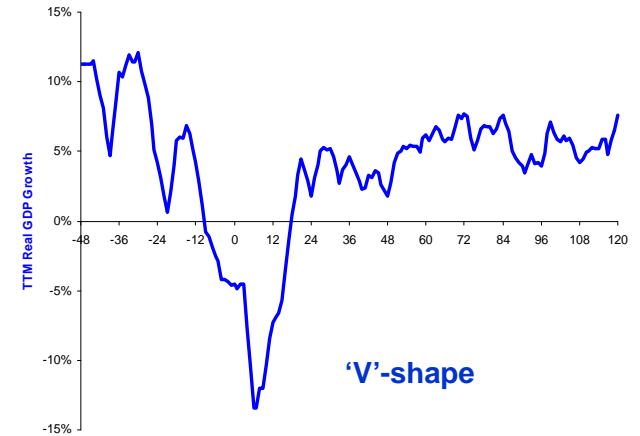
**United States 1929**



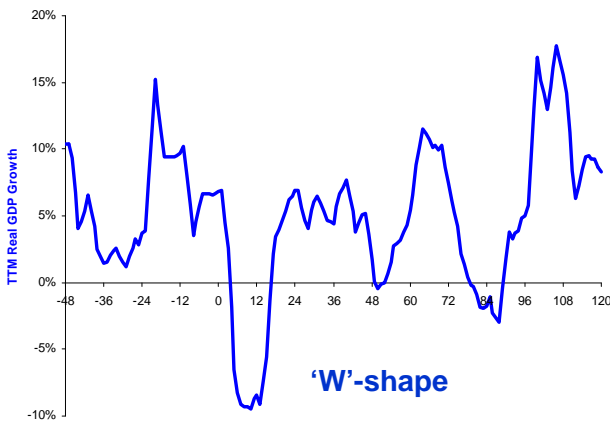
**Japan**



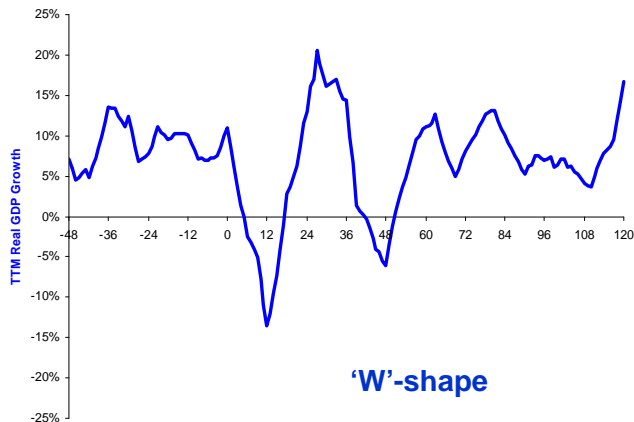
**Thailand**



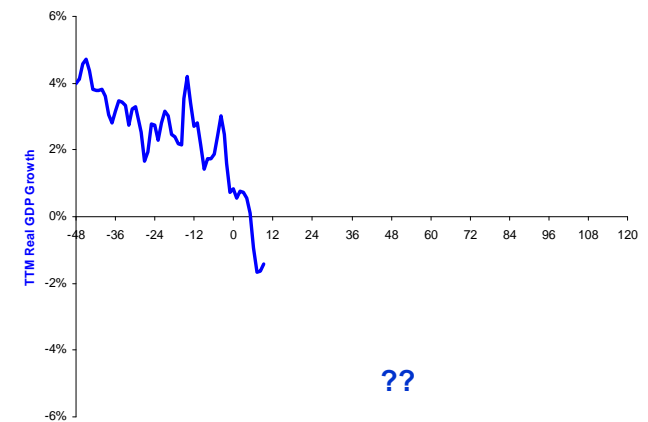
**Mexico**



**Malaysia**

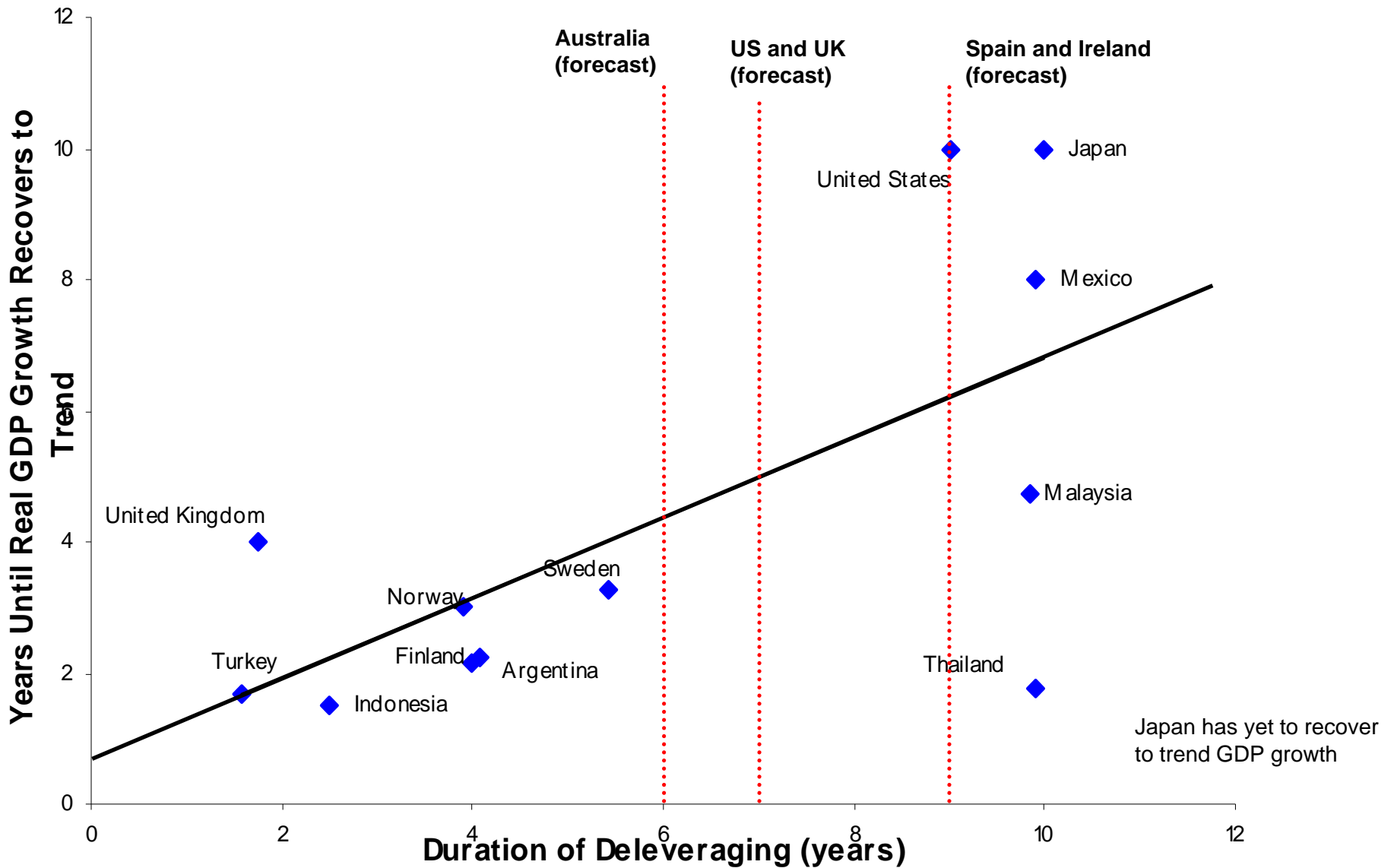


**United States 2007**



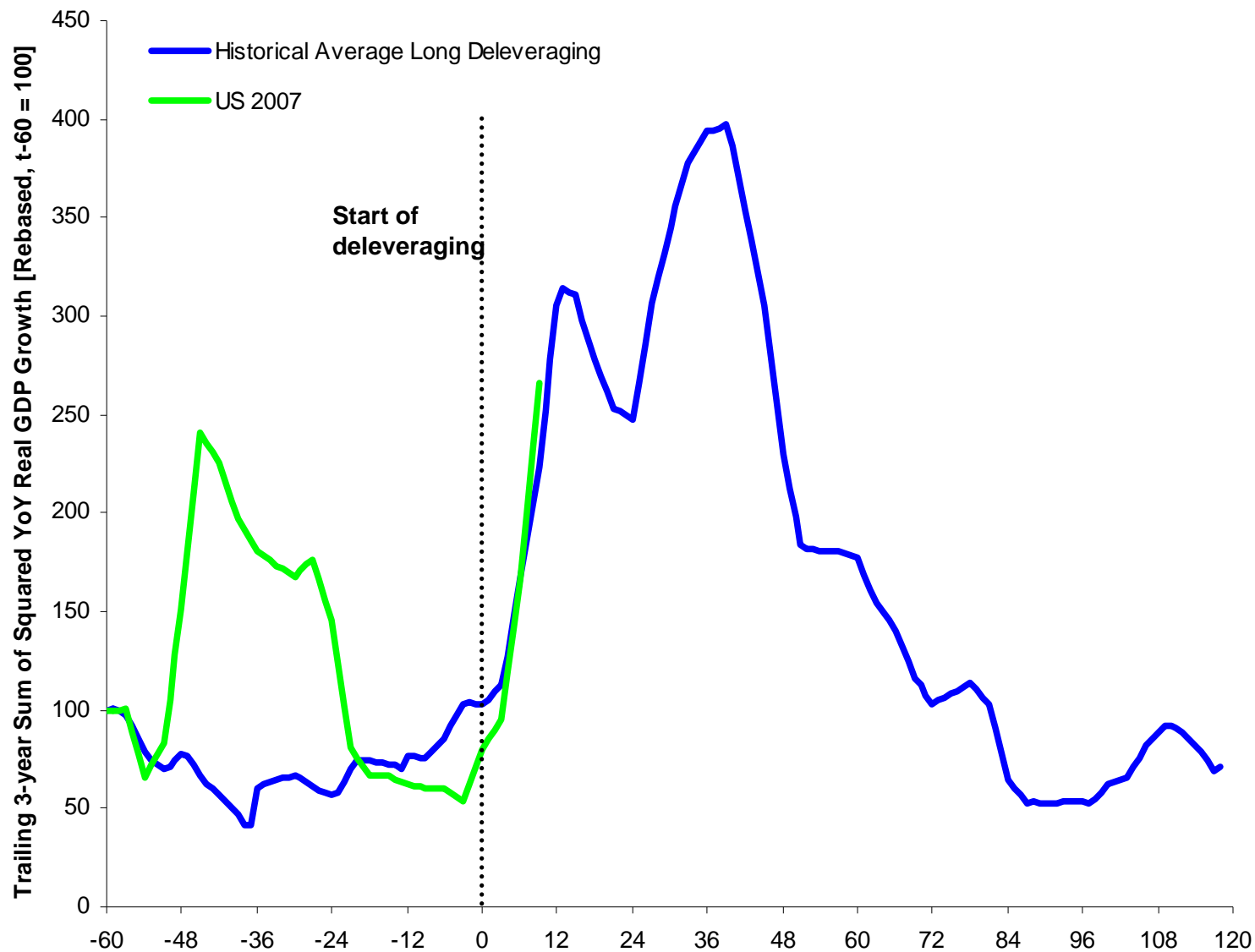
US (1929), JP (1997)

# Longer cycle associated with prolonged economic weakness



r-sq = 0.44

# The end of the Great Moderation



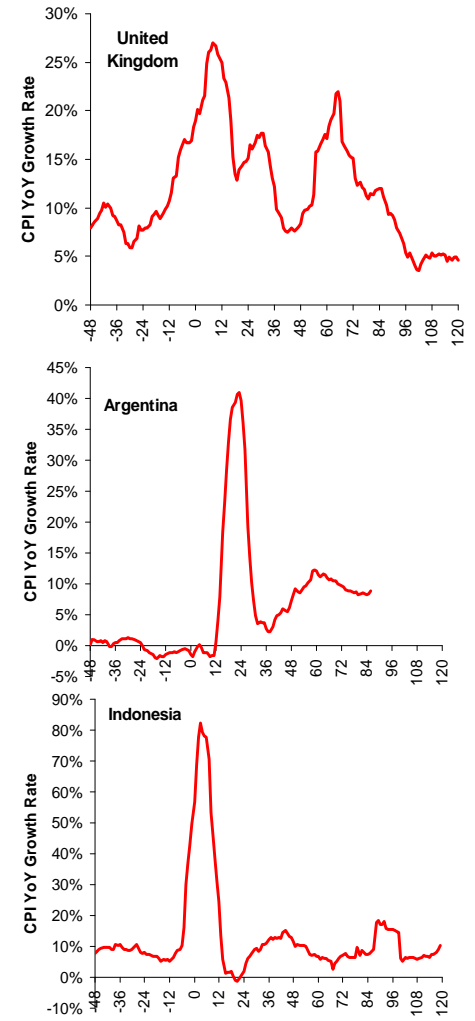
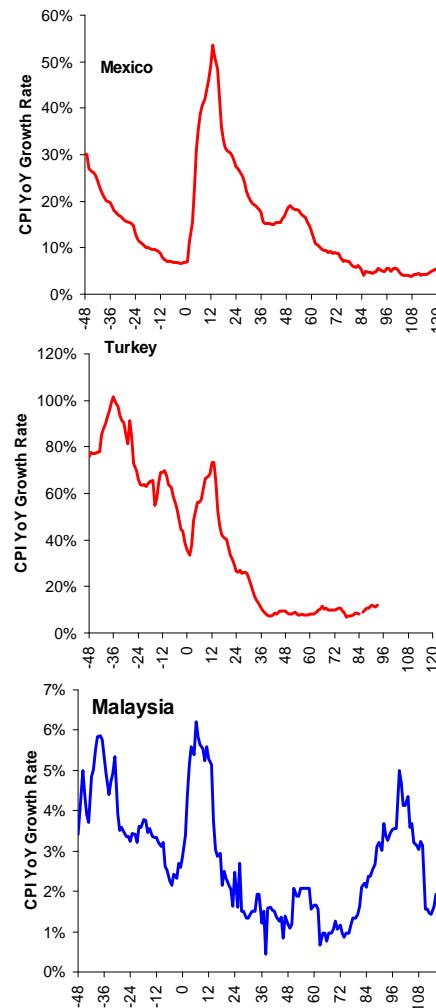
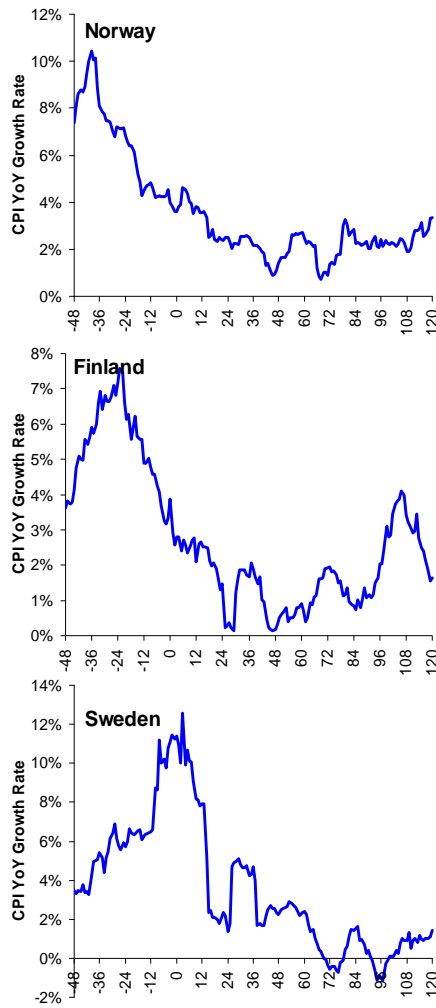
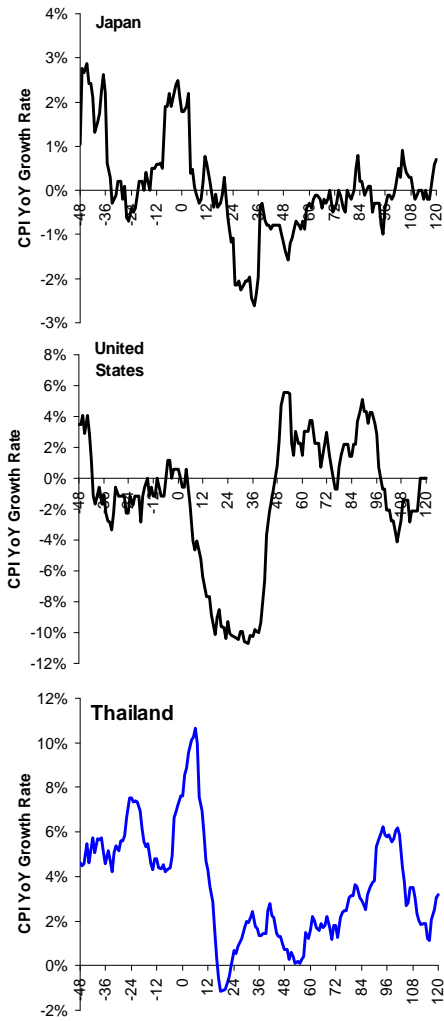
Long: JP (1997), MX, MY, TH

# Deleveraging tends to lower inflation, but can also be deflationary or hyperinflationary

## Deflationary

## Disinflationary

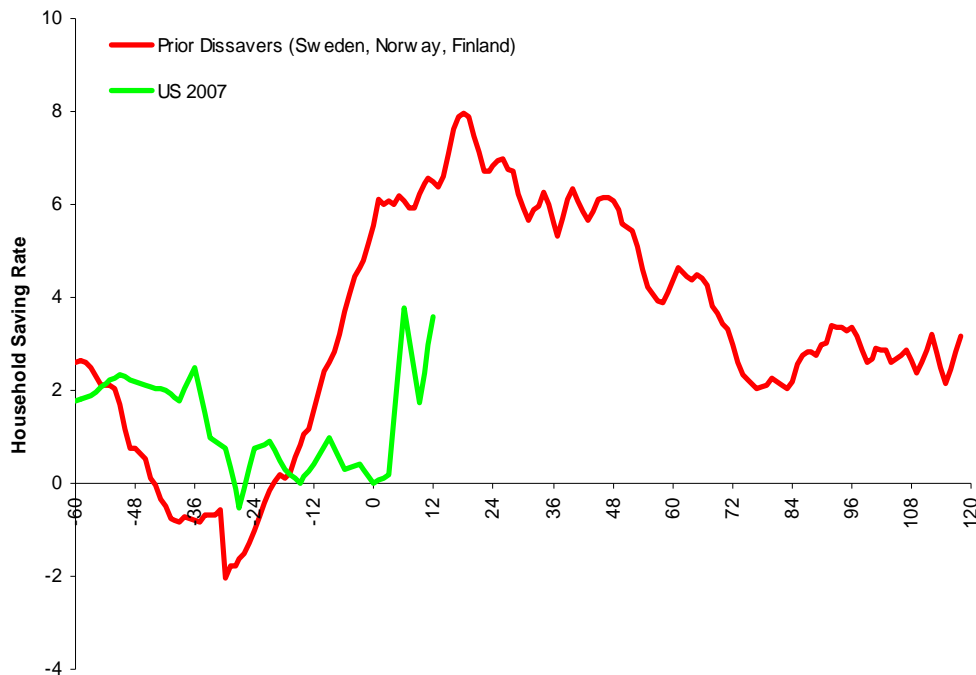
## Hyperinflationary



Note: JP (1997); US (1929)

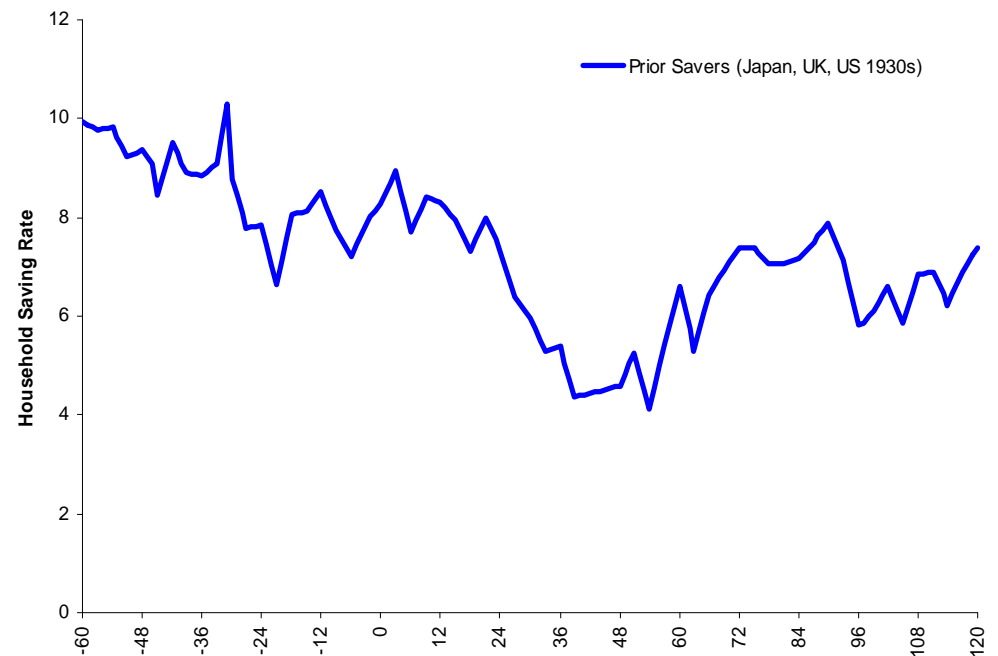
# Deleveraging can be driven by household or corporate sector

## Household



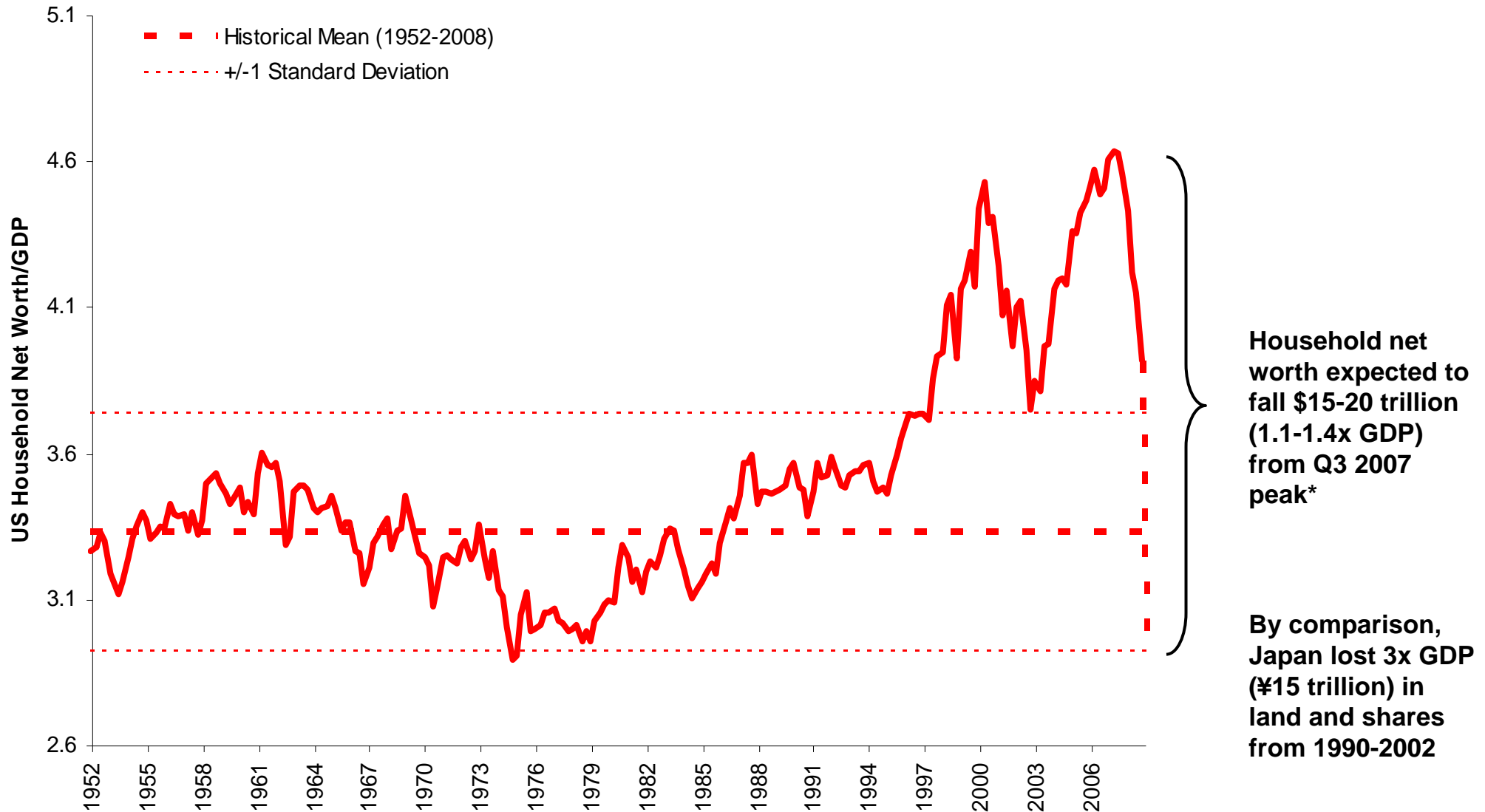
- Dissaving households increase saving to repair balance sheets
- Private consumption falls as households turn to thrift

## Corporate



- Deleveraging driven by decline in corporate borrowing
- Wealthy households draw on savings as incomes fall
- Fixed investment falls more sharply

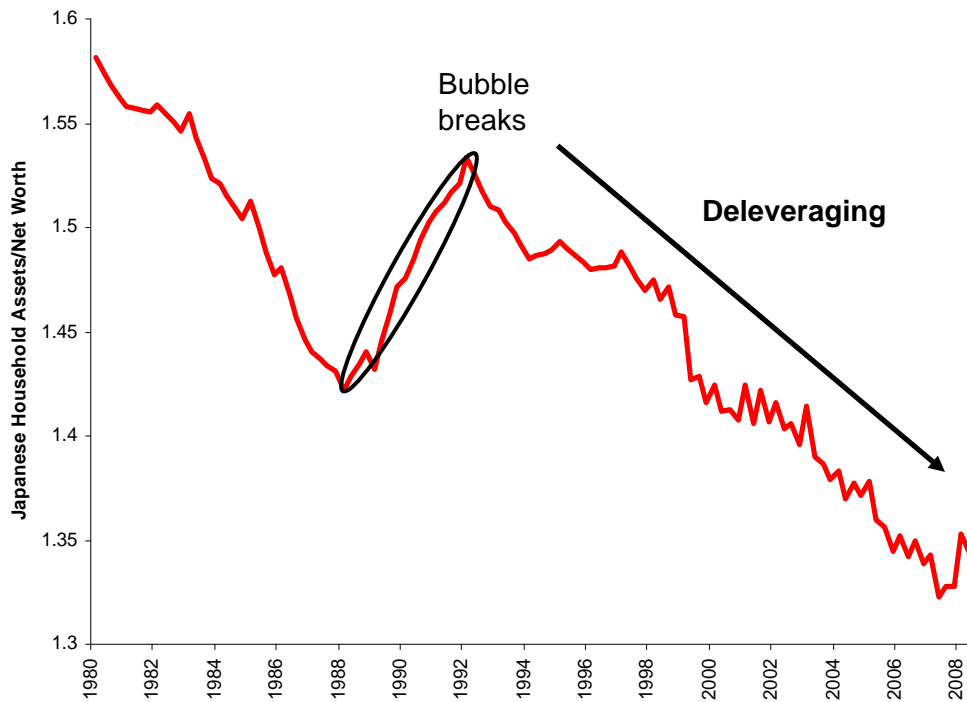
# Household net worth will fall as asset bubble deflates...



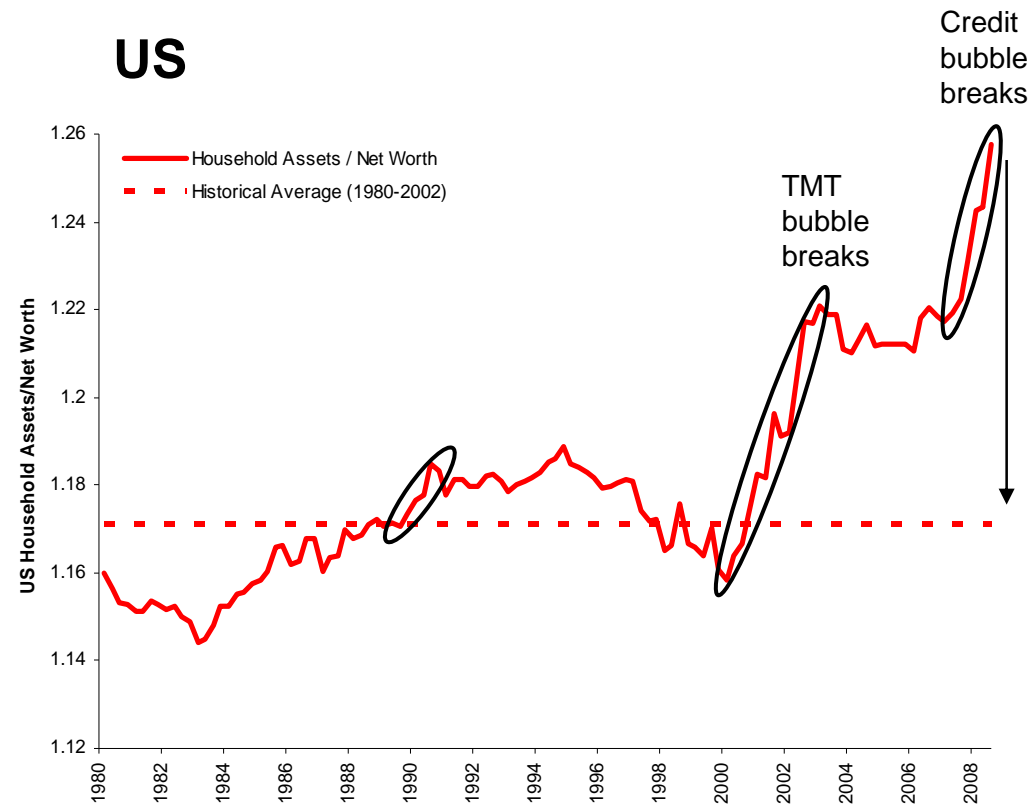
\* Estimate based on losses in real estate and securities

# ...producing a rise in household leverage

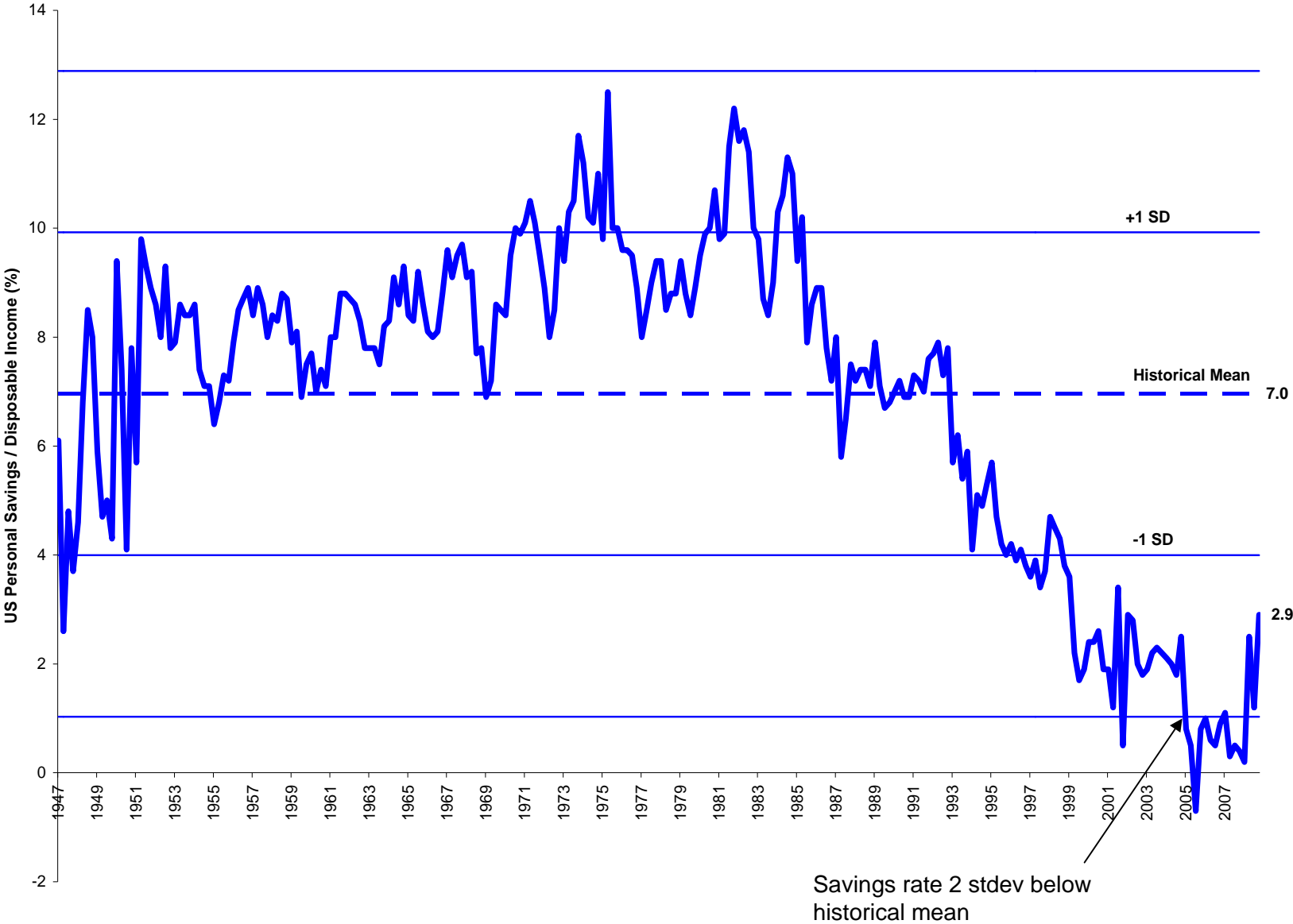
## Japan



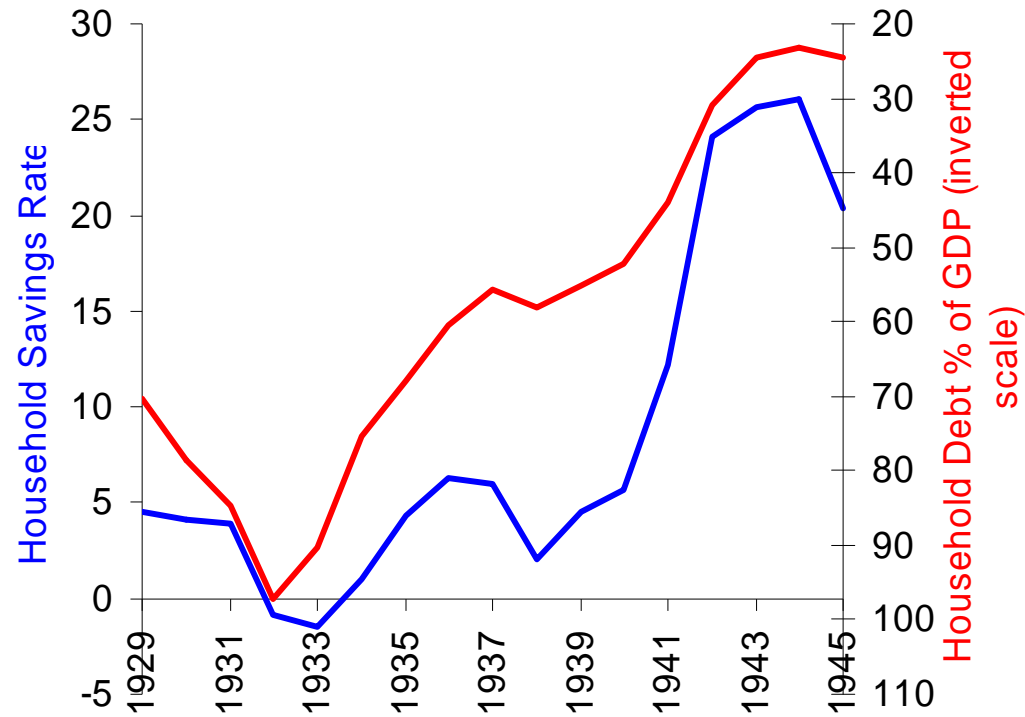
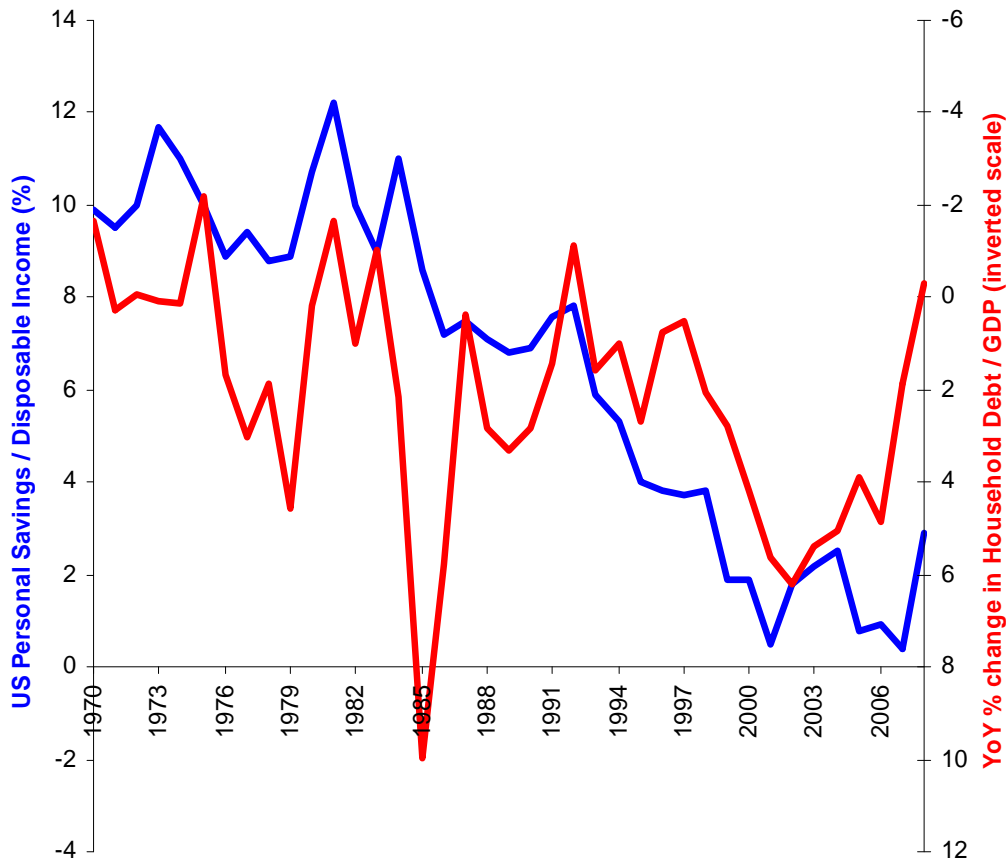
## US



# U.S. savings were two stdev. below historical mean



# Deleveraging correlated with rise in household savings



1959-2008 correl = -0.4; 1992-2008 correl = -0.6 (quarterly)

# Private investment collapses

	Fixed Investment (% of GDP)		
	Prior 5 years	Next 5 years	Difference
Thailand	40	23	-16.3
Malaysia	41	27	-14.4
Indonesia	28	21	-7.1
US 1930s	14	9	-5.7
Japan	29	25	-3.6
Sweden	22	18	-3.6
Turkey	18	16	-2.5
Argentina	18	16	-2.5
Mexico	18	19	0.8
UK	20	20	0.8
Norway	27	34	6.3
<b>Average</b>			
Corporate	21	18	-2.8
Household	24	26	1.4

- Corporate deleveraging experiences massive decline in fixed investment:
  - Japan: -10% of GDP (1990-2002)
  - US: -9% of GDP (1929-1933)
- Household deleveraging also witnesses decline in investment, although Norway is an exception
- Higher initial fixed investment share of GDP associated with greater subsequent contraction in investment (r-sq = 0.46)
- Fixed investment (and net exports) are most volatile components of GDP

Corporate: US (1929), Japan (1997), UK; Household: Sweden, Norway

# Private consumption

## Private Consumption (% of GDP)

Prior 5 years      Next 5 years      Difference

	Prior 5 years	Next 5 years	Difference
Turkey	69	64	-4.9
Argentina	69	64	-4.9
Malaysia	48	44	-4.0
Norway	54	52	-2.1
UK	61	60	-0.8
Mexico	67	67	-0.4
Sweden	49	50	1.0
Japan	55	57	1.4
Thailand	54	56	1.7
US 1930s	75	79	4.6
Indonesia	61	67	6.5

### Average

Corporate	64	65	1.7
Household	52	51	-0.5

- Corporate deleveraging: households draw on savings to boost consumption
- Household deleveraging: consumption determined by two factors:
  - Household saving rate (rise in Swe/Norw)
  - Household incomes (rise in Swed, fall in Norw)
    - Role of fiscal stimulus?
- US consumption is currently 70% of GDP

Corporate: US (1929), Japan (1997), UK; Household: Sweden, Norway

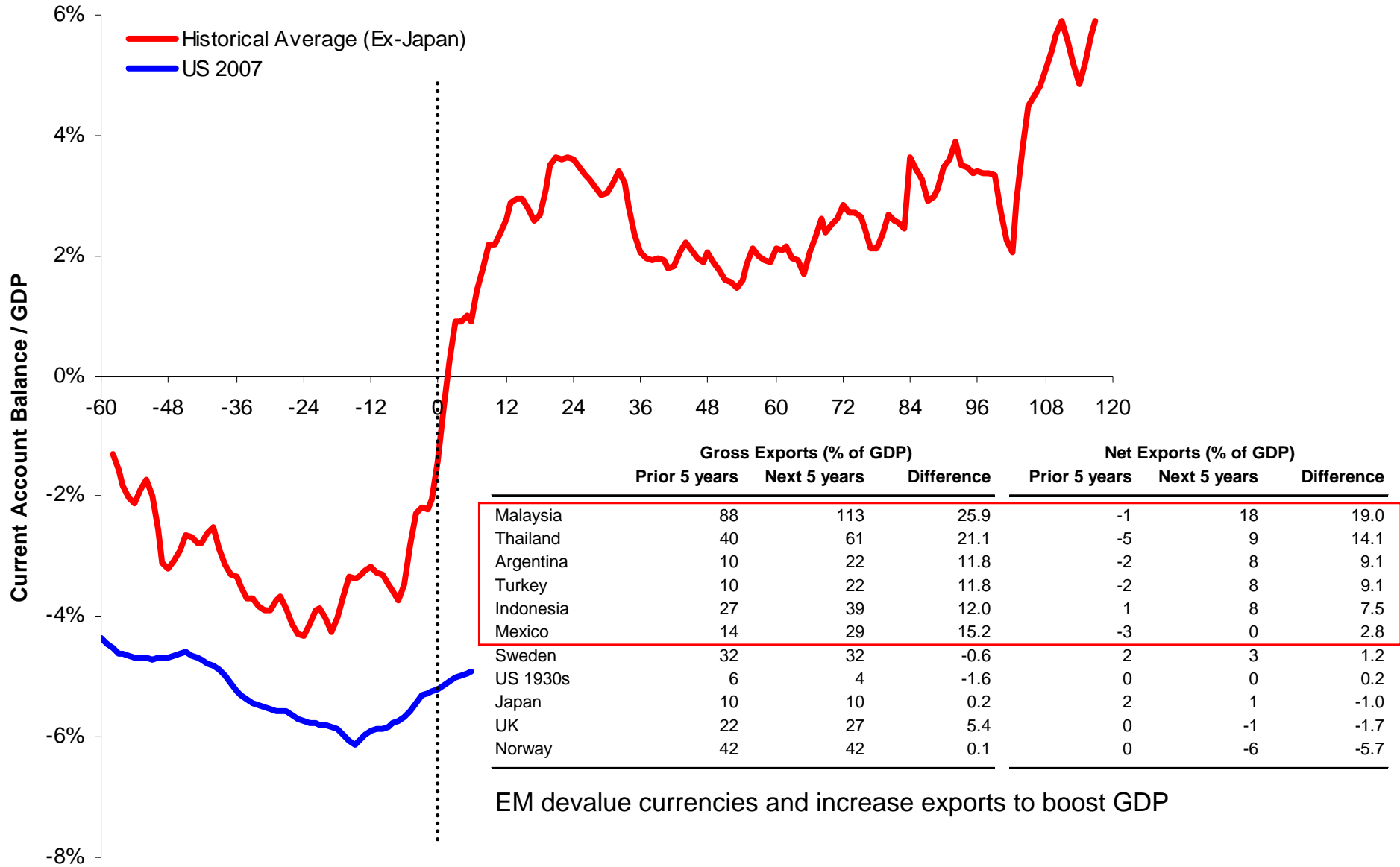
# Government spending

	Government Consumption (% of GDP)		
	Prior 5 years	Next 5 years	Difference
US 1930s	9	13	4.2
UK	18	21	2.7
Japan	15	17	2.0
Norway	17	19	1.9
Sweden	27	28	1.4
Mexico	9	10	1.3
Thailand	10	11	1.2
Argentina	13	12	-0.5
Turkey	13	12	-0.5
Malaysia	12	11	-1.1
Indonesia	8	7	-1.1
<b>Average</b>			
Corporate	14	17	3.0
Household	22	24	1.7
Emerging	11	11	-0.1

- Government spending rises in developed economies
- Ability of governments to ramp up spending less in emerging markets
  - Effect of funding crises?

Corporate: US (1929), Japan (1997), UK; Household: Sweden, Norway

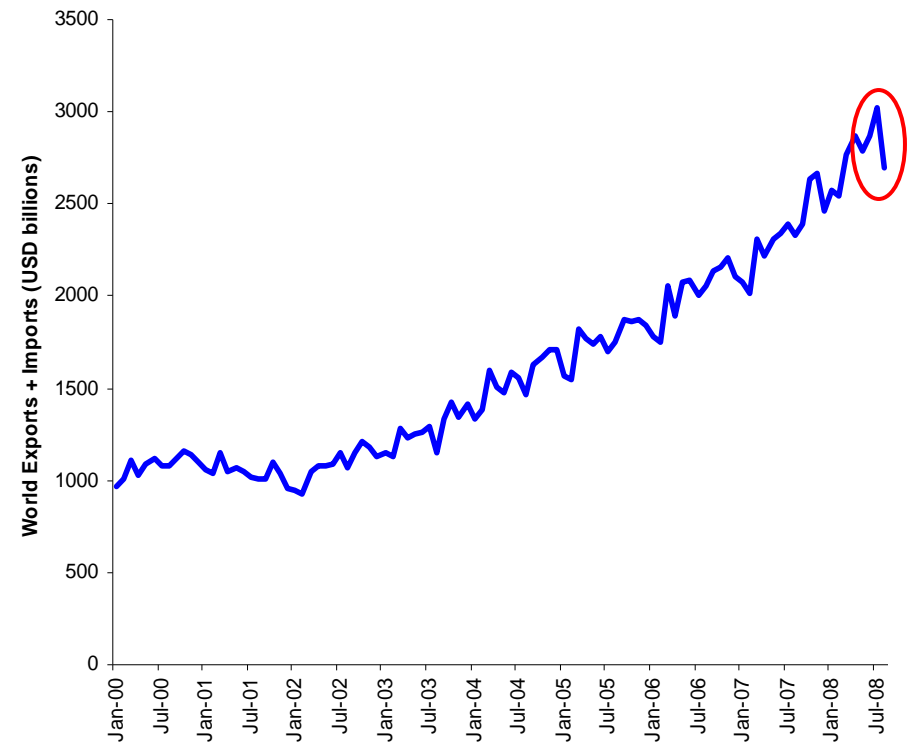
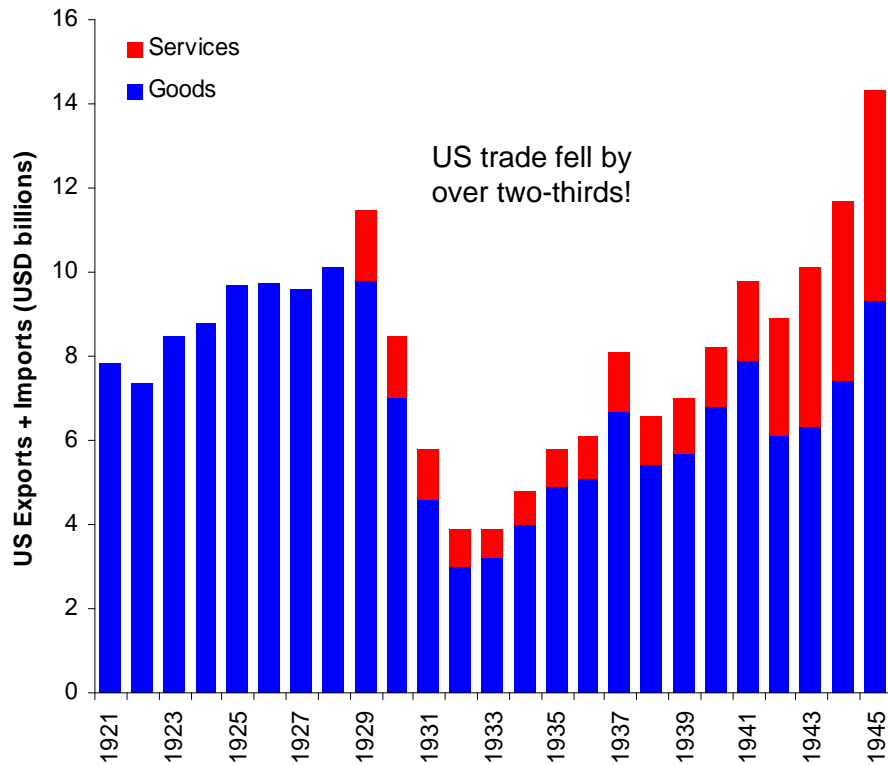
# Trade surpluses normally assist recovery



EM devalue currencies and increase exports to boost GDP

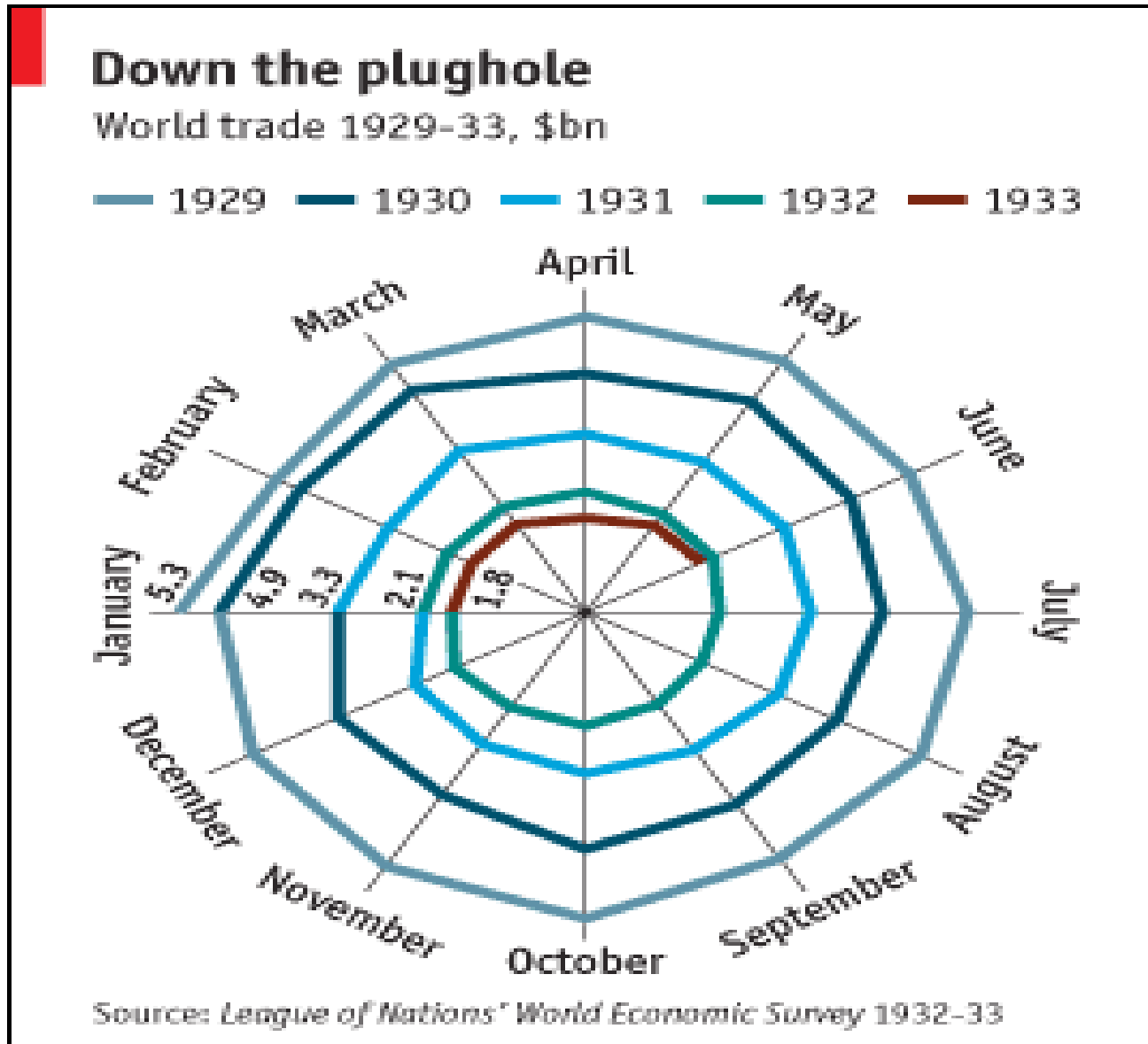
Average: AG, FN, ID, MY, MX, NW, SD, TH, TK, US (1929)

# But with weak global economy, export route may not exist



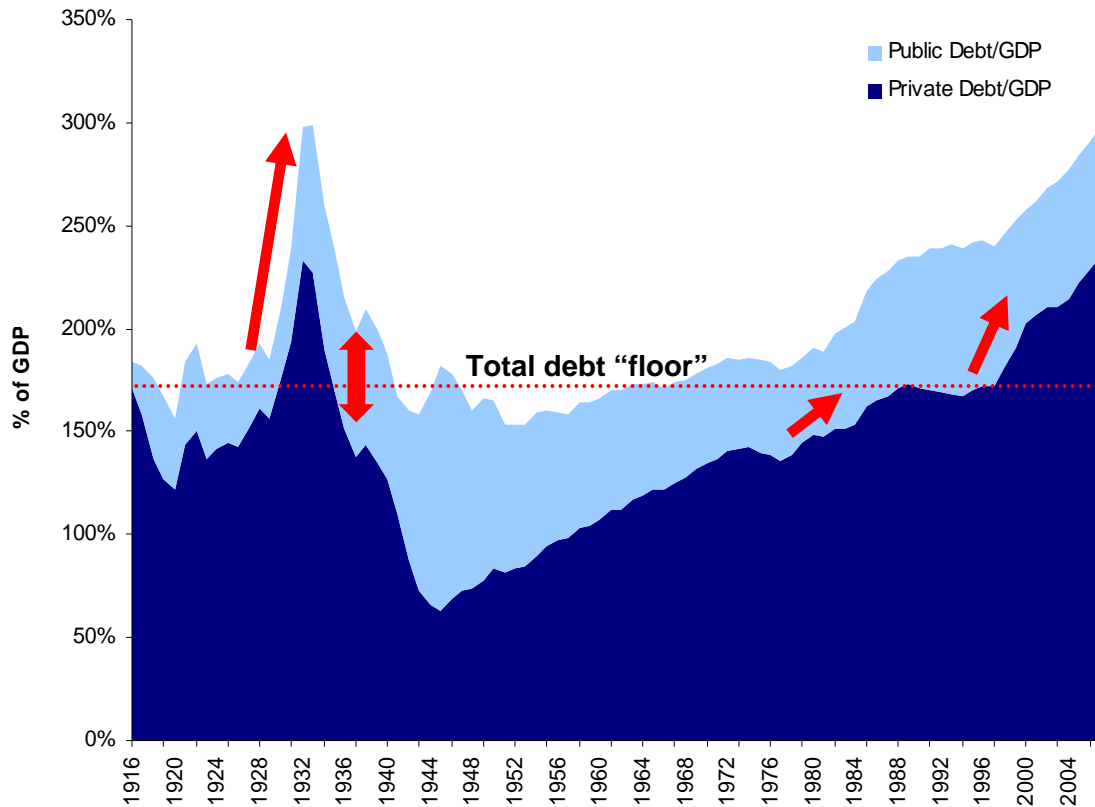
Note: Data on US trade in services unavailable before 1929

# Hawley-Smoot here we come?

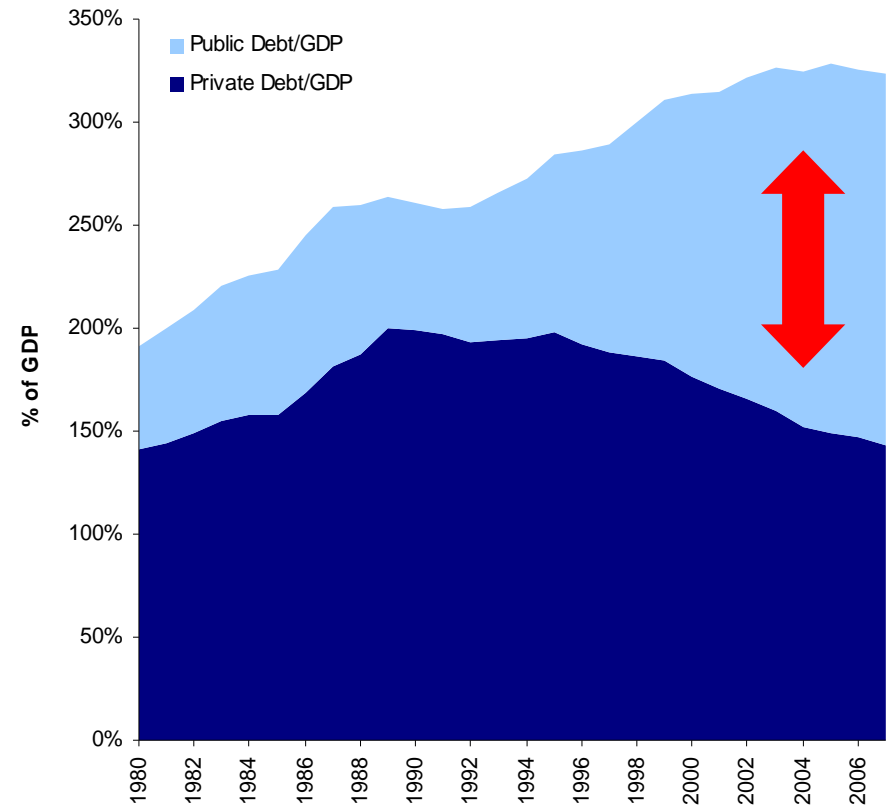


# Public debt rises to offset fall in private debt

## US Debt/GDP

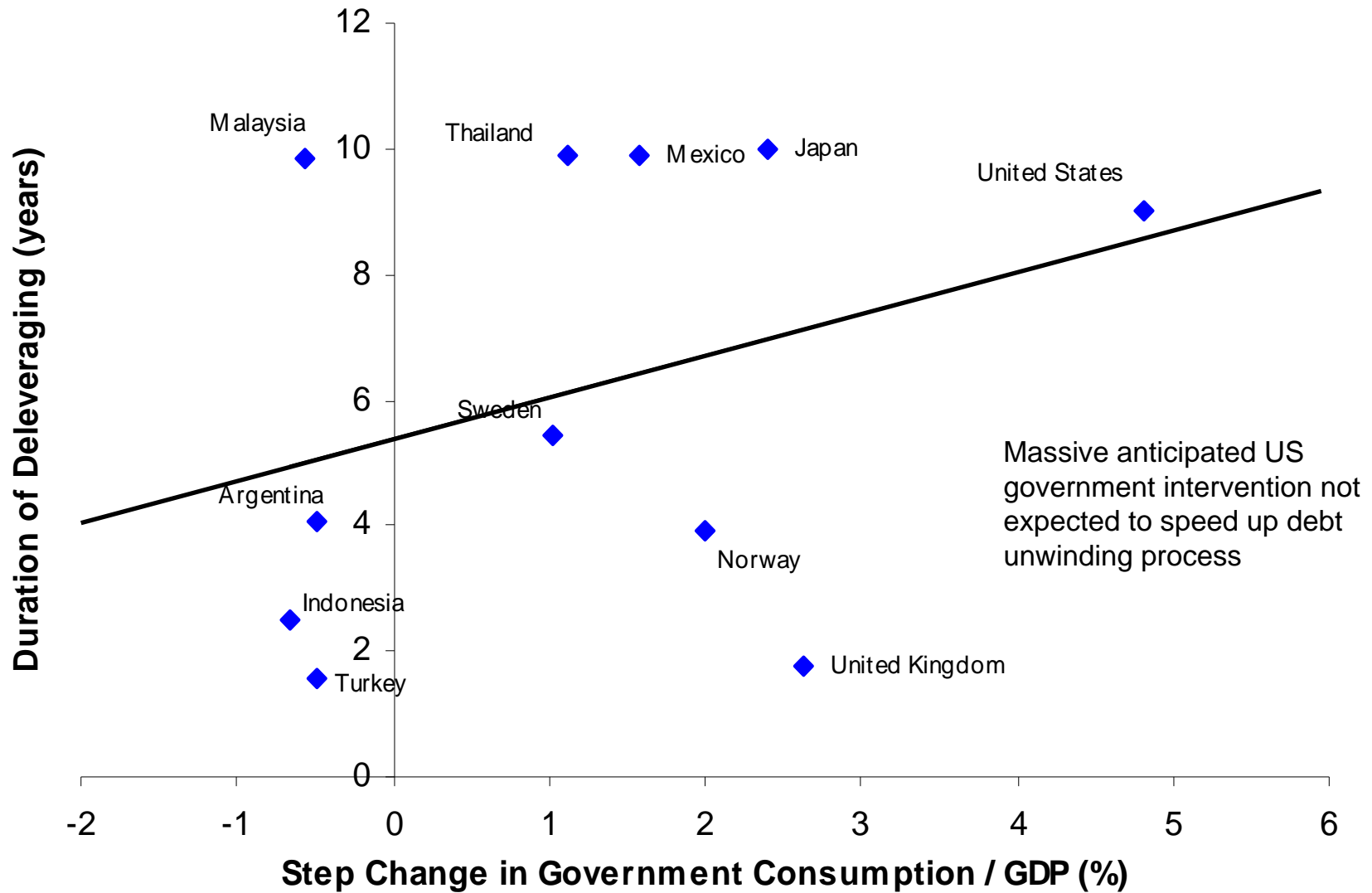


## Japanese Debt/GDP



Note: Private debt is sum of household, non-profit, and non-financial business debt

# But fiscal deficits don't end deleveraging



r-sq = 0.10

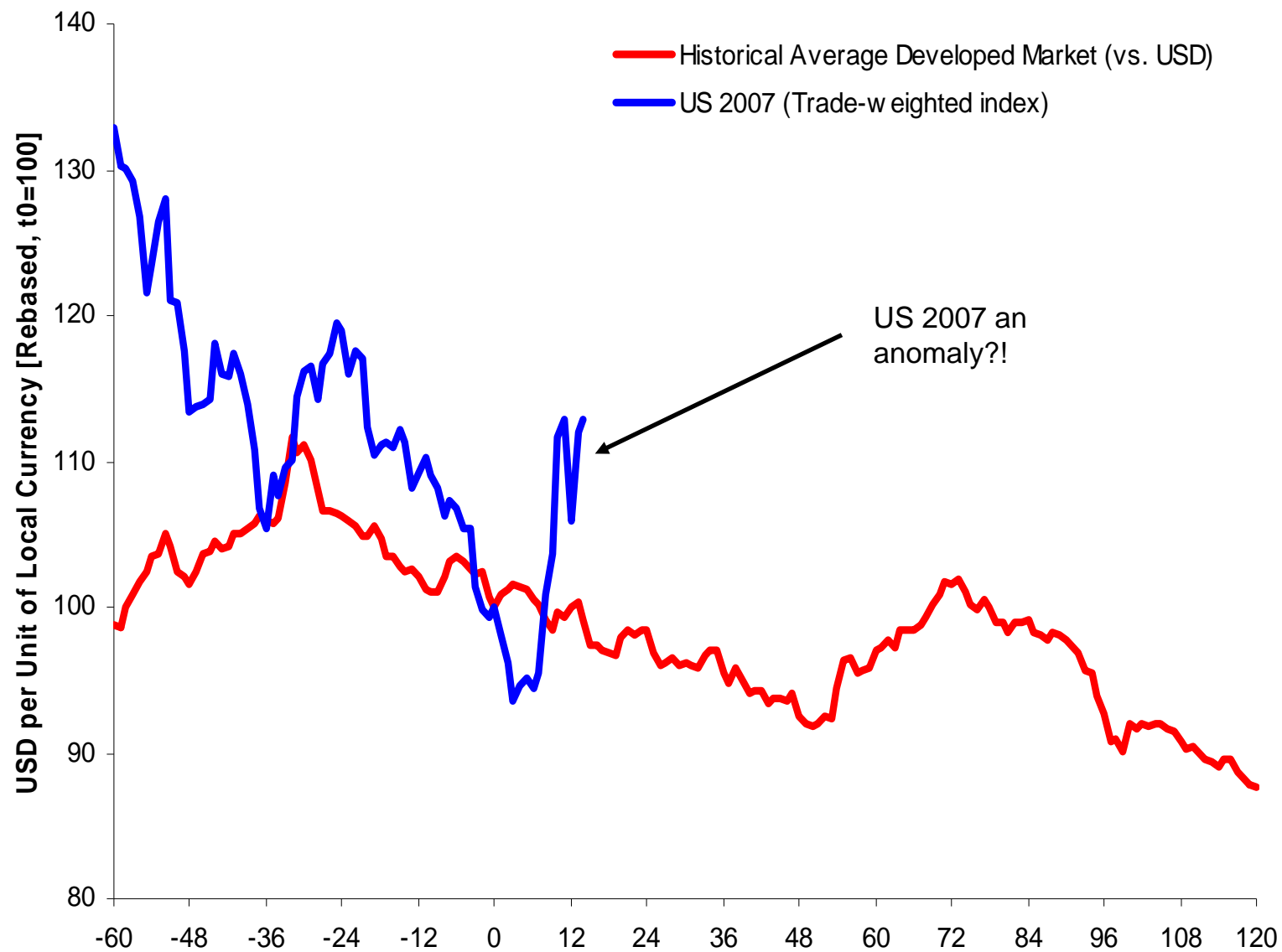
# Investment Implications

# Investment Summary

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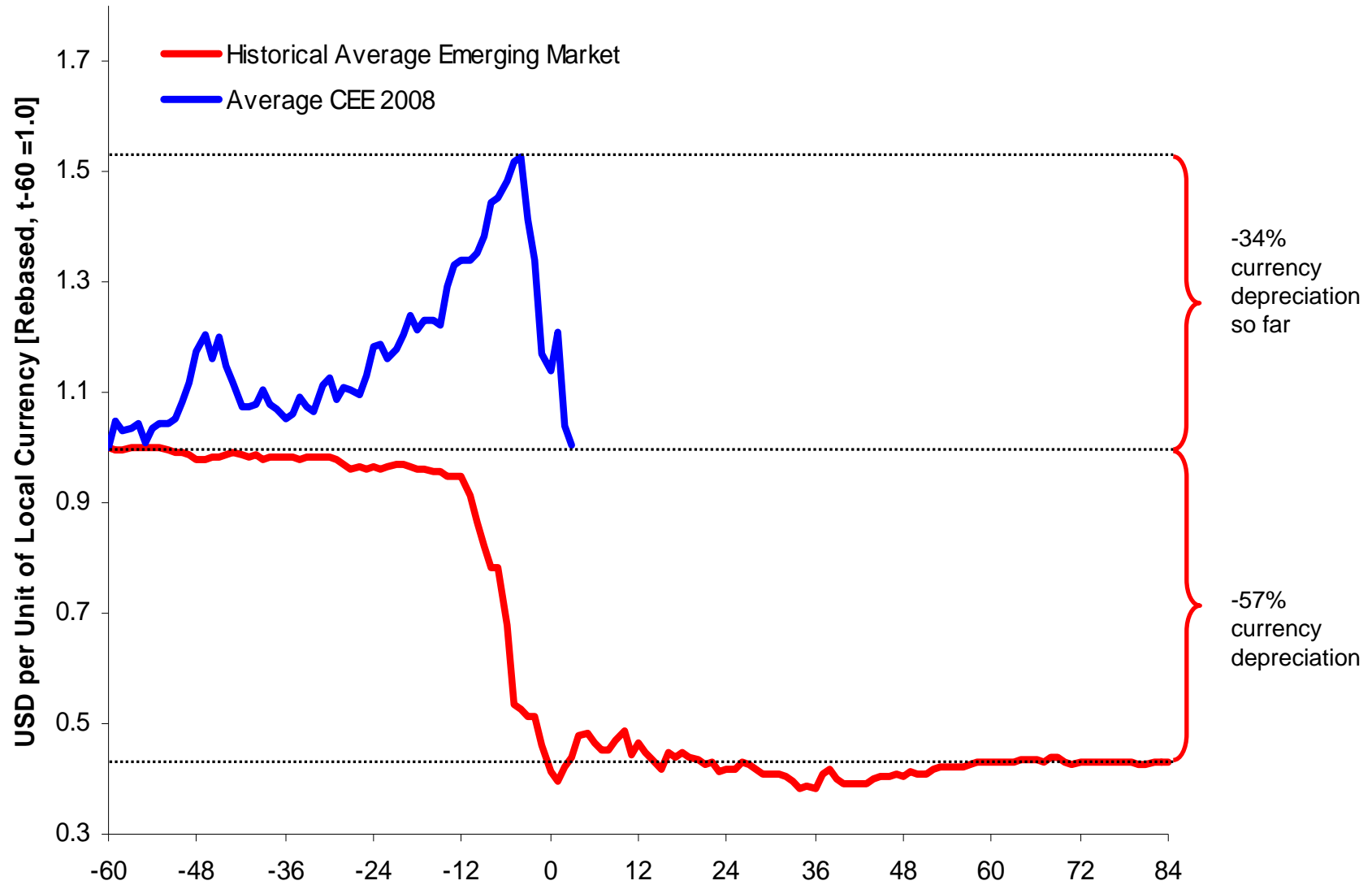
- Currencies weaken
- Bond yields decline
  - But may spike due to funding crises
- Prolonged stock market volatility
- Equity valuations decline
- Housing market doesn't recover until de-leveraging over

# Deleveraging normally associated with currency weakness



Dev: FN, JP (1997), NW, SD, UK; US as of 2/16/2009

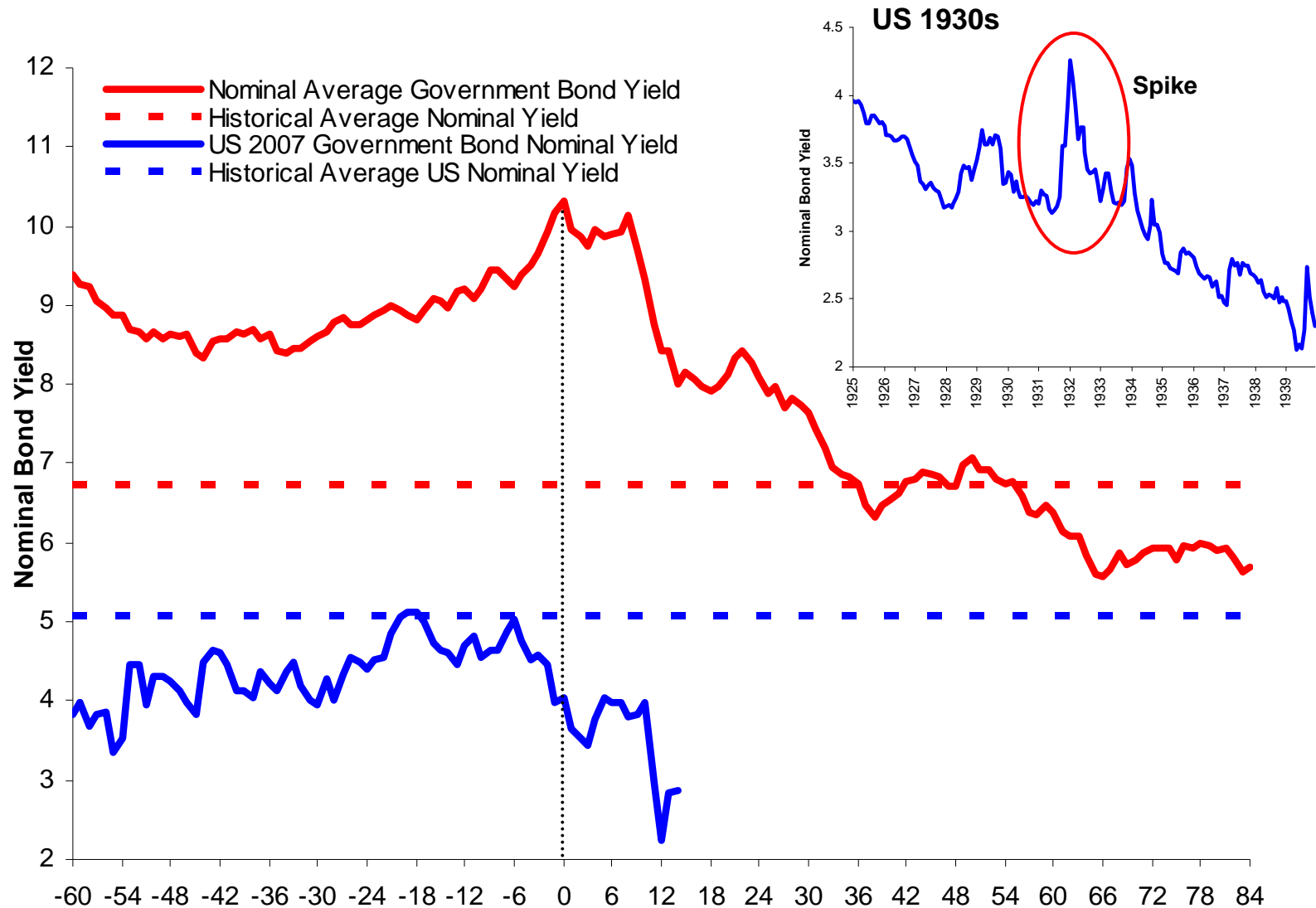
# Emerging currencies vulnerable to collapse



EM: Argentina (2001), Indonesia (1998), Malaysia (1998), Mexico (1994), Thailand (1998)

CEE: Bulgaria, Romania, Poland, Hungary; as of 2/13/2009

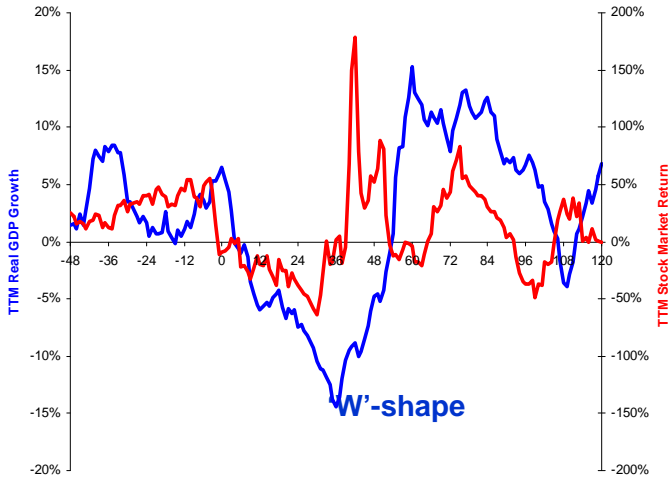
# Bond yields normally fall, but can spike in crisis



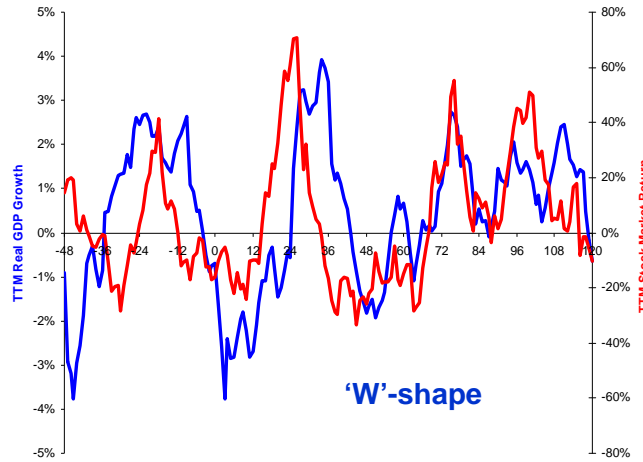
JP (1990), MY, TH, US (1929), FN, NW, SD, UK; as of 2/13/2008

# Volatile stock market accompanies economic turbulence

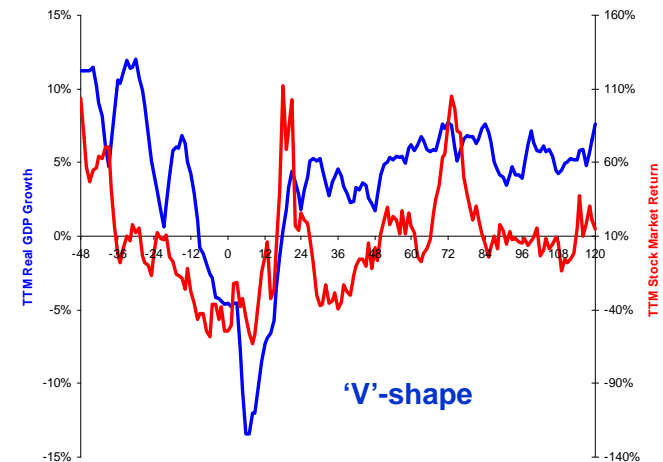
**United States 1930s**



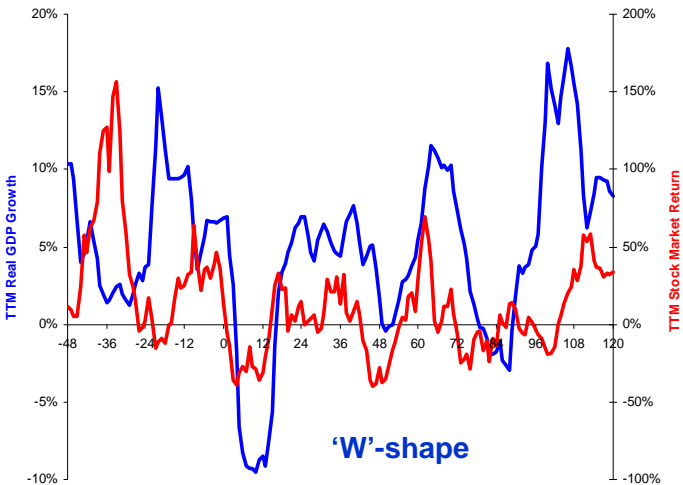
**Japan**



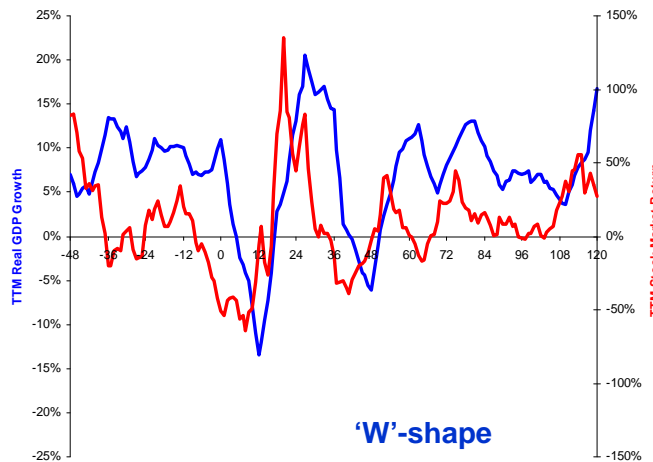
**Thailand**



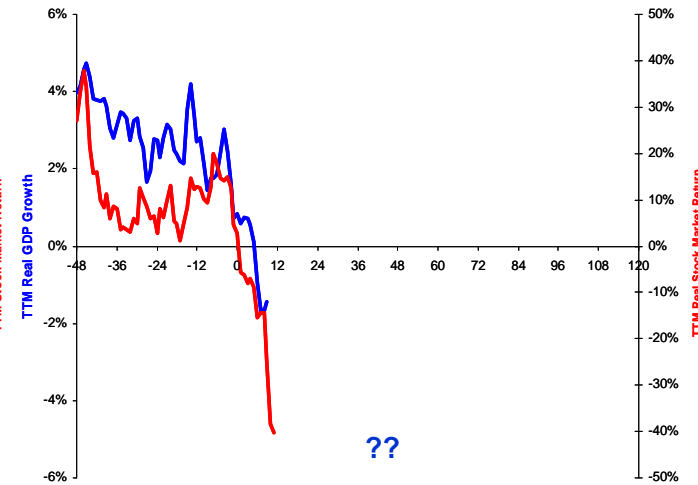
**Mexico**



**Malaysia**



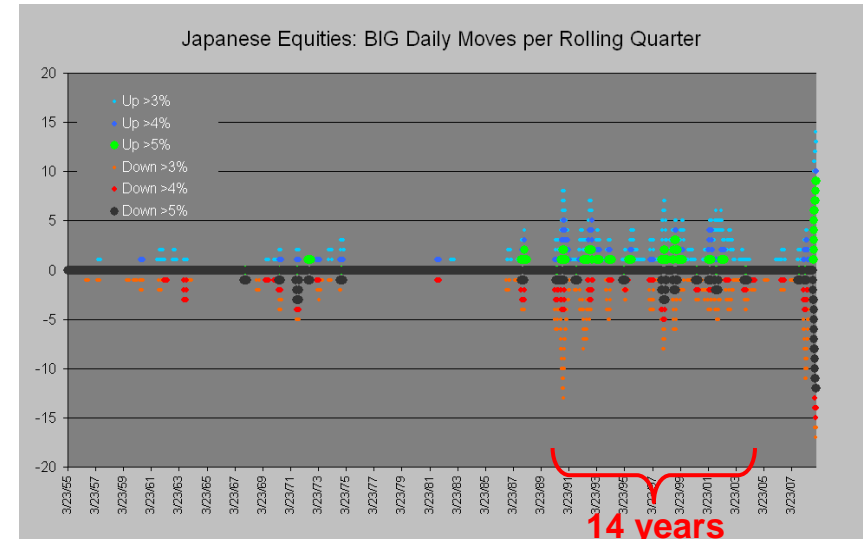
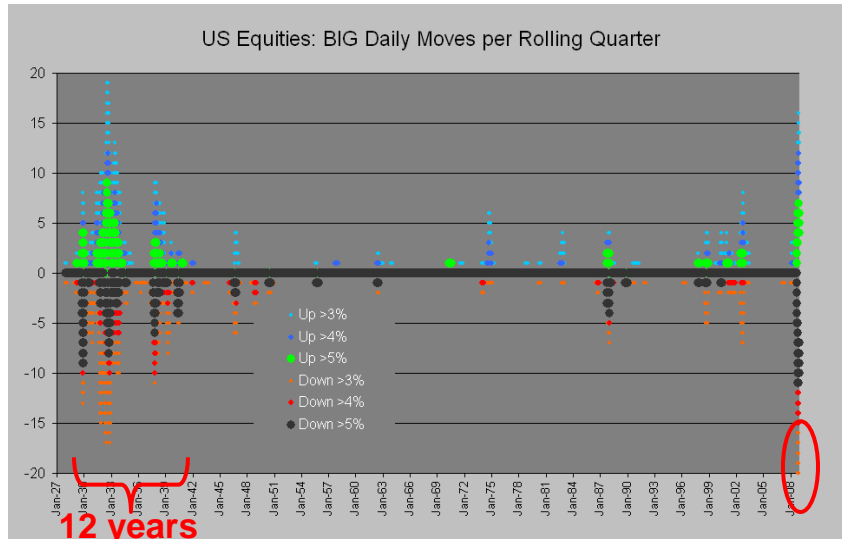
**United States 2007**



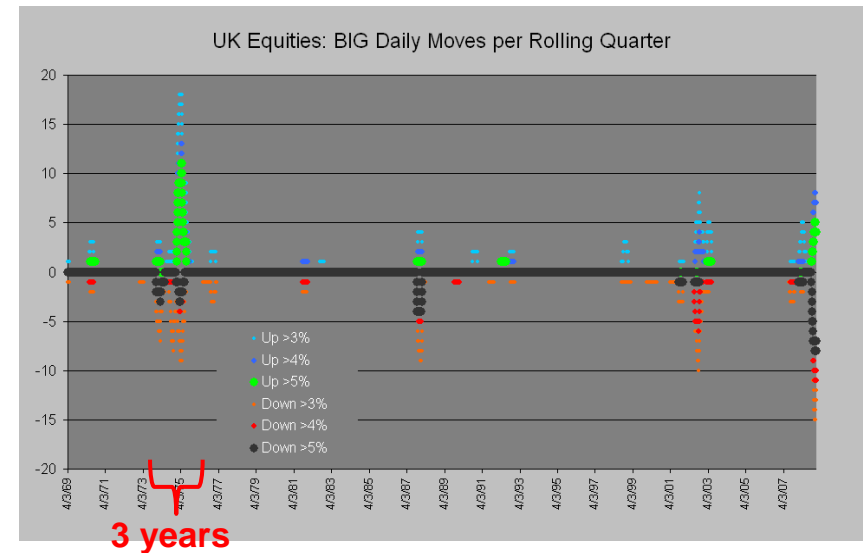
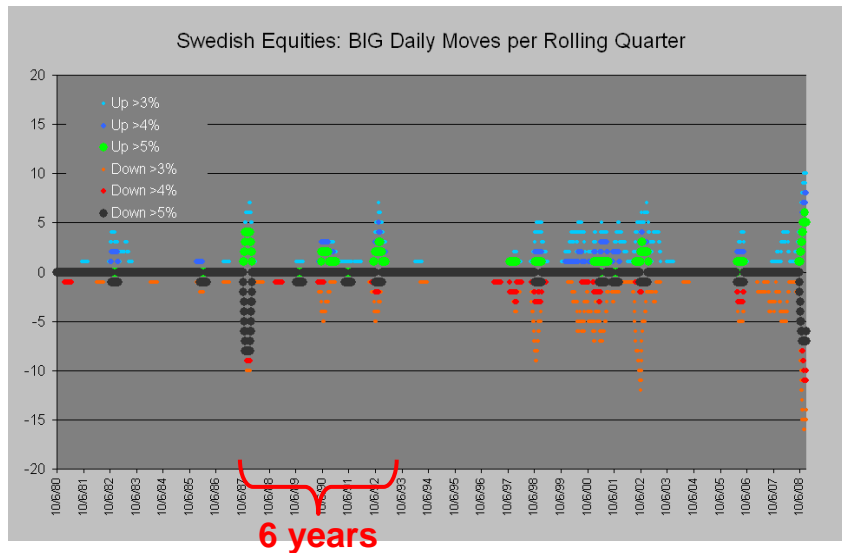
US (1929), JP (1997)

# Large daily moves persist in equity markets

Long Deleveraging

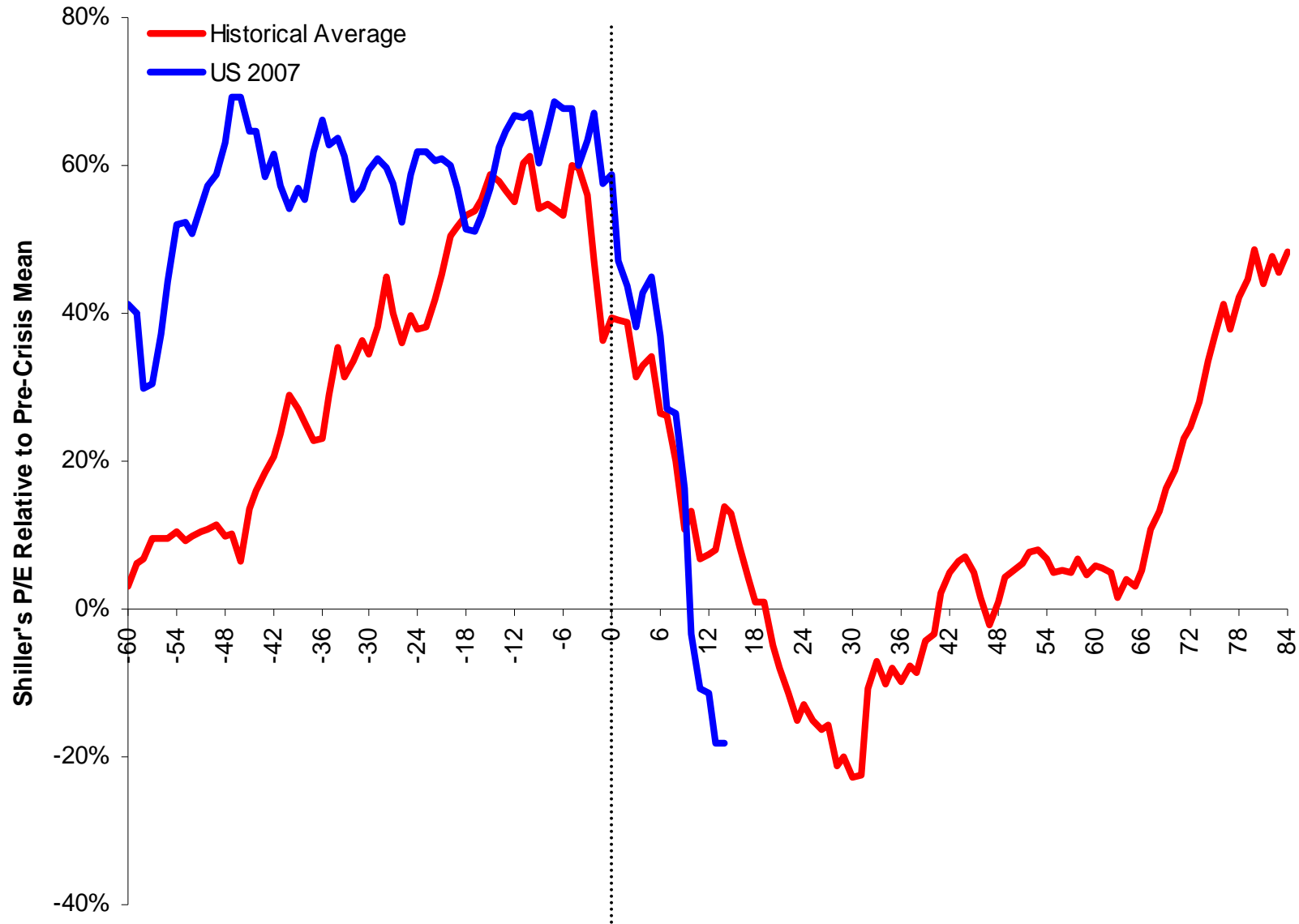


Short Deleveraging



Note: Other episodes display similar results (in appendix)

# Volatility associated with declining equity valuations



NW, SD, JP (1990), UK, US (1929), as of 2/13/2009

# Equities trough at large valuation discounts

	PE peak to trough % decline	Trough PE (% of mean)	Years from peak to trough
United States 1930s	-83	-63	2.8
United Kingdom 1970s	-75	-52	2.3
Japan 1990s	-69	N/A	5.5
Norway 1990s	-55	-49	2.4
Sweden 1990s	-60	-43	3.2
<b>Average</b>	<b>-68</b>	<b>-52</b>	<b>3.2</b>

S&P500 P/E could trough 12/31/2009-4/30/2013 (2.3-5.5 years from 10/31/2007 peak)

Market	Index	Current Index (2/13)		GMO Fair Value	High-Cost Recession 40% discount	Deleveraging Episode 52% discount	Major De-rating Cycle 61% discount
		Level	Discount				
US	S&P 500	830	-13%	950	570	460	370
UK	FTSE All-Share	2,100	-22%	2,700	1,620	1,300	1,050
Spain	Madrid SE General	880	-32%	1,300	780	620	510
Japan	Topix	770	-32%	1,130	680	540	440
Australia	ASX All-Ordinaries	3,500	-8%	3,730	2,240	1,790	1,450

Index price assuming bottom occurs tomorrow (does not take into account earnings growth or inflation)

P/E is cyclically-adjusted (10-year moving average earnings)

# GMO

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