

26<sup>th</sup> Conference of the American Committee for Asian Economic Studies (ACAES)  
Doshisha University, Kyoto, Japan  
5-6 March, 2010

# After Two Crises: The Case of Indonesia

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# Content of Presentation

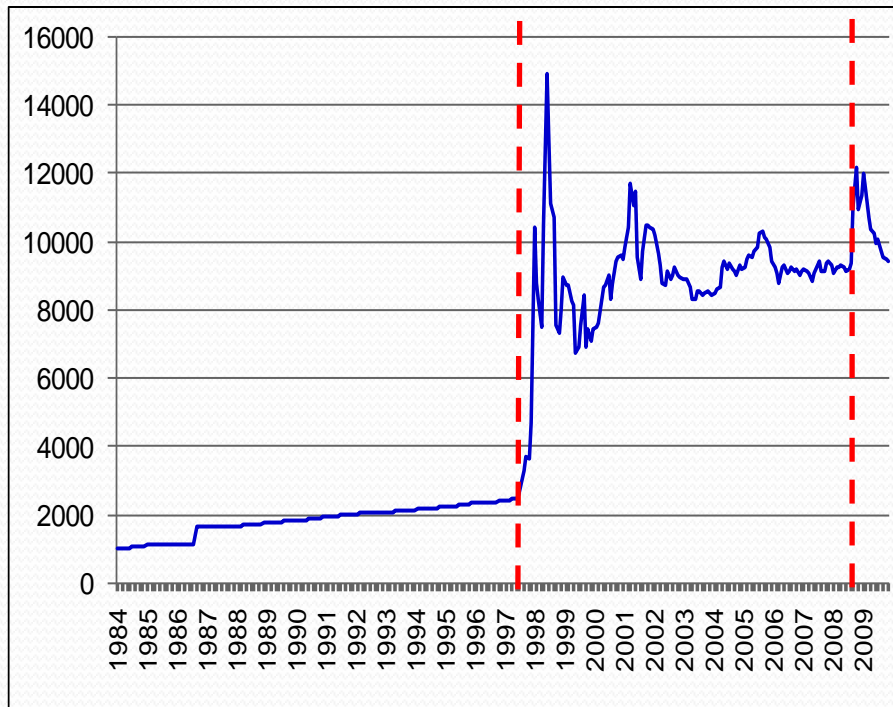
- Introduction
- Macroeconomic Indicators  
(Exchange rate, stock price, export and import, economic growth, debt, reliance on domestic economy, capital flows)
- Economic Structure  
(Efficacy of monetary and fiscal policy, Feldstein-Horioka puzzle, structural changes after the Asian crisis)
- Analysis of the Policy Response  
(Compare the policy response to both crises)
- Conclusion

# Introduction

- Objective of this study is to assess the impacts of the Asian crisis and current crisis on macroeconomic condition.
  - ❑ Review macroeconomic conditions before and after the two crises
  - ❑ Evaluate structural change
  - ❑ Analyze the policy response
- Methodology:
  - ❑ Reviewing macroeconomic indicators
  - ❑ Estimating interest parity condition and saving-investment relation
  - ❑ Evaluating policy response and the impact.
- The study offers the perspective of a developing country which underwent financial crises started from financial sector abroad. Contagion transmitted the crises to domestic economy.

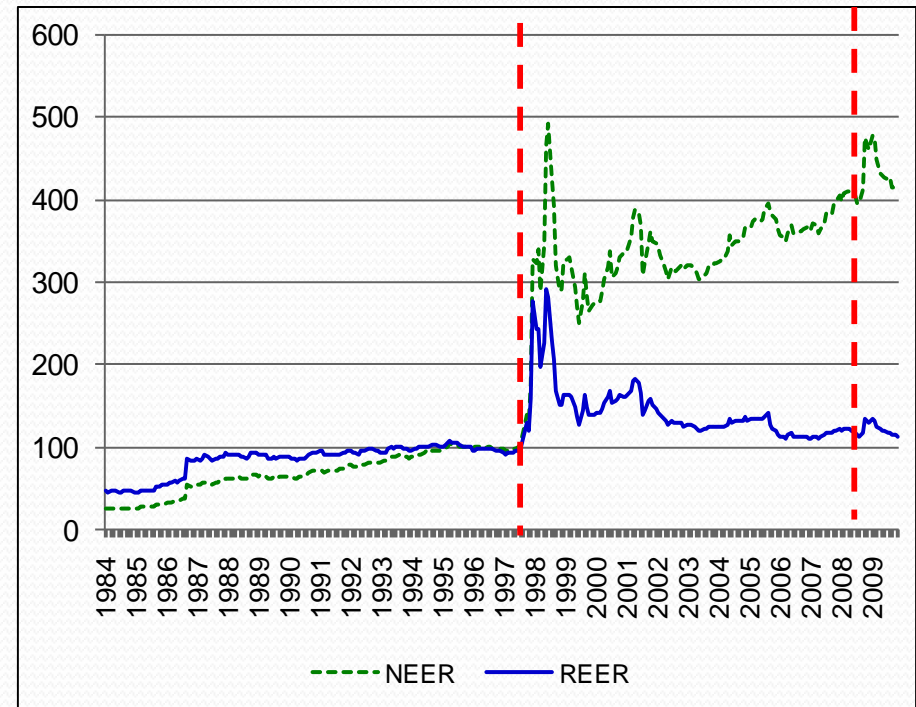
# Exchange Rate Depreciation

Market Exchange Rate (IDR/USD)



Source: IFS

NEER and REER (1995=100)



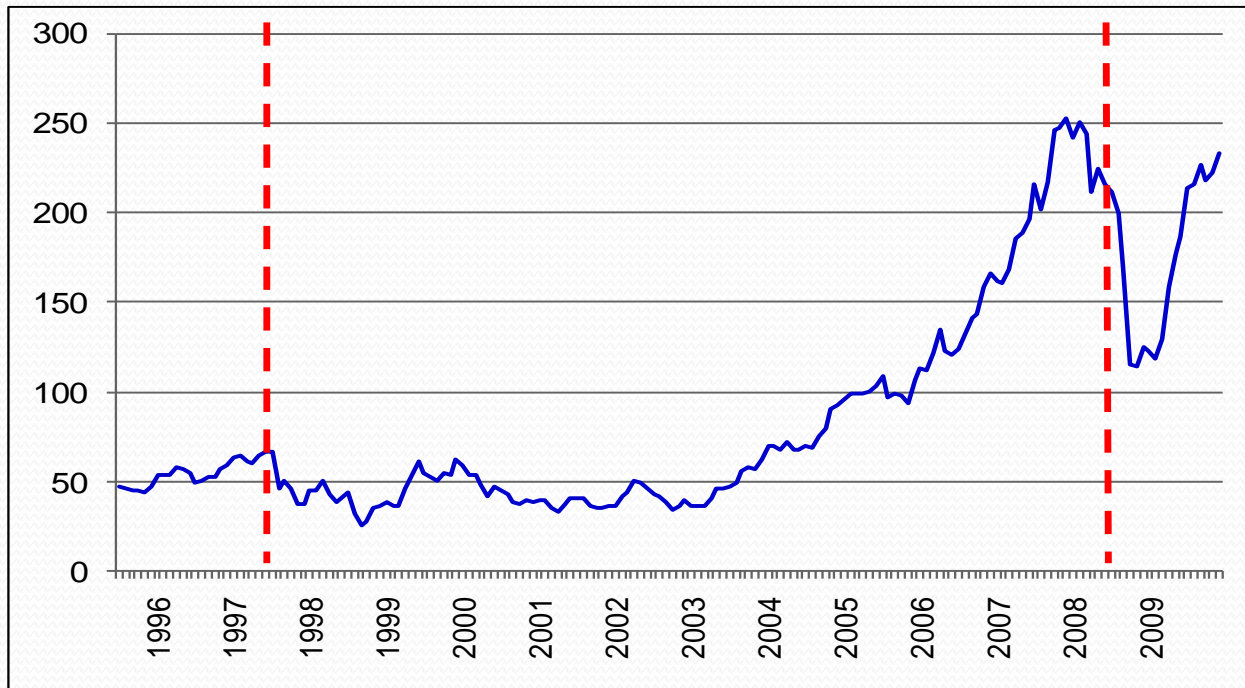
Source: BIS (from 1994), author calculation (1984-1993)

Exchange rate was managed before the Asian crisis, but floated afterward. Large depreciation happened in both crises. Recovery was rapid in the current crisis.

REER was back to before the Asian crisis level, but not NEER. This indicates higher domestic inflation relative to trading partners.

# Assets Price

Stock Price Index (2005=100)



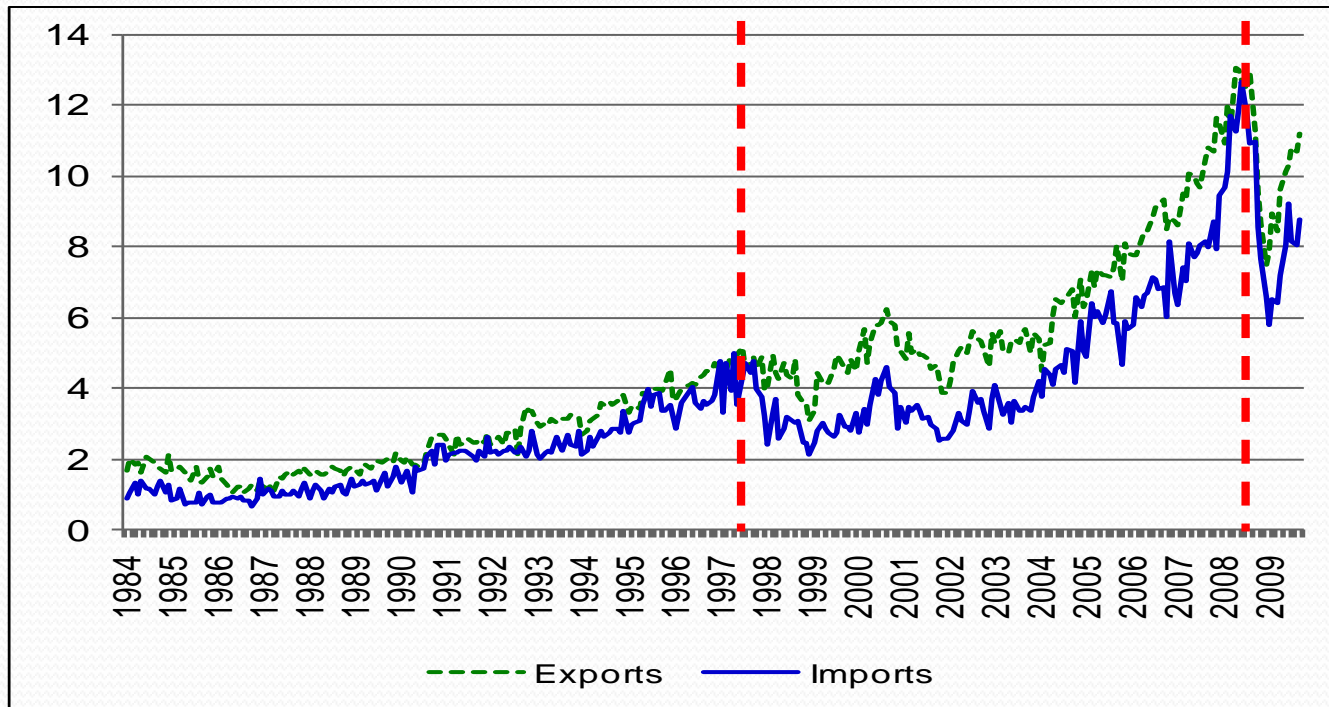
Source: IFS

Stock price plunged just after the crises. The increase was started only after 2004.

In the current crisis, the price is returning to the pre-crisis value.

# International Trade

Export and Import (Billions USD)



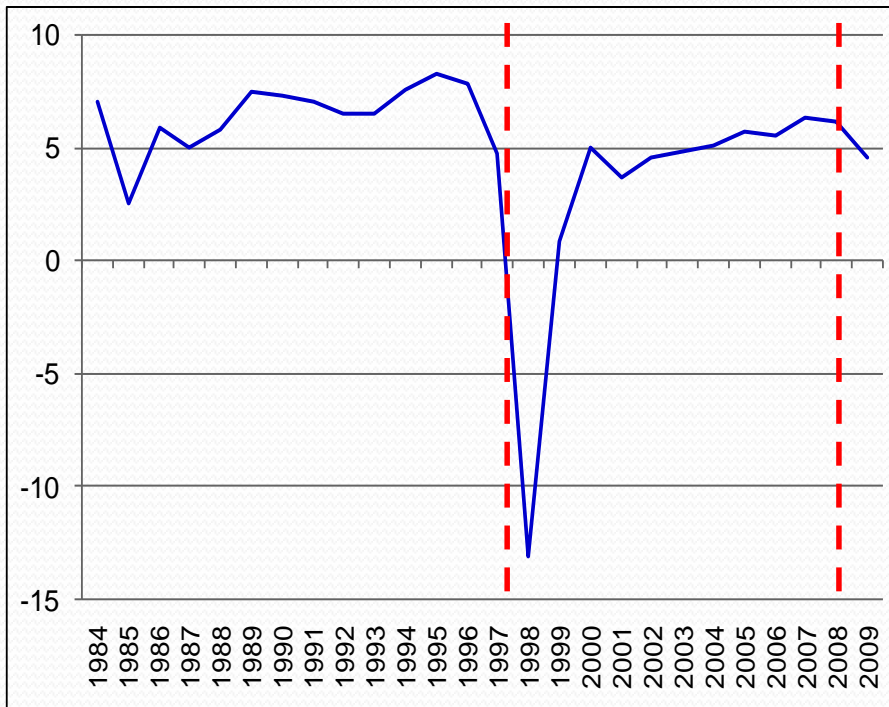
Source: IFS

Export deteriorated after the crises.

Import was restricted by the foreign currency liquidity. Net export was always positive.

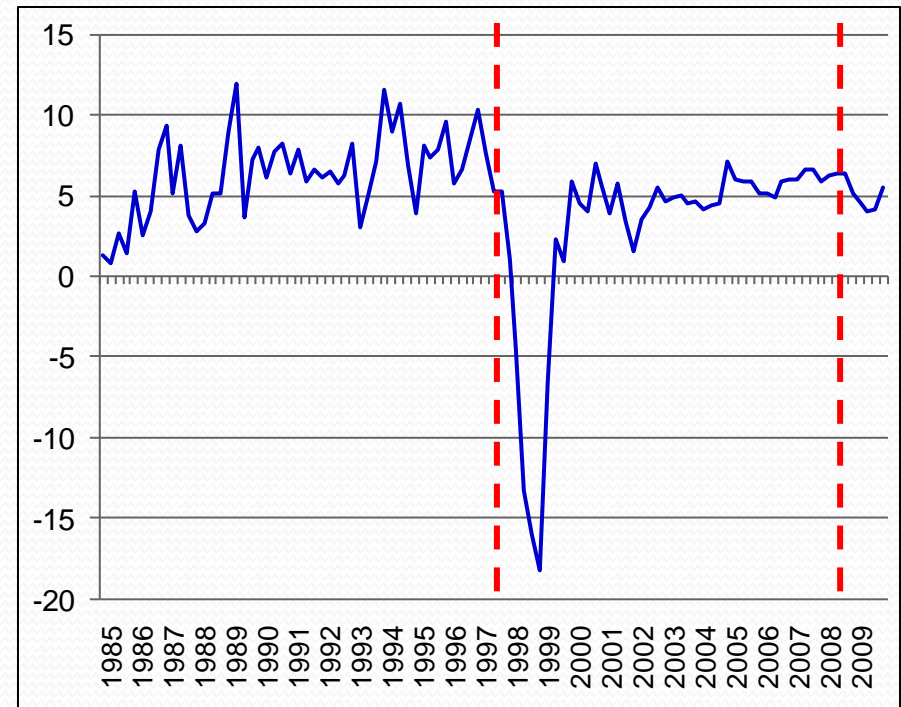
# Economic Growth

GDP Growth (Annual %)



Source: IFS (up to 2008), Statistics Indonesia (2009)

GDP Growth (Quarterly y-y %)



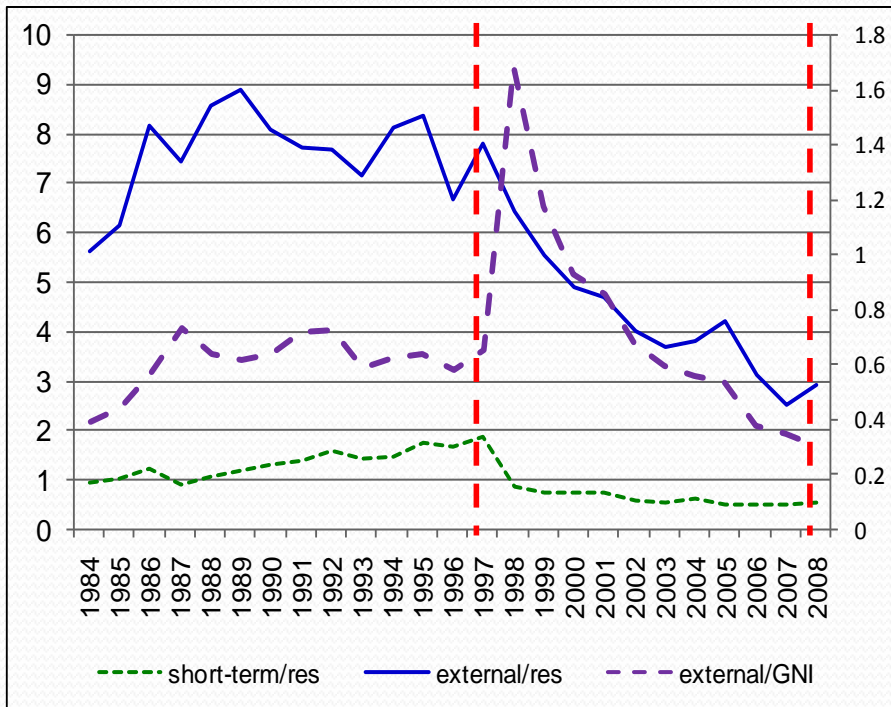
Source: Statistics Indonesia

The impact of the Asian crisis was negative growth in 1998. Annual growth was still positive after the current crisis.

Growth was declining since 4<sup>th</sup> quarter of 2008 until 3<sup>rd</sup> quarter of 2009. In 4<sup>th</sup> quarter of 2009 GDP growth started to increase.

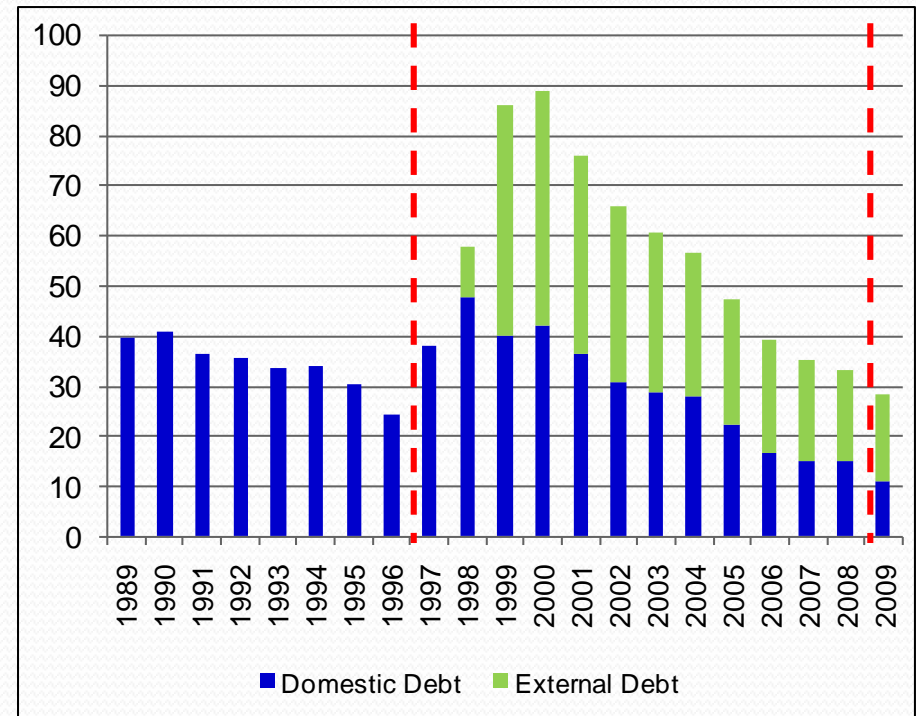
# Debt

External Debt Ratio to Reserve (left) and GNI (right)



Source: World Bank's GDF

Government Debt to GDP Ratio (%)



Source: Bank Indonesia (up to 1995), MOF (1996-2009)

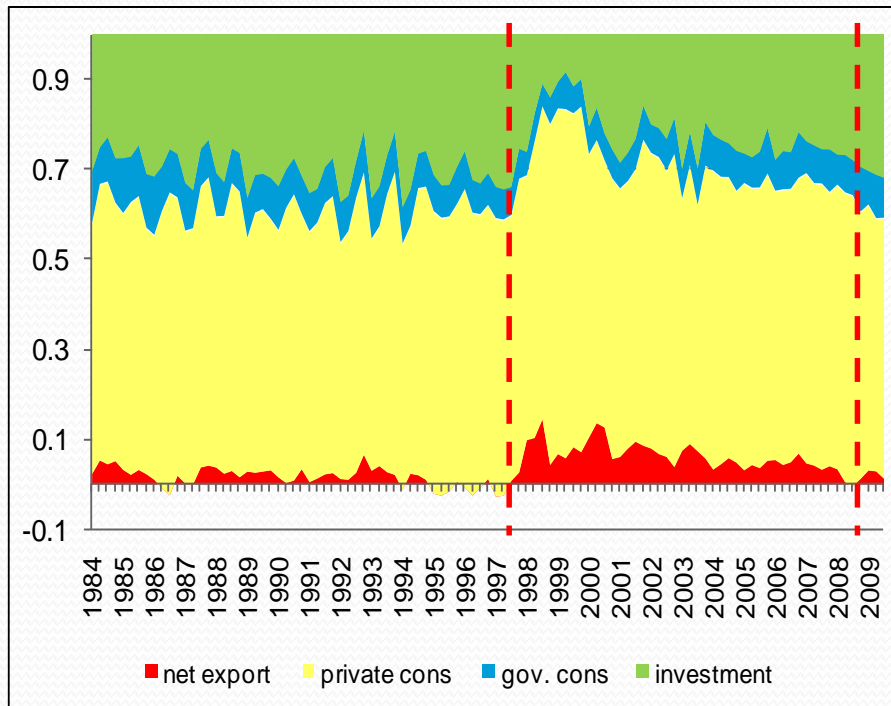
Short-term debt to reserve ratio was very high in the Asian crisis, but not in the current crisis. Debt to GNI ratio should not be a problem in both crises. Sudden increase just after the Asian crisis was caused by exchange rate depreciation, not the USD value.

Debt problem arose because of banking sector recapitalization.



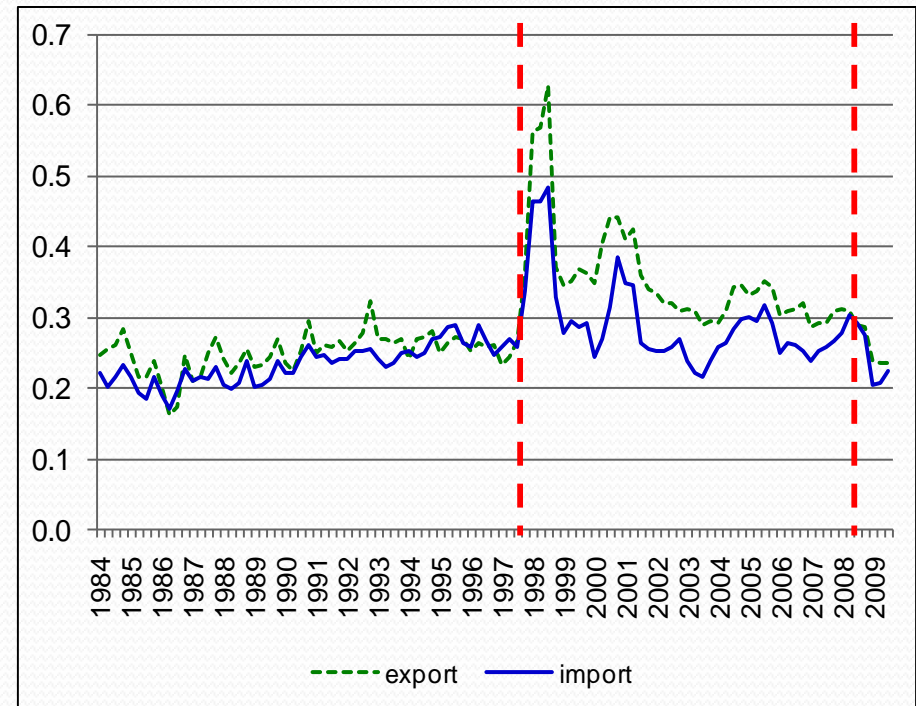
# Reliance to Domestic Economy

Composition of GDP



Source: IFS

Export and Import Ratio to GDP



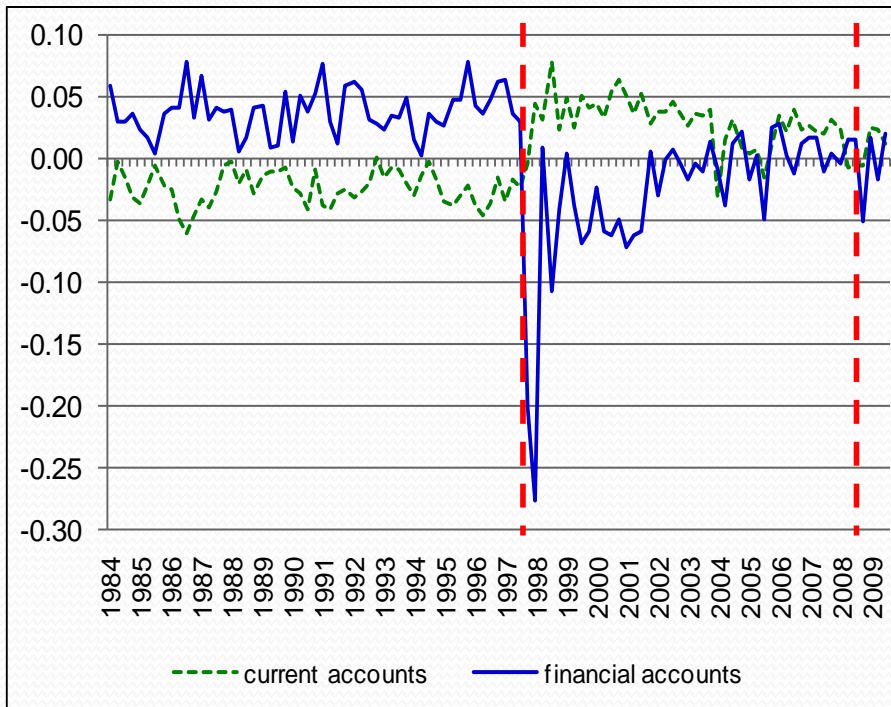
Source: IFS

External sector only contributed less than 10 percent of GDP. Export was below 30 percent of GDP before the Asian crisis.

Reliance on domestic economy caused limited impact of contagion through international trade channel. Therefore, contagion was mostly through financial channel.

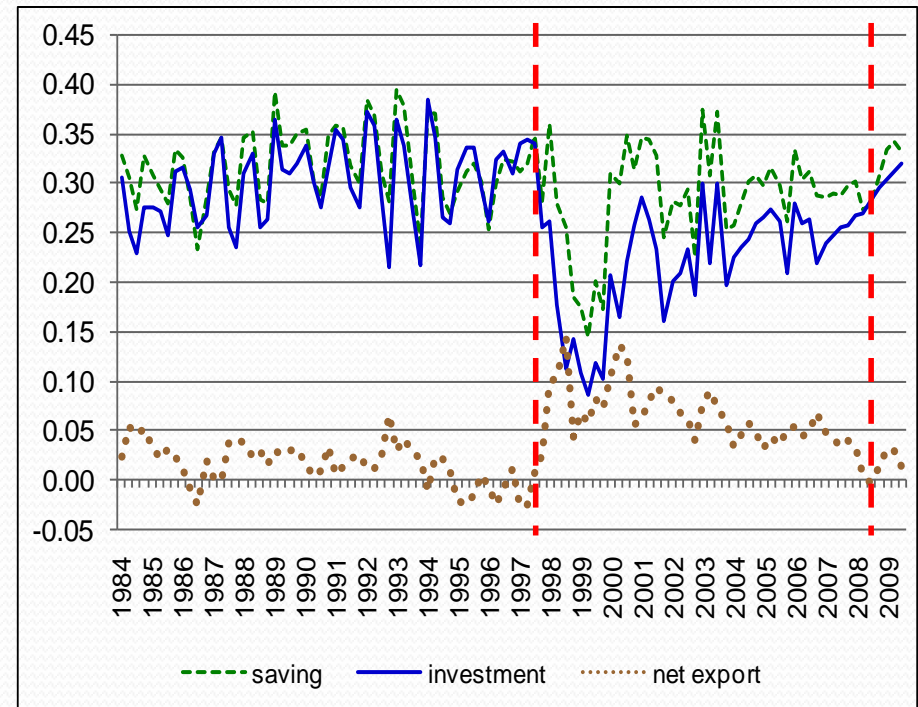
# Capital Inflows and Investment

Current Acc. and Financial Acc. Ratio to GDP



Source: IFS (from 1993), Statistics Indonesia (1984-1992)

Saving and Investment Ratio to GDP



Source: IFS (from 1993), Statistics Indonesia (1984-1992)

Large capital inflows was apparent before 1997. Capital outflows happened after the Asian crisis until 2001.

Saving and investment moved one for one in the first sub-period. In the second sub-period the movement was in similar pattern, but with a gap.

# Interest Parity

Based on uncovered interest parity relation.

$$(1 + id_t) = (1 + ib_t) \cdot \frac{s_{t+1}}{s_t}$$

Specifications employed:

$$lrd_t = \alpha + \beta_1 \cdot lrb_t + \beta_2 \cdot lfx_t + u_t$$

$$\Delta lrd_t = \alpha + \beta_1 \cdot \Delta lrb_t + \beta_2 \cdot \Delta lfx_t + u_t$$

$$\Delta lrd_t = \alpha + \beta_1 \cdot \Delta lrb_t + \beta_2 \cdot \Delta lfx_t + \theta \cdot (lrd_{t-1} - \gamma_1 \cdot lrb_{t-1} - \gamma_2 \cdot lfx_{t-1}) + \varepsilon_t$$

id : domestic interest rate  
ib : benchmark interest rate  
s : sport exchange rate

lrd : log domestic return, log (1+id)  
lrb : log benchmark return, log (1+ib)  
lfx : log expected depreciation, log (s<sub>t-1</sub>/s<sub>t</sub>)

# Saving and Investment

From national account concepts.

$$S - I = CA = NFI$$

$$S = I + NFI$$

Specifications employed:

$$i_t = \alpha + \beta \cdot s_t + u_t \quad \text{implies:} \quad nfi_t = -\alpha + (1 - \beta) \cdot s_t + u_t$$

$$\Delta i_t = \alpha + \beta \cdot \Delta s_t + u_t$$

$$\Delta i_t = \alpha + \beta \cdot \Delta s_t + \theta \cdot (i_{t-1} - \gamma \cdot s_{t-1}) + u_t$$

S : saving

I : investment

CA : current account

NFI : net foreign investment

s : saving to GDP ratio

i : investment to GDP ratio

nfi : net foreign investment to GDP ratio

# Interest Parity Condition

	$\alpha$	$\beta_1$	$\beta_2$	$\theta$	$\gamma_1$	$\gamma_2$	Adj. R <sup>2</sup>	DW	$\beta_1=1$	$\gamma_1=1$
1984m1-1997m6										
lrd	7.5272 *** (1.6714)	0.9352 *** (0.3038)	-0.0012 (0.0018)				0.1714	0.9905	0.8315	
$\Delta$ lrd	0.0454 (0.1606)	1.9966 (1.6127)	-0.0025 (0.0018)				0.0058	2.5623	0.5375	
$\Delta$ lrd	3.6783 ** (1.5909)	1.5026 (1.2615)	-0.0007 (0.0013)	-0.4976 *** (0.1703)	0.9577 ** (0.3901)	0.0060 (0.0054)	0.2383	2.0315	0.6909	0.9139
2000m1-2008m6										
lrd	8.2941 *** (1.3848)	0.2668 (0.3199)	-0.0063 (0.0098)				-0.0023	0.3444	0.0240	
$\Delta$ lrd	-0.0609 (0.1335)	-0.7620 (0.6509)	-0.0011 (0.0021)				-0.0123	2.8581	0.0080	
$\Delta$ lrd	1.3761 ** (0.5158)	-1.6907 * (0.8021)	-0.0054 (0.0033)	-0.2040 *** (0.0699)	0.6629 (0.3995)	-0.0480 (0.0204)	0.0920	2.6222	0.0011	0.4009

Notes:

- \*, \*\* and \*\*\* represent 10%, 5% and 1% levels of significance, respectively.

Domestic interest followed benchmark rate in the first sub-period. Monetary policy was not independent before the Asian crisis. Fiscal policy was the only option.

No relationship in the second sub-period because of floating exchange rate. If the pressure was on capital outflows, expansionary fiscal policy was still useful?

# Saving and Investment

	$\alpha$	$\beta$	$\theta$	$\gamma$	Adj. R <sup>2</sup>	DW	$\beta=1$	$\gamma=1$
1984q1-1997q2								
i	0.0072 (0.0248)	0.9447 *** (0.0702)			0.8081	0.8498	0.4350	
$\Delta i$	0.0010 (0.0019)	1.0446 *** (0.0582)			0.8624	2.4716	0.4471	
$\Delta i$	0.0202 (0.0181)	1.0139 *** (0.0505)	-0.4184 *** (0.0802)	0.8235 *** (0.1299)	0.8880	2.0600	0.7839	0.1805
2000q1-2008q2								
i	0.0275 (0.0320)	0.7070 *** (0.1051)			0.4361	0.6224	0.0089	
$\Delta i$	0.0024 (0.0028)	0.8416 *** (0.0473)			0.8424	1.9133	0.0021	
$\Delta i$	0.0179 (0.0315)	0.7921 *** (0.0608)	-0.2496 (0.1635)	0.5833 (0.4547)	0.8503	1.7050	0.0018	0.3667

Notes:

- \*, \*\* and \*\*\* represent 10%, 5% and 1% levels of significance, respectively.
- Standard errors reported in parentheses are robust to heteroskedasticity and autocorrelation.

Despite high capital mobility, investment moved one for one with saving in the first sub-period. Where did the capital inflows go?

Less tight short-run relation and no long-run relation in the second sub-period.

# Chow Breakpoint Test

	interest parity				saving and investment				
	1997		2008		1997		2008		
	F-stat	ll ratio	F-stat	ll ratio	F-stat	ll ratio	F-stat	ll ratio	
M1	5.4629 ***	32.0718 ***	0.3195	2.1165	Q1	6.6082 ***	24.6374 ***	1.4714	6.7795
M2	5.8389 ***	34.0793 ***	0.3239	2.1455					
M3	6.0039 ***	34.9531 ***	0.3042	2.0166					
M4	7.7686 ***	44.0386 ***	0.2698	1.7899	Q2	9.0278 ***	31.5862 ***	1.3365	6.2049
M5	9.1380 ***	50.7812 ***	0.2799	1.8564					
M6	12.2392 ***	65.1630 ***	0.2363	1.5695					
M7	14.0805 ***	73.1800 ***	0.2193	1.4572	Q3	9.9204 ***	33.9562 ***	0.6159	2.9824
M8	22.6077 ***	106.1980 ***	0.2177	1.4467					
M9	5.2619 ***	30.9893 ***	0.1972	1.3110					
M10	5.7974 ***	33.8590 ***	0.1636	1.0888	Q4	9.6148 ***	33.1555 ***	0.4057	1.9902
M11	7.8360 ***	44.3768 ***	0.1276	0.8497					
M12	13.9118 ***	72.4601 ***	0.1060	0.7068					

Notes:

- \*, \*\* and \*\*\* represent 10%, 5% and 1% levels of significance, respectively.
- F-stat denotes F statistic value and ll ratio denotes loglikelihood ratio.
- The null hypothesis is no breaks at specified breakpoints.

Structural break was apparent in 1997, but not in 2008.

The breakpoint in 1997 was probably in 8<sup>th</sup> month or 3<sup>rd</sup> quarter, indicated by the largest value of F-Statistic and loglikelihood ratio.

# Policy Response: Asian Crisis

- Supported by IMF
- Tight fiscal policy
  - cancel unnecessary projects ...
- Tight monetary policy
  - high interest rate ...
- Financial sector
  - closure of 16 banks at the onset of the crisis ...



# Policy Response: Current Crisis

## Fiscal Policy:

- Boost the purchasing power to maintain private consumption
  - ❑ reducing personal income tax
  - ❑ providing more direct subsidy for medium and low income household
- Reduction of costs of business
  - ❑ lower income tax
  - ❑ subsidy for energy prices
- Support employment creation and poverty reduction
  - ❑ additional expenditure on infrastructure projects

# Policy Response: Current Crisis

## Monetary Policy:

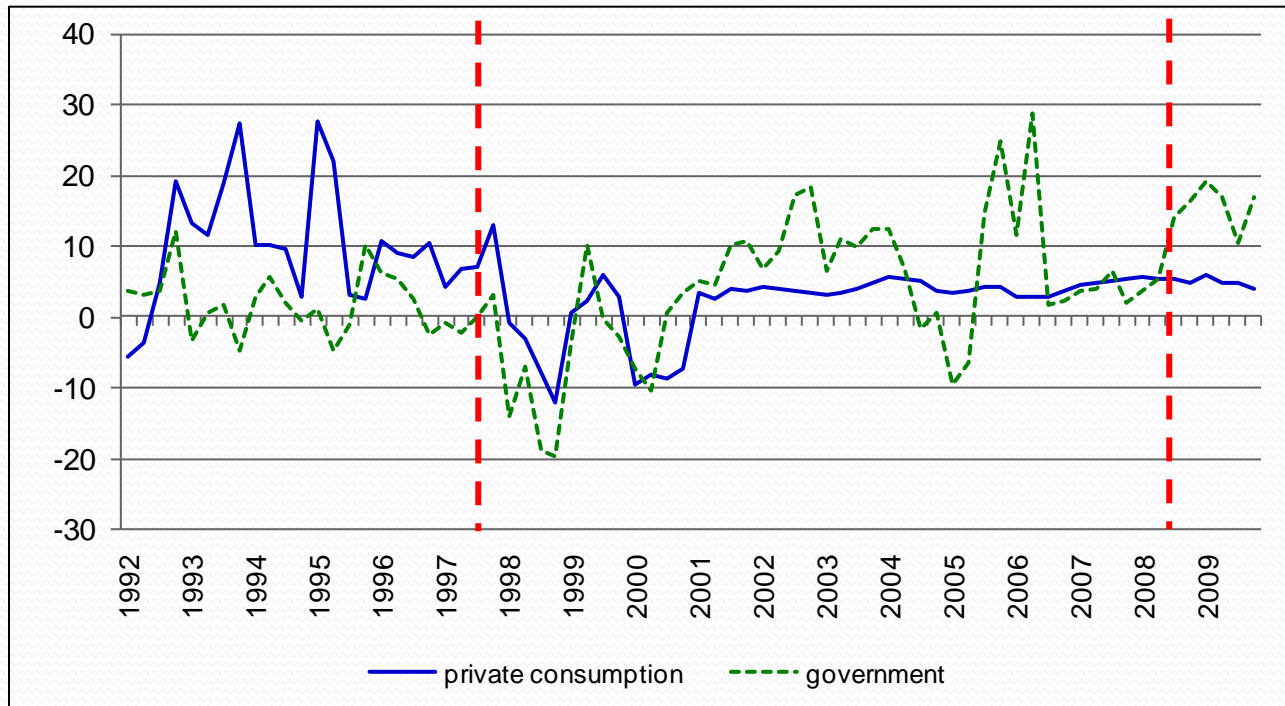
- Providing liquidity
  - ❑ cutting reserve requirement in foreign currency deposit;
  - ❑ extension of foreign exchange swap tenor;
  - ❑ provision of foreign currency for domestic companies through the banking sector.
- Minimizing speculative transactions
  - ❑ requirement of underlying transaction for purchase of foreign currency through bank;
  - ❑ prohibition of structured product transactions.

## Financial Sector:

- Bail-out one bank at the onset of the current crisis.

# Impacts of Policy Responses

Growth of Private and Government Consumption (%)



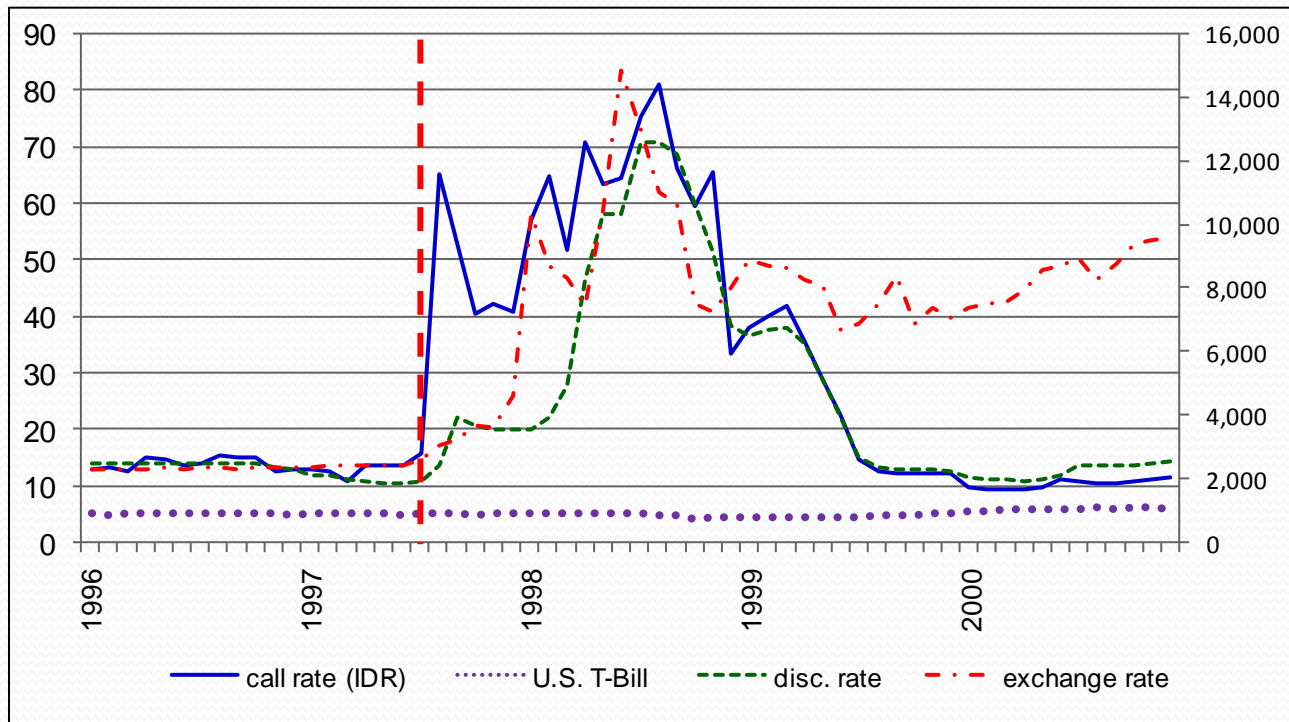
Source: Statistics Indonesia

Private consumption was influenced by government consumption.

Tight fiscal policy caused private sector contraction in 1998, while fiscal stimulus successfully maintained private consumption in 2008/2009.

# Impacts of Policy Responses

Interest Rates (Left - %) and Exchange Rate (Right - IDR/USD)



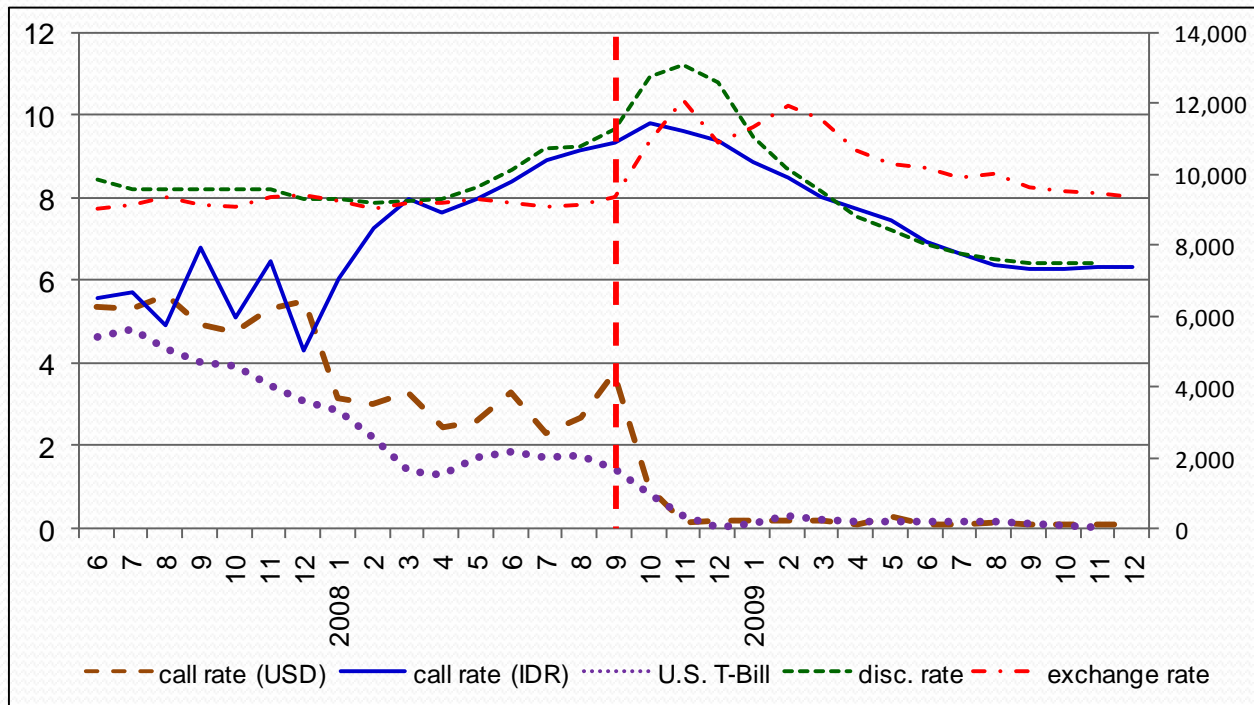
Source: IFS

Liquidity problem was exacerbated by tight monetary policy in 1998.

Exchange rate depreciation was started at the end of 1997 following the closure of 16 banks. In the mid 1998, Indonesian Rupiah depreciated more than 500 percent compared to its value in early 1997.

# Impacts of Policy Responses

Interest Rates (Left - %) and Exchange Rate (Right - IDR/USD)



Source: Bank Indonesia (call rate USD), IFS (Others)

Interest rate was increased to reduce inflationary pressure in the mid 2008, but relaxed after the onset of the current crisis. USD money market rate even converged to benchmark rate.

Exchange rate depreciated by more than 30 percent at the end of 2008, but returned at the end of 2009.

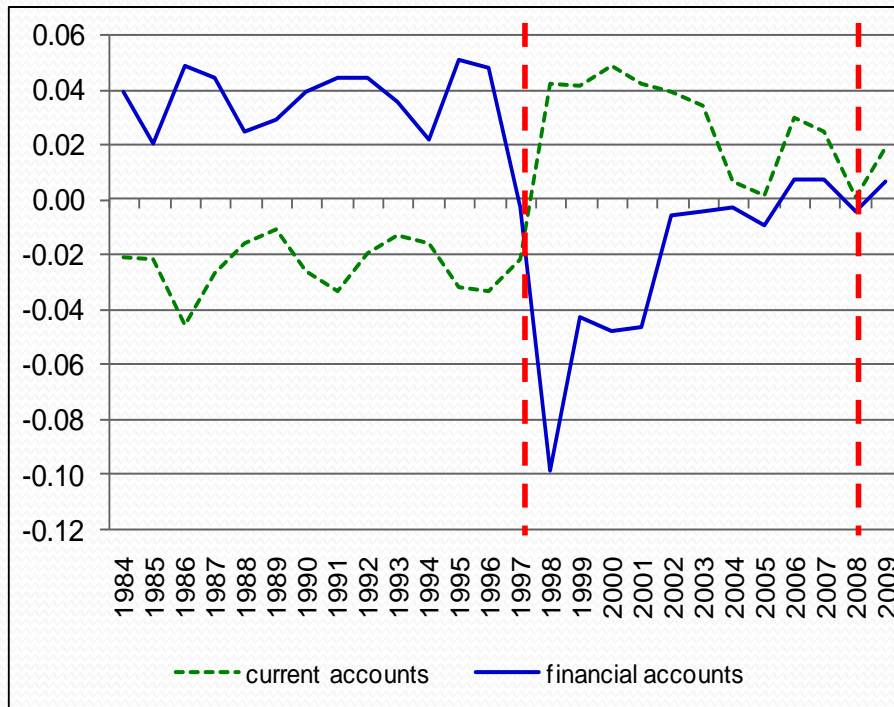
# Conclusion

- Both crises originated from external financial sector and transmitted into domestic economy by contagion through financial channel.
- Different response for the two crises: i.e. fiscal and monetary contraction in the Asian crisis and fiscal and monetary expansion for the current crisis.
- Structural changes happened after the Asian crisis, but not after the current crisis.
- Lower short-term debt and reliance on domestic demand may contribute to the less suffering from the current crisis.
- Rapid recovery for the current crisis may be attributed to expansionary fiscal and monetary policy. The resilience of the financial sector may also influence the result.
- Unlike in the Asian crisis, speculative behavior and herding was successfully limited in the current crisis.

Thank you!

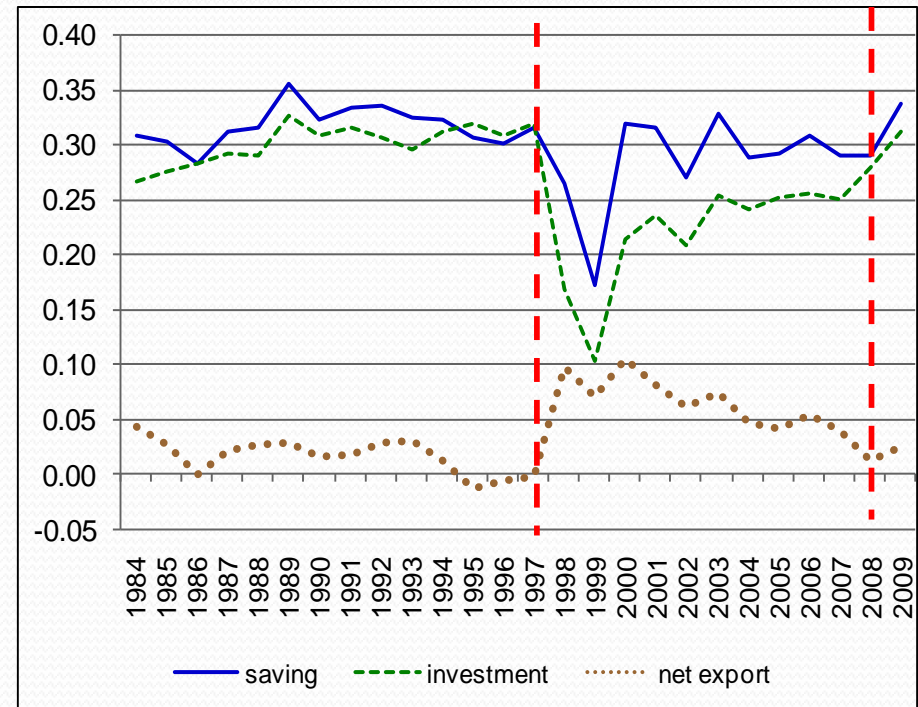
# Capital Inflows and Investment (Yearly)

Current Acc. and Financial Acc. Ratio to GDP



Source: IFS and Statistics Indonesia

Saving and Investment Ratio to GDP

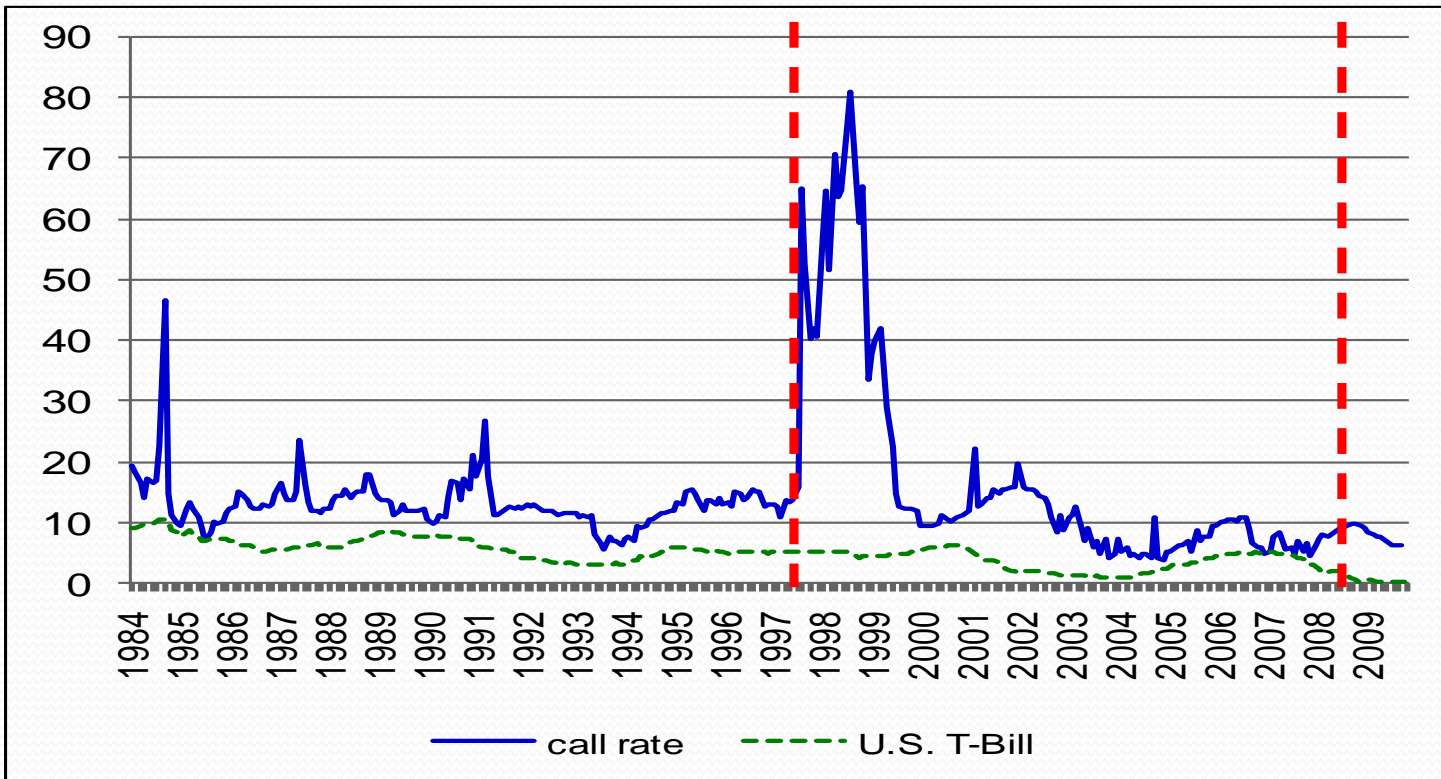


Source: IFS (from 1993), Statistics Indonesia (1984-1992)



# Interest Parity

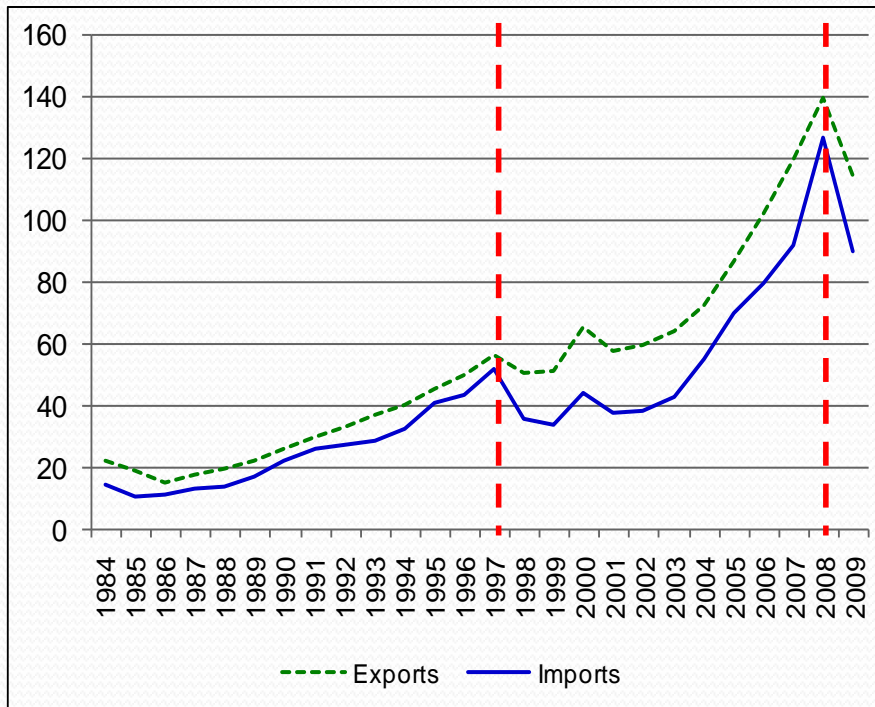
Domestic and Benchmark Interest Rate (%)



Source: IFS

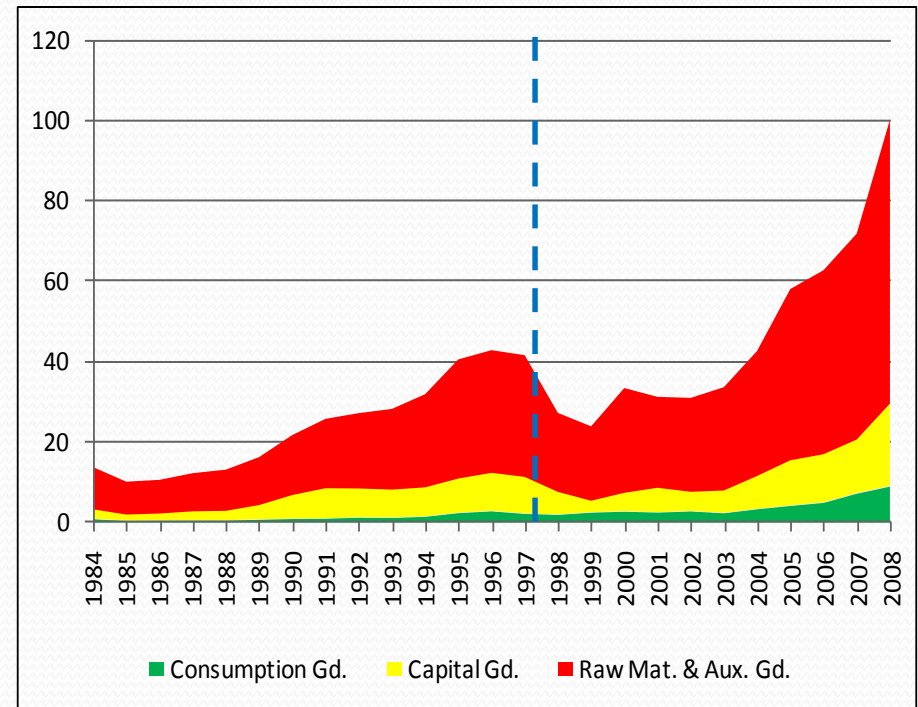
# International Trade

Export and Import (Billions USD)



Source: IFS

Import Composition (Billions USD)



Source: Statistics Indonesia

# Saving and Investment

From national account concepts.

$$GDP = C + G + I_d + X - M$$

$$GDP - C - G - I_d = X - M$$

$$S_d - I_d = NX$$

$$NFIA + S_d - I_d = NFIA + NX$$

$$NFIA + S_d - I_d = CA = NFI$$

$$NFIA + S_d = I_d + NFI$$



$$S_n = I_d + NFI$$

C : private consumption  
X : export  
 $I_d$  : domestic investment  
 $S_d$  : domestic saving  
CA : current account

G : government consumption  
M : import  
NFI : net foreign investment  
 $S_n$  : national saving  
NFIA : net factor income from abroad

# Saving and Investment

	$\alpha$	$\beta$	$\theta$	$\gamma$	Adj. R <sup>2</sup>	DW	$\beta=1$	$\gamma=1$
1984q1-1997q2								
i	0.0214 (0.0201)	1.0099 *** (0.0644)			0.8178	1.0001	0.8785	
$\Delta i$	0.0007 (0.0019)	1.0735 *** (0.0498)			0.8970	2.6089	0.1459	
$\Delta i$	0.0328 (0.0227)	1.0333 *** (0.0548)	-0.5001 *** (0.0917)	0.8597 *** (0.1402)	0.9203	2.0570	0.5460	0.3216
2000q1-2008q2								
i	0.0529 ** (0.0222)	0.7345 *** (0.0698)			0.4912	0.7008	0.0006	
$\Delta i$	0.0020 (0.0029)	0.7817 *** (0.0542)			0.8163	2.3141	0.0003	
$\Delta i$	0.0377 (0.0328)	0.7244 *** (0.0773)	-0.3245 ** (0.1557)	0.5128 (0.3917)	0.8356	1.9758	0.0012	0.2233

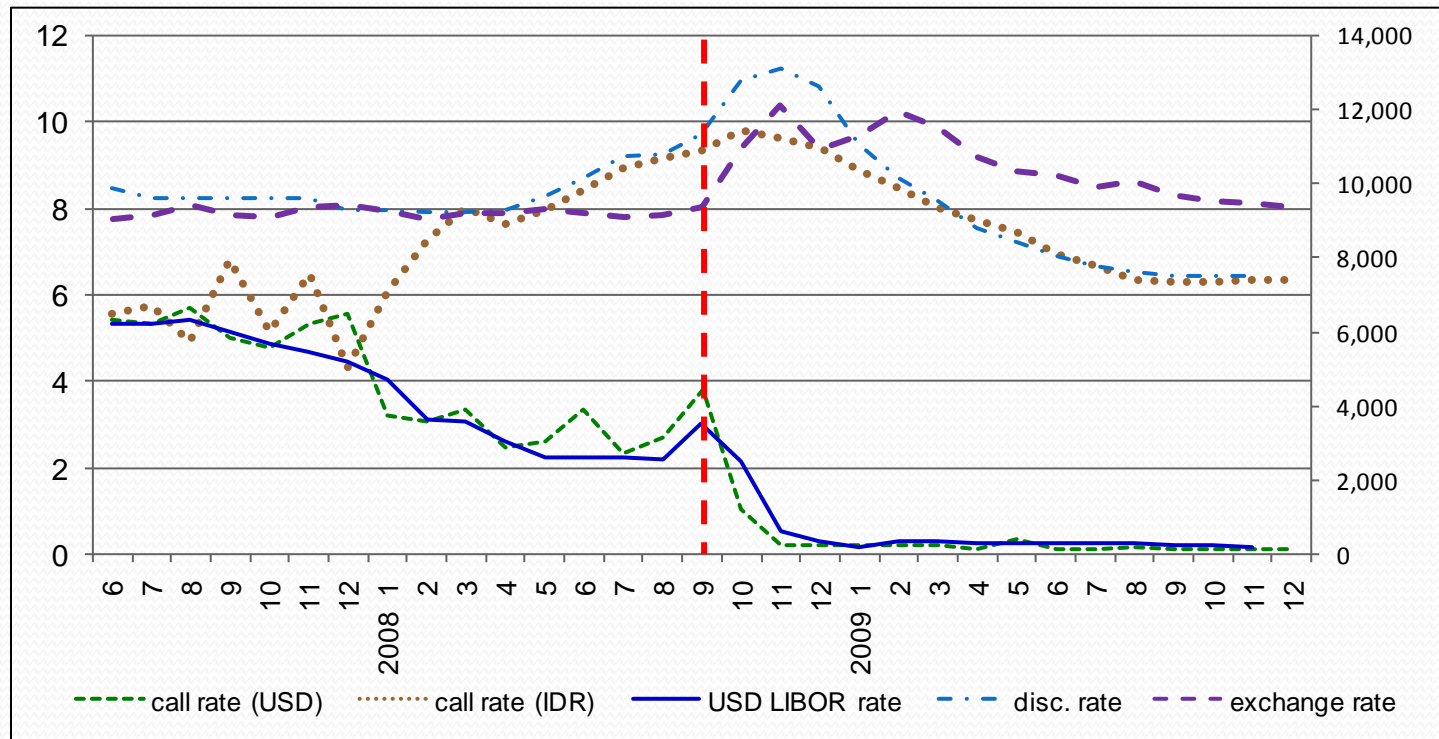
Notes:

- \*, \*\* and \*\*\* represent 10%, 5% and 1% levels of significance, respectively.
- Standard errors reported in parentheses are robust to heteroskedasticity and autocorrelation.

Using national saving definition the results are the same with domestic saving.

# Impact of Policy Responses

Interest Rates (Left - %) and Exchange Rate (Right - IDR/USD)



Source: Bank Indonesia (call rate USD), IFS (Others)

Domestic foreign currency overnight money market rate followed LIBOR closely.

# Structured Products

*Table 1. Structured Products*

Products	Components	Additional Profit/Loss Option
<b>Deposits</b>		
FX-linked Deposits	Exchange Rate	(+/-) percentage of exchange rate changes
Equity-linked Deposits	Stock Index	(+/-) percentage of stock index changes
Interest rate-linked Deposits	Interest Rate Differential	(+/-) percentage of interest rate differential
Commodity-linked Deposits	Commodity Price	(+/-) percentage of commodity price changes
<b>Non Deposito</b>		
<b>Structured Notes</b>		
FX-linked Note	Exchange Rate	(+/-) percentage of exchange rate changes
Equity-linked Note	Stock Index	(+/-) percentage of stock index changes
Interest rate-linked Note	Interest Rate Differential	(+/-) percentage of interest rate differential
Commodity-linked Note	Commodity Price	(+/-) percentage of commodity price changes
<b>Structured Forward</b>		
Callable/Cancellable Forward	Exchange Rate	(+/-) percentage of exchange rate changes
Target Redemption Forward	Exchange Rate	(+/-) percentage of exchange rate changes

Source: Annual Report of Bank Indonesia 2008, p. 133.

# Government External Debt

OUTSTANDING OF GOVERNMENT AND CENTRAL BANK EXTERNAL DEBT BY MAJOR CURRENCIES (Millions USD)

Jenis Valuta						2007	2008		2009					Currency	
	2003	2004	2005	2006	2007	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3*		
1 EUR	10,560	10,851	9,570	10,188	10,475	10,475	11,357	10,937	10,135	9,512	8,873	9,038	9,260	EUR	1
2 GBP	1,447	1,444	1,295	1,370	1,279	1,279	1,274	1,222	1,122	835	824	905	867	GBP	2
3 JPY	28,284	31,312	24,934	23,899	24,189	24,189	27,463	25,147	25,398	29,265	26,988	26,783	28,832	JPY	3
4 SDR	10,656	9,758	9,098	1,753	2,197	2,197	2,386	2,477	2,585	2,671	2,787	2,909	6,198	SDR	4
5 USD	29,655	28,217	29,560	29,562	30,192	30,192	31,928	33,471	32,969	34,650	37,211	37,166	37,485	USD	5
6 Lainnya 1)	1,064	1,143	5,614	9,036	12,276	12,276	13,110	14,876	14,155	9,643	9,097	11,428	14,346	Others 1)	6
7 <b>Jumlah</b>	81,666	82,725	80,072	75,809	80,607	80,607	87,519	88,131	86,363	86,576	85,780	88,229	96,988	<b>Total</b>	7

Source: Bank Indonesia

# Government External Debt

OUTSTANDING OF GOVERNMENT AND CENTRAL BANK EXTERNAL (Millions USD)

Periode	Komersial Commercial	Pemerintah Government		Subjumlah Sub-total	US\$	Subtotal Persentasi Percentage of Subtotal			BUMN State enterprises	Jumlah Total
		Non Komersial Non Commercial				Yen	DM	Others		
		ODA	Non ODA							
1994	1,727	41,761	15,130	58,618	39.1	43.5	5.2	12.2	5,070	63,688
1995	1,085	43,335	15,169	59,588	41.4	40.3	5.4	12.9	4,822	64,410
1996	1,048	38,888	15,367	55,303	43.5	38.1	5.3	13.1	3,742	59,045
1997	890	38,163	14,812	53,865	42.8	34.5	4.9	17.8	3,995	57,860
1998	2,375	48,427	16,519	67,321	37.6	33.1	4.6	24.7	4,153	71,474
1993/1994	2,313	39,233	13,492	55,037	38.3	45.3	4.2	12.2	5,181	60,218
1994/1995	1,707	44,487	16,375	62,568	36.7	45.3	5.5	12.5	5,010	67,578
1995/1996	1,029	42,238	15,345	58,612	42.0	39.8	5.6	12.6	4,903	63,514
1996/1997	988	36,741	14,911	52,640	44.3	37.3	5.5	12.9	3,646	56,286
1997/1998	1,674	37,854	14,632	54,160	43.6	34.1	4.8	17.5	3,842	58,002

Source: Bank Indonesia