



The Impact Effect of the Crisis on Emerging Market Countries

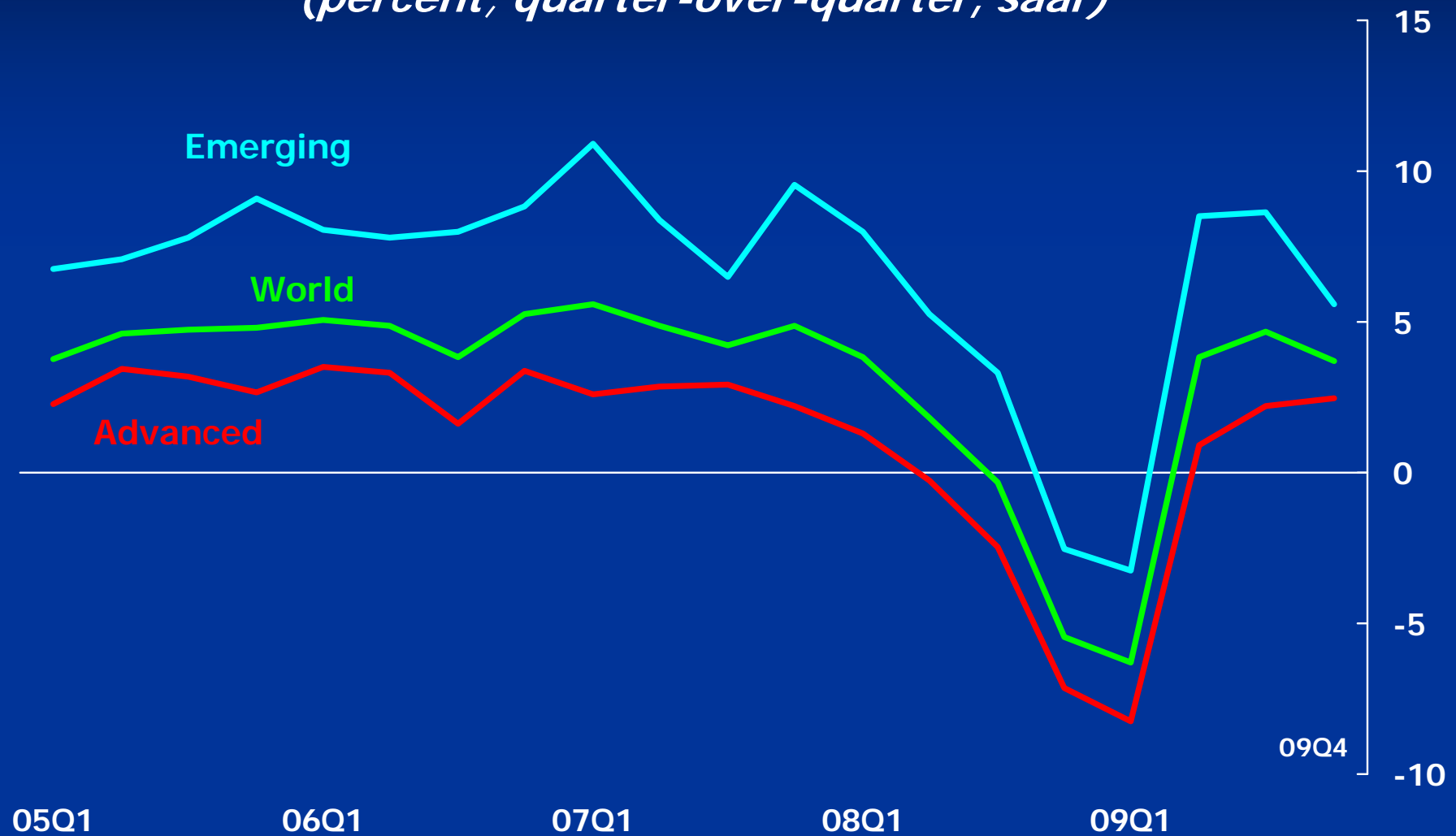
*Olivier Blanchard, Hamid Faruqee, Mitali Das
Research Department*

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A Surprisingly Synchronized Recession

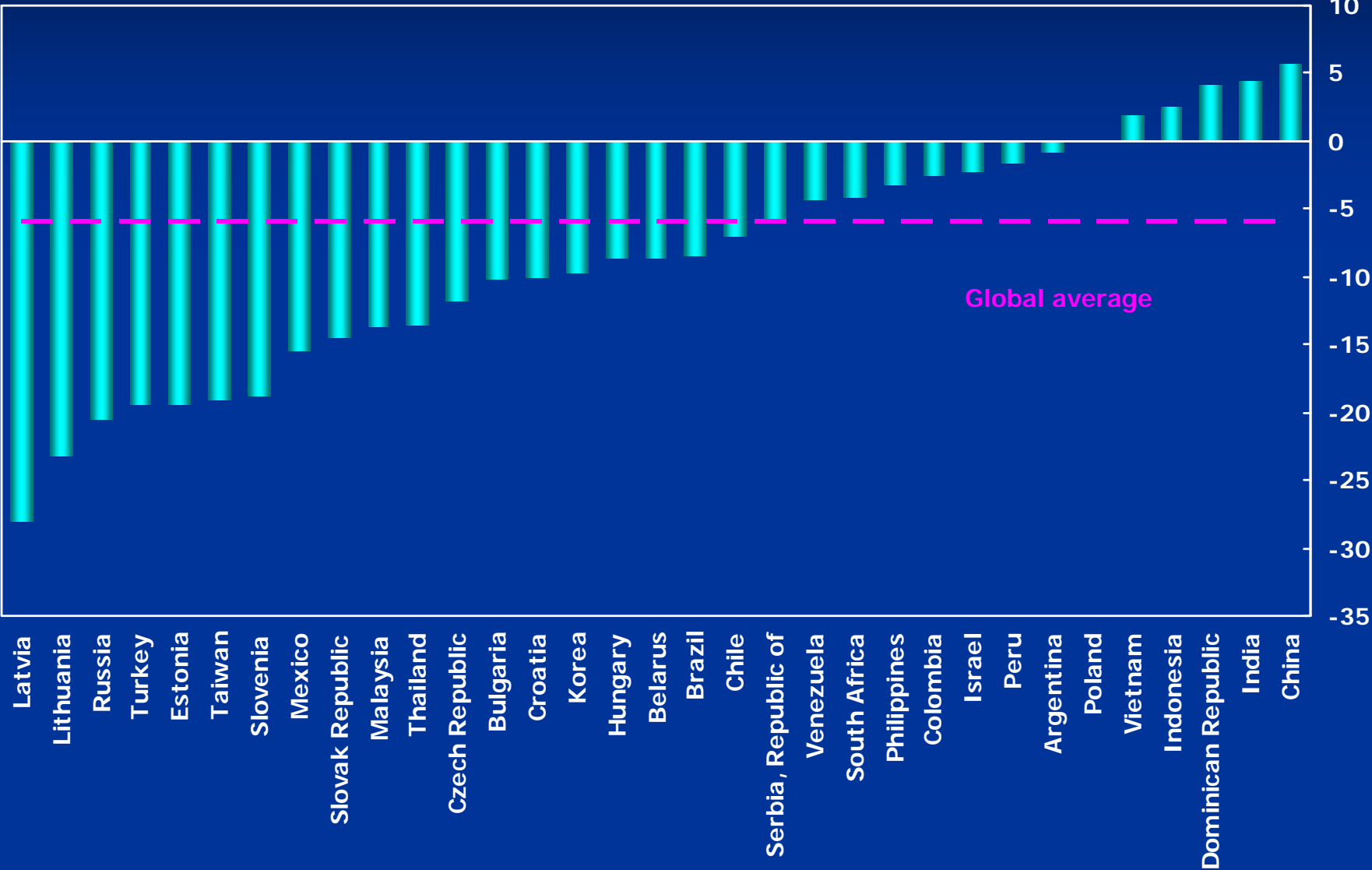
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Evolution of Advanced and Emerging Economies *(percent; quarter-over-quarter, saar)*



But with Substantial Heterogeneity within EMs

GDP Growth
(percent; semester growth, 2009Q1 vs. 2008Q3, saar)



Organization

- A simple model. Trade and capital flows.
- Econometric, cross country, evidence.
- Case studies. Latvia, Russia, Thailand, Brazil, Chile

A Simple Model

- Most countries affected mainly by two external shocks
 - Trade flows (and declines in terms of trade), and Capital flows

- Model: Mundell Fleming, with two relevant modifications
 - Imperfect capital mobility
 - Balance sheet effects

- Unapologetically: reduced form, static, no expectations

Capital Flow Equilibrium, 1

Three relevant interest rates:

- Policy (riskless) rate: r
- Domestic dollar rate: $\hat{r} = r + x + \frac{\dot{e}}{e} = r + x$
- US dollar rate: r^*

Choice between domestic and US dollar assets:

Net capital flows:

$$F(\hat{r} - r^* - (1 + \theta)x, D)$$

$$= F(r - r^* - \theta x, D)$$

Capital Flow Equilibrium, 2

Net exports $NX(e, Y, Y^*)$

Capital flow equilibrium

$$F(r - r^* - \theta x, D) + e NX(e, Y, Y^*) = \Delta R$$

External shocks: x, θ, Y^*

Initial condition: D

Policy instruments: r, R

Decrease in net exports must be offset by higher capital flows or decrease in reserves

Decrease in capital flows must be offset by higher net exports or decrease in reserves

Goods Market Equilibrium

$$\text{IS: } Y = A\left(Y, r + x, \frac{D}{e}\right) + NX(e, Y, Y^*)$$

Two reasons why a depreciation may be contractionary:

- Marshall Lerner condition may not hold.
- Balance sheet effects: $\frac{D}{e}$

Equilibrium

- Equilibrium and effects of shocks depends on Marshall Lerner, and balance sheet effects.

For example, effect of increased home bias:

- If $ML > 0$, $BS < ML$, then increase in output (!)
- If $ML > 0$, $BS > ML$, then decrease in output
- If $ML < 0$, $BS > ML$, then larger decrease in output (need for stability condition in last case)

The effects of shocks.

- The effects of increased home bias
 - Output may increase or decrease
 - More likely to decrease, the stronger the balance sheet effects,
The weaker the ML condition
- The effects of increased uncertainty
 - Output likely to decrease
 - More likely to decrease, the stronger the balance sheet effects,
The weaker the ML condition
- The effects of decreased exports (larger trade deficit)
 - Output decreases
 - Larger decrease, the stronger the balance sheet effects,
The weaker the ML condition

The Effects of Policies

- In the face of increased uncertainty, x
 - Increasing r . Ambiguous. Probably worse
 - Sterilized intervention. $\Delta R = \Delta F, r$ constant
Still the adverse effect of x on demand

- In the face of decreased exports (larger trade deficit)
 - Increasing r , to increase F But adverse effect on Y
 - Financing decrease in exports through $\Delta R < 0$:
Less depreciation, less balance sheet effects
But larger trade deficit
 - Increasing G and decreasing reserves

Turning to the Evidence

The collapse of Trade

Growth Rate of World Output and World Exports

(percent; quarter-over-quarter, annualized)

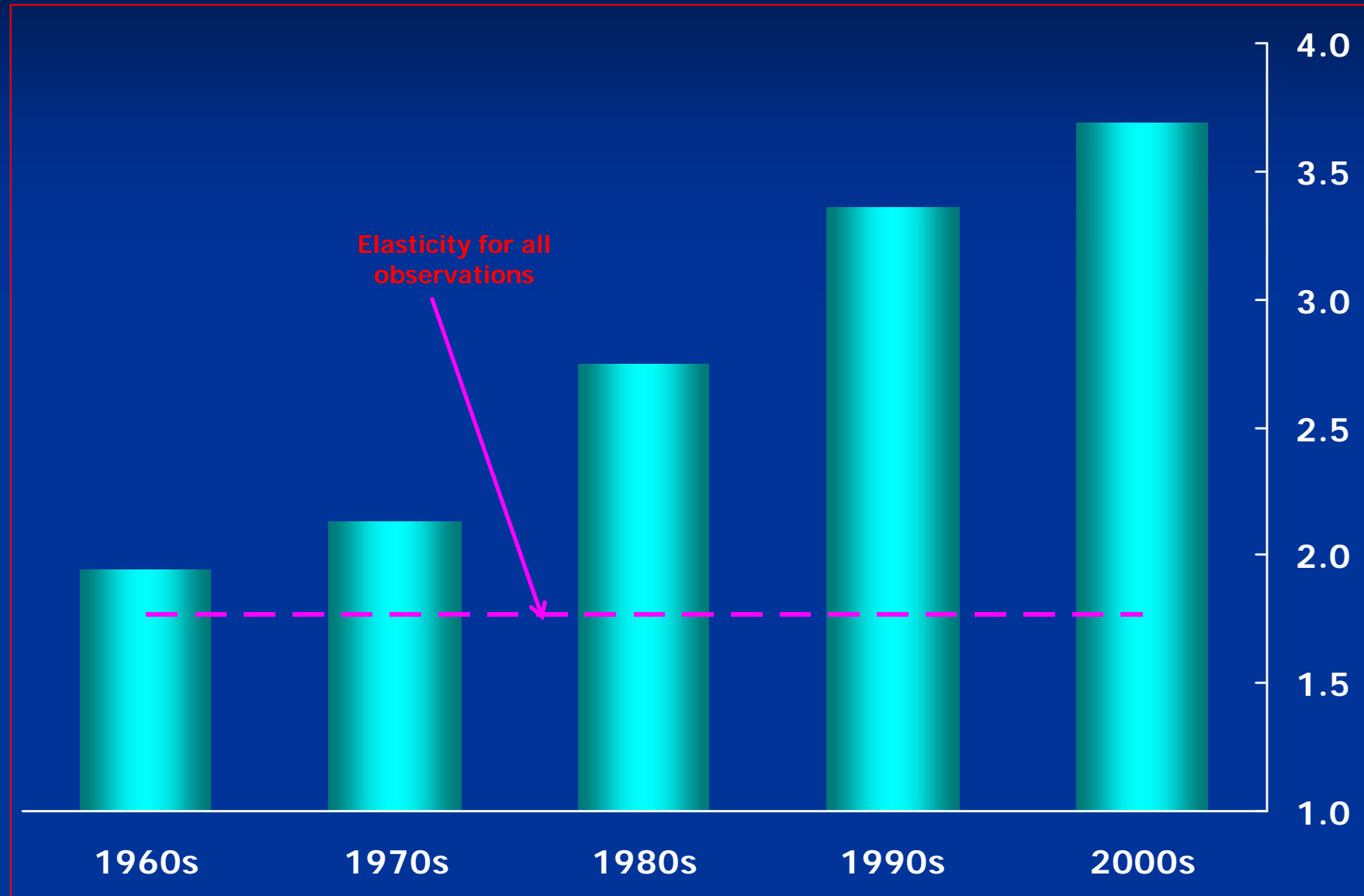


1/ World export volumes (Source: Netherlands CPB trade monitor)

An Overall Trade Puzzle?

- For 2008-4, 2009-1, $g(\text{trade volume}) = -30\%$, $g(\text{output}) = -6\%$. So elasticity of 5.
- Historically, much lower. But a clear trend over time. From 1.7 in the 1960s to 3.5 in the 2000s.
- Trade finance?
- Composition. Uncertainty and unusual decreases in durables and I?
- Value chains and inventory behavior?

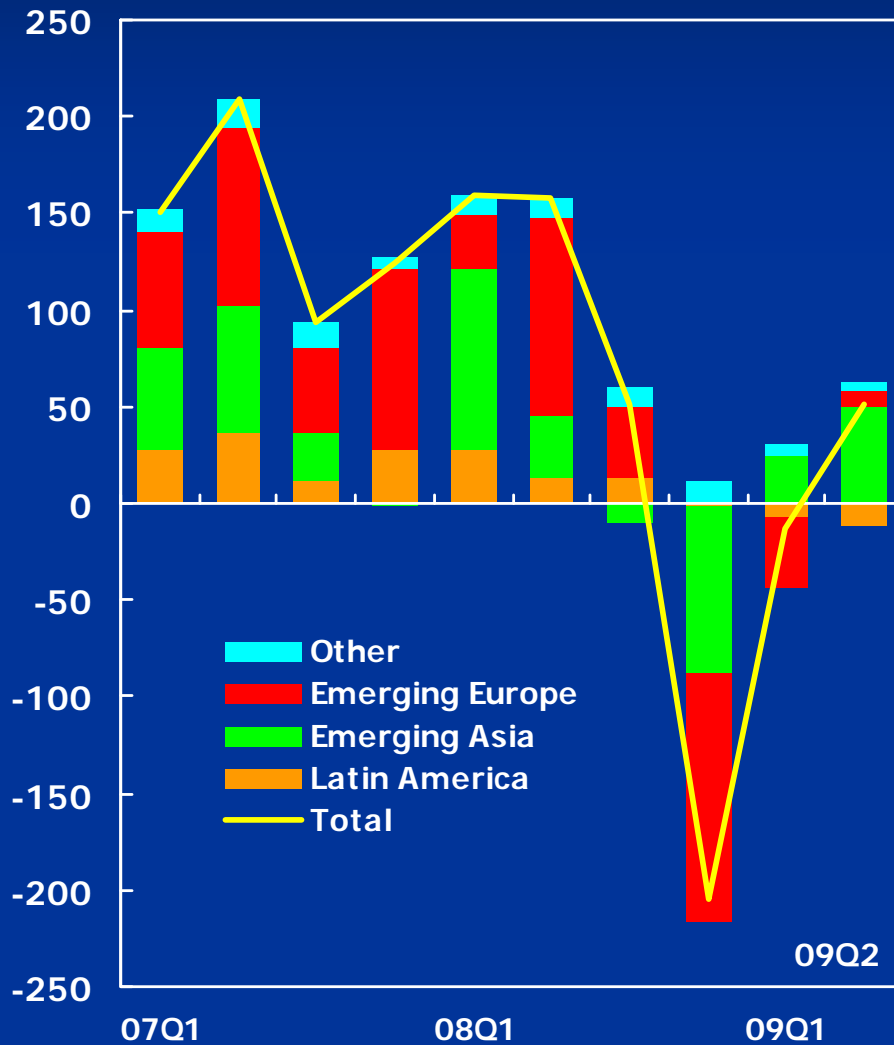
Elasticity of World Trade to World Income by Decade



The Collapse of Capital and Bank Flows to EMs

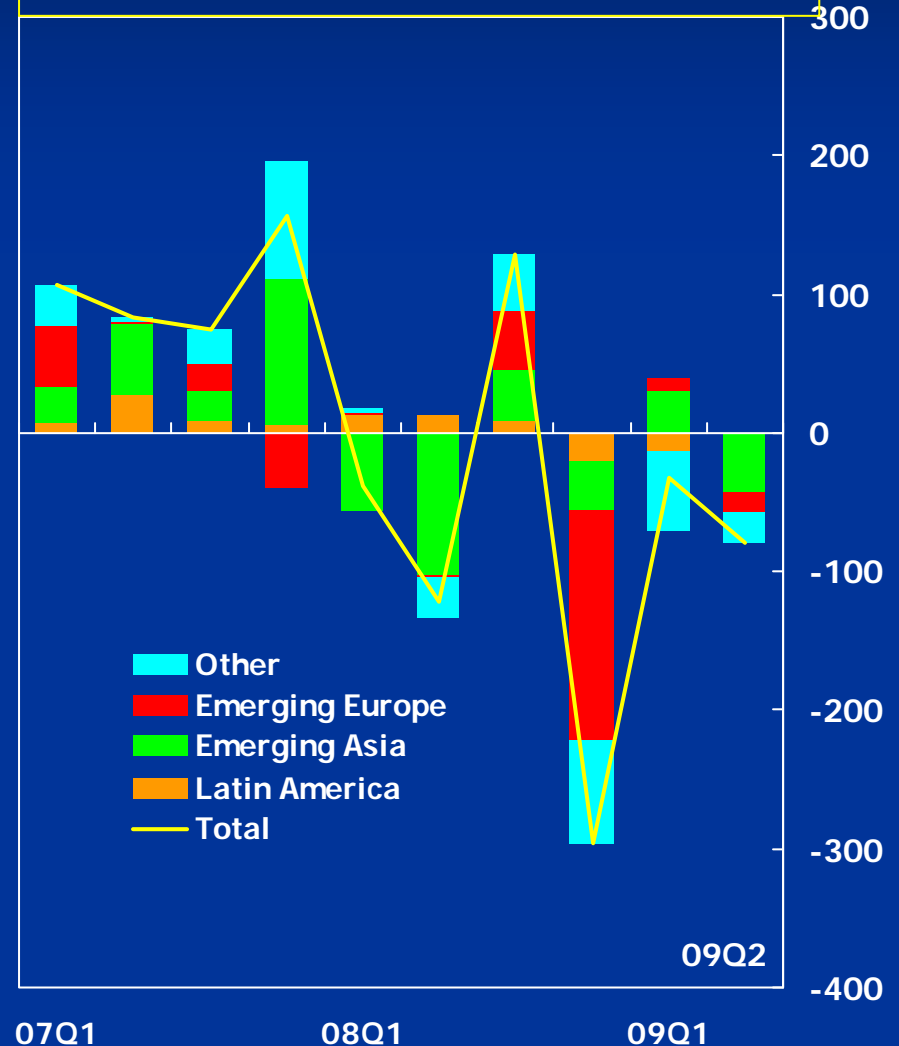
Net Flows to Emerging Market Economies

(US\$ billion; exclude reserves and IMF lending)



Change in Cross Border Bank Liabilities

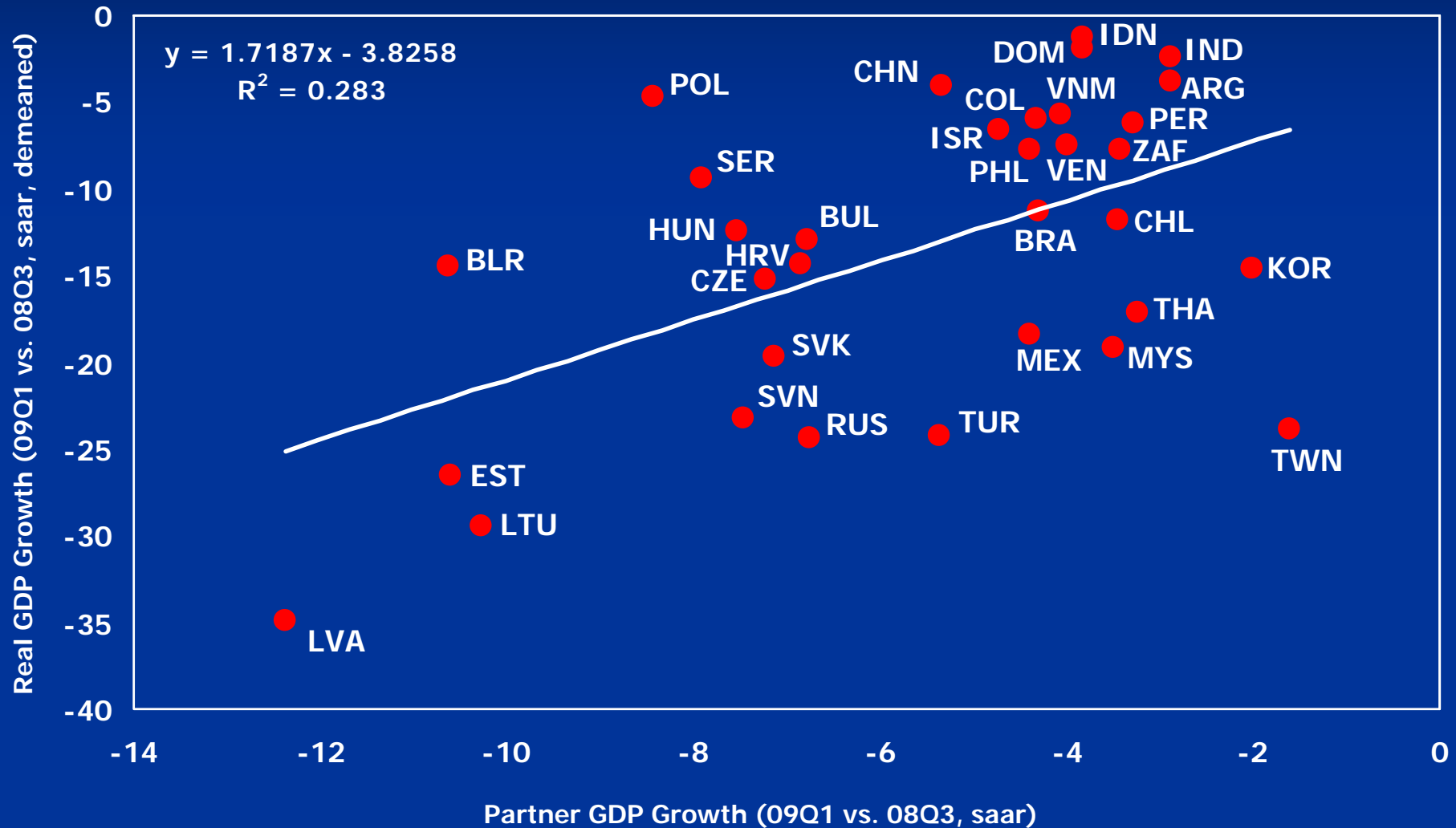
(US\$ billion; exchange rate adjusted changes)



Bivariate evidence: Growth and Partner Country Demand⁷

Partner GDP Growth and GDP Growth

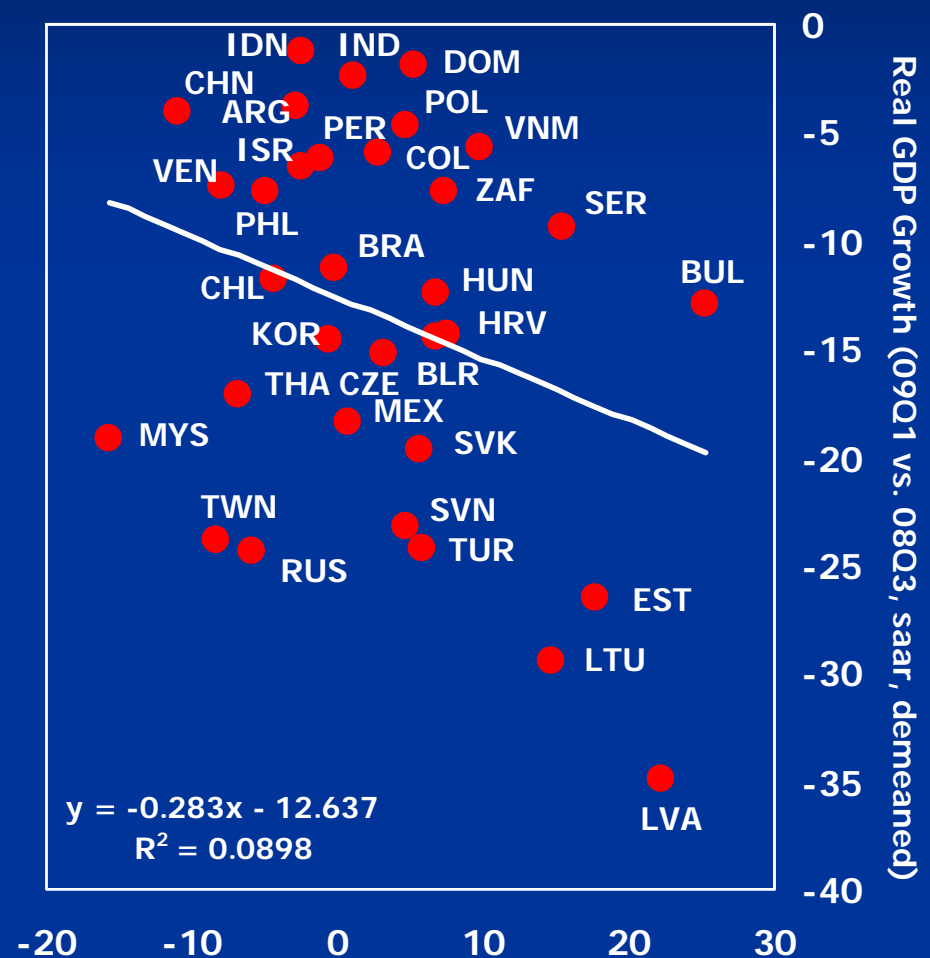
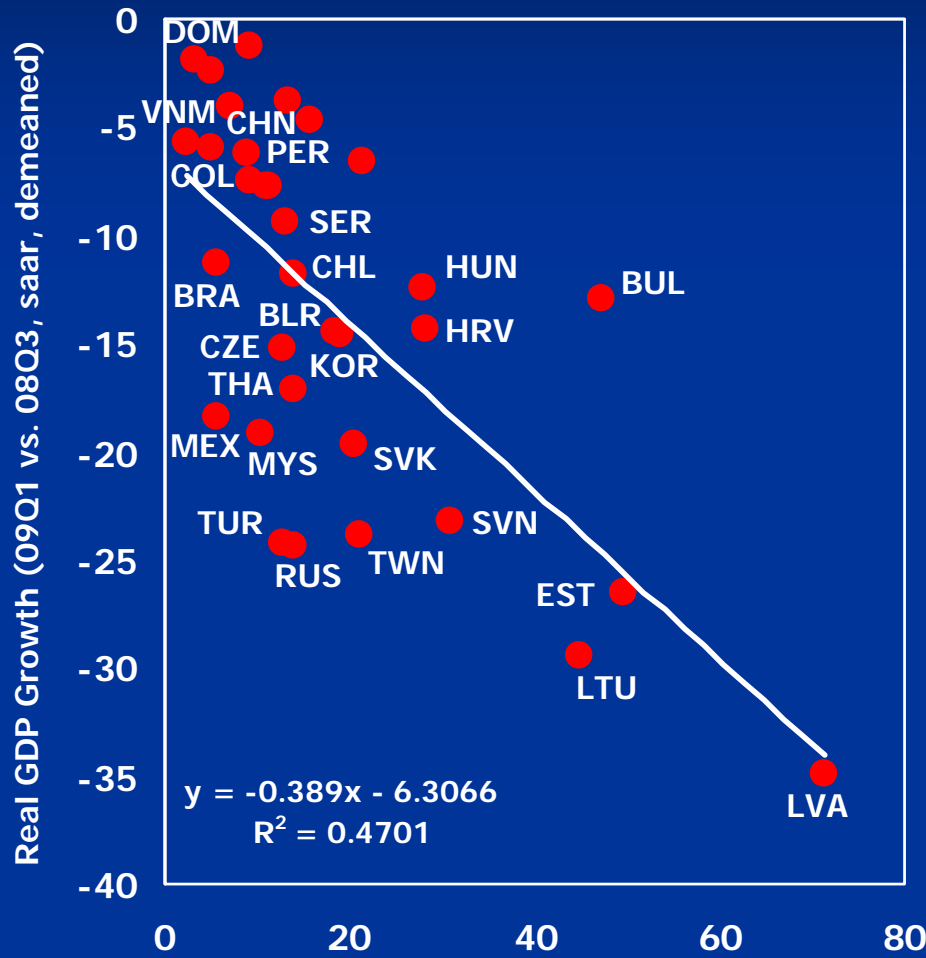
(Semester growth, 2009Q1 vs. 2008Q3, saar; selected emerging economies)



Bivariate evidence: Growth and Financial Measures

Short-term External Debt, Current Account Deficit, and GDP Growth

(Semester growth, 2009Q1 vs. 2008Q3, saar; selected emerging economies)



Short-term external debt in percent of GDP (2007)

Current account deficit in percent of GDP (2007)

Basic Regressions 1/

Dependent variable: demeaned semester GDP growth (2009Q1 vs. 2008Q3, saar)

	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>
Export share 2/	-0.09+ (0.045)				
Partner growth 3/		0.77 (0.628)	2.29** (0.819)	0.92 (0.606)	1.18 (0.780)
Short-term external debt 4/	-0.37** (0.064)	-0.34** (0.073)		-0.45** (0.070)	
Current account deficit (in percent of GDP, 2007)			-0.11 (0.187)	0.28+ (0.149)	
Short-term debt + CA deficit (in percent of GDP, 2007)					-0.18* (0.073)
NOBs	33	33	33	33	33
R-sq	0.511	0.485	0.240	0.533	0.382

1/ Robust standard errors in brackets (corrected for heteroskedasticity); ** p<0.01, * p<0.05, + p<0.1

2/ Nominal exports in 2007 as percent of nominal GDP (2007)

3/ Trade-weighted partner GDP growth (09Q1 vs. 08Q3, ar) multiplied by home export share of GDP (2007)

4/ Short-term debt outstanding and with remaining maturity less than one year in 2007; in percent of nominal GDP in 2007

Basic Regressions: Some conclusions

- Do not hope for too much. Cross section of 33 countries. (Why not use the quarterly information?)
- ST debt always and strongly significant. 10% more debt, 3.7% less growth. (with Baltic dummy: 2.5%)
- CA deficit significant if not controlling for ST debt. Wrong signed otherwise.
- Trade right signed, but not significant

Looking at Alternative/Additional Trade Measures 1/

Dependent variable: demeaned semester GDP growth (2009Q1 vs. 2008Q3, saar)

	(1)	(2)	(3)	(4)
Partner growth 2/	0.74 (0.672)	0.53 (0.672)		
Adjusted partner growth 3/			1.19 (1.196)	
Adjusted commodity tot 4/	0.27 (0.300)	0.24 (0.319)		
Advanced manufacturing (in percent of GDP, 2005)		-0.29 (0.273)		
Change in real exports 5/				0.47 (0.363)
Short-term external debt 6/	-0.35** (0.080)	-0.35** (0.097)	-0.35** (0.066)	-0.37** (0.068)
NOBs	33	28	33	33
R-sq	0.502	0.452	0.550	0.481

1/ Robust standard errors in brackets (corrected for heteroskedasticity); ** p<0.01, * p<0.05, + p<0.1

2/ Trade-weighted partner GDP growth (09Q1 vs. 08Q3, ar) multiplied by home export share of GDP (2007)

3/ Trade-weighted partner GDP growth (09Q1 vs. 08Q3, ar) multiplied by adjusted home export share of GDP (2007); export share adjusted by import content of exports from GTAP data

4/ Commodity weighted terms of trade change (09Q1 vs. 08Q3) times the ratio of commodity exports to GDP

5/ Change in real exports (09Q1 vs. 08Q3) in percent of real GDP (2007)

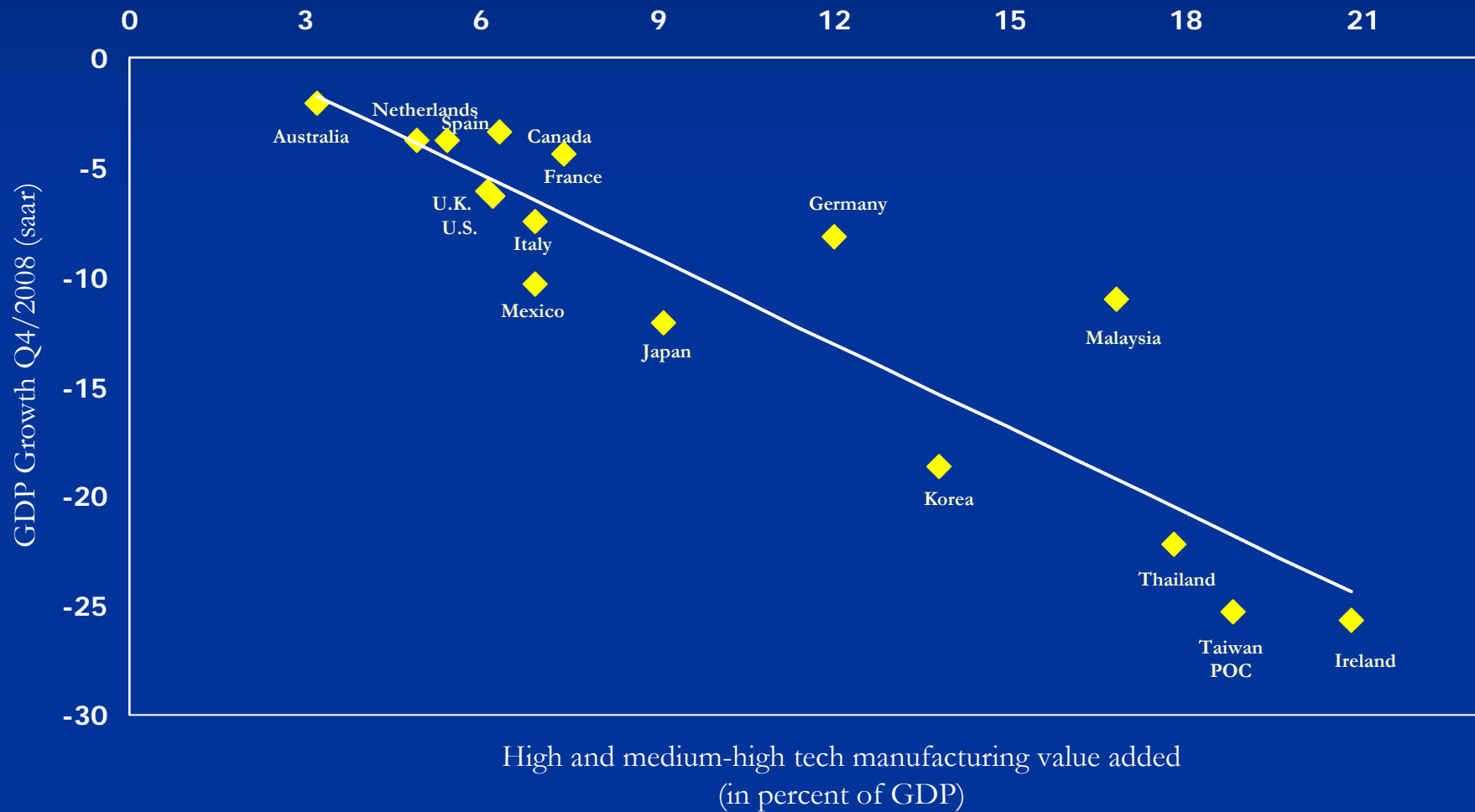
6/ Short-term debt outstanding and with remaining maturity less than one year in 2007; in percent of nominal GDP in 2007

Alternative trade measures. Some conclusions

- Using value added export shares. Marginally better
- Terms of trade. If export commodity share is 10%, a 50% decline in TOT implies 1.5% less growth.
- Advanced manufacturing (nice fit for G20. next slide). But insignificant when controlling for ST debt. 10% higher share implies 2.8% less growth
- Change in real exports. Weaker than partner growth. Puzzle.

High and Medium-High Manufacturing Share and the GDP decline

2008Q4 GDP Growth vs. Manufacturing Share in GDP



Sources: CEIC, OECD, Haver Analytics and IMF staff calculations.

Bank versus Other Short Term Debt 1/

Dependent variable: demeaned semester GDP growth (2009Q1 vs. 2008Q3, saar)

	(1)	(2)	(3)
Partner growth 2/	0.95 (0.696)	1.08+ (0.574)	0.99 (0.631)
Short-term external debt 3/	-0.33** (0.072)	-0.33** (0.082)	-0.33** (0.082)
Bank debt 4/	0.02 (0.048)		0.01 (0.052)
Financial openness 5/		0.01 (0.042)	0.01 (0.046)
NOBs	32	32	32
R-sq	0.512	0.511	0.512

1/ Robust standard errors in brackets (corrected for heteroskedasticity); ** p<0.01, * p<0.05, + p<0.1

2/ Trade-weighted partner GDP growth (09Q1 vs. 08Q3, ar) multiplied by home export share of GDP (2007)

3/ Short-term debt outstanding and with remaining maturity less than one year in 2007; in percent of nominal GDP in 2007

4/ Bank liabilities stock in percent of GDP (2007)

5/ Foreign assets in percent of GDP (2007)

The Role of Reserves 1/

Dependent variable: demeaned semester GDP growth (2009Q1 vs. 2008Q3, saar)

	(1)	(2)
Partner growth 2/	1.57+ (0.844)	0.98 (0.800)
Log of short-term external debt (in percent of GDP, 2007)		-5.31** (1.659)
Log of reserves/short-term debt 3/	2.72* (1.326)	
Log of reserves (in percent of GDP, 2007)		0.44 (1.586)
Exchange rate regime 4/	-3.62 (2.988)	-2.61 (2.754)
NOBs	32	32
R-sq	0.420	0.488

1/ Robust standard errors in brackets (corrected for heteroskedasticity); ** p<0.01, * p<0.05, + p<0.1

2/ Trade-weighted partner GDP growth (09Q1 vs. 08Q3, ar) multiplied by home export share of GDP (2007)

3/ Reserves in percent of short-term external debt (2007)

4/ Fixed exchange rate regime in 2008 = 1; 0 otherwise

The Role of Exchange Rate Regimes 1/

Dependent variable: demeaned semester GDP growth (2009Q1 vs. 2008Q3, saar)

	(1)	(2)	(3)	(4)
Partner growth 2/	0.75 (0.666)		0.77 (0.637)	
Export share 3/		-0.09+ (0.047)		-0.10+ (0.048)
Short-term external debt 4/	-0.34** (0.082)	-0.35** (0.083)	-0.31 (0.198)	-0.26 (0.188)
Exchange rate regime 5/	-0.52 (2.889)	-1.10 (2.867)		
Exchange rate regime * short-term external debt			-0.03 (0.165)	-0.09 (0.159)
NOBs	33	33	33	33
R-sq	0.485	0.513	0.485	0.517

1/ Robust standard errors in brackets (corrected for heteroskedasticity); ** p<0.01, * p<0.05, + p<0.1

2/ Trade-weighted partner GDP growth (09Q1 vs. 08Q3, ar) multiplied by home export share of GDP (2007)

3/ Nominal exports in 2007 as percent of nominal GDP (2007)

4/ Short-term debt outstanding and with remaining maturity less than one year in 2007; in percent of nominal GDP in 2007

5/ Fixed exchange rate regime = 1 in 2008; 0 otherwise

Putting Some Flesh. Case Studies.

- Latvia
- Russia

To be completed:

- Brazil
- Chile
- Thailand

1. Latvia. The role of Foreign Banks

Pre crisis. Boom (2005-2007. GDP growth: 10%) and beginning of bust (from end of 2007 on). Two legacies:

- High foreign debt. 135% of GDP
Largely bank debt.
Subsidiaries of foreign parent banks: 60%
Largely FX debt 85%
- High current account deficits 2005-2007: 19% of GDP

Latvia Table 1

	<u>2005-2007</u>	<u>2008Q1</u>	<u>2008Q2</u>	<u>2008Q3</u>	<u>2008Q4</u>	<u>2009Q1</u>
GDP growth (qoq, saar)	10.7	-10.2	-7.4	-6.1	-18.5	-38.4
Current account deficit (in percent of GDP)	-19.0	-17.1	-15.5	-11.4	-7.8	-1.3
CPI inflation (yoy percent change)	7.8	16.3	17.7	15.8	12.1	9.2
Real effective exchange rate (CPI-based, 1995 = 100)	125.0	145.0	150.0	150.0	153.0	
Market capitalization (EUR, millions)	1829.0	1814.2	1828.4	1480.0	1166.4	1051.6
Market capitalization (yoy percent change)	32.3	9.5	-16.6	-38.4	-44.4	-40.3

Latvia. Effects of the crisis

- Decrease in exports (and depreciation of competitors)
- Decrease in capital inflows.
- Peg, and maintained low policy rate
- An output collapse, and a large decrease in net exports.
(-17% in 2008-4, -37% in 2009-1)
- An apparent puzzle: Why the output collapse, if e constant, and r low? Back to the IS.
Foreign banks and lending rules. Shadow $r+x$
Questions about solvency and peg. Increase in x .
(Rigibor)

Current Account, capital flows, and Reserves

(in U.S. \$ million)

31

	<u>2005-2007</u>	<u>2008Q1</u>	<u>2008Q2</u>	<u>2008Q3</u>	<u>2008Q4</u>	<u>2009Q1</u>
Exports (goods and services)	10524.9	3843.4	4265.1	4341.7	3507.5	2816.6
Imports (goods and services)	-15322.7	-5313.4	-5954.9	-5745.2	-4205.3	-2853.9
Current account	-4312.8	-1336.3	-1397.7	-1147.3	-610.7	77.1
Net bank flows	973.0	707.9	1207.7	1245.7	-1230.4	-1486.1
Net non-bank flows	342.2	1276.2	4.1	-116.8	160.8	600.5
Financial account (private)	5260.8	1984.1	1211.8	1128.9	-1069.6	-885.6
Exceptional Financing (Fund, EU)					814.2	
Change in reserves 1/	1161.7	446.3	110.9	-64.7	-979.2	-639.7

1/ Change in reserves equal to sum of current and (private) financial account balances, plus exceptional financing and net errors and omissions .

2. Russia. Reserves, Anticipations

Pre-crisis. Oil boom. (2000-2007: 7% growth)

- Strengths: fiscal and current account surpluses
- Vulnerabilities: external debt, oil reliance, Georgia
- Two-thirds of export revenues tied to oil.
- Gross external debt 40% of GDP, short-term debt 14% of GDP.
- Large foreign exchange reserves: 35% of GDP

Russia Table 1

	<u>2005-2007</u>	<u>2008Q1</u>	<u>2008Q2</u>	<u>2008Q3</u>	<u>2008Q4</u>	<u>2009Q1</u>
GDP growth (qoq, saar)	8.0	8.2	4.0	-2.1	-5.1	-31.1
Current account surplus (in percent of GDP)	8.9	7.3	6.4	7.1	3.5	0.9
CPI inflation (yoy percent change)	10.5	12.9	14.9	15.0	13.7	13.8
Real effective exchange rate (CPI-based, 2000 = 100)	163.5	181.3	186.5	187.4	189.5	165.1
Market capitalization (US\$, billions)	140.4	189.0	195.4	109.4	55.8	57.0
Market capitalization (yoy percent change)	69.2	4.9	5.4	-39.2	-71.5	-69.9

The Crisis and Policy Responses

- Trade and TOT shock. Decrease in oil revenues, and fiscal deficits.
- (Outside) financial shock: relatively minor?
- Initial CB policy. Maintain exchange rate through reserve decumulation. Provide liquidity to large banks, and through them, to others.
- Sharp decrease in reserves. Anticipations of a depreciation. Shift by residents from ruble to dollar accounts. (M2 as the relevant variable)
- Sharp decrease in credit, especially to households.

The Crisis and Policy Response, continued

- Change in CB strategy. From November on, faster depreciation. (Smaller balance sheet effects from time to hedge by banks and firms)
- Delayed fiscal response. (April 2009)
- Large decline in output (-7.2% in 2008-4, -31.9% in 2009-1).

Russia Balance of Payments

(in U.S. \$ billion)

	<u>2005-2007</u>	<u>2008Q1</u>	<u>2008Q2</u>	<u>2008Q3</u>	<u>2008Q4</u>	<u>2009Q1</u>
Exports (goods and services)	364.0	136.0	156.8	167.2	121.9	74.4
Imports (goods and services)	276.5	97.2	130.6	136.5	112.2	64.6
Current account	85.4	38.0	26.2	29.7	8.5	9.4
Net bank flows	20.5	-11.3	22.1	-13.2	-51.4	0.5
Net non-bank flows	12.5	-14.2	12.8	3.5	-84.4	-33.2
Financial account 1/	33.0	-25.6	34.9	-9.8	-135.9	-32.6
Official Financing (Fund)	-0.3					
Change in reserves 2/	71.4	6.4	64.2	15.0	-131.1	-31.1

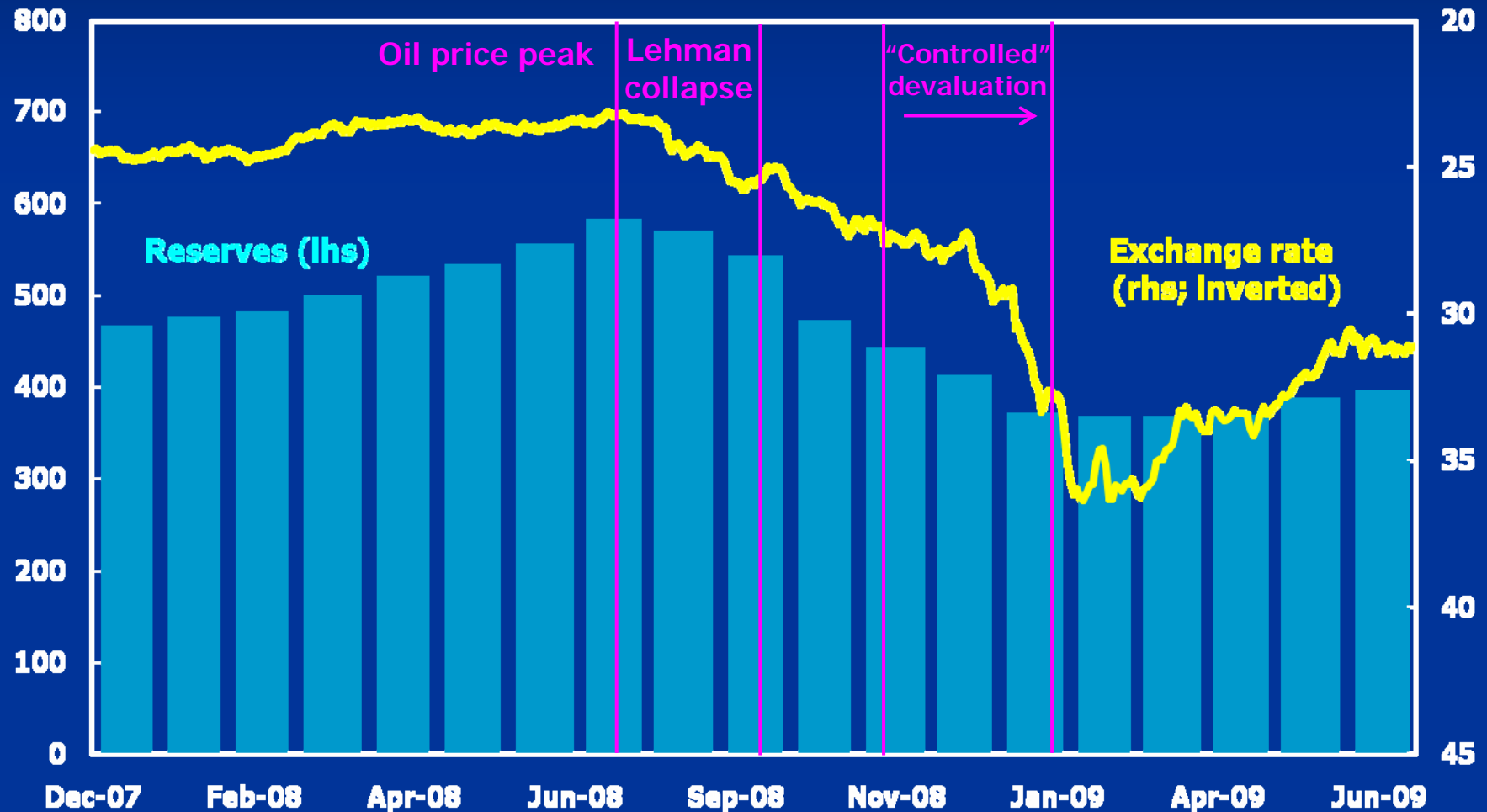
1/ Excluding changes in reserves and official (Fund) financing.

2/ Change in reserves differs from the sum of current and financial account balances, plus official financing, due to errors and omissions (not shown).

Russia's Reserve Loss and Devaluation

Reserves and Nominal Exchange Rate

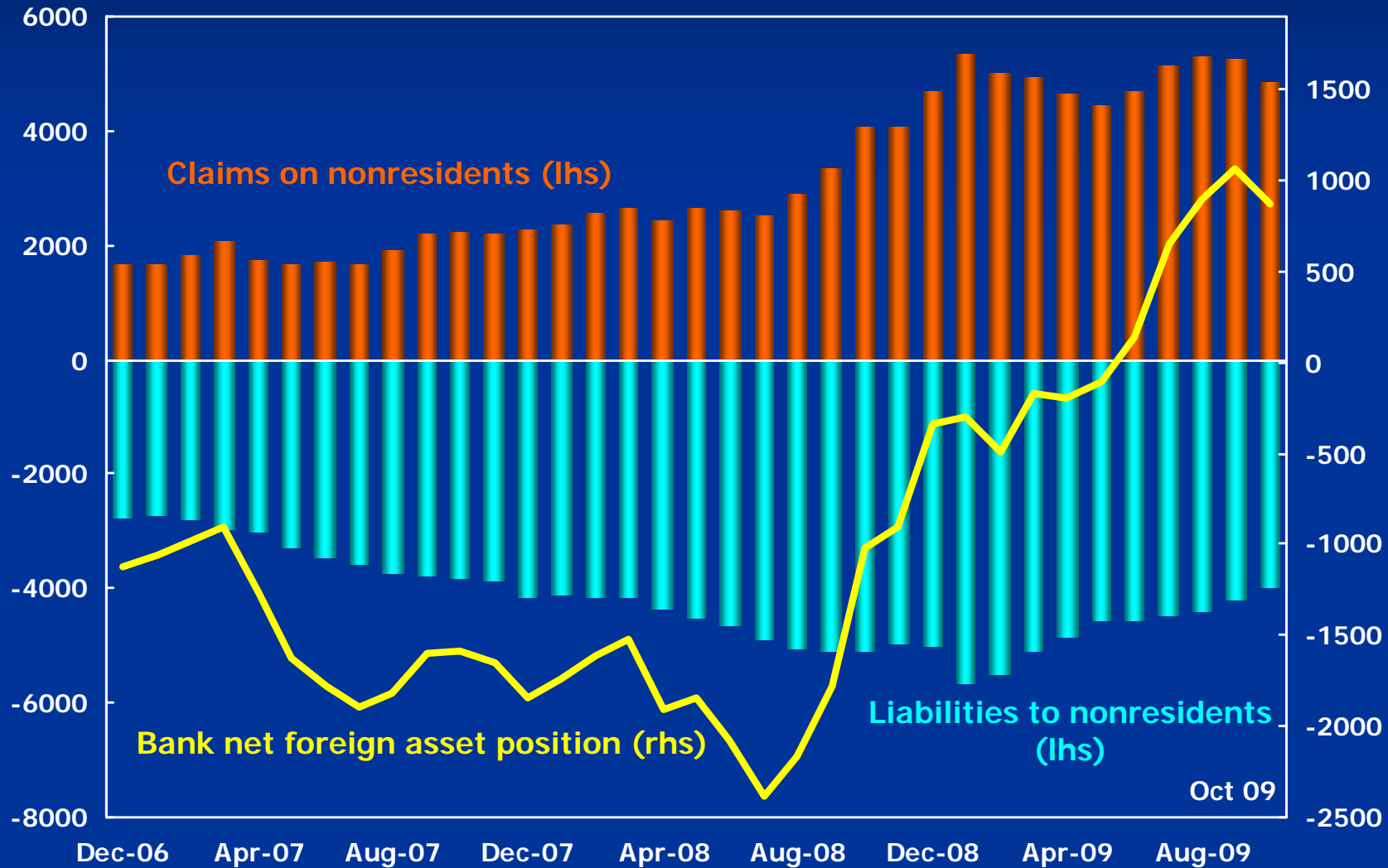
(reserves in billions of US\$, monthly ; exchange rate is ruble per US\$, daily)



Russian Bank Assets, Liabilities, and Net Foreign Position

Banks Net Foreign Asset Position

(in billions of rubles)



Conclusions (so far)

- Effects of both trade and financial flows. But details matter.
- Initial conditions? Strong effect of ST debt.
- Role of foreign banks?
- Role of reserves? No strong evidence.
- Role of macro policies. More work needed.

