

LATIN AMERICA'S INFLATION

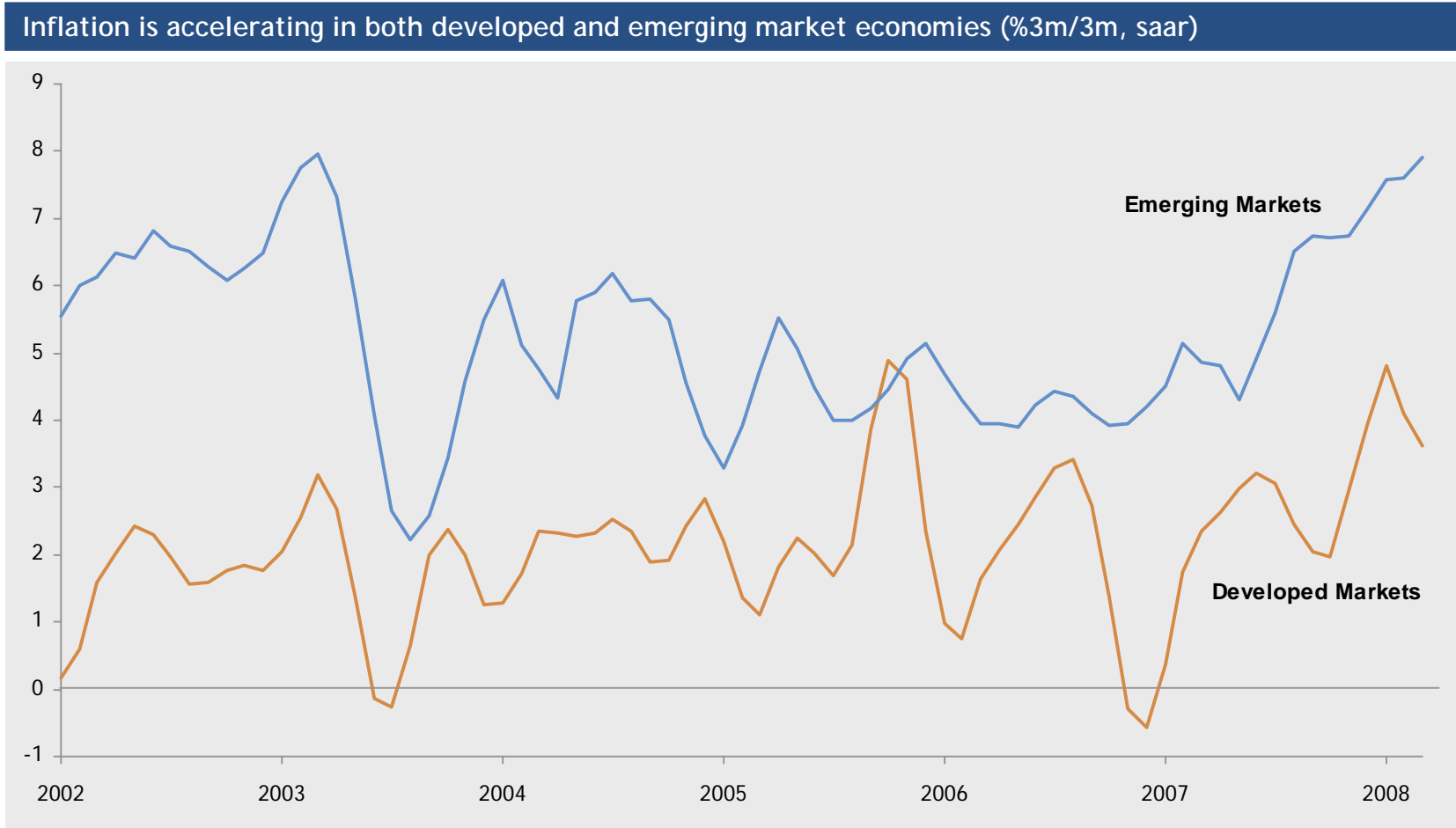
Alfredo Thorne, MD, Global Economics Department

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# Agenda

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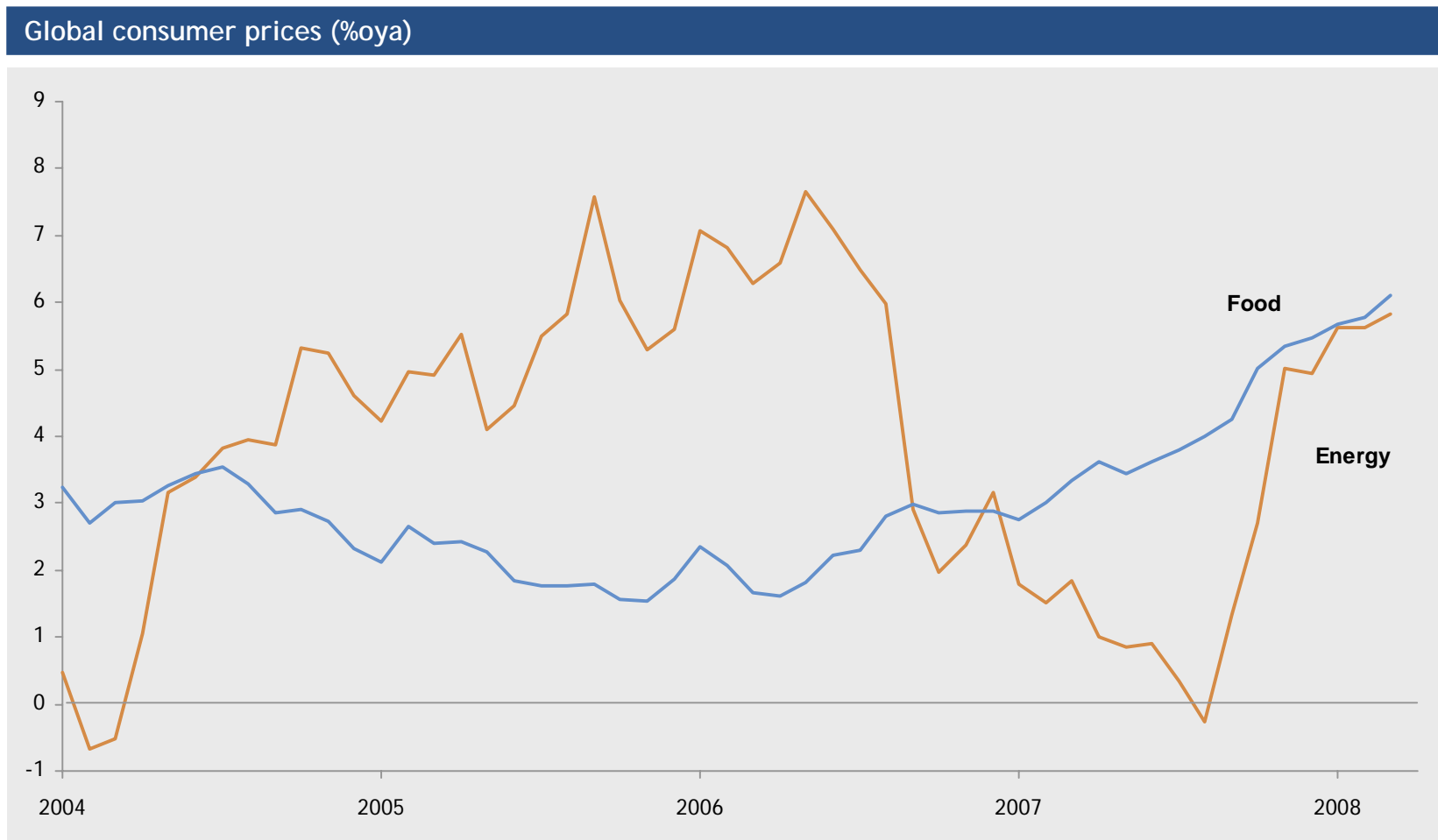
# Global and EM inflation has accelerated



Source: JPMorgan

SURPRISES ON INFLATION AND GROWTH

# Mostly induced by food and energy components



Source: JPMorgan

SURPRISES ON INFLATION AND GROWTH

# Latin American inflation is well above their targets

## Latin America: CPI inflation-forecasts and targets (%oya, quarterly average)

	4Q07	1Q08	2Q08Q	3Q08	4Q08	2008	
						%Dec/Dec	Target
Brazil	4.3	4.6	5.2	5.2	5.1	5.5	4.5(±)
Chile	7.2	8.0	8.0	6.0	5.0	4.7	3.0(±)
Colombia	5.4	6.1	5.9	5.5	5.2	5.6	3.5 -4
Ecuador	2.8	5.3	7.5	7.0	6.9	8.0	2.4-2.
Mexico	3.8	3.9	5.0	4.9	4.5	4.5	3(±1
Peru	3.5	4.7	5.2	4.7	4.3	4.6	2.0(±)
Venezuela	20.2	26.2	29.3	31.4	30.0	28.0	19.5

\*Forecast is for official inflation measure (JPMorgan estimates of actual rate for April 2008 is 24%oya).

Source: JPMorgan

# Food and energy account for most of the inflation acceleration

## Latin America: food and energy in CPI baskets

	% share of CPI basket:		% of Jan-May CPI inflation explain	
	Food*	Energy	Food*	Energy
Argentina	31.3	12.3	39.4	8.9
Brazil	22.0	9.5	46.4	-1.9
Chile	27.2	11.1	58.2	-2.0
Colombia	29.7	3.2	56.2	4.6
Mexico	22.7	7.9	68.5	-29.6
Peru	47.5	6.2	91.2	-3.7
Venezuela	29.6	7.0	43.5	-
<b>Latin America</b>	<b>25.2</b>	<b>8.6</b>	<b>56.7</b>	<b>-11.8</b>

\*Includes food and beverages consumption at home and in restaurants, excludes tobacco. For Venezuela and Mexico this include tobacco (within alcoholic beverages and tobacco category) and hotel services (within hotels and restaurants category)

Source: JPMorgan

## However, most countries subsidize fuel prices

### Most Emerging Markets countries subsidize domestic oil prices-net exporters and importers alike

Country	Are oil price subsidized?	Who bears the cost of the subsidy	Has the subsidy risen in the past 12-18months?	Are there plans to reduce the subsidy?	Domestic prices of gasoline US\$/liter
<b>Net oil exporters</b>					
Argentina	Yes	Private companies	Yes	No	0.80
Colombia	Yes	State oil company	Yes	Yes, reduction under way	1.07
Ecuador	Yes	State oil company	Yes	No	0.38
Mexico	Yes	Government	Yes, significantly	Yes	0.71
Venezuela	Yes	State oil company	-	No definite plans	0.04
<b>Net oil importers</b>					
Brazil	Yes	State oil company	Yes	No	1.53
Chile	Yes	State oil company	Yes	No	1.20
Peru	Yes	Stabilization fund	Yes	Yes	0.87

Source: JPMorgan

## And markets are pricing future long term inflation

### EM breakeven inflation has increased since the beginning of the year

	Short end			Long end		
	Tenor	Rate (%)	Change (bp)	Tenor	Rate (%)	Change (bp)
<b>Latin America</b>						
Brazil	1-year	5.33	-4	10-year	5.57	35
Chile	1-year	5.23	133	10-year	3.98	40
Mexico	1-year	4.55	21	10-year	4.09	-13

Source: JPMorgan



## Inflation has been the main surprise...

Inflation forecasts moving up in EM						
Country	2008			2009		
	End-April	Current	Forecast revision (%point)	End-April	Current	Forecast revision (%point)
Latin America						
Brazil	4.7	5.5	0.8	4.5	4.8	0.3
Chile	4.5	5.5	1.0	3.1	3.5	0.4
Colombia	5.0	5.6	0.6	4.0	4.5	0.5
Ecuador	5.3	8.0	2.7	4.0	4.0	0.0
Mexico	3.6	4.5	0.9	3.3	3.3	0.0
Peru	4.1	4.6	0.5	3.0	3.0	0.0
Venezuela	30.0	28.0	-2.0	29.9	29.2	-0.7

Source: JPMorgan

# ...while on growth the forecasts have experienced limited changes

JPMorgan's forecast for EM countries growth in 2008 to remain unchanged						
Country	2008			2009		
	End-April	Current	Forecast revision (%point)	End-April	Current	Forecast revision (%point)
Argentina	6.5	6.5	0.0	5.0	3.0	-2.0
Brazil	4.4	4.4	0.0	4.0	4.0	0.0
Chile	3.5	3.5	0.0	5.0	5.0	0.0
Colombia	5.0	5.0	0.0	5.0	5.0	0.0
Ecuador	2.5	2.5	0.0	2.5	2.5	0.0
Mexico	2.6	2.6	0.0	4.5	4.0	-0.5
Peru	7.0	7.7	0.7	6.0	6.0	0.0
Venezuela	6.0	3.5	-2.5	3.5	3.5	0.0

Source: JPMorgan

## This explains the recent revision in policy stance

JPMorgan's policy rate forecast changes since end-April					
Country	Official interest rate	Current rate	End-2008 rate forecasts		
			Current forecast	End-April	Forecast r (%poi
Brazil	SELIC overnight rate	12.25	14.00	13.00	100
Chile	Discount rate	6.75	7.0	5.75	125
Colombia	Repo rate	9.75	10.00	9.75	25
Mexico	Policy rate	7.50	8.0	7.00	100
Peru	Reference rate	5.75	6.00	5.50	50

Source: JPMorgan

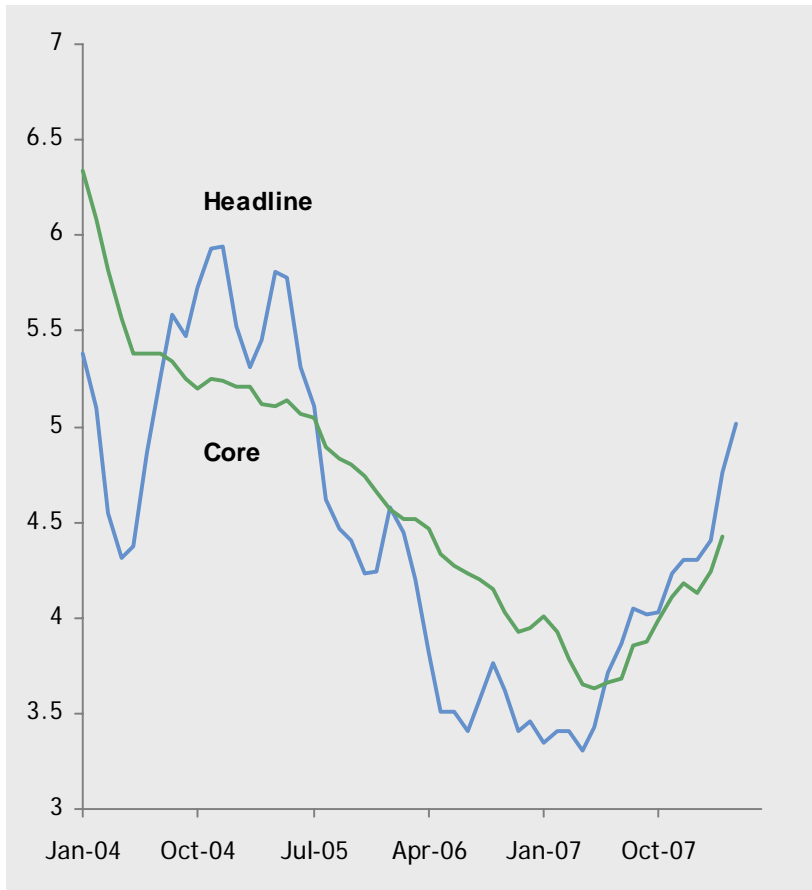
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# Food has driven Latin inflation

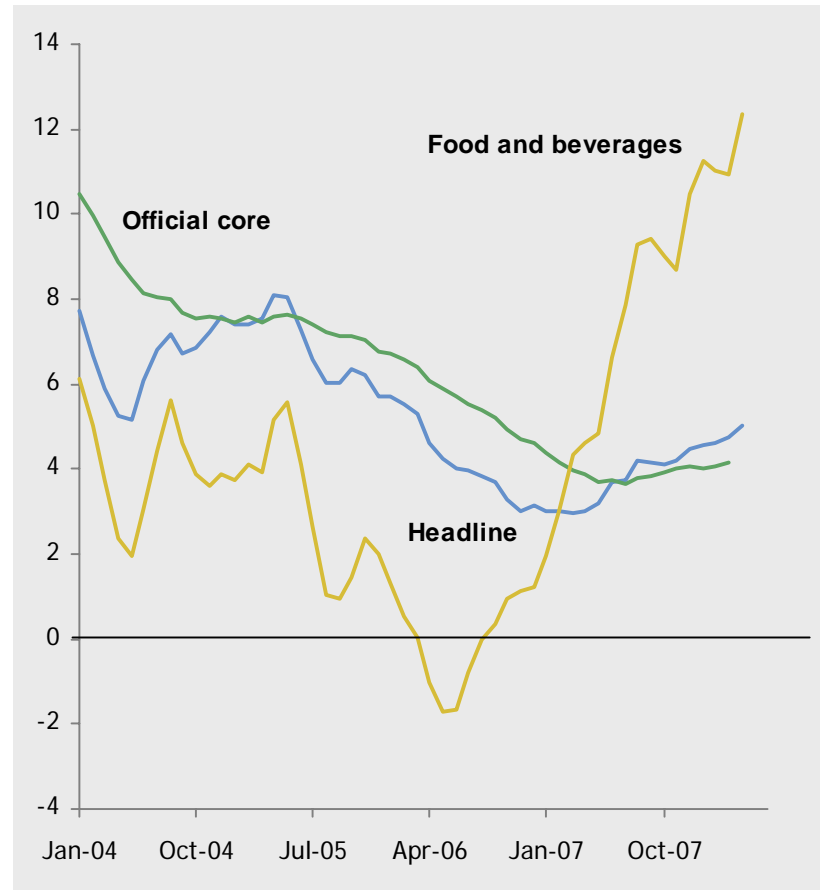
SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

Latam inflation rates (%oya, Bra, Mex, Chi, Per)



Source: Country data

Brazil inflation rates (%oya)

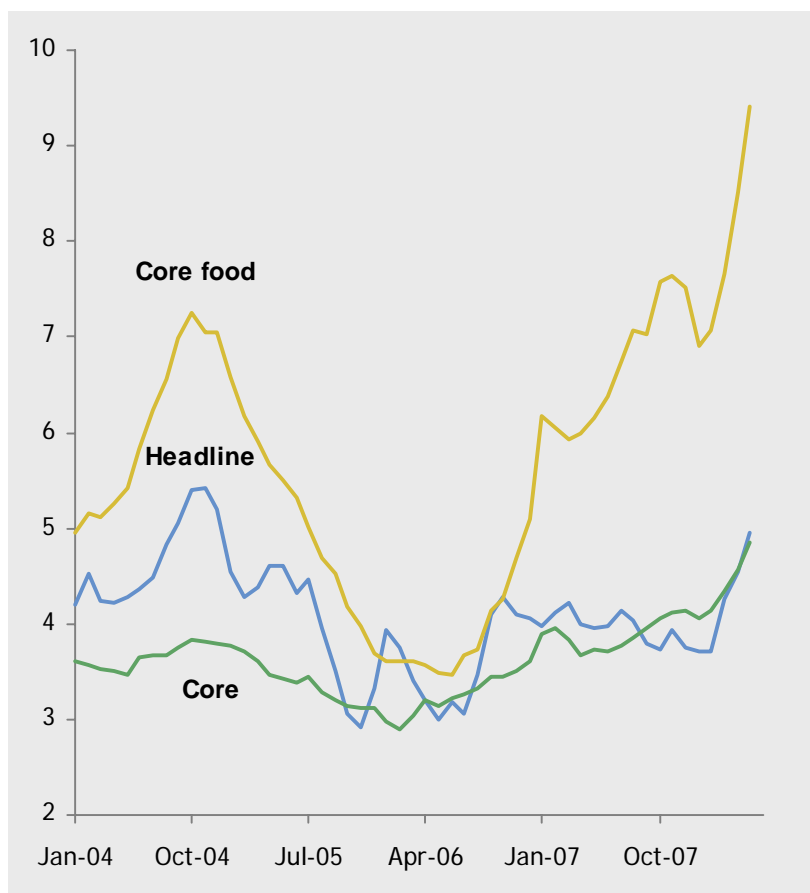


Source: IBGE

# Brazil and Chile have experienced that strongest shocks

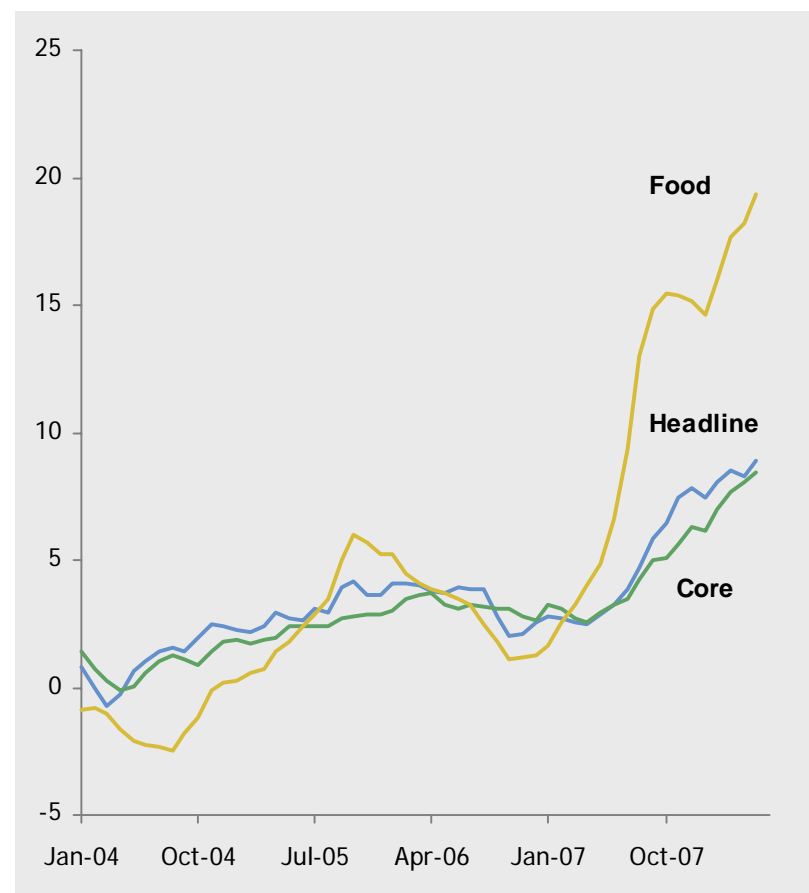
SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

**Mexico's inflation (%oya)**



Source: Banxico

**Chile's inflation (%oya)**

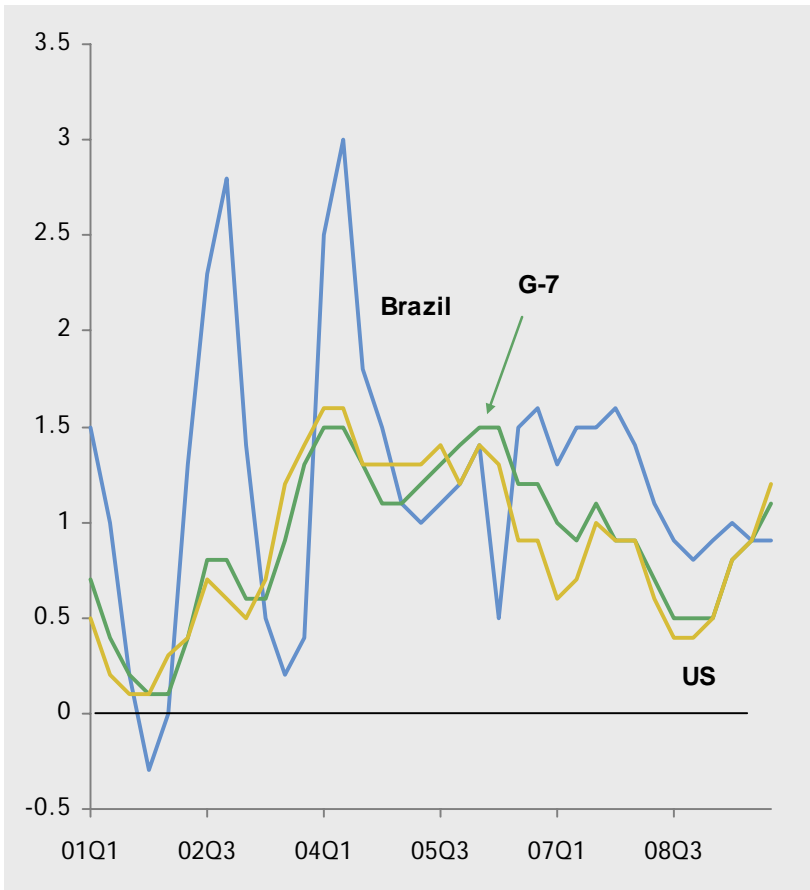


Source: INE

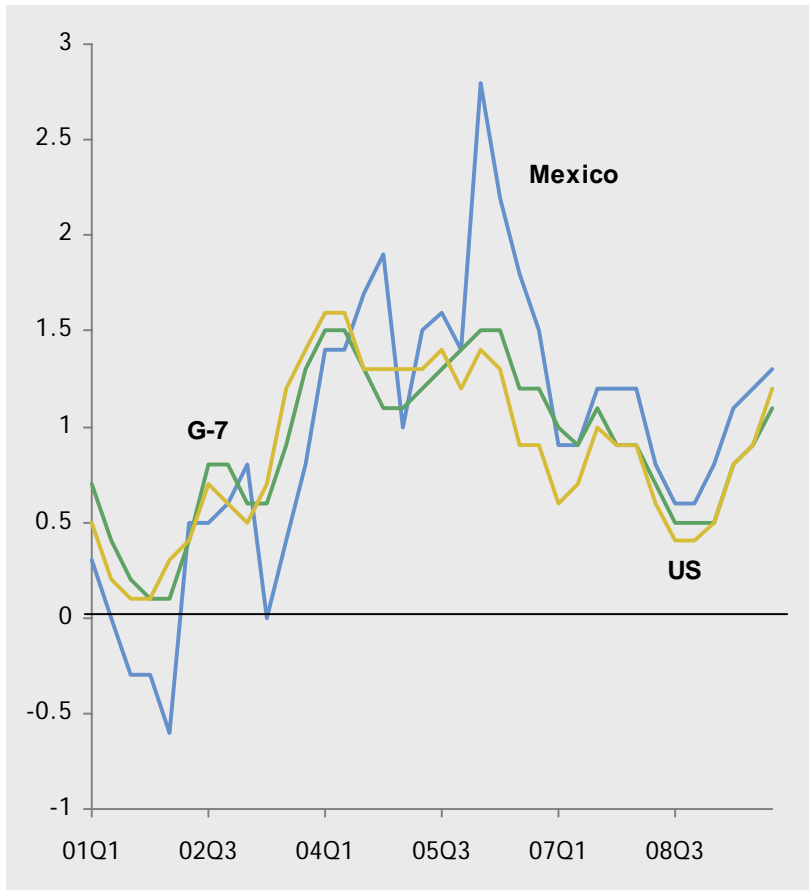
# Business cycles have diverged—Mexico is more in sync with the global economy and Brazil much less

SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

**Brazil: Deviation of real GDP growth (from 5-year moving average)**



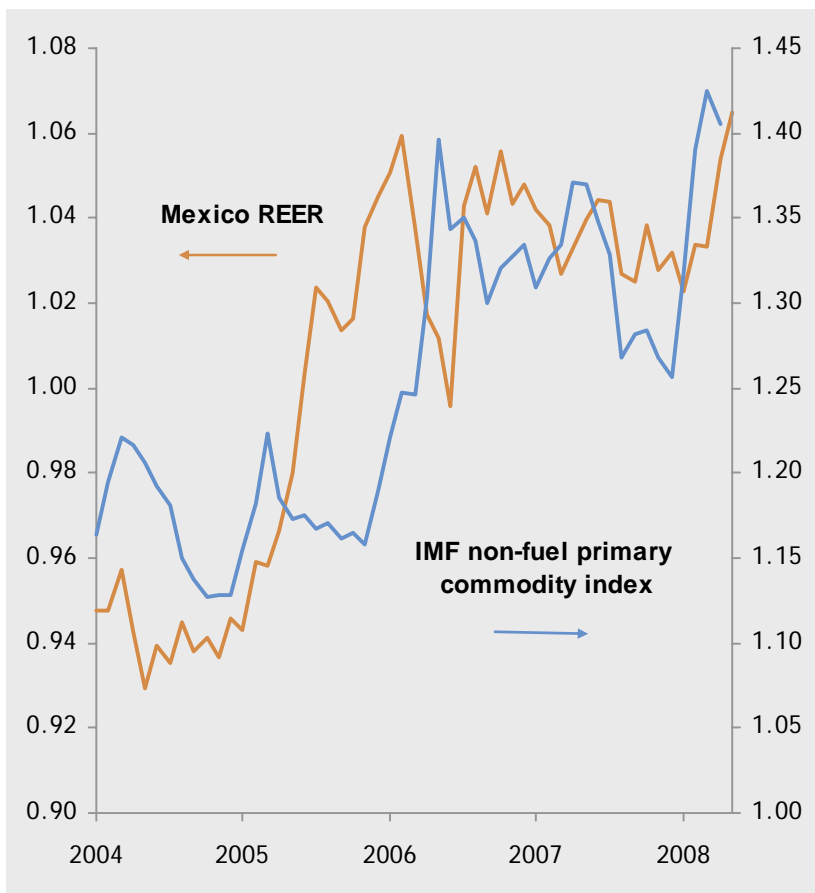
**Mexico: Deviation of real GDP growth (from 5-year moving average)**



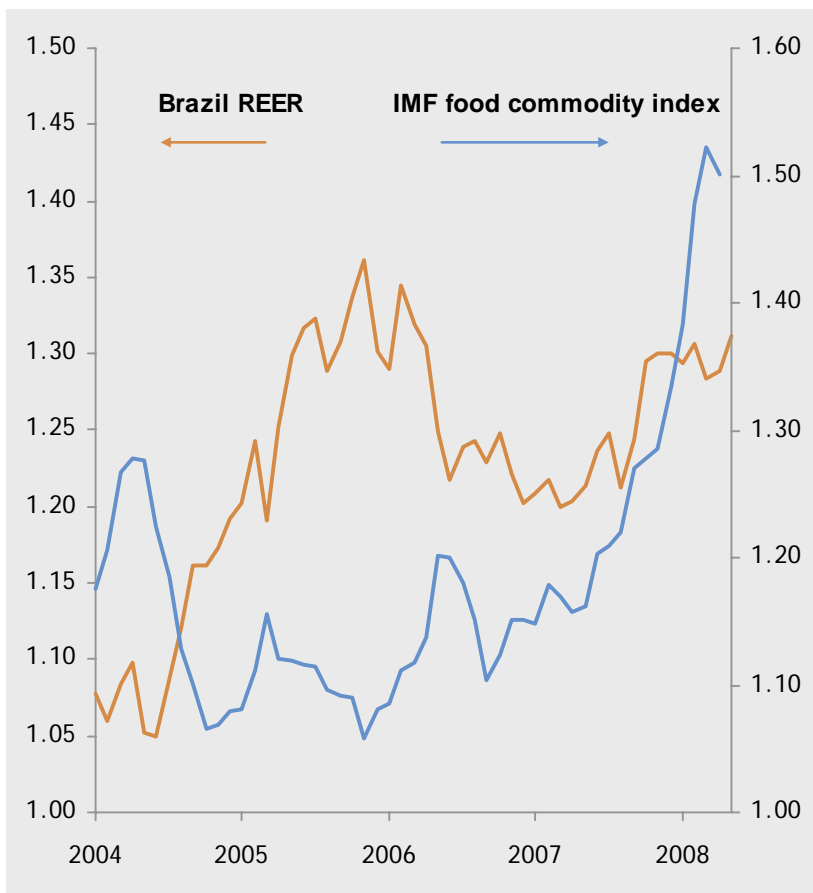
# Surprising REER have not been as closely correlated with commodity prices

SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

**Mexico: Deviation REER and IMF non-fuel primary commodity index (from 5-year moving average)**



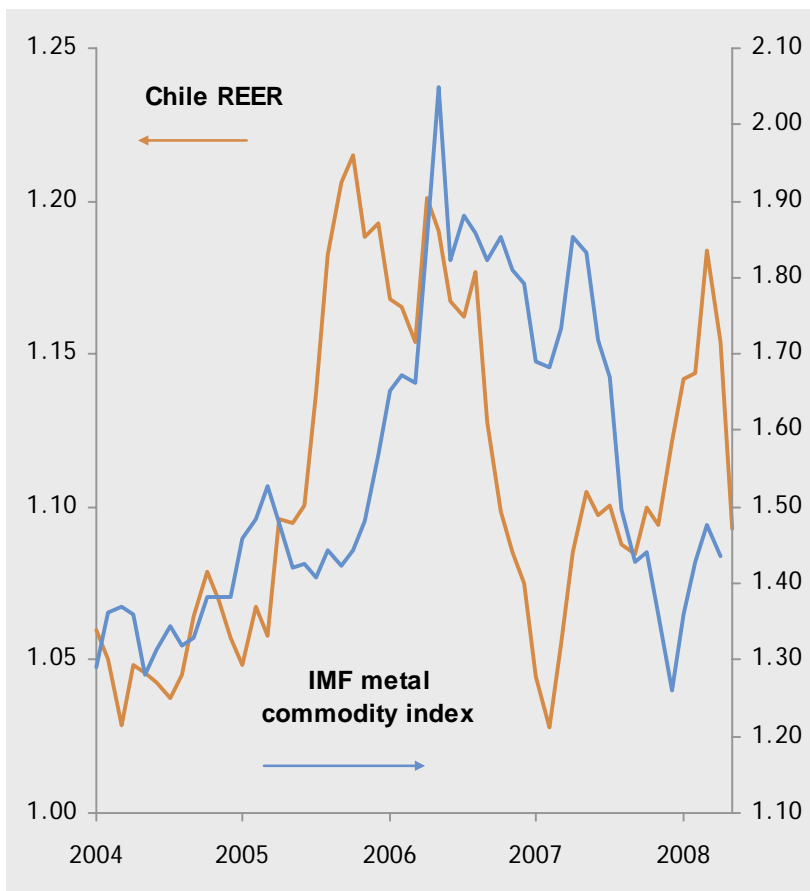
**Brazil: Deviation REER and IMF food commodity index (from 5-year moving average)**



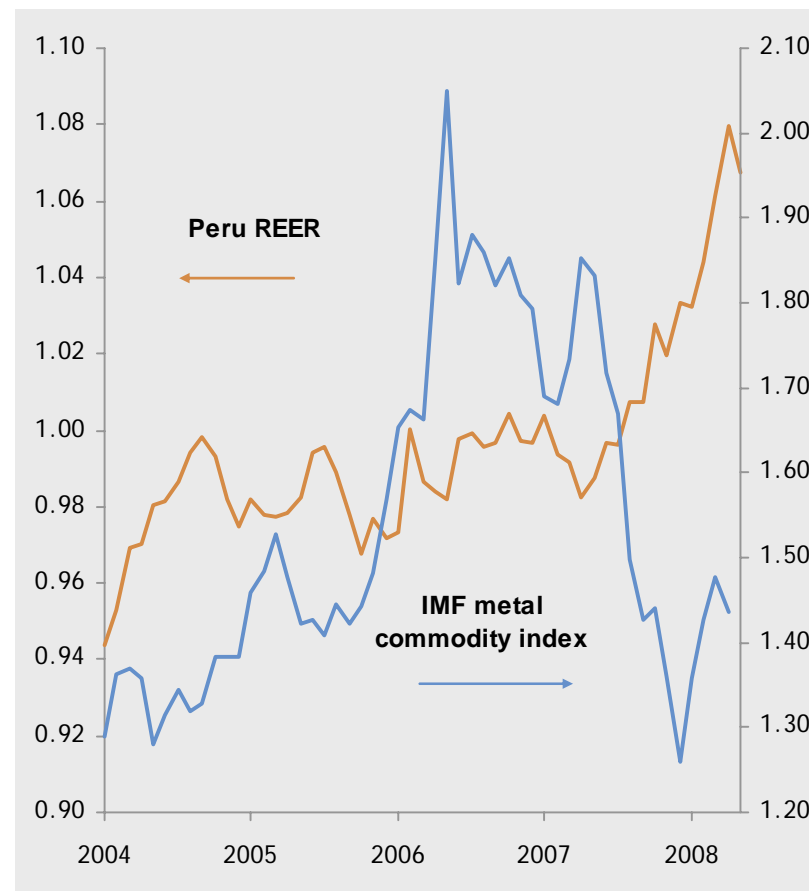


# This is mostly apparent in Chile and Peru

**Chile: Deviation REER and IMF metal commodity index (from 5-year moving average)**



**Peru: Deviation REER and IMF metal commodity index (from 5-year moving average)**

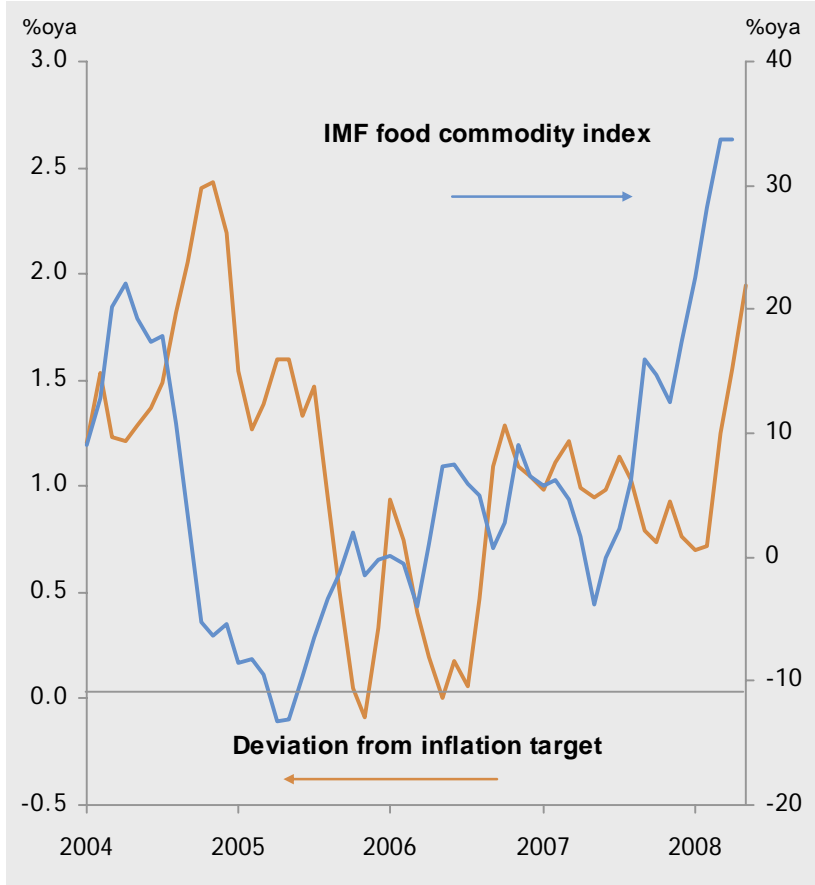


SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

# This had a side effect on overall inflation

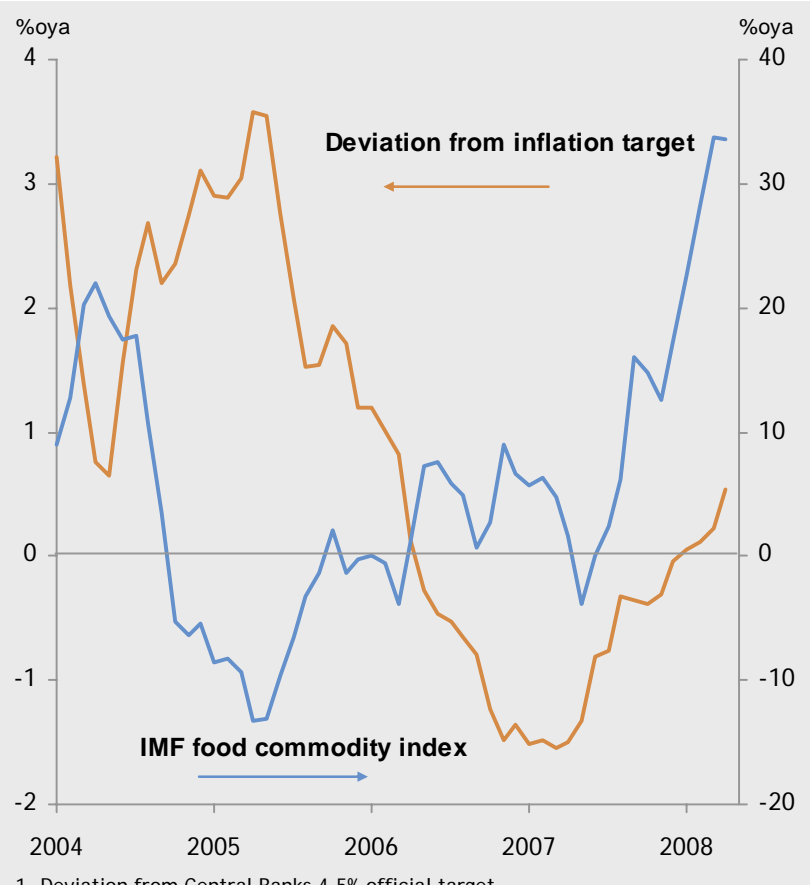
SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

**Mexico: inflation deviation from target and IMF food commodity index (from 5-year moving average)**



1. Deviation from Banxico's 3% (+/-1%) official target.  
Source: JPMorgan and IMF.

**Brazil: inflation deviation from target and IMF food commodity index (from 5-year moving average)**

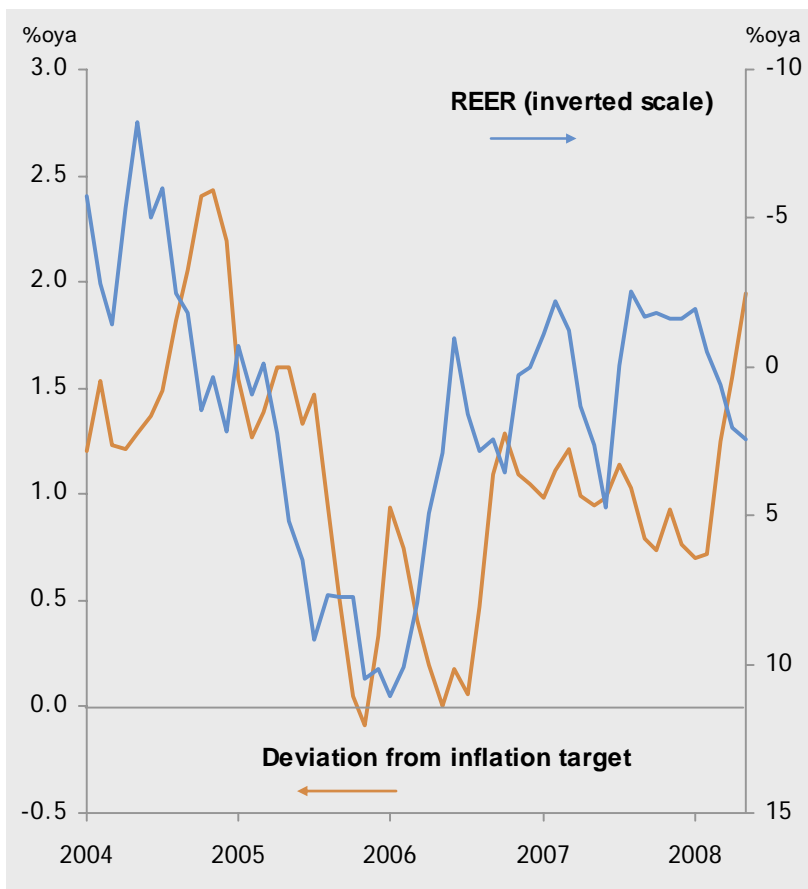


1. Deviation from Central Banks 4.5% official target.  
Source: JPMorgan and IMF.

# FX intervention may have limited the low inflation gains

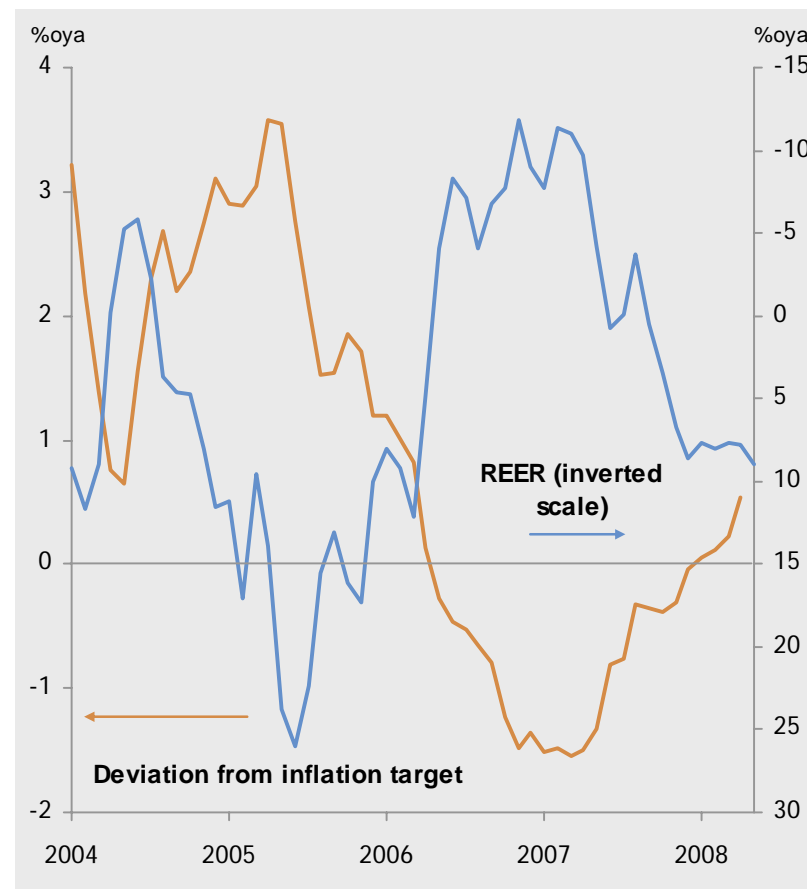
SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

**Mexico's inflation deviation from target and REER (from 5-year moving average)**



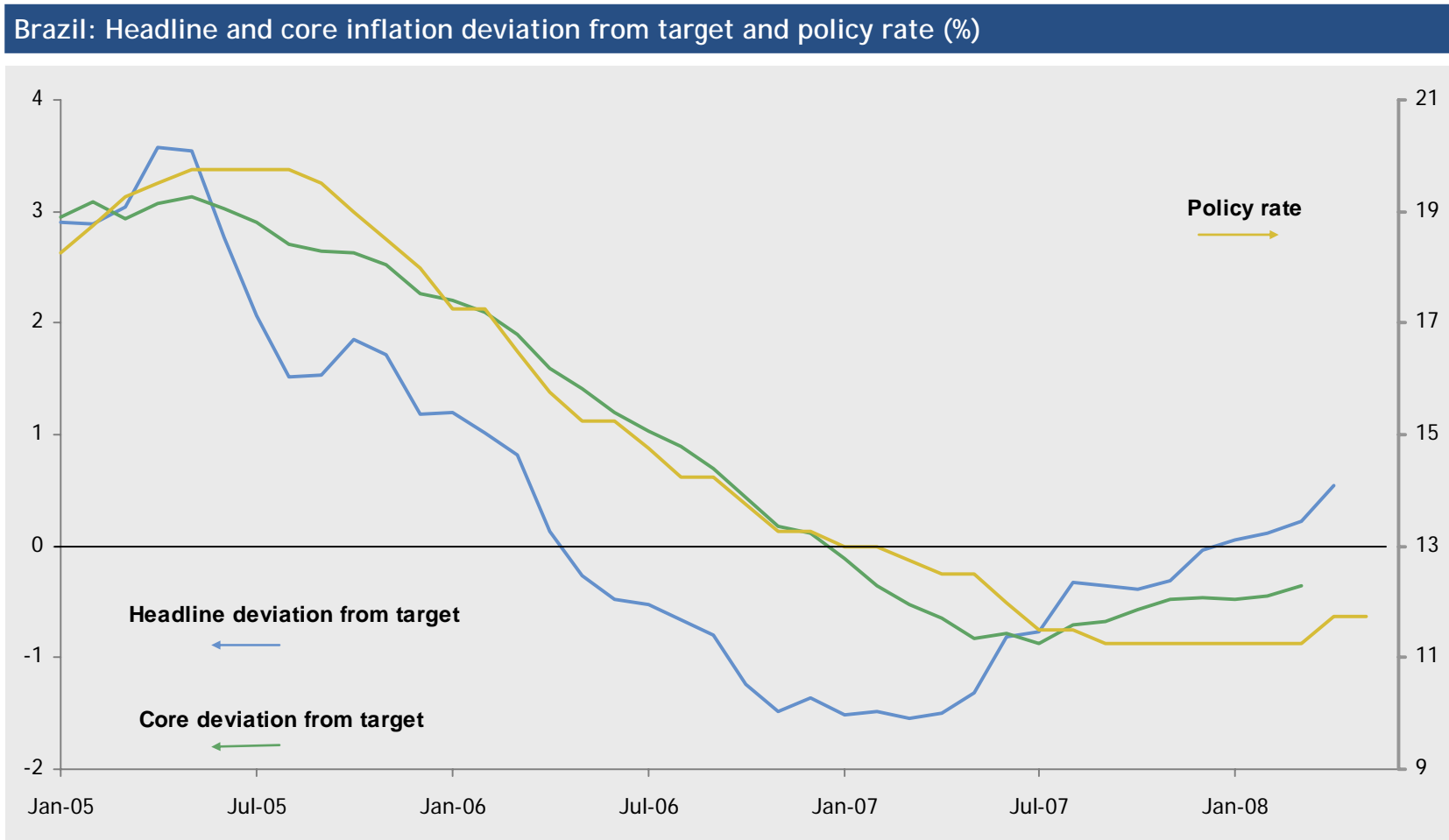
1. Deviation from Banxico's 3% (+/-1%) official target. Source: JPMorgan and IMF.

**Brazil's inflation deviation from target and REER (from 5-year moving average)**



1. Deviation from Banxico's 3% (+/-1%) official target. Source: JPMorgan and IMF.

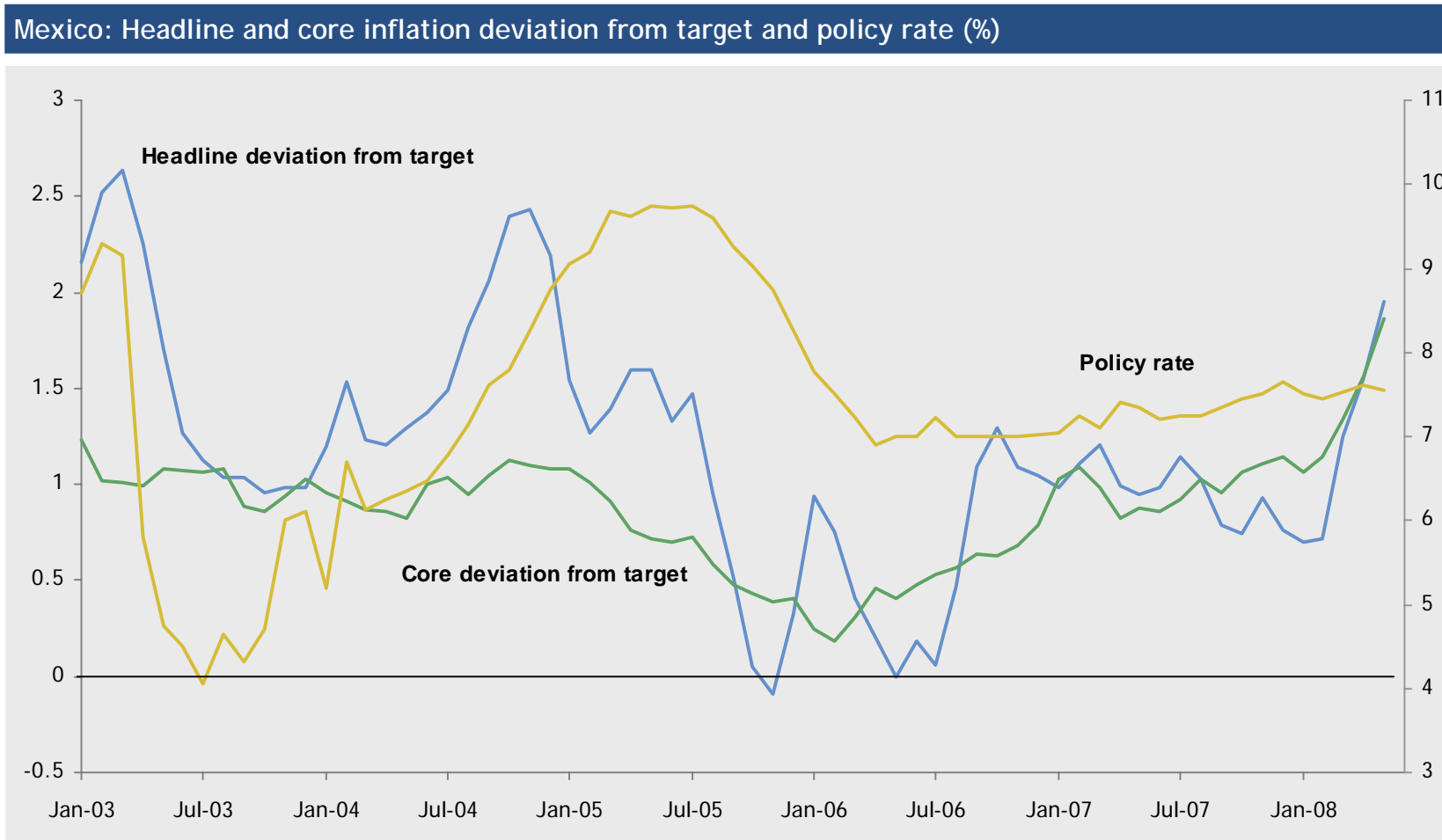
# Central banks policy rates seem to respond more to headline than core inflation



Source: IBGE and BCB

SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

# In Mexico shocks have resulted in both headline and core components



Source: Banxico

SEARCHING FOR A RATIONALE OF EXTERNAL SHOCKS

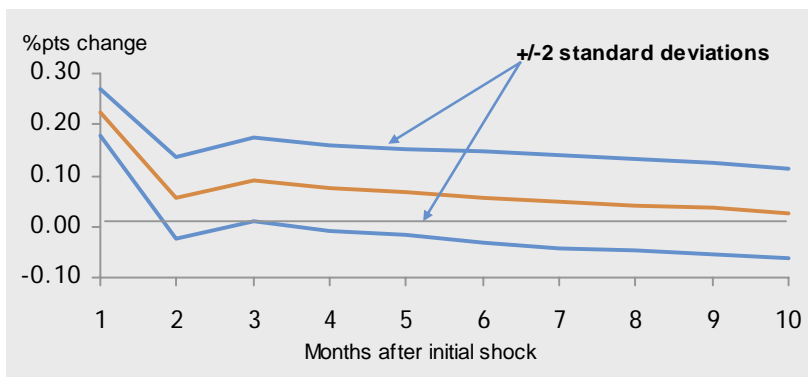
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# Banxico impulse responses of policy rate

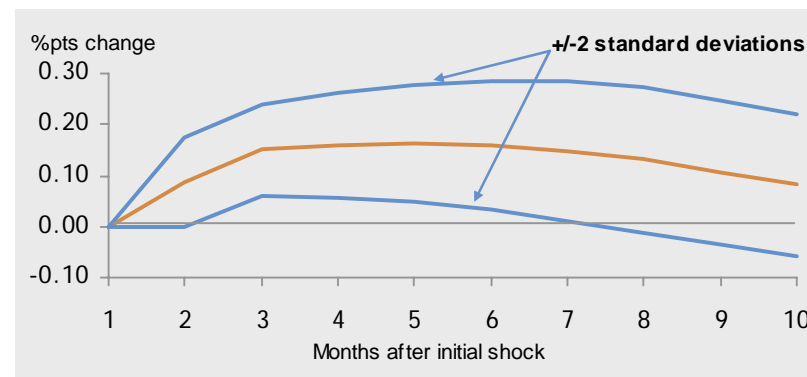
INVESTIGATING MEXICO'S REACTION FUNCTION

**Impulse response of policy rate**



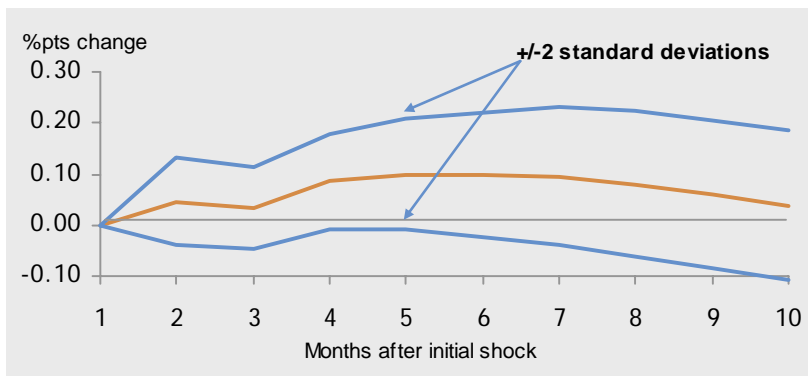
Source: JPMorgan

**Impulse response from 1 year inflation expectations shock**



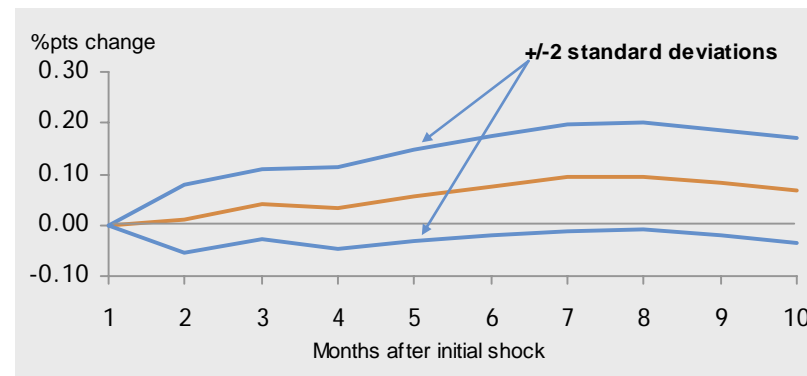
Source: JPMorgan

**Impulse response from a 4 years inflation expectations shock**



Source: JPMorgan

**Impulse response from monthly headline CPI %oya shock**

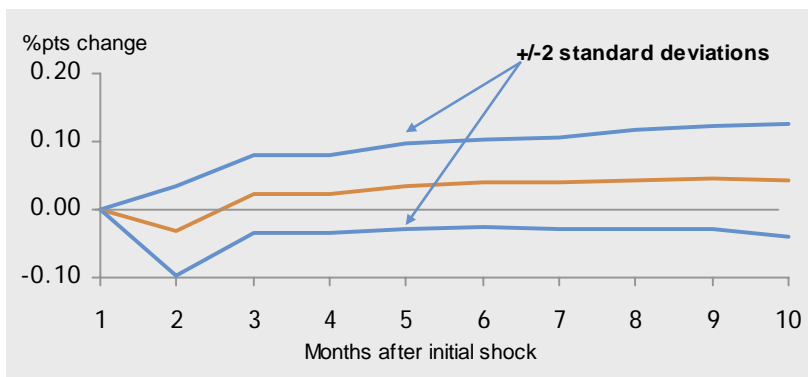


Source: JPMorgan

# Banxico impulse responses of policy rate

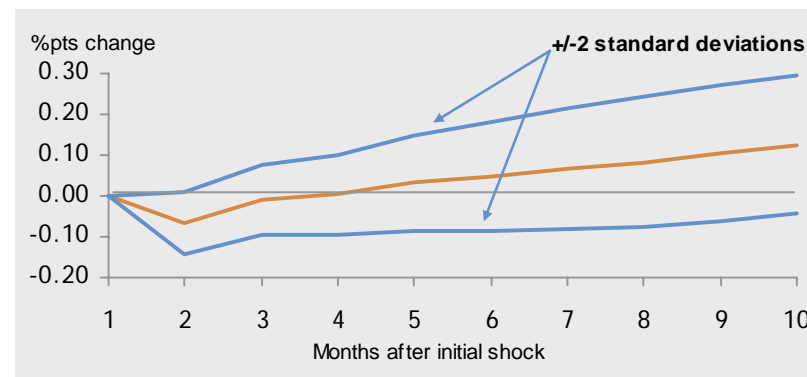
INVESTIGATING MEXICO'S REACTION FUNCTION

**Impulse response from monthly core CPI %oya shock**



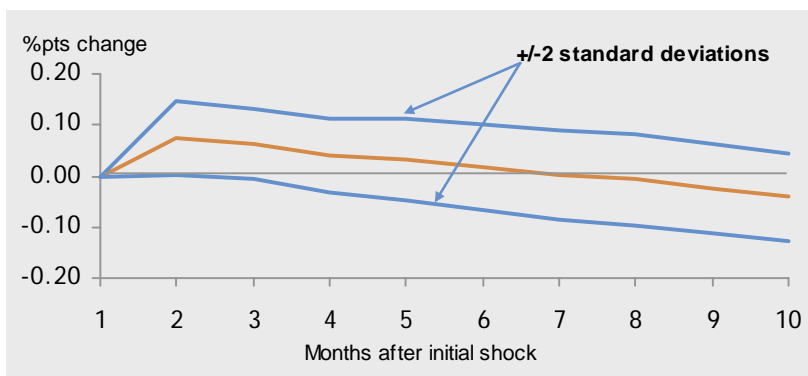
Source: JPMorgan

**Impulse response from real exchange rate shock**



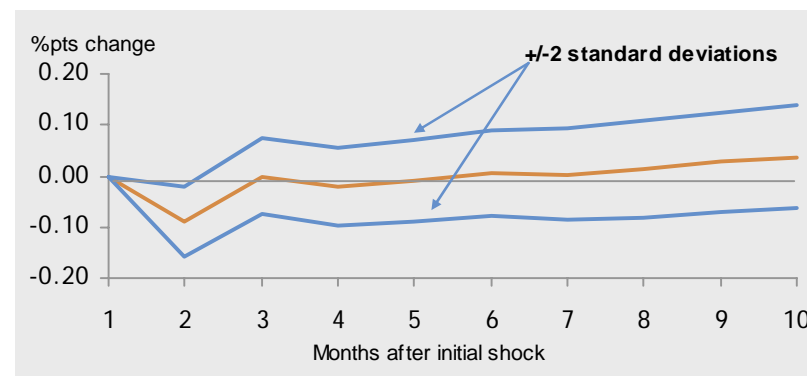
Source: JPMorgan

**Impulse response from Fed Fund rate shock**



Source: JPMorgan

**Impulse response from economic activity shock**



Source: JPMorgan



# Variance decomposition

Variance decomposition (% unless indicated)										
	Months after the initial shock									
	1	2	3	4	5	6	7	8	9	10
Policy rate	100	65	51	41	34	29	25	23	21	19
1yr inflation expectations <sup>1</sup>	0	9	25	34	39	42	42	42	41	39
4yr inflation expectations <sup>1</sup>	0	3	3	6	10	12	13	13	13	12
Headline CPI (%oya) <sup>1</sup>	0	0	2	2	3	5	7	9	10	10
Core CPI (%oya) <sup>1</sup>	0	1	1	1	2	2	2	2	3	3
Economic Activity (%oya) <sup>2</sup>	0	10	7	5	4	3	3	3	2	3
Real exchange rate <sup>3</sup>	0	5	4	3	3	3	4	5	8	11
Fed Fund rate	0	7	8	7	6	5	4	4	3	3
<b>Total Variance</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

1. Deviation from Banxico's 3% mid-point target.

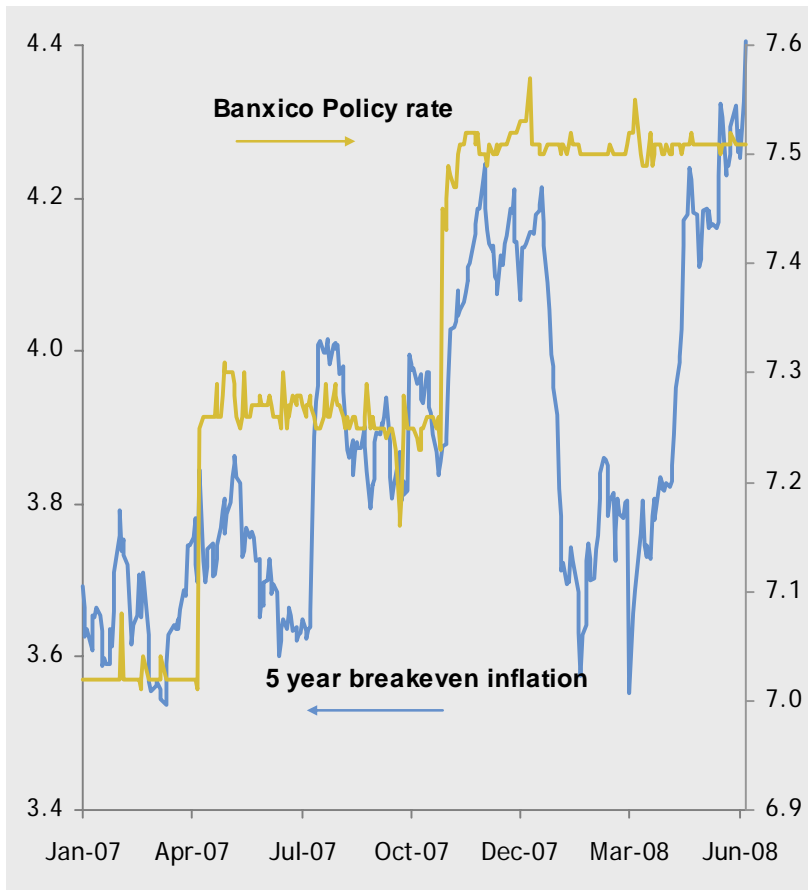
2. Deviation from 3.5% potential growth rate

3. Deviation in % points from 5-years average.

Source: JPMorgan

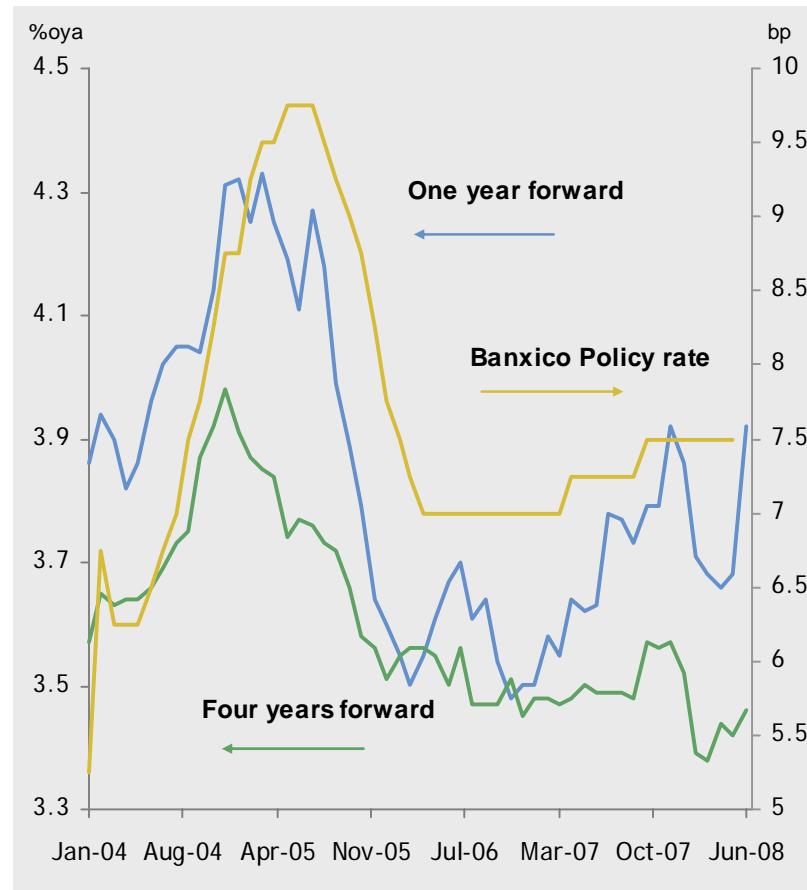
# Banxico's response seems geared to inflation expectations

Mexico breakeven inflation (%)



Source: JPMorgan and Banxico

Banxico policy rate and inflation expectations



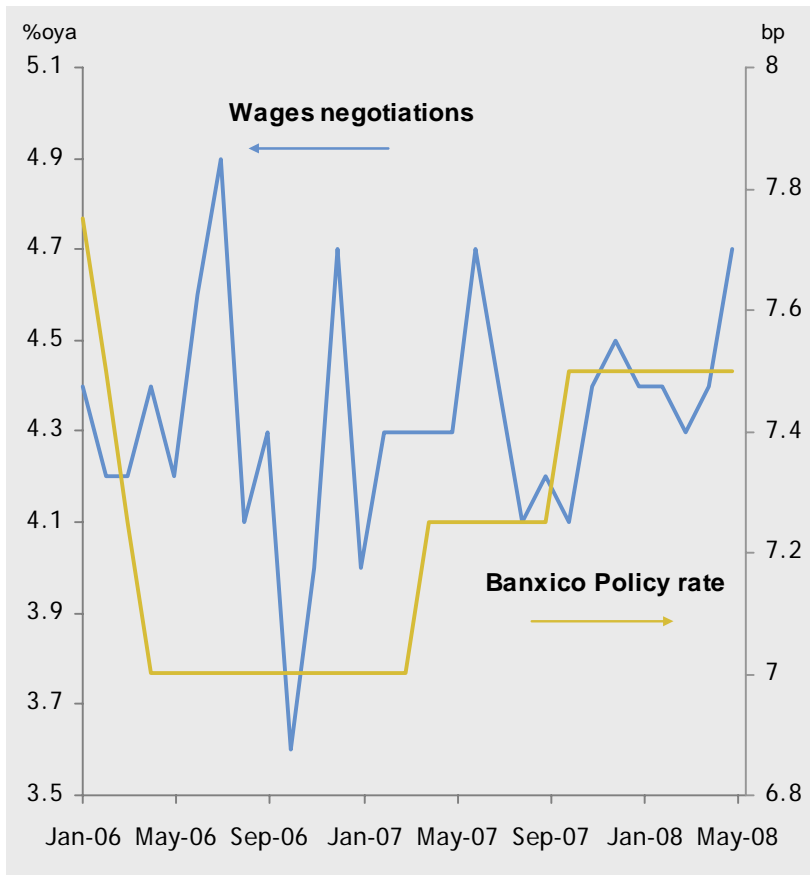
Source: Banxico survey

INVESTIGATING MEXICO'S REACTION FUNCTION

# However, the central bank typically responds ahead of inflation contamination in labor markets

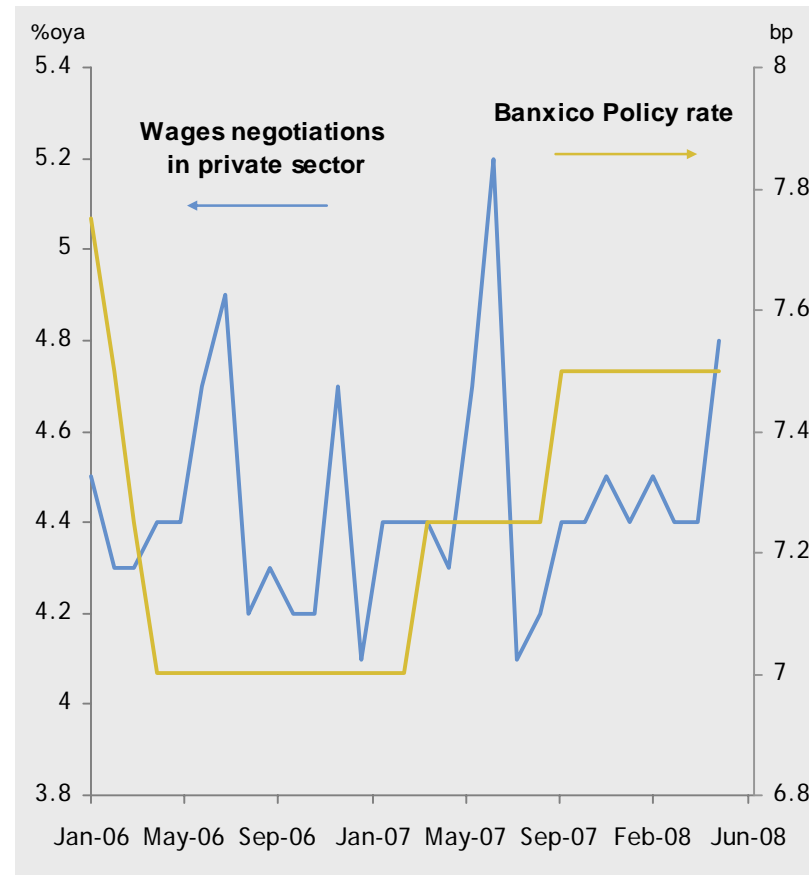
INVESTIGATING MEXICO'S REACTION FUNCTION

**Nominal wage increases in negotiations and Banxico's policy rate**



Source: Labor Ministry and Banxico

**Nominal wage increases in private sector and Banxico's policy rate**



Source: Labor Ministry and Banxico

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# Why do Latin central banks respond to headline and not core as the US Fed does?

Latin America: Investment to GDP and growth rate per worker (%)						
	Investment to GDP (%)			Growth rate of real GDP per worker		
	1950-59	1970-79	2000-04	1950-59	1970-79	2000-04
Argentina	15.73	20.72	12.19	1.05	1.32	-4.61
Brazil	25.43	26.19	14.73	4.30	4.25	-0.02
Chile	31.04	15.64	20.88	1.46	-0.50	1.10
Colombia	15.99	13.95	9.51	2.33	2.62	-0.70
Mexico	19.22	21.49	19.03	3.79	2.26	-1.72
Peru	41.74	16.15	15.69	2.17	-0.01	-0.08
Venezuela	40.00	30.51	11.23	4.42	0.44	-6.06

Source: University of Pennsylvania, Center for International Comparisons of Production, Income and Prices

## Limited productivity growth seems the answer

### Latin America: Investment to GDP and growth rate per worker (%)

	Investment to GDP (%)			Growth rate of real GDP per worker		
	1950-59	1970-79	2000-04	1950-59	1970-79	2000-04
Argentina	15.73	20.72	12.19	1.05	1.32	-4.61
Brazil	25.43	26.19	14.73	4.30	4.25	-0.02
Chile	31.04	15.64	20.88	1.46	-0.50	1.10
Colombia	15.99	13.95	9.51	2.33	2.62	-0.70
Mexico	19.22	21.49	19.03	3.79	2.26	-1.72
Peru	41.74	16.15	15.69	2.17	-0.01	-0.08
Venezuela	40.00	30.51	11.23	4.42	0.44	-6.06

Source: University of Pennsylvania, Center for International Comparisons of Production, Income and Prices

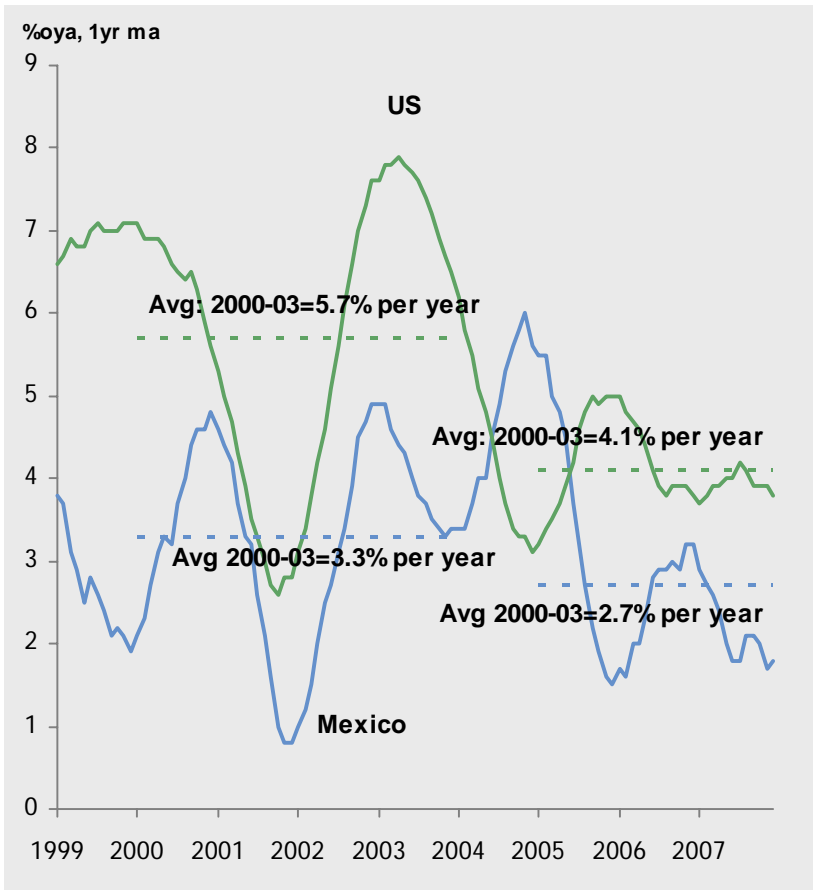
### Asia: Investment to GDP and growth rate per worker (%)

	Investment to GDP (%)			Growth rate of real GDP per worker		
	1950-59	1970-79	2000-04	1950-59	1970-79	2000-04
China	22.82	28.29	29.99	4.76	3.53	7.39
Indonesia	8.42	11.66	11.50	1.98	1.24	3.68
Korea	11.71	27.25	34.53	2.34	5.79	3.33
South Africa	11.35	13.07	7.96	2.24	1.19	2.31
Taiwan	9.20	20.46	17.00	5.60	7.21	...
Thailand	15.56	30.57	21.29	-0.75	3.99	3.92

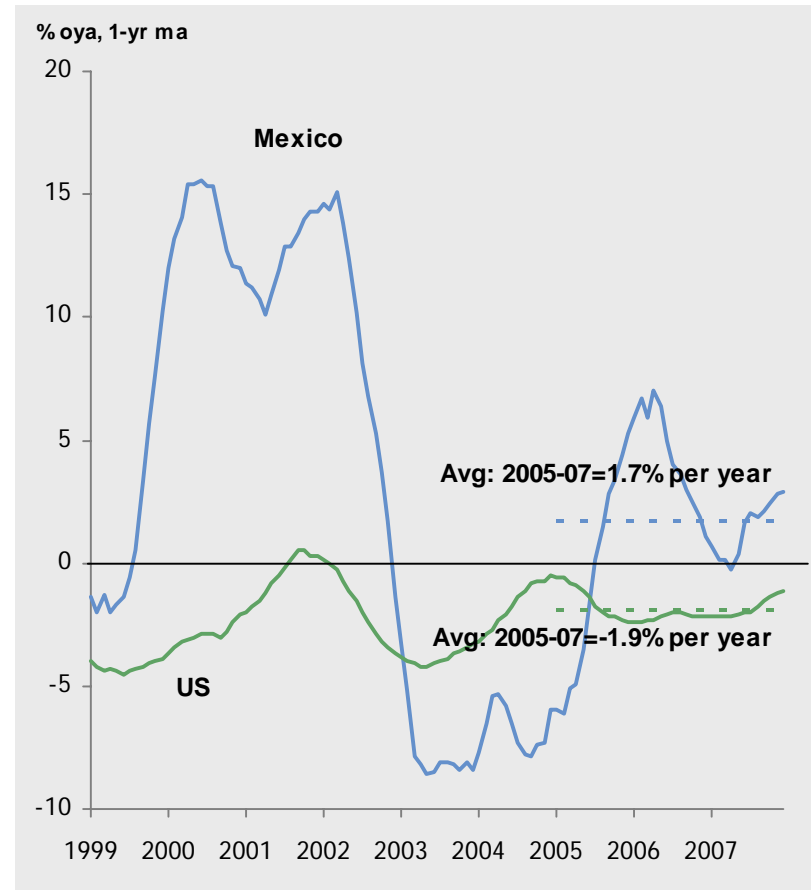
Source: University of Pennsylvania, Center for International Comparisons of Production, Income and Prices

# Mexico is a good experience

**Mexico and US: Labor productivity in manufacturing**



**Mexico and US: Unit labor costs in manufacturing**



A FINAL COMMENT

LATIN AMERICA'S INFLATION

Alfredo Thorne, MD, Global Economics Department

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