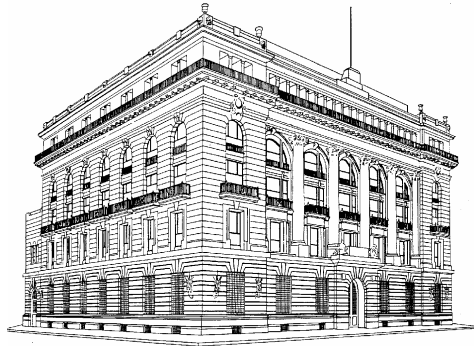


# ***MONETARY POLICY IN MEXICO***



BANCO<sup>DE</sup>MEXICO

***“Monetary Policy in Emerging Markets”  
OECD and CCBS/Bank of England  
February 28, 2007***

**Manuel Ramos-Francia  
Head of Economic Research**

**I. INTRODUCTION**

**II. MONETARY POLICY STRATEGY**

**III. MONETARY TRANSMISSION MECHANISM**

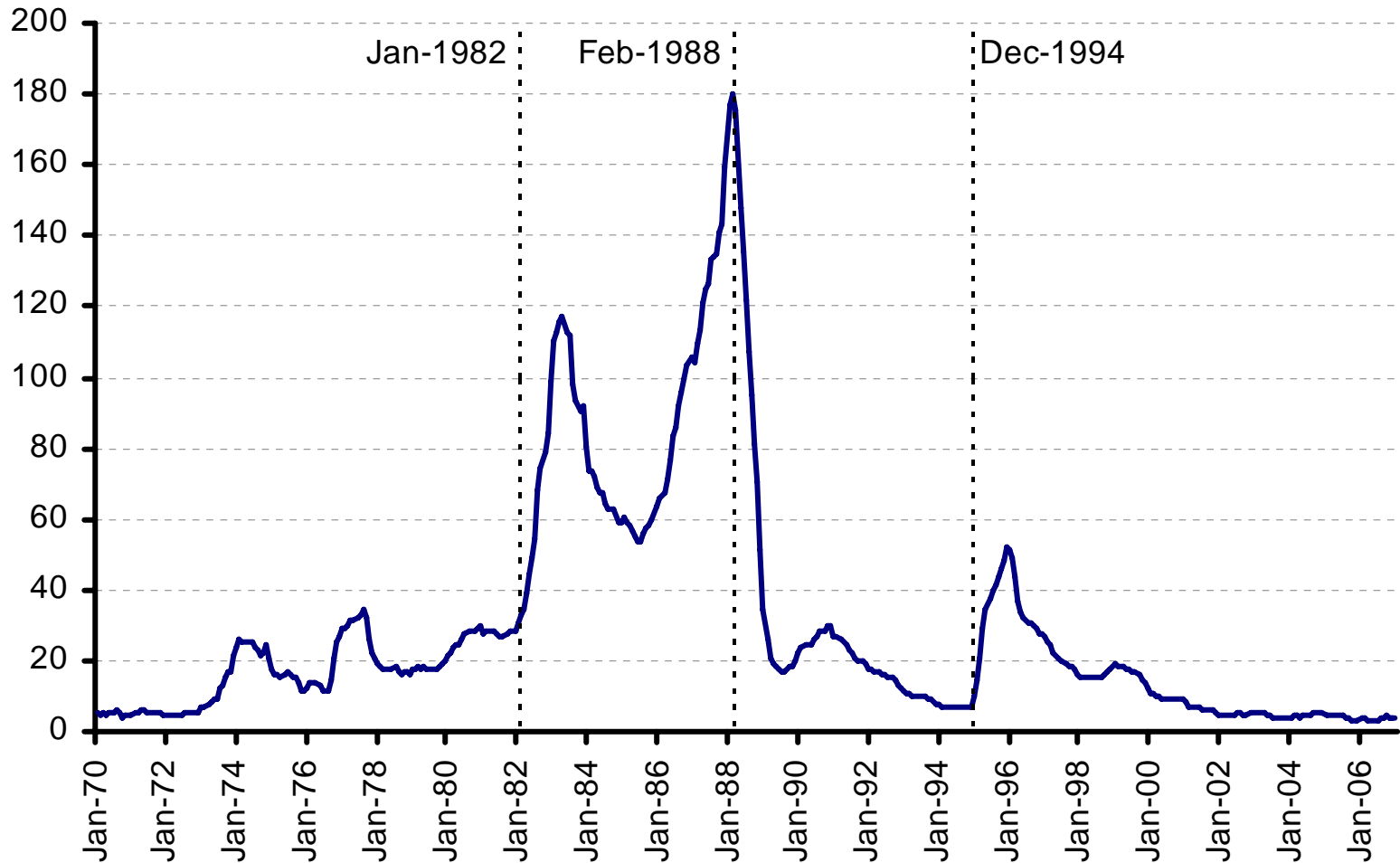
**IV. MONETARY POLICY AND THE YIELD  
CURVE**

**V. FINAL REMARKS**



# I. Introduction

## CPI Inflation (Percent)



Source: Banco de México.



# I. Introduction

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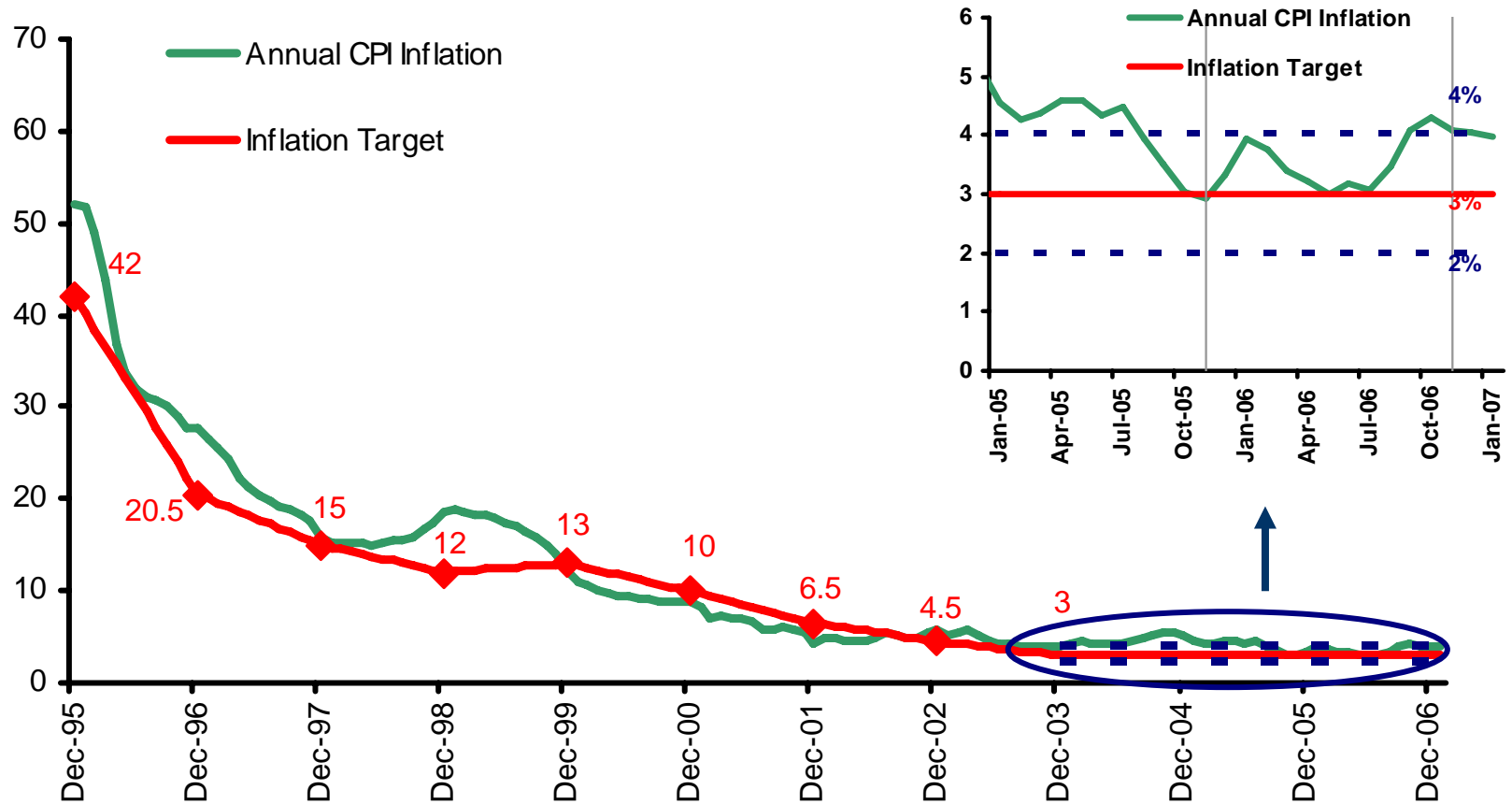
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- During the last years, Mexico has converged to a low, stable inflation equilibrium.
- Essential elements:
  - ✓ *Fiscal control. Fiscal Responsibility Law.*
  - ✓ *Central Bank (Constitutional) Autonomy.*
  - ✓ *Floating exchange rate.*
  - ✓ *Financial sector reforms (e.g., capital account liberalization, pension reform, development of derivatives markets, etc).*
- A favorable external environment has also contributed:
  - ✓ *Benign international financial conditions.*
  - ✓ *Lower global inflationary conditions.*
  - ✓ *Solid economic growth.*
  - ✓ *High oil prices.*



# I. Introduction

## CPI Inflation and CPI Inflation Targets (Percent)



Source: Banco de México.

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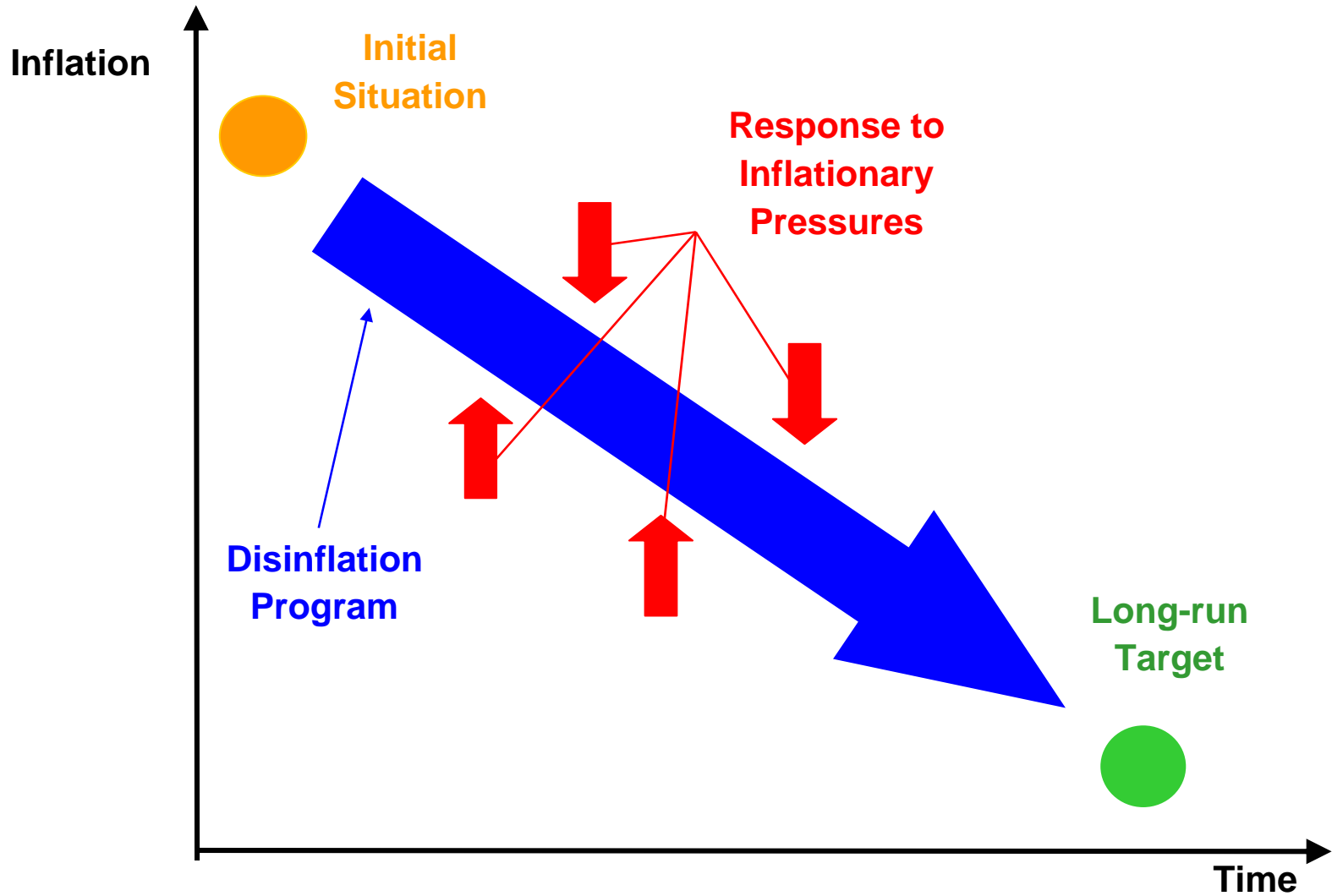
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# II. Monetary Policy Strategy





## II. Monetary Policy Strategy

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- **Late 1980's and early 90's: ERB stabilization and external debt renegotiation. The reasons for the failure of ERB programs are well known (Tequila Crisis).**
  
- **Over the last years:**
  - ① **(1995-1996) Containment of inflationary pressures from crisis. Reestablishing orderly market conditions.**
  
  - ② **(1997-1998) Monetary policy becomes nominal anchor. Use of “corto”.**
  
  - ③ **(1998- ) Gradual convergence towards inflation targeting. By 2001, fully fledged IT.**



## II. Monetary Policy Strategy

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- Over the last years, IT has become a mechanism to coordinate inflation expectations.

1999



Medium-term inflation target: inflation similar to that of major trading partners for 2003.

2000



3% CPI inflation target for 2003.

2001



Formal adoption of IT.

2002



Long-term inflation target: 3% ( $\pm 1$  percentage point) from December 2003 onwards. Pre-announced dates for decisions.

- Does IT also help to disinflate?



## II. Monetary Policy Strategy

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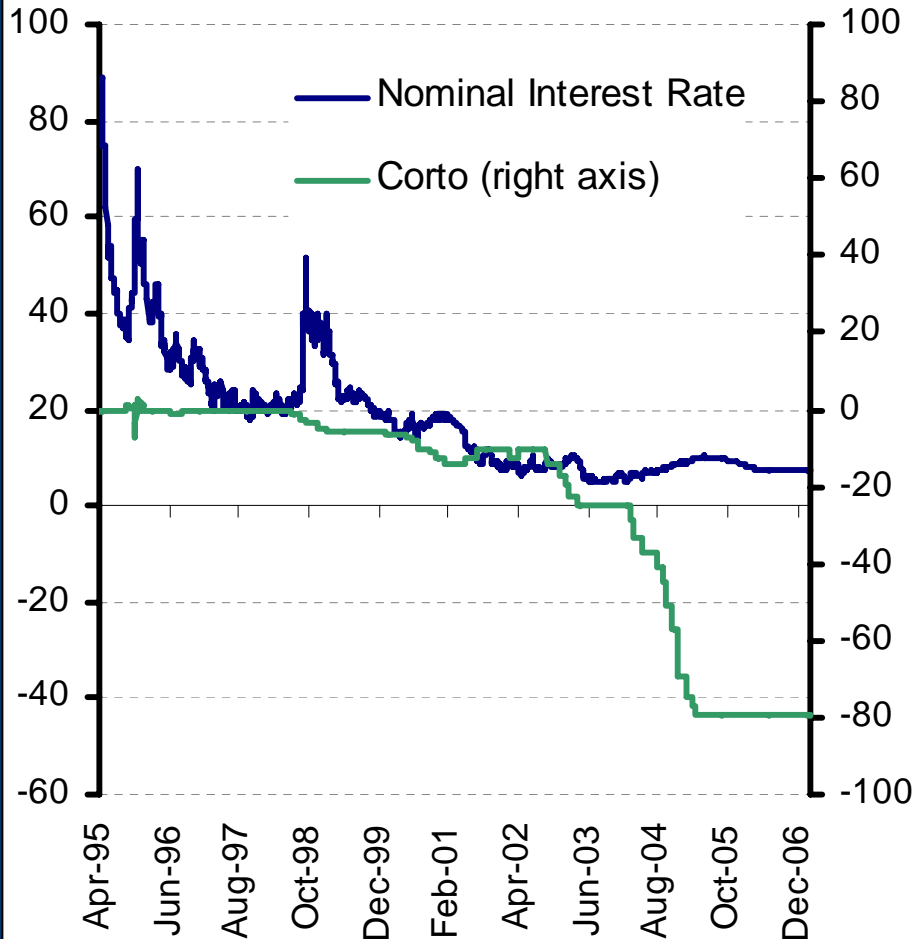
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- **Disinflation (“low-frequency”). Use of a Non- borrowed Reserves Target “Corto”.**
  - ✓ *Numerous shocks to the exchange rate, together with a high pass-through.*
  - ✓ *High exchange rate exposure (balance sheet effects).*
  - ✓ *With high and volatile inflation, difficult to determine a “suitable” level for interest rates.*
  - ✓ *As inflation and risk premia fall, markets determine the speed at which interest rates can be reduced.*
  - ✓ *The use of the “corto” allowed the Central Bank to maintain a persistent restrictive bias.*

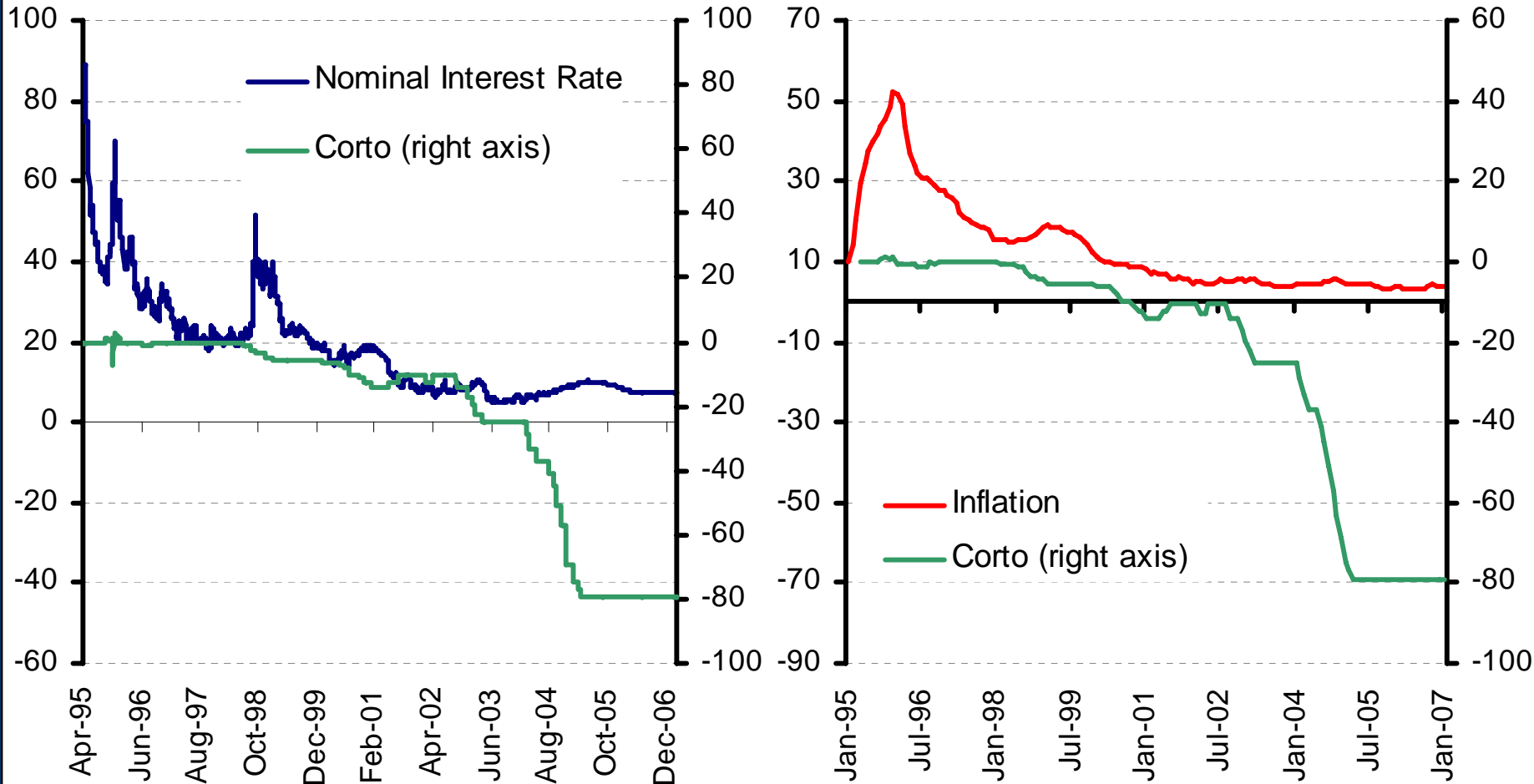


## II. Monetary Policy Strategy

**Nominal Interest Rate (TIEE 28 days) and “Corto”**  
**(Percent and Daily Million Pesos)**



**CPI Inflation and “Corto”**  
**(Percent and Daily Million Pesos)**



Source: Banco de México.



## II. Monetary Policy Strategy

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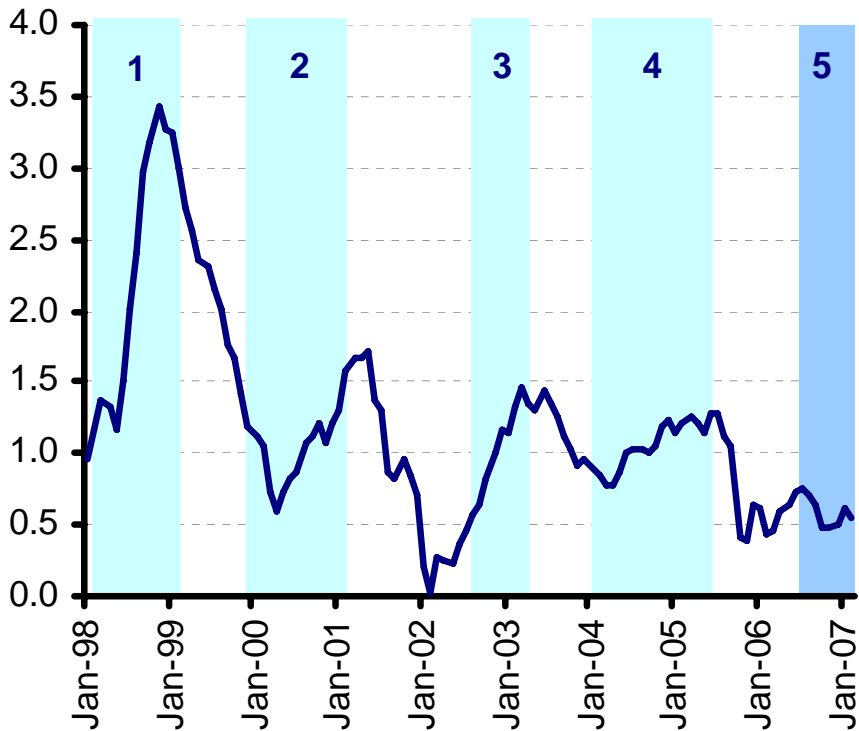
- Response to (“higher-frequency”) shocks.
- Among recent inflationary shocks, the following stand out:
  1. *External cost-push shock at the end of 1998 and the beginning of 1999 (East Asian economies, Russia and Brazil crises).*
  2. *Internal demand shock during 2000.*
  3. *Internal cost-push shock at the end of 2002 and the beginning of 2003.*
  4. *Cost-push shock (mainly external) during 2004 (commodities - e.g., energy and foodstuff prices).*
  5. *External cost-push shock (commodity prices) exacerbated by domestic distortions.*



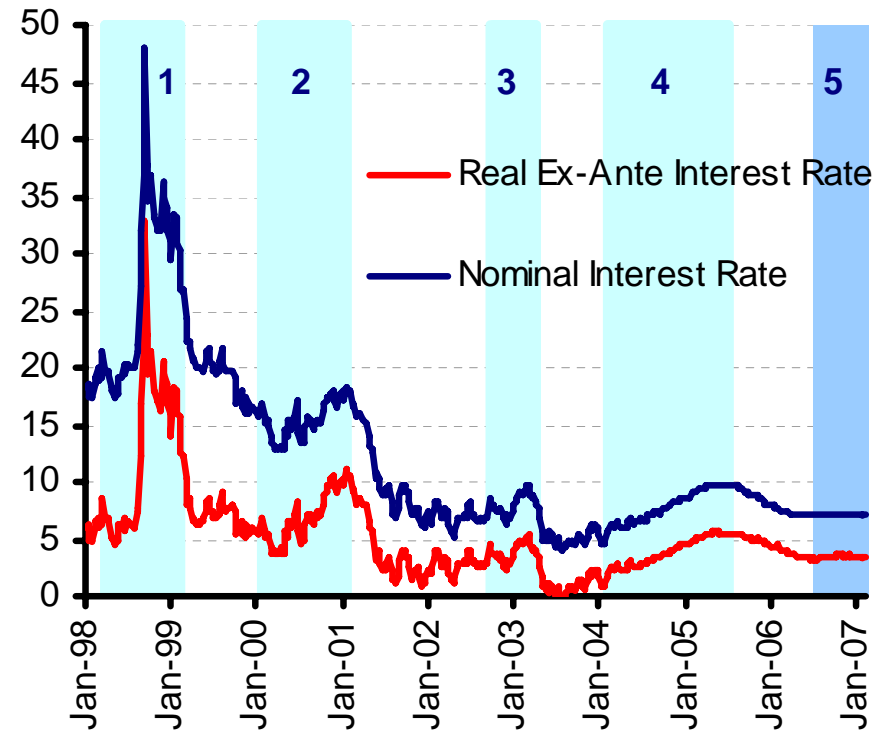
## II. Monetary Policy Strategy

- Response to (“higher–frequency”) Inflationary Pressures

**Inflation Gap\***  
(Percent)



**Nominal and Real Ex-ante  
Interest Rate\***  
(Percent)



\* Shaded areas correspond to episodes of inflationary pressures. The inflation gap is the difference between inflation expectations for the next 12 months and the inflation target. The latter is calculated based on the annual inflation targets announced by Banco de México.

\* Shaded areas correspond to episodes of inflationary pressures.

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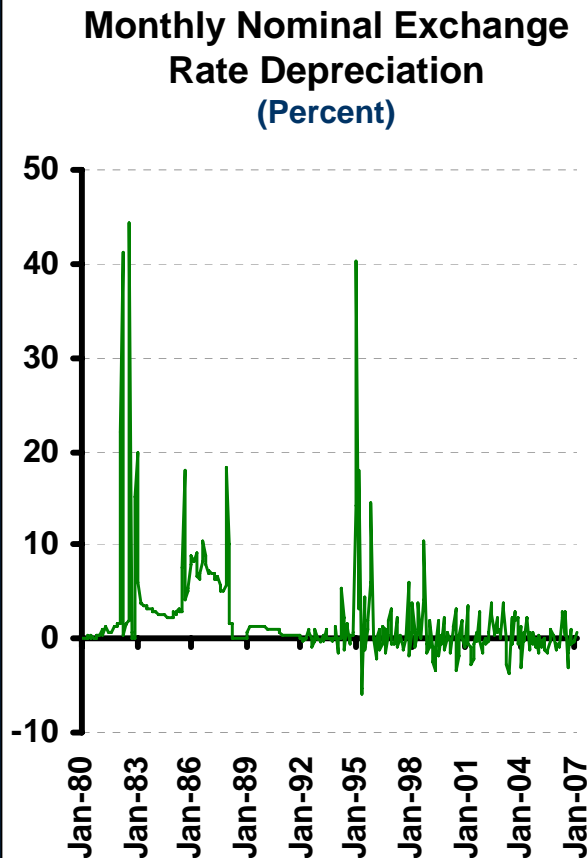
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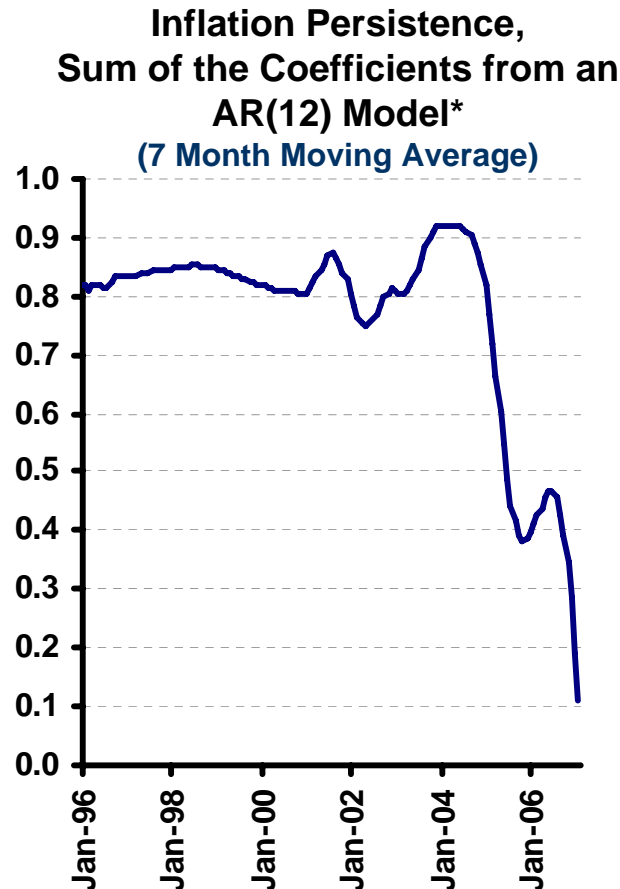


# III. Monetary Transmission Mechanism

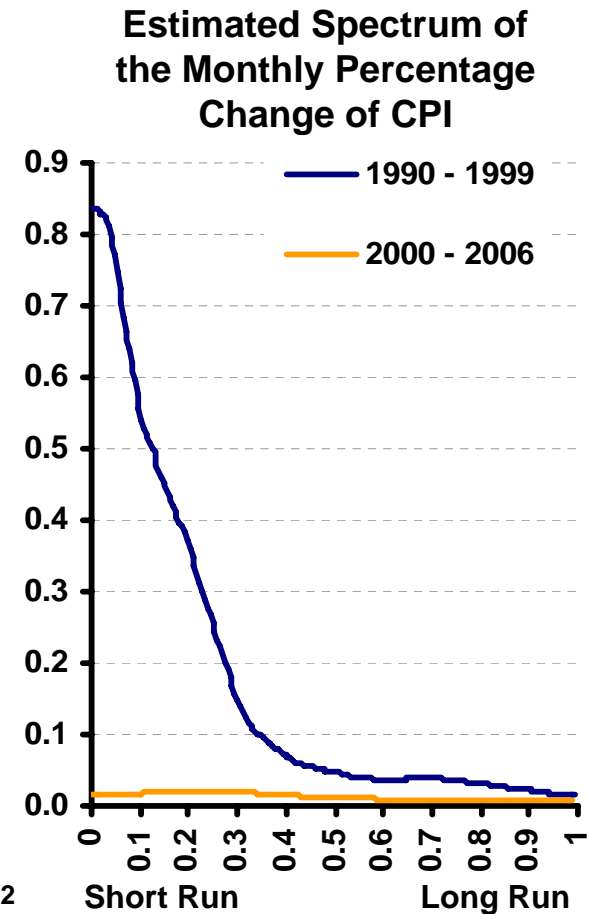
- Low, stable inflation has improved the functioning of the nominal system, and thus, also of the real economy (e.g., run-of-the-mill business cycles).



Source: Banco de México.



\* Corresponds to the sum of the 12 coefficients from an AR(12) process estimated using a window for the previous 6 years.





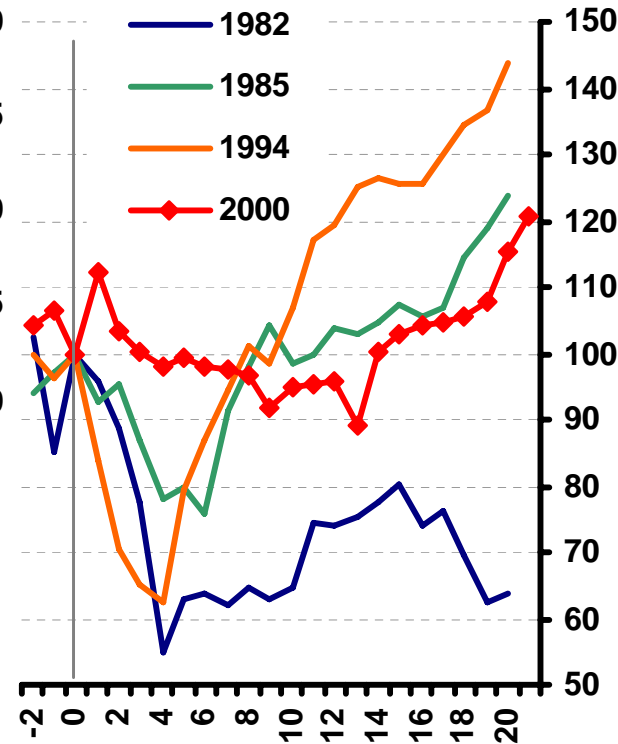
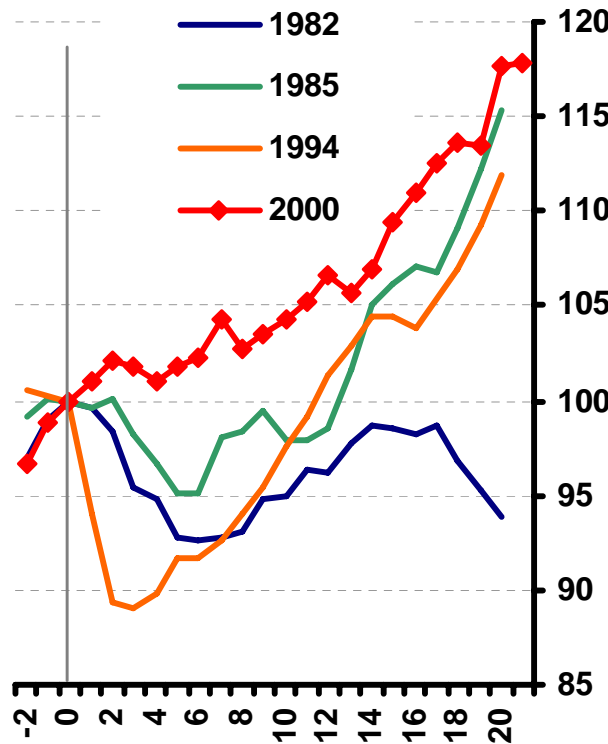
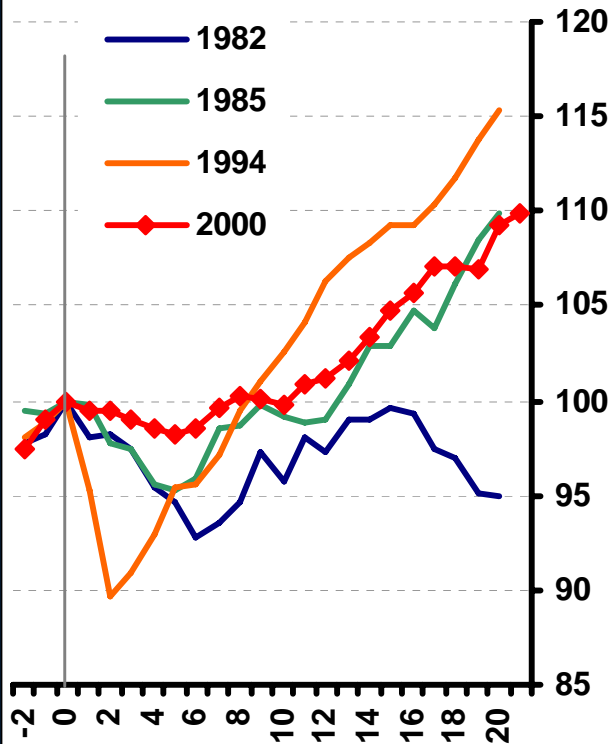
# III. Monetary Transmission Mechanism

## Less Volatile Macroeconomic Aggregates

**Gross Domestic Product\***  
(Peak=100)

**Private Consumption\***  
(Peak of GDP=100)

**Gross Fixed Investment\***  
(Peak of GDP=100)



\* Seasonally Adjusted Data.

Source: INEGI.



## III. Monetary Transmission Mechanism

- These changes imply that the transmission mechanism of monetary policy has been changing in two dimensions:
  - ✓ *Relative importance of the different channels.*
  - ✓ *Speed with which the economy adjusts to shocks.*
- To illustrate, a standard small-scale macroeconomic model with four structural equations is used:

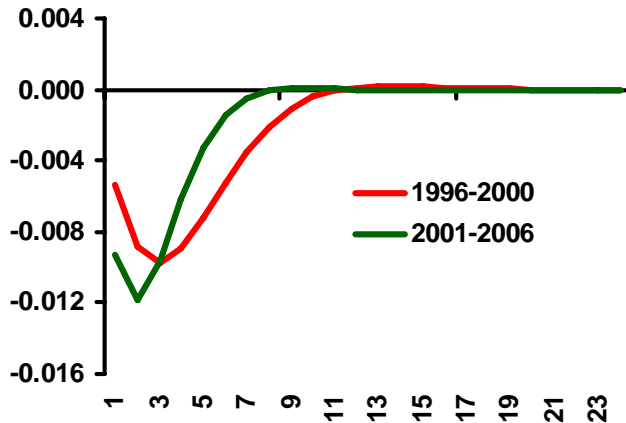
<u>Equations:</u>	<u>Samples:</u>	<u>Shocks:</u>
1. Phillips curve	1. 1996-2000	1. Interest rate
2. IS curve	2. 2001-2006	2. Exchange rate
3. RER		3. Cost-push
4. MP rule		



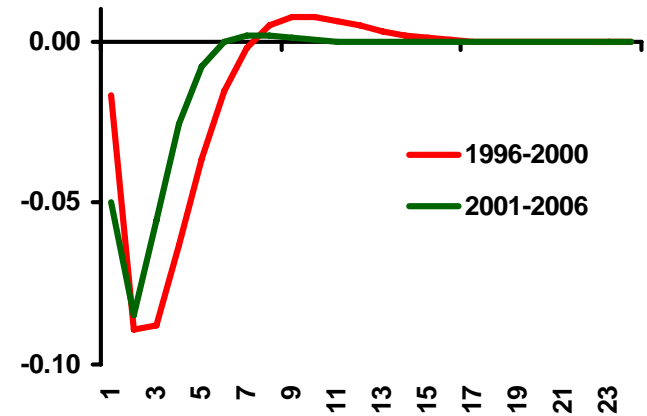
# III. Monetary Transmission Mechanism

- Interest Rate Shock of 1 percentage point in nominal interest rate.

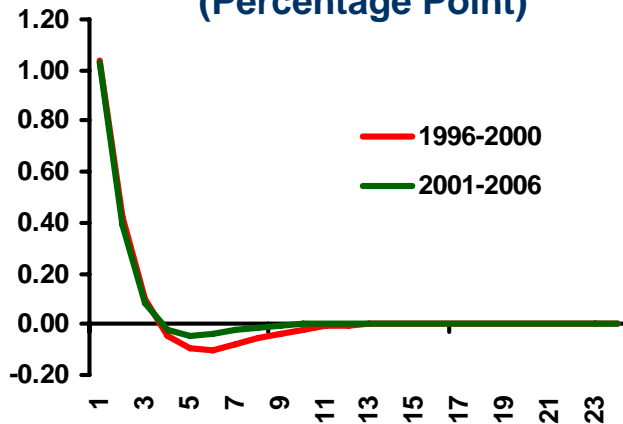
**Inflation 1a**  
(Percent)



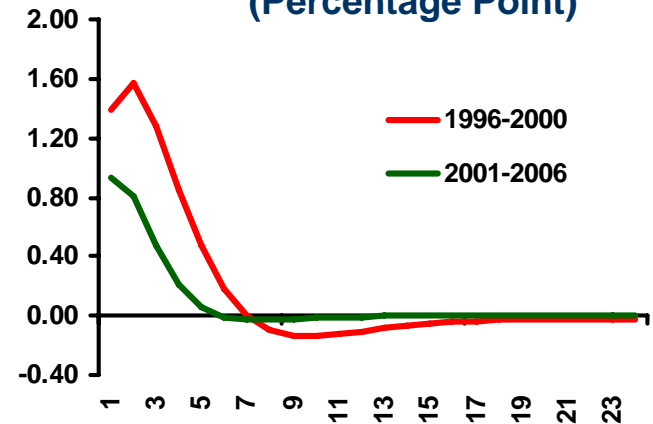
**Output Gap 1b**  
(Percent)



**Nominal Interest Rate 1c**  
(Percentage Point)



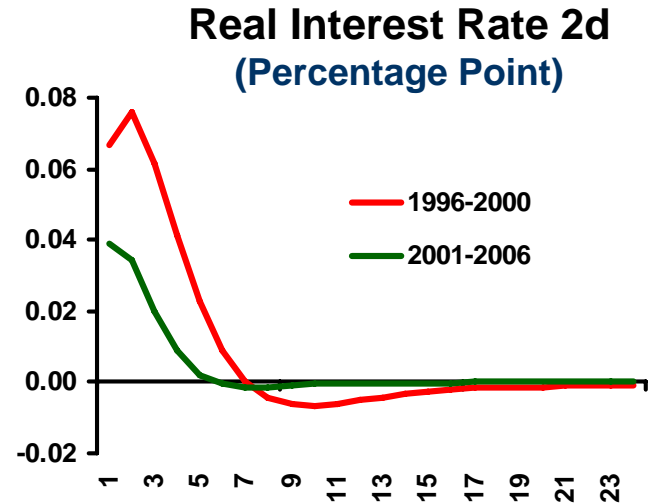
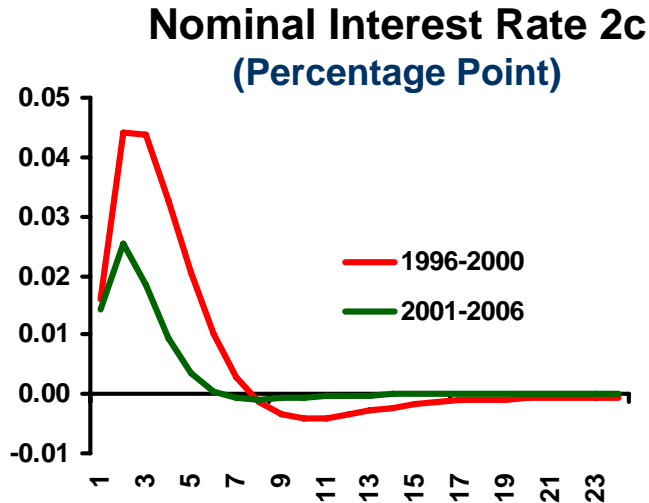
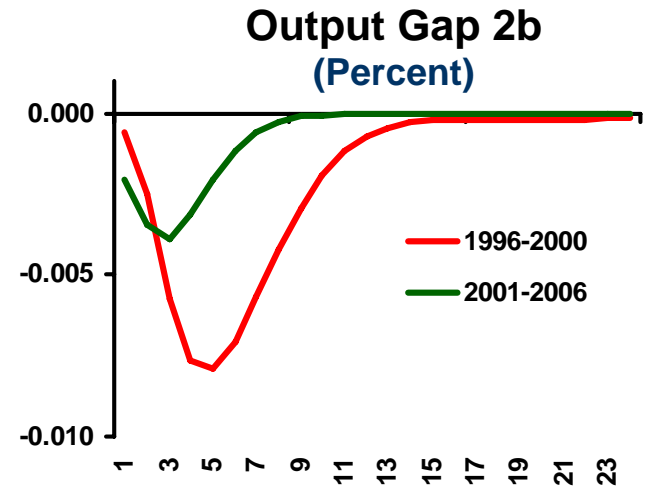
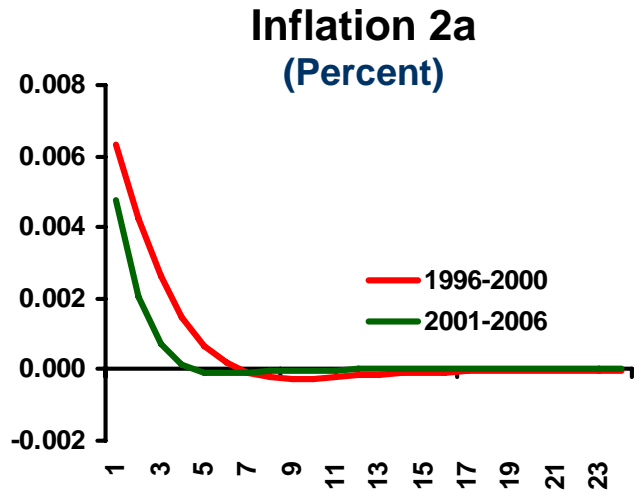
**Real Interest Rate 1d**  
(Percentage Point)





# III. Monetary Transmission Mechanism

- ER Shock: 1 percent depreciation of the exchange rate.

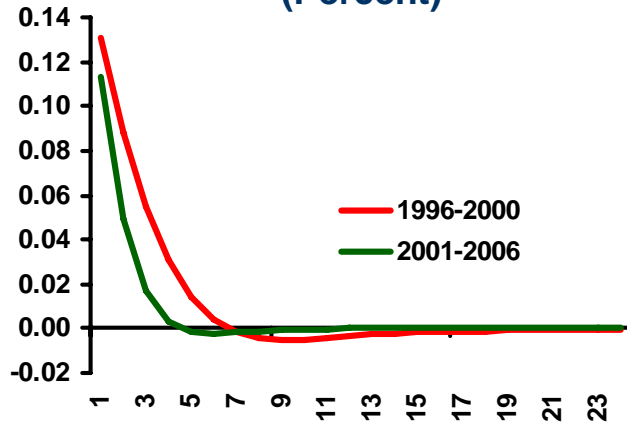




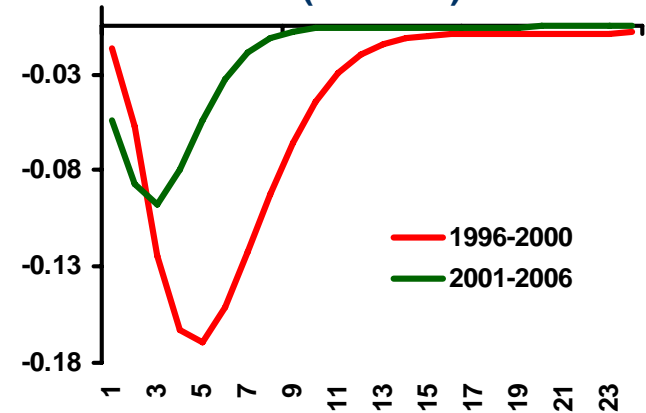
# III. Monetary Transmission Mechanism

- Cost-push Shock: 1 percent increase in annual inflation.

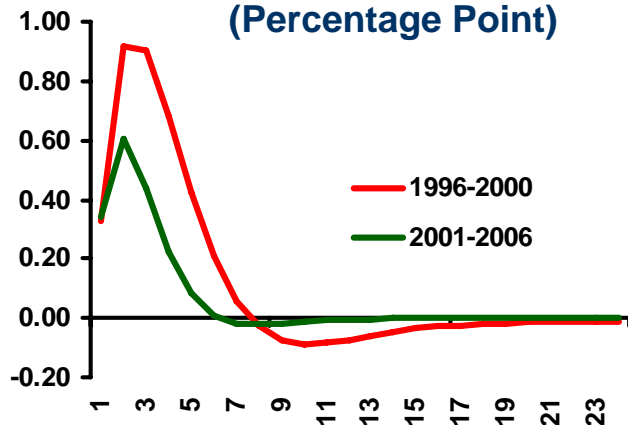
**Inflation 3a**  
(Percent)



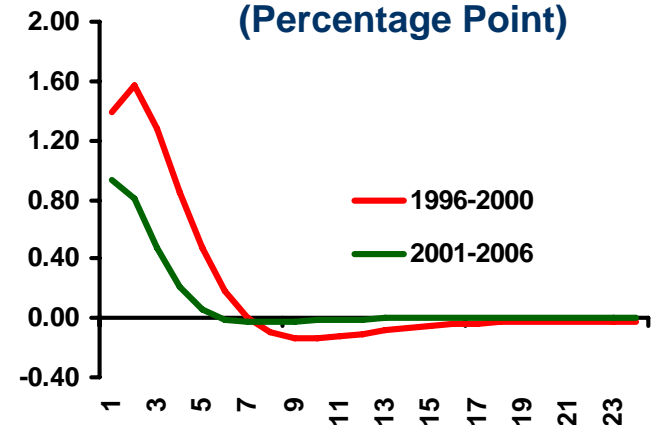
**Output Gap 3b**  
(Percent)



**Nominal Interest Rate 3c**  
(Percentage Point)



**Real Interest Rate 3d**  
(Percentage Point)





## III. Monetary Transmission Mechanism

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- The previous exercises show:
  - ✓ *Low inflation and the development of financial markets has eased credit constraints for households.*
  - ✓ *Additionally, households are able to better smooth their consumption through time.*
  - ✓ *The importance of the expectations channel of monetary policy has increased in recent years. This has allowed the economy to better adjust to shocks.*
  - ✓ *The reduction in the exchange rate pass-through makes the economy (e.g. inflation and output) less vulnerable to external shocks.*
  - ✓ *Monetary policy has become more effective in reducing inflation and such reduction can be attained with a lower output cost.*

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## IV. Monetary Policy and the Yield Curve

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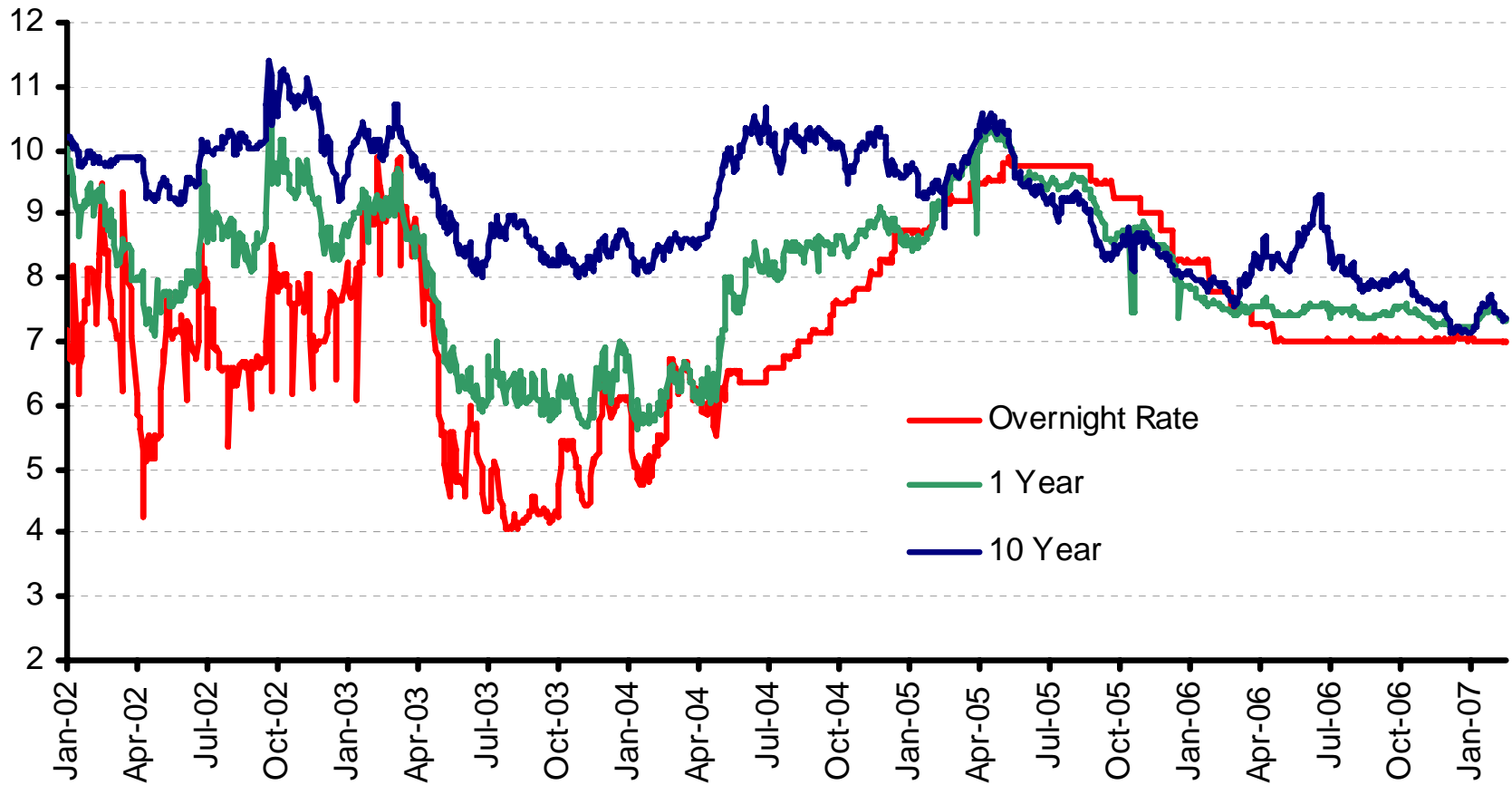
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- **As the macro environment has become stable, financial markets have deepened. Simultaneously, monetary policy has become more effective. These changes are reflected in a marked improvement in the behavior of the yield curve.**
- **Analysis of the yield curve uses zero-coupon bonds and “principal-component” methodology.**
- **A stylized fact found in the literature is that the first principal component can be associated with the level of the yield curve, while the second with its slope (Litterman and Scheinkman, 1991).**



# IV. Monetary Policy and the Yield Curve

## Nominal Interest Rates (Percent)

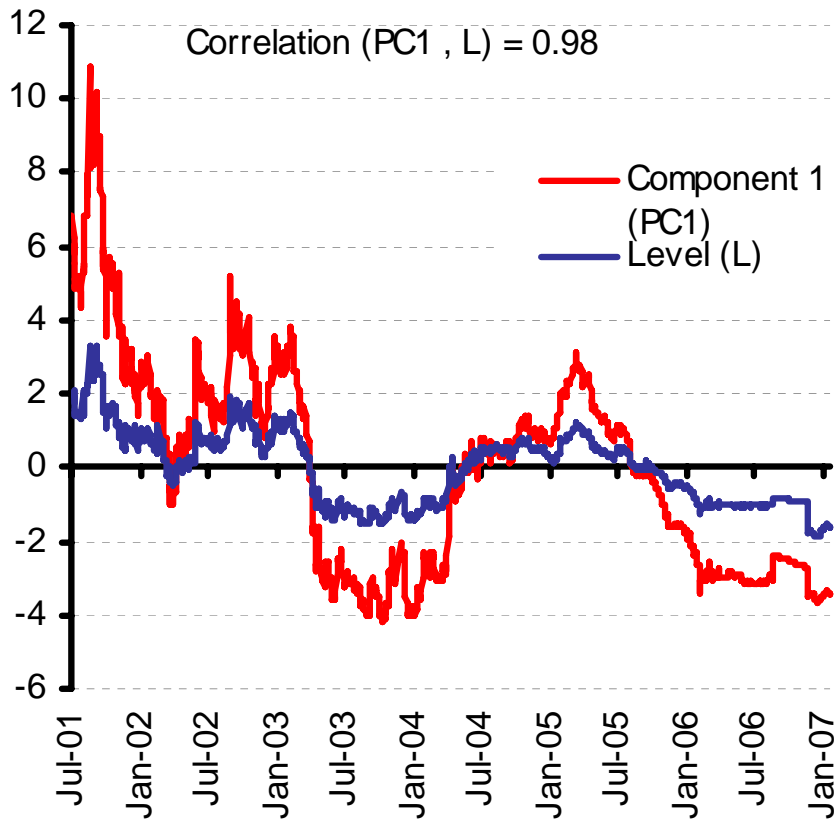


Source: Banco de México.

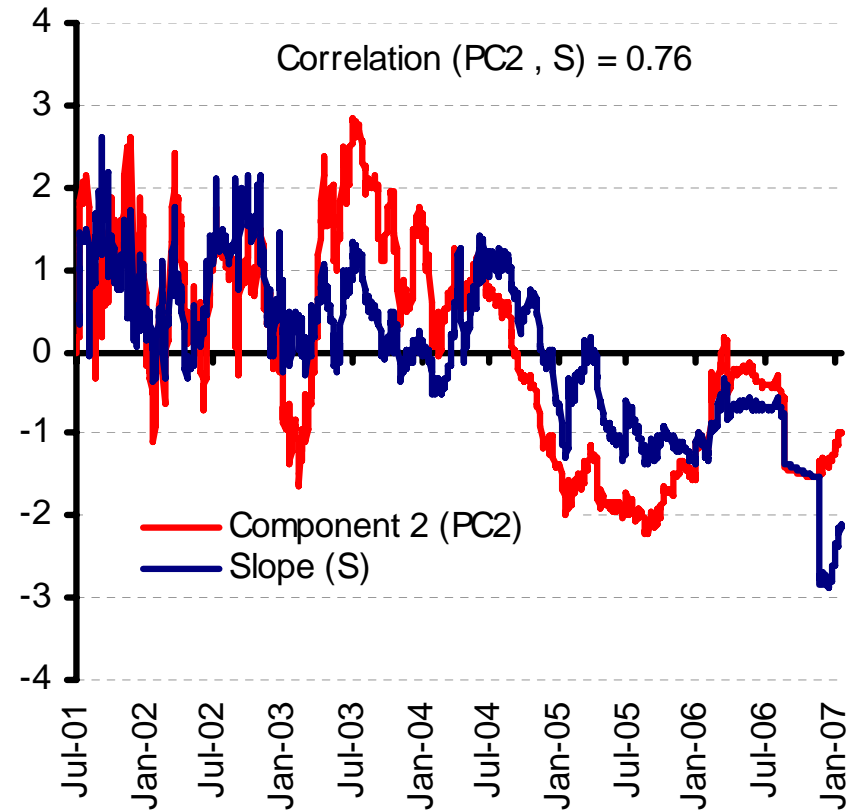


# IV. Monetary Policy and the Yield Curve

### Level and First Principal Component\*



### 10 Year-1 Day Slope and Second Principal Component\*

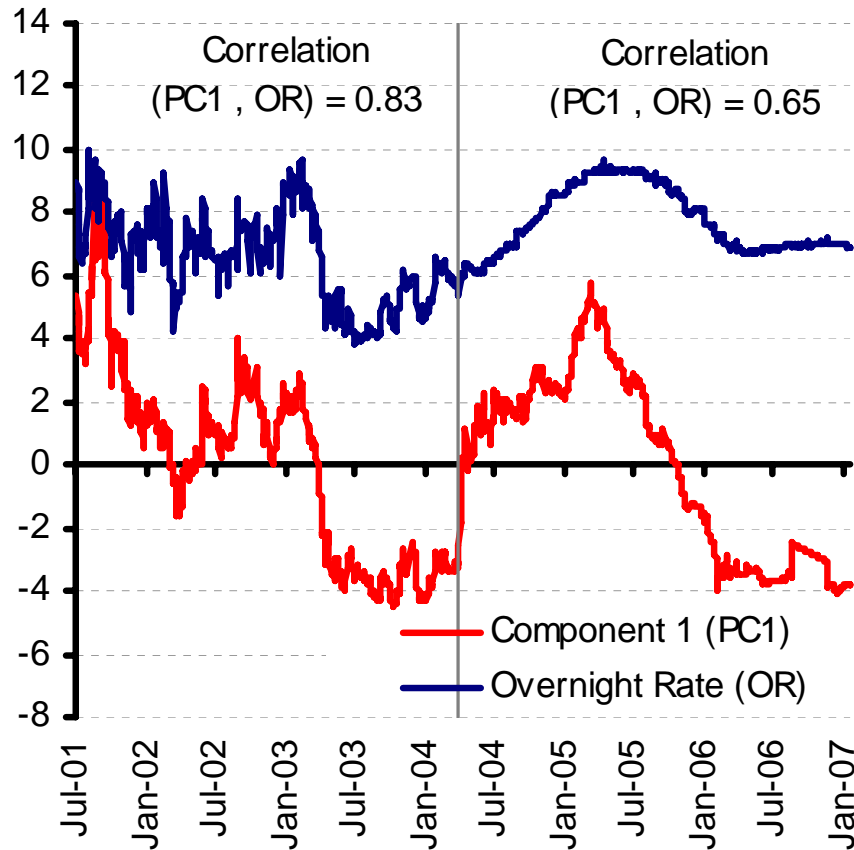


\* The level is computed as the average of 1-day, 1-year and 10-year yields. The level and first component are standardized.

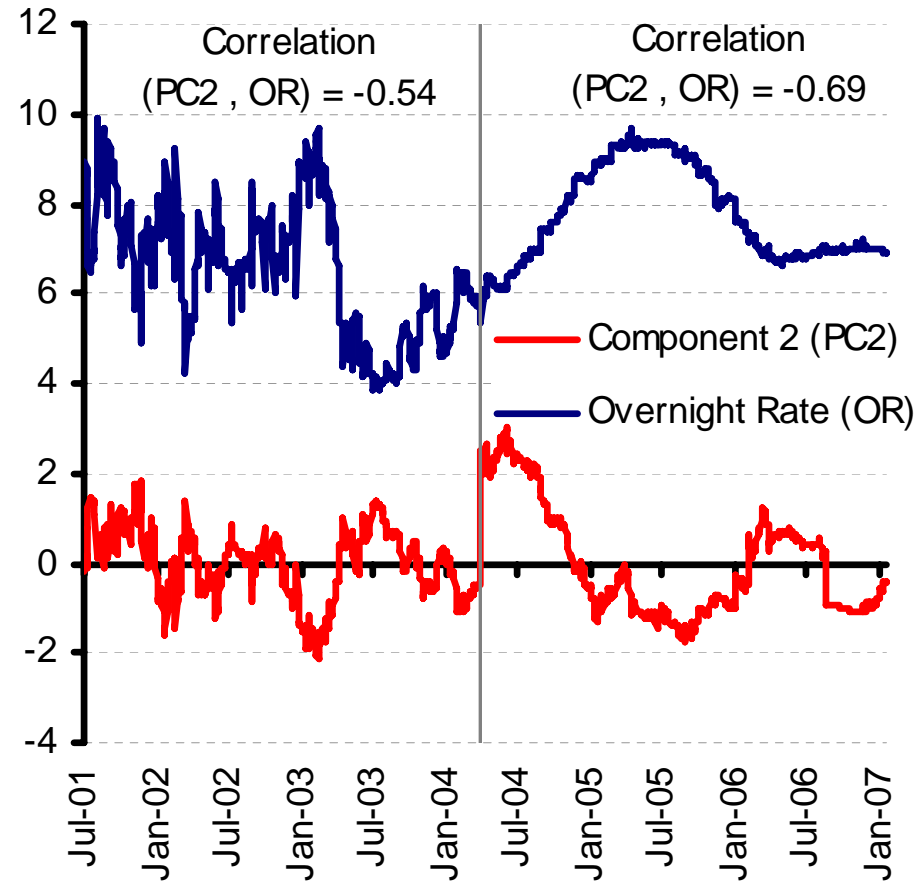


# IV. Monetary Policy and the Yield Curve

## Overnight Interest Rate and First Principal Component\*



## Overnight Interest Rate and Second Principal Component\*

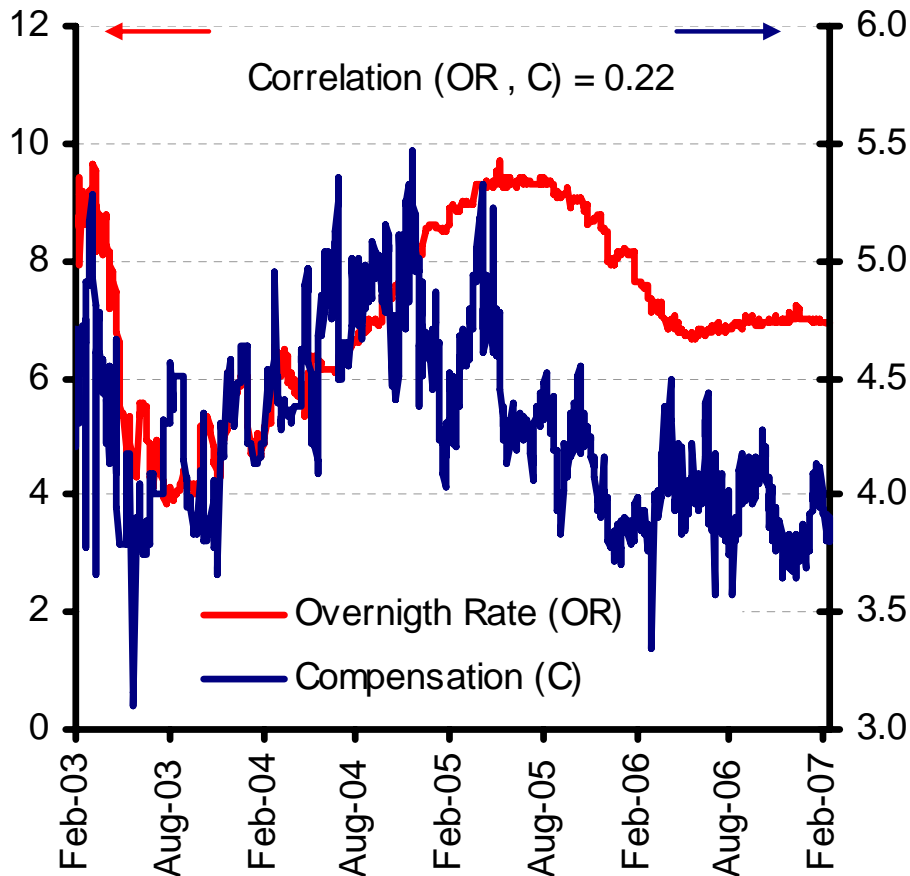


\* The principal component is standardized. Interest rate in percent.

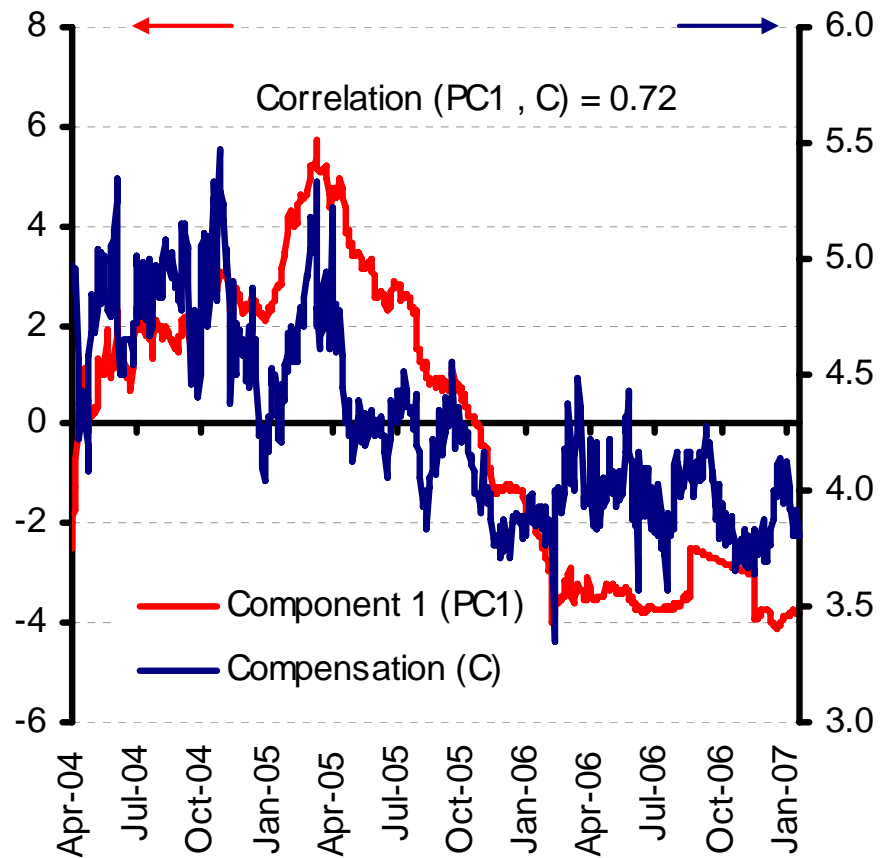


# IV. Monetary Policy and the Yield Curve

### Compensation for Inflation and Inflation Risk Implicit in 10 year Bonds and Overnight Rate\*



### Compensation for Inflation and Inflation Risk Implicit in 10 year Bonds and First Principal Component\*

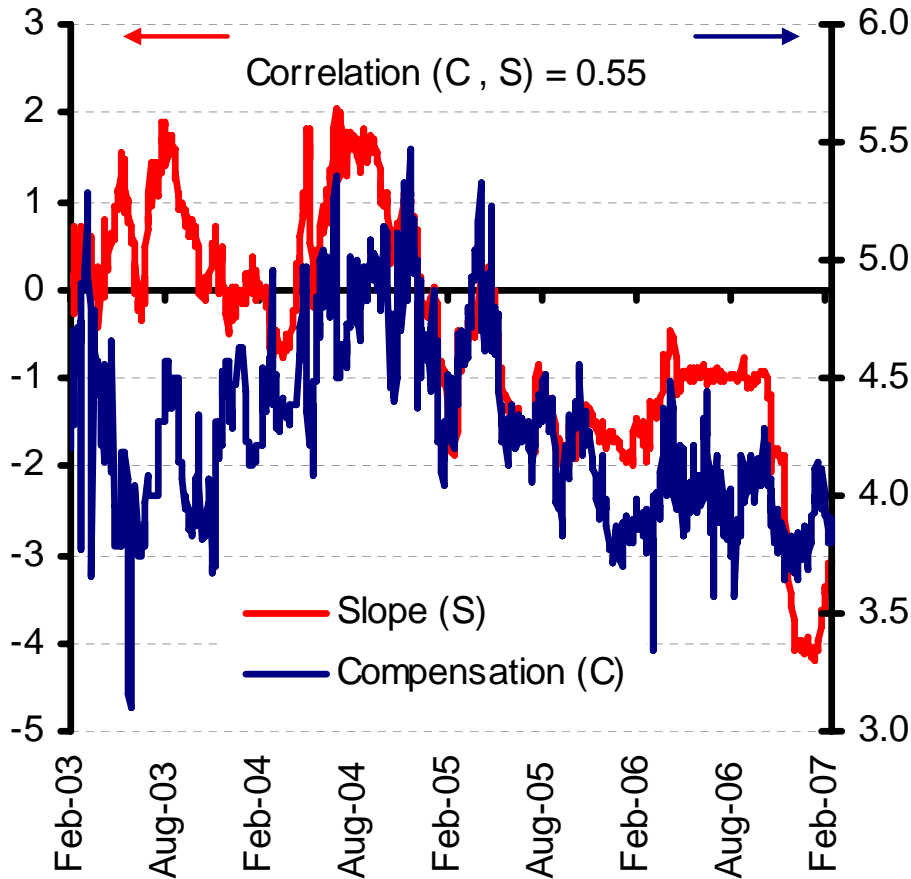


\* Computed using nominal and inflation-indexed bonds. The principal component is standardized. Compensation in percent.

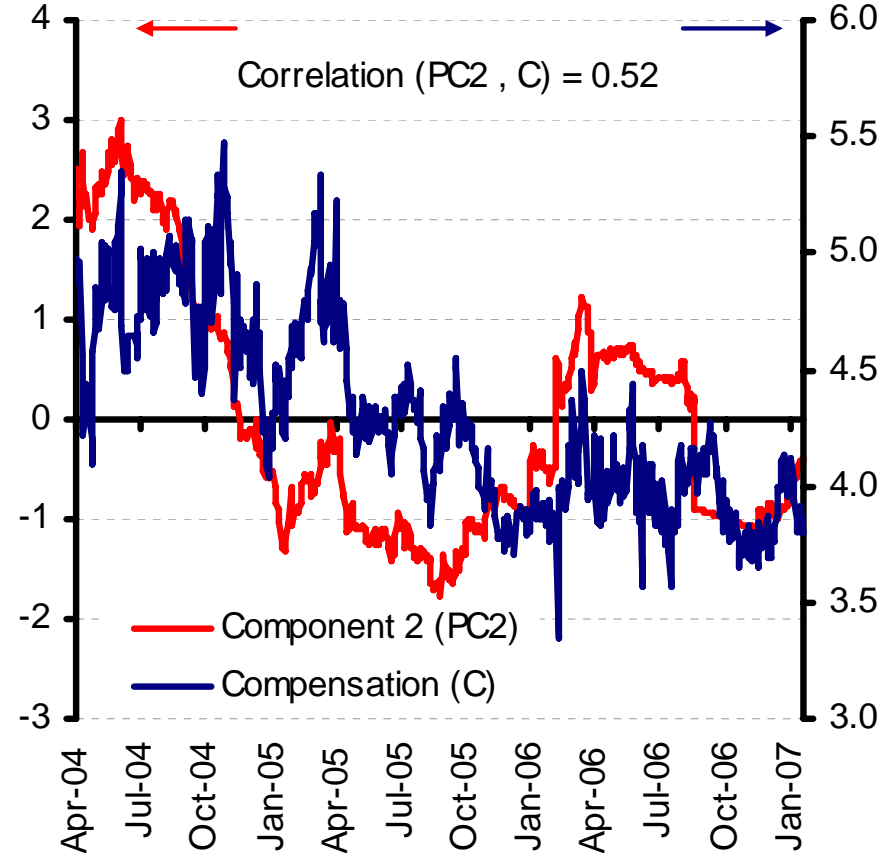


# IV. Monetary Policy and the Yield Curve

### Compensation for Inflation and Inflation Risk Implicit in 10 year Bonds and 10 Year-1 Day Slope\*



### Compensation for Inflation and Inflation Risk Implicit in 10 year Bonds and Second Principal Component\*



\* Computed using nominal and inflation-indexed bonds. The principal component is standardized. Compensation in percent.

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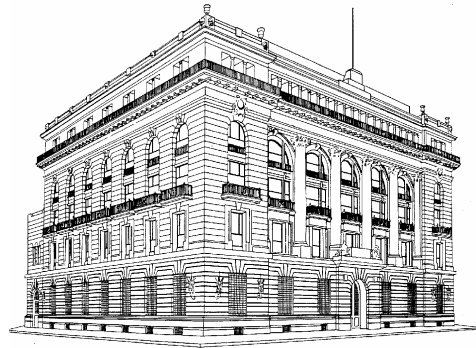
# V. Final Remarks

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- **Further issues:**
  - ✓ ***Risk Management***
  - ✓ ***Domestic distortions***
  - ✓ ***Communication strategy***
  - ✓ ***Changes in the external environment***

# APPENDIX

## Small Scale Hybrid Macroeconomic Model



BANCO DE MEXICO



# Small Scale Hybrid Macroeconomic Model

Phillips curve  $\pi_t = a_1 \pi_{t-1} + a_2 E_t[\pi_{t+1}] + a_3 x_t + a_4 (\Delta e_t + \pi_t^{US})$

IS curve  $x_t = b_0 + b_1 x_{t-1} + b_2 E_t[x_{t+1}] + b_3 r_{t-1} + b_4 x_{t-1}^{US} + b_5 q_t$

RER  $q_t = c_1 q_{t-1} + c_2 (E_t[q_{t+1}] + (r_t^{US} - r_t))$

Monetary policy rule  $i_t = (1 - d_4)[(d_0 + d_1 \pi_t^*) + d_2 (\pi_t - \pi_t^*) + d_3 (x_t)] + d_4 i_{t-1}$