

# EXCHANGE RATE DYNAMICS IN EMERGING MARKET ECONOMIES

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## THE CASES OF BRAZIL AND MEXICO BETWEEN 2000 AND 2017

# STRUCTURE

- ▶ This paper tries to explain some differences in the exchange rate dynamics of the Brazilian real and the Mexican peso using the PK framework of exchange rate determination and some institutional characteristics of each country.

**THE POST-KEYNESIAN VIEW ON EXCHANGE RATE DYNAMICS IN EMERGING MARKET ECONOMIES**

**INSTITUTIONAL FEATURES OF EACH COUNTRY THAT CAN CONTRIBUTE TO A SPECIFIC DYNAMIC**

**CORRELATION OF FX AND ITS DETERMINANTS**

## THE KEYNESIAN EQUATION OF PORTFOLIO CHOICE TO THE FOREIGN EXCHANGE MARKET

- ▶ The exchange rate is considered a financial asset class subject to investment decision (asset allocation and liabilities formation) of investors in a hierarchical and asymmetric IMFS.
- ▶ Taking these asymmetries into account, Keynes's model of asset choice has been used by several post-Keynesian authors to study the exchange rate dynamics of emerging countries.

$$s_t = s_{t+1}^e + (q^* - q) + \beta(l^* - l) - (c^* - c)$$

$s_{t-1}^e$  → Expected exchange rate (currency studied/ world's key-currency)

$q$  → Country's short term interest rate       $q^*$  → Key-currency short term interest rate

$l$  → Currency's liquidity premium       $l^*$  → Key - currency liquidity premium

$\beta$  → Agents liquidity preference       $(c^* - c)$  → Country's degree of financial openness

- ▶ There are also other institutional factors that can contribute to the exchange rate dynamics

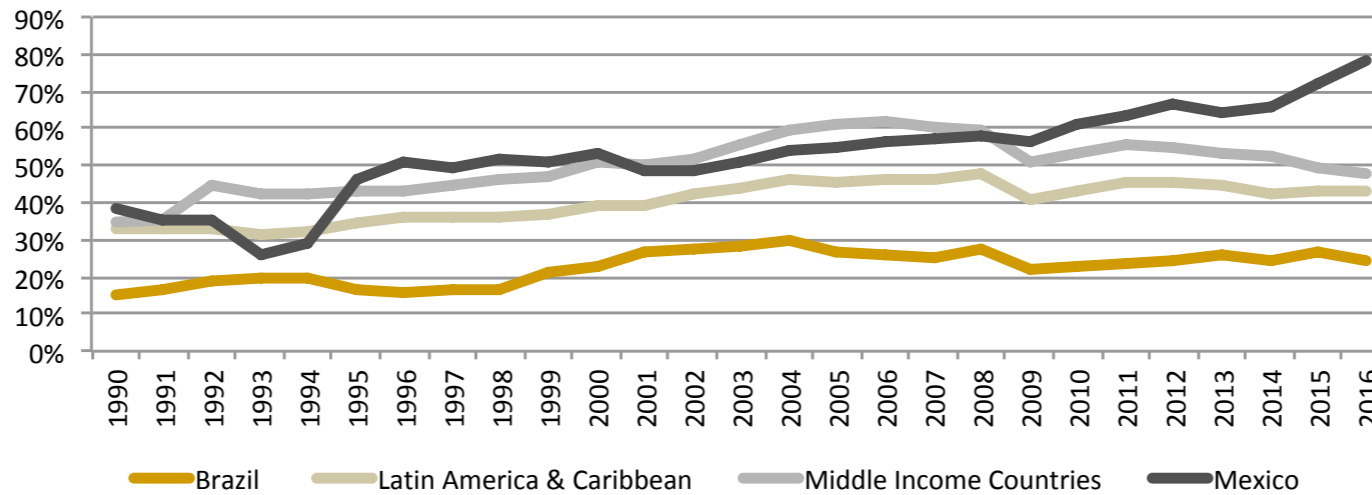
# FINANCIAL OPENNESS

- ▶ Similar degree of financial openness, but some difference in the type.
- ▶ Brazil opened its financial account through circulars of the BCB and resolutions of the CNM, without changes in legislation:
  - ▶ Right to impose controls over any balance of payment account, while in Mexico this requires changes in legislation.
- ▶ Main difference of the degree of financial openness are related to outward and FX transactions:

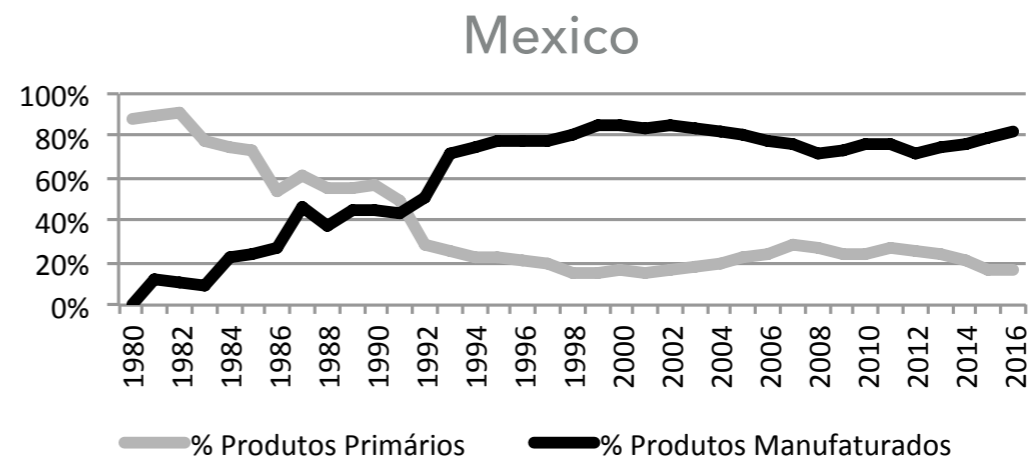
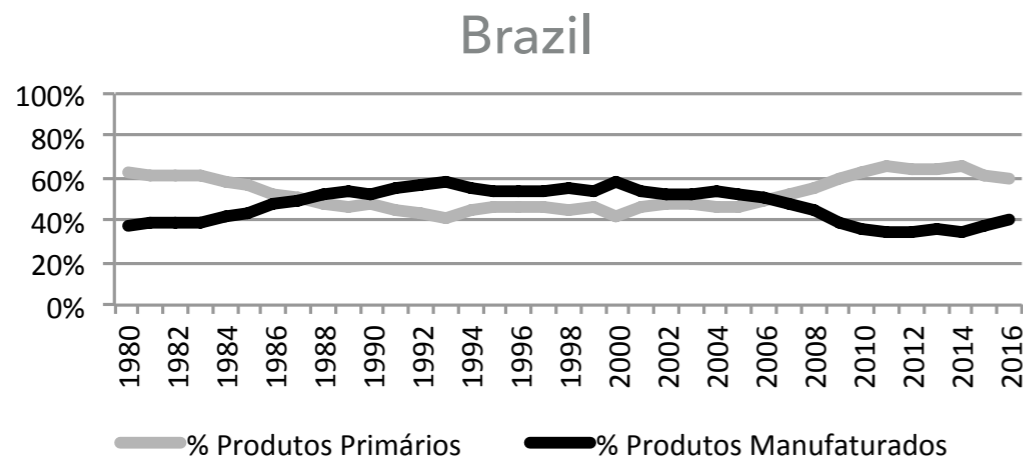
	BRAZIL X MEXICO
INWARD TRANSACTIONS (INFLOWS)	SIMILAR IN BOTH COUNTRIES
OUTWARD TRANSACTIONS (OUTFLOWS)	NON RESIDENTS ARE NOT ALLOWED TO BORROW IN THE DOMESTIC MARKET (BR)
DOMESTIC TRANSACTIONS IN FOREIGN CURRENCY	MORE RESTRICTIONS ON BANK DEPOSITS AND LENDING IN FOREIGN CURRENCY (BR)

# TRADE LIBERALIZATION AND EXPORTS

▶ Trade indicator (%GDP)



▶ Exports of primary and manufactured products (%Total exports)



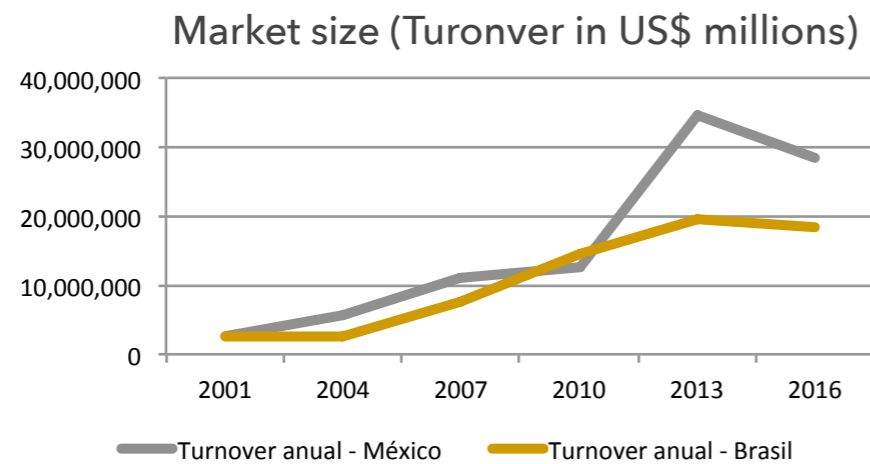
➔ Commodities exporter

➔ Maquilas

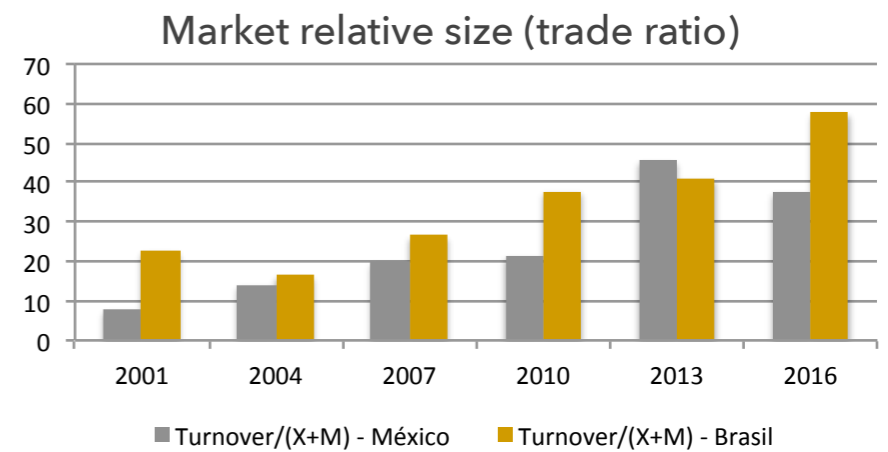
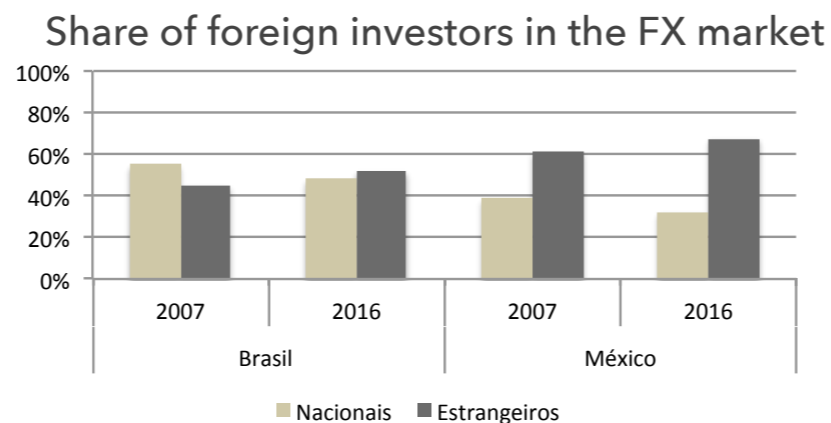
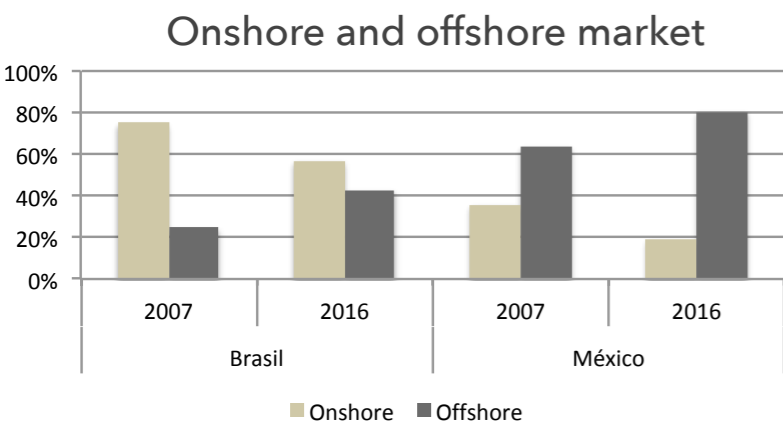
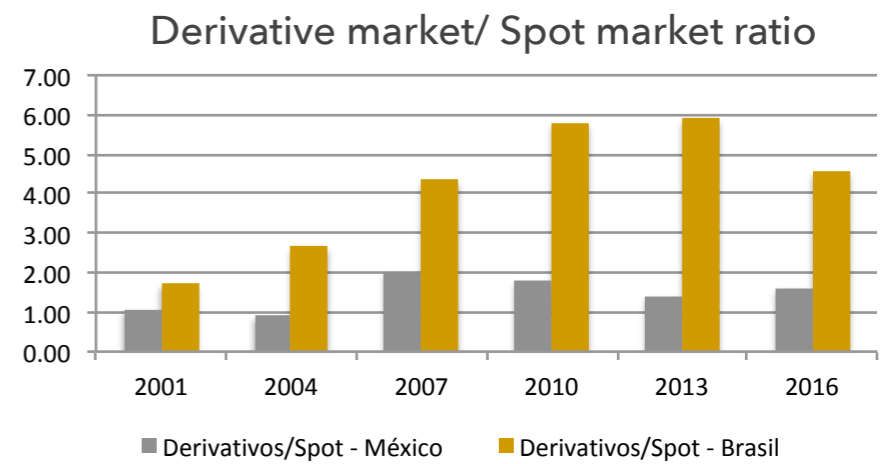
# THE FOREIGN EXCHANGE RATE MARKET

- ▶ **Brasil:** regulatory asymmetry between the spot and derivative market
- ▶ **México:** lower restrictions. The main feature is the central bank's control over PEMEX FX transactions

## CURRENCY INTERNATIONALIZATION

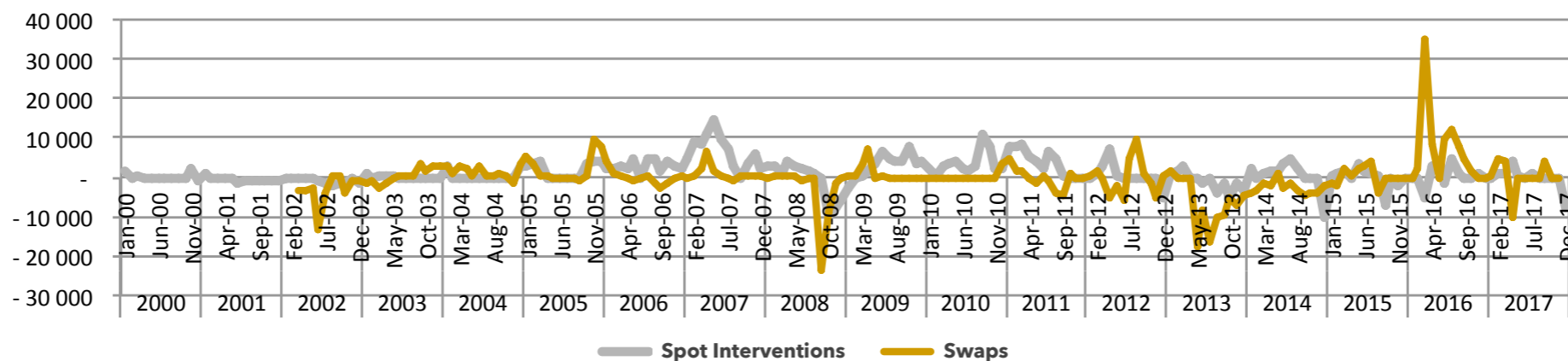


## CURRENCY FINANCIALIZATION

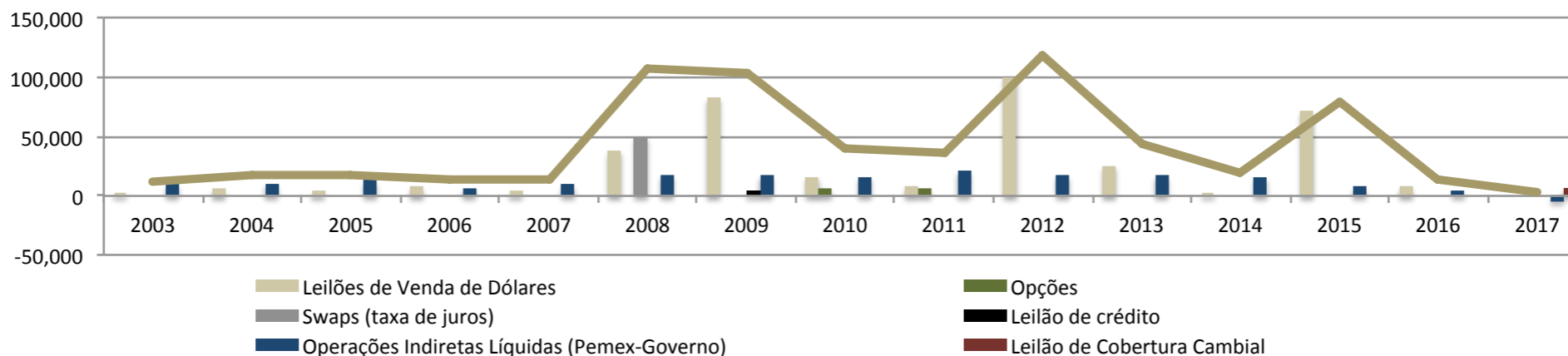


# THE "DIRTY" FLOATING EXCHANGE RATE REGIME

- ▶ Same institutional framework: dirty floating with inflation targeting regime.
- ▶ Objective of the regime: Some authors have raised the hypothesis of an implicit subordination to the monetary policy.
- ▶ Given the characteristics of FX market BCB intervenes mostly in the derivative market (in moments of stress)

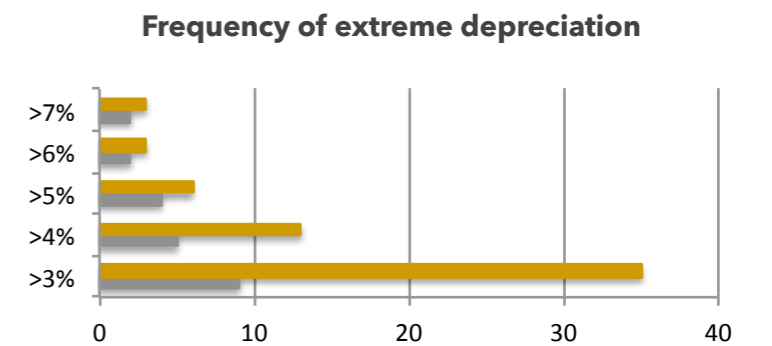
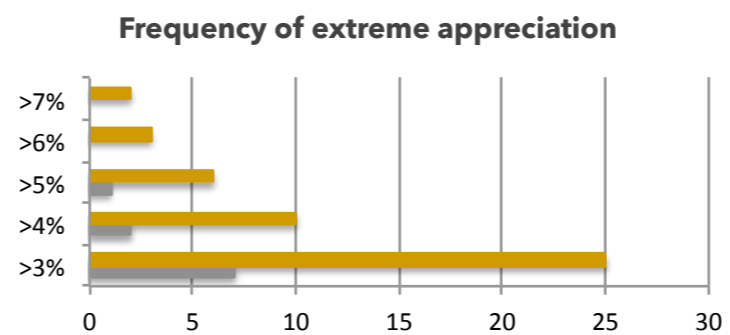
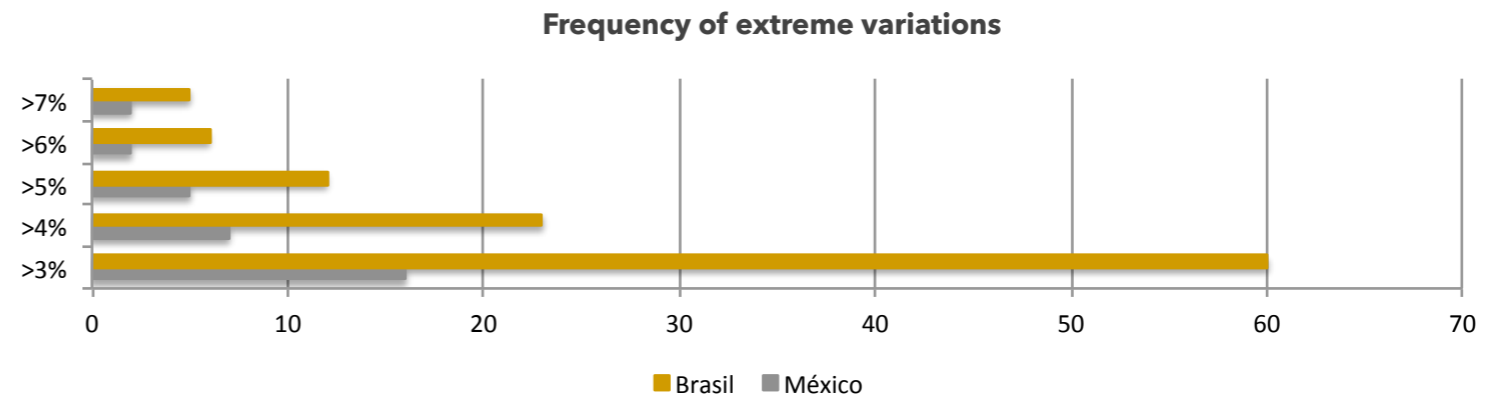


- ▶ BCM intervires "indirectly" with PEMEX regulation. Taking it into consideration, BCM interventions are higher



# PATH AND VOLATILITY

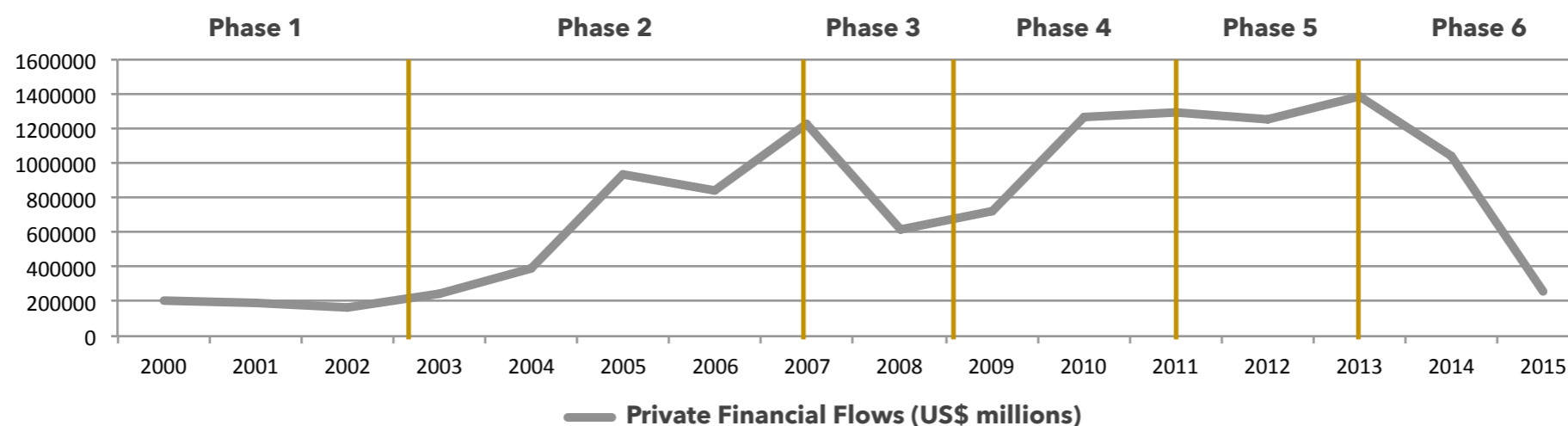
- ▶ After 2009 both currencies follow a depreciation trend.
- ▶ Brazilian real is more volatile independent of the method used
- ▶ While both currencies showed daily depreciations higher than 6%, only brasil suffered appreciation of this magnitude





# FINANCIAL CYCLE AND CORRELATIONS

- ▶ To study the correlation between the determinants and the exchange rate, it was opted to divide it in sub periods, according to six phases of the financial cycle.

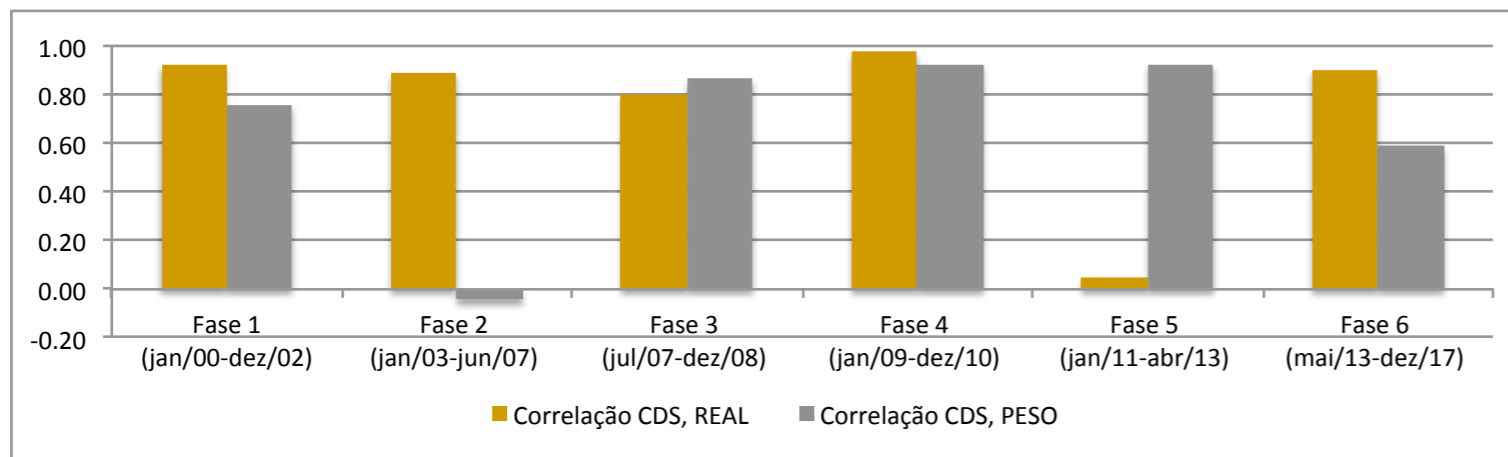


<b>PHASE 1</b>	<b>LOW</b>	<b>PHASE 4</b>	<b>HIGH</b>
<b>PHASE 2</b>	<b>HIGH + COMMODITIES PRICES</b>	<b>PHASE 5</b>	<b>EURO CRISIS (TURBULENT PERIOD BUT HIGH)</b>
<b>PHASE 3</b>	<b>BUST - FINANCIAL CRISIS</b>	<b>PHASE 6</b>	<b>LOW - TAPERING TALK</b>

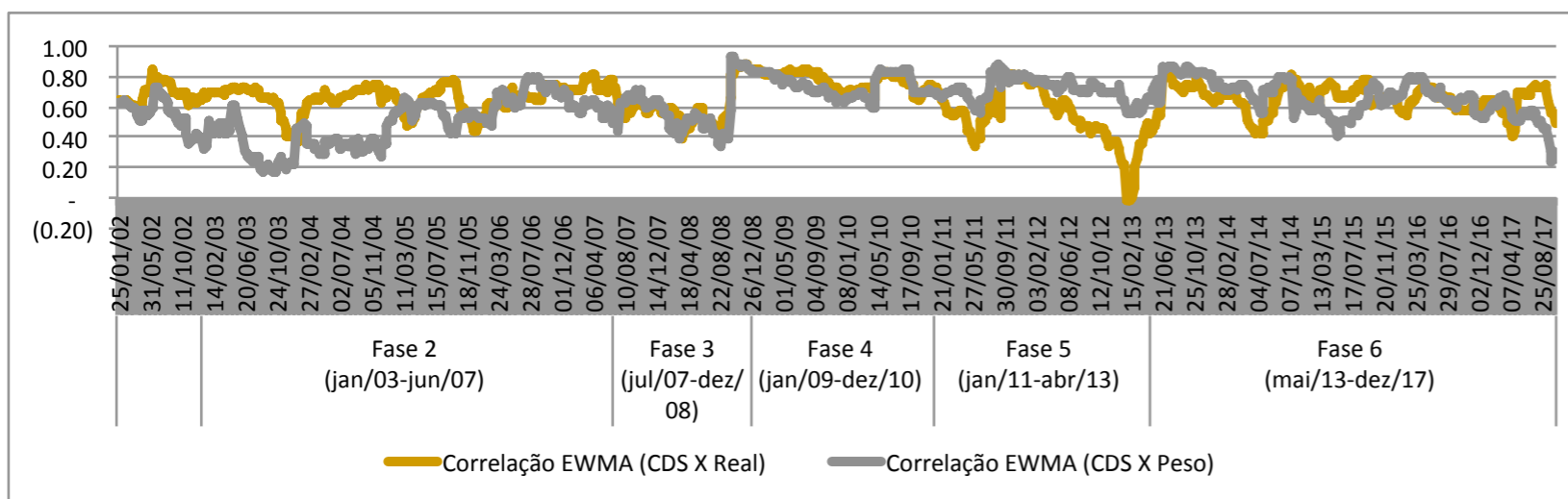
- ▶ Additionally, to gain some insight on the correlation dynamic in the short period, without having the predetermine the time window the EWMA method was used.

# LIQUIDITY PREFERENCE

- ▶ International liquidity preference as a function of risk aversion of international investors.
- ▶ Moments of decline (rise) in sovereign risk are usually accompanied by movements of appreciation (depreciation) in exchange rates.
- ▶ There is no much difference on the volatility of the CDS of each country



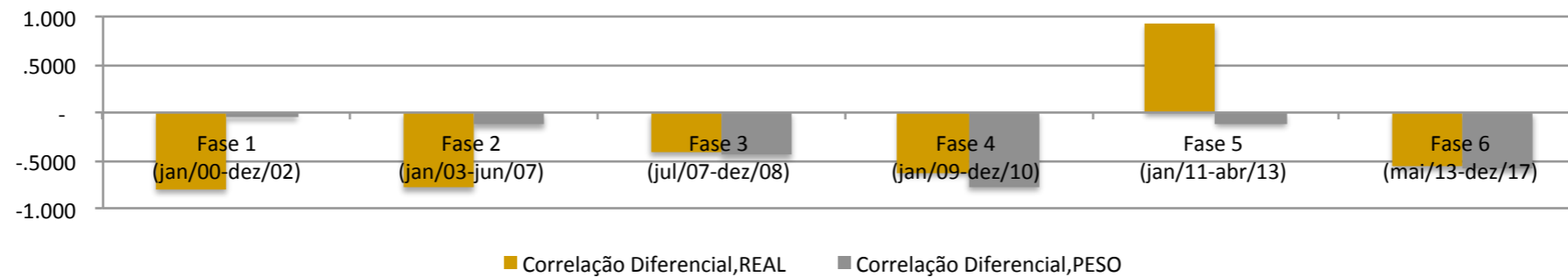
- ▶ Phase 2: Low MXN x CDS
  - ▶ commodity prices
  - ▶ low risk aversion
  - ▶ lower MXN relative return



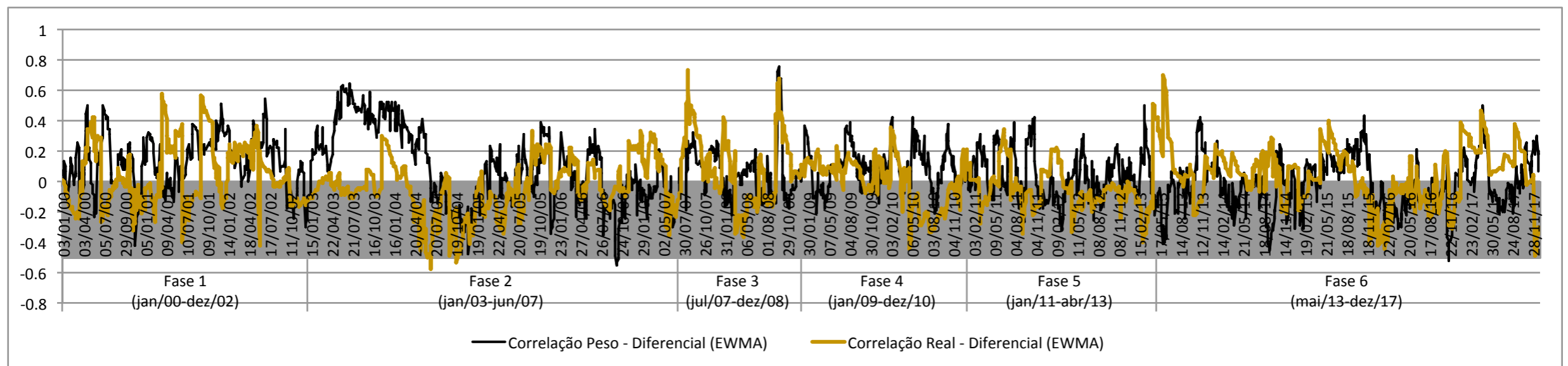
- ▶ Phase 5: Low BRL x CDS
  - ▶ capital account management
  - ▶ Regulations on the derivative market

# INTEREST RATE DIFFERENTIAL

- ▶ Major difference is in the level on the interest rate of each country (average 5% x 12%)
- ▶ Interest rate differential is more volatile in Mexico
- ▶ Correlations with person suggest that interest rate have a higher co-movement with FX in Brazil (higher interest rate -> currency appreciation)

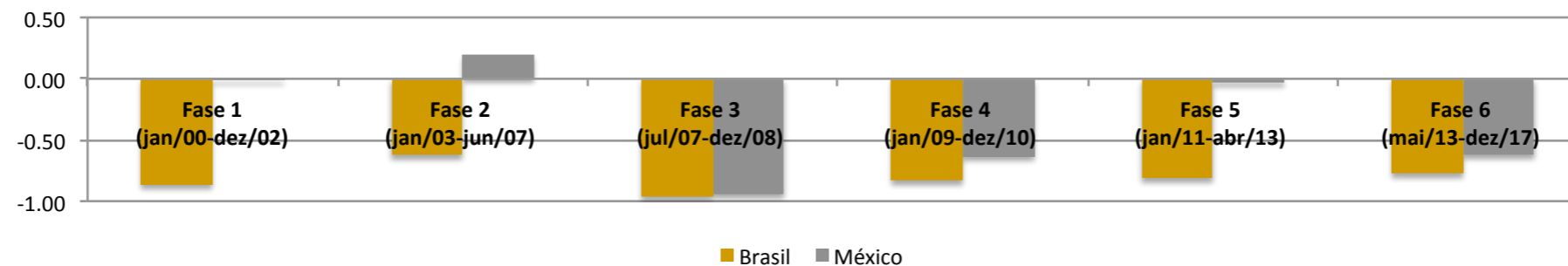


- ▶ Result is not confirmed using EWMA correlation that points to more unstable and different dynamic

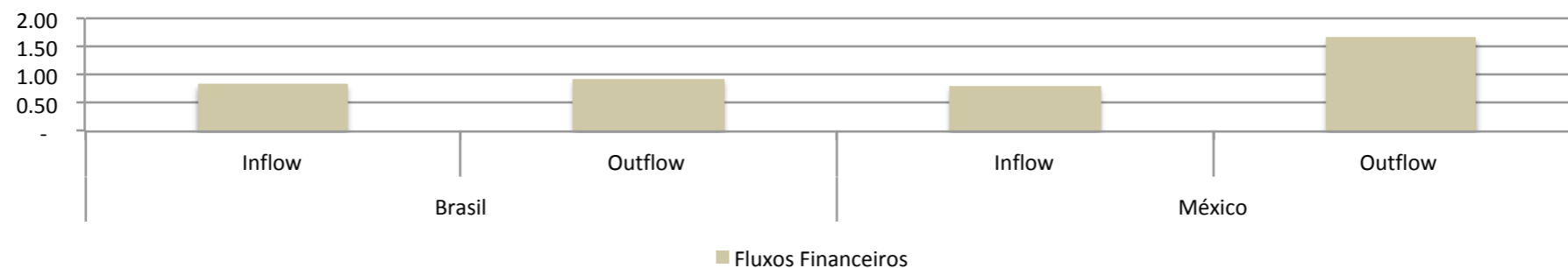


## FINANCIAL FLOWS

- ▶ Non-residents flows to the national economy
- ▶ Negative correlation -> positive inflows from non-residents are associated with exchange appreciation movements



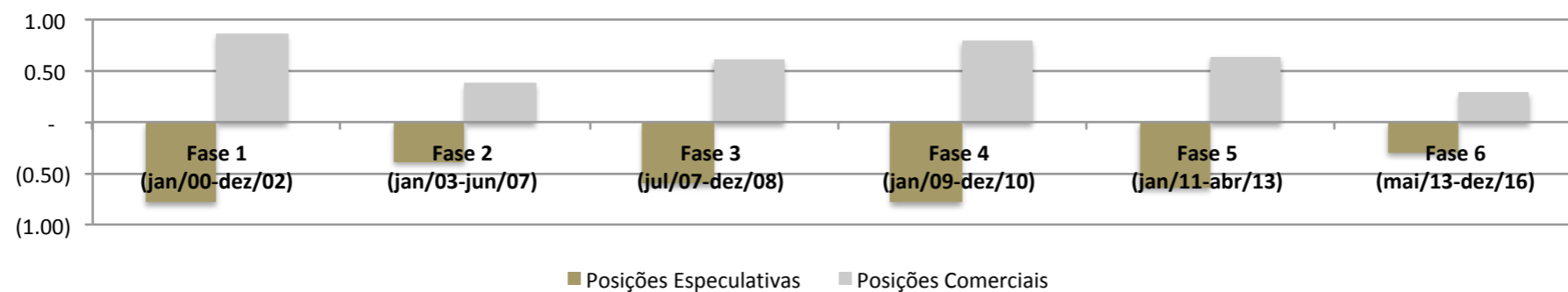
- ▶ Volatility of inflows and outflows



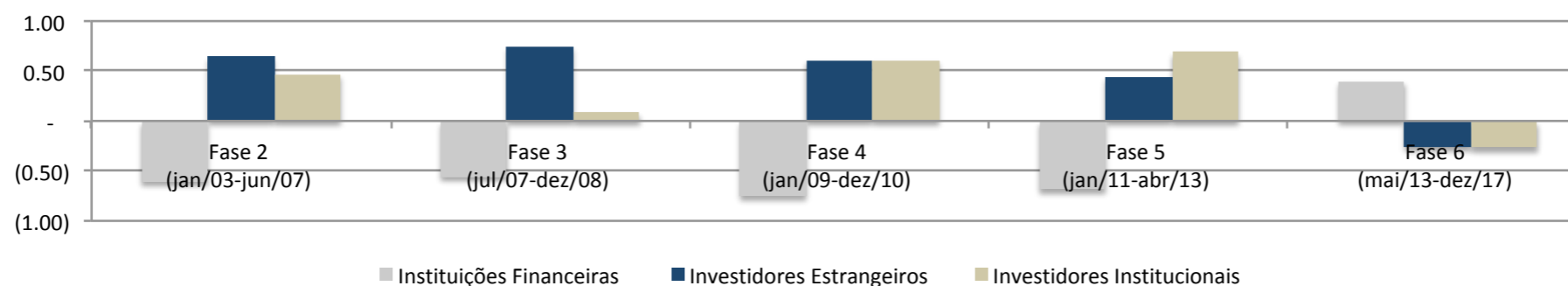
- ▶ Given it's high return, the external turmoil necessary to provoke capital outflows in Brazil might be higher than in Mexico (where profitability is lower). On the other hand, given the lower regulation in the Mexican market, capital outflows are also facilitated.
- ▶ Thus, if Mexico appears to be more vulnerable to capital outflows, these are apparently more intense in Brazil, leading to sharper depreciation

## DERIVATIVES

- ▶ Mexico: Offshore negotiation of peso future. Positive values indicate net long positions of pesos (bets on appreciation of the Mexican currency).
- ▶ Throughout the analyzed period, exchange rate variations had a negative correlation with speculative positions, so these agents tend to be "on the right side" of bets in this market. Impact or trend followers.



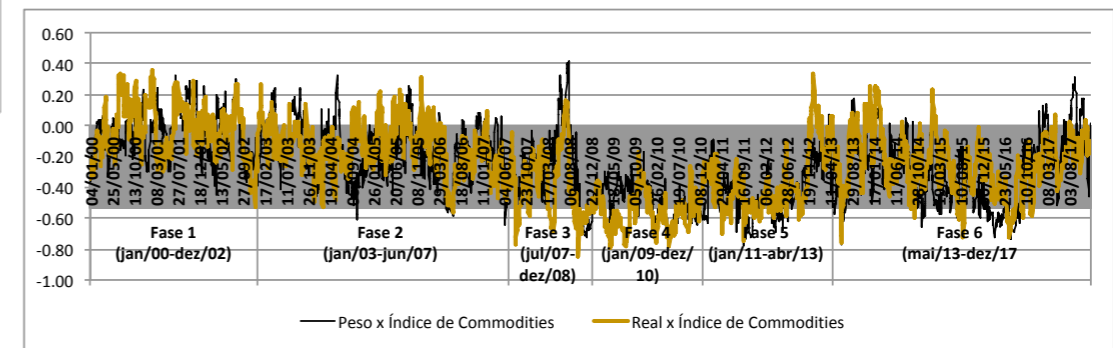
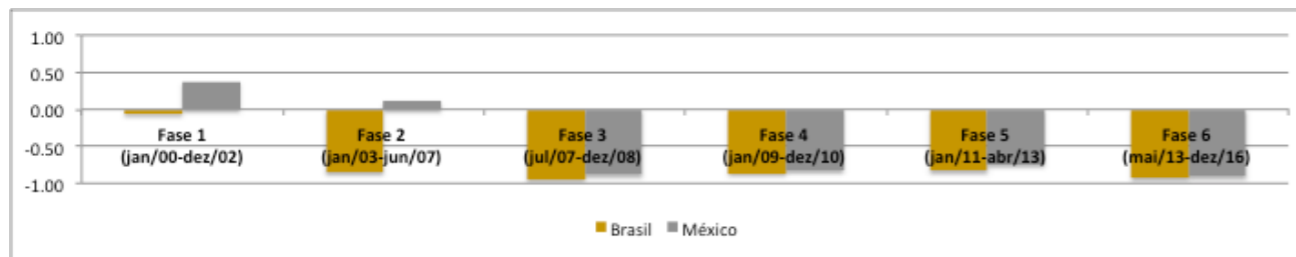
- ▶ Brazil: Onshore market of future dollar. Positive values indicate net short positions of reais (dollar purchases or bet on depreciation of the Brazilian currency)



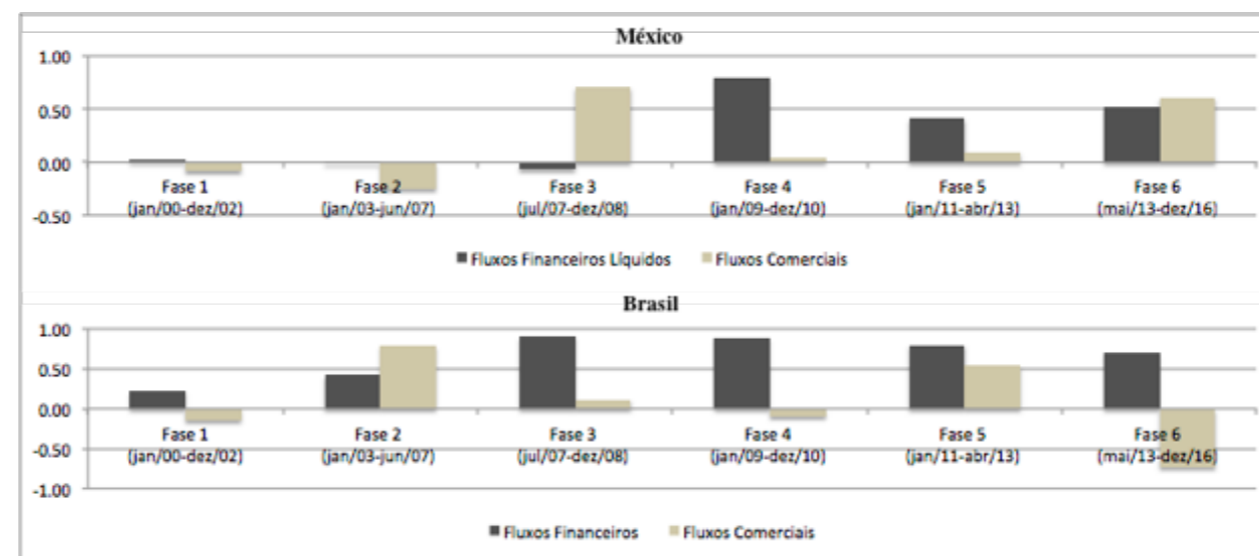
- ▶ Exchange appreciation periods are associated with positions sold in dollars by foreign and institutional investors, while banks perform the counterpart of these operations.

# COMMODITIES PRICES

- ▶ The correlation was high and negative (higher commodity prices -> exchange rate appreciation). In Brazil, the negative correlation coefficient became higher from phase 2.



- ▶ The higher correlation of the financial flows with the exchange rate might indicated, that the transmission of commodity prices is a indirect one.



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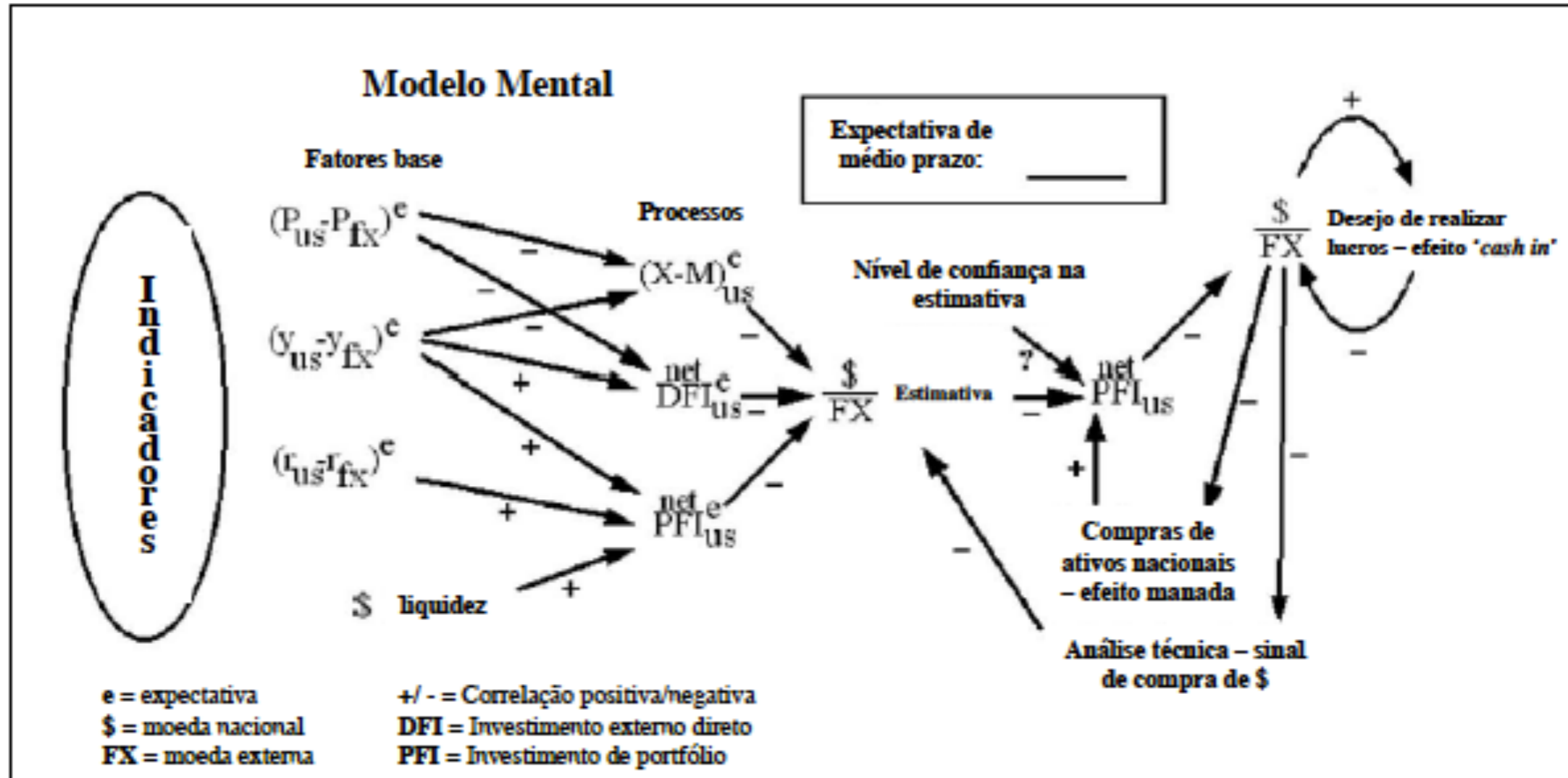
## CONCLUSION AND LIMITATIONS

- ▶ Results show that there are differences regarding their volatility and the impact of some PK theoretical determinants in the different phases of the international liquidity cycle.
- ▶ Lower controls in MXN:
  - ▶ Led to a higher internationalization and along with its low interest rate level might explain why this currency has been used as a proxy for hedge operation with other EME currencies
  - ▶ This also explains the volatility of financial outflows in MX economy and its higher vulnerability to position of investor in offshore markets
- ▶ High interest rate differential the relevance of the derivative market in BR:
  - ▶ Derivative carry trade operation might explain the higher appreciations and volatility
- ▶ Method might be further improve
- ▶ Closer look at some determinants such as the interest rate and especially the exchange rate expectations.





**Figura 2: Modelo mental completo – Dinâmica da taxa de câmbio**



Fonte: Harvey (2009, p. 88)

## FATOR DE DECAIMENTO

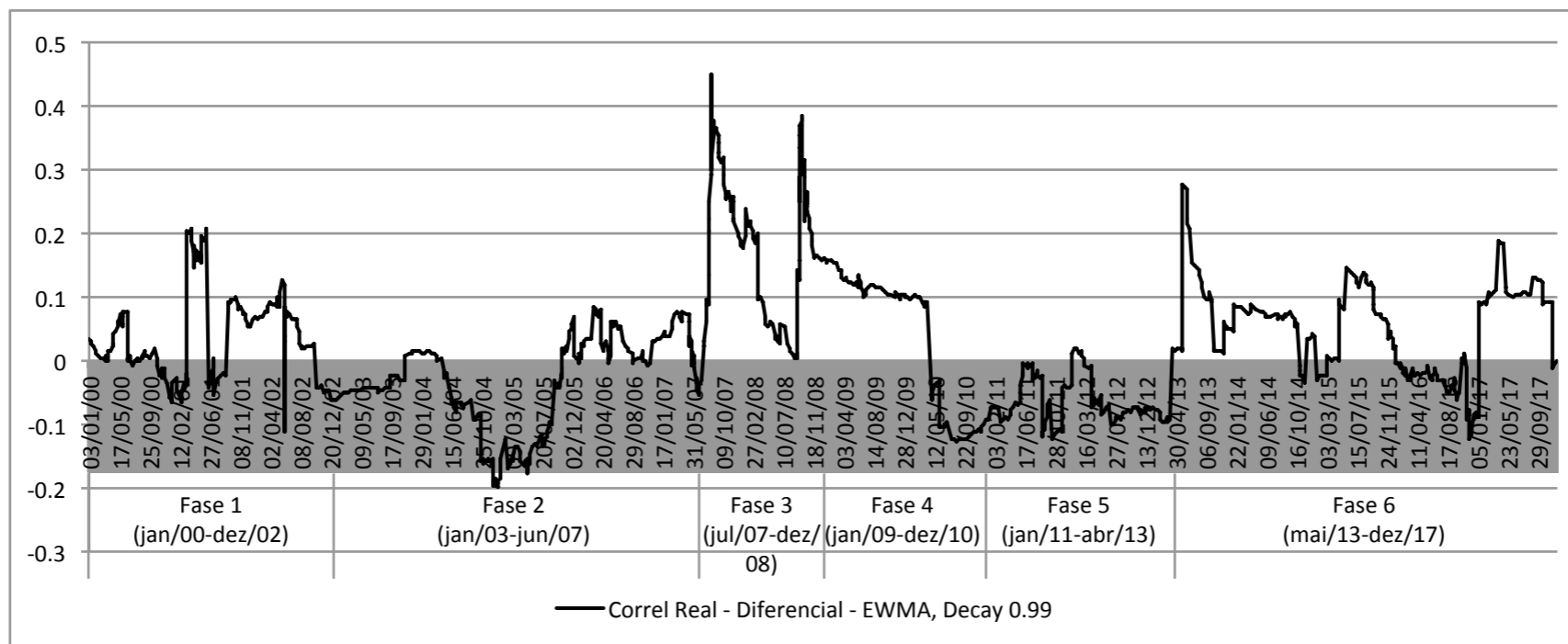
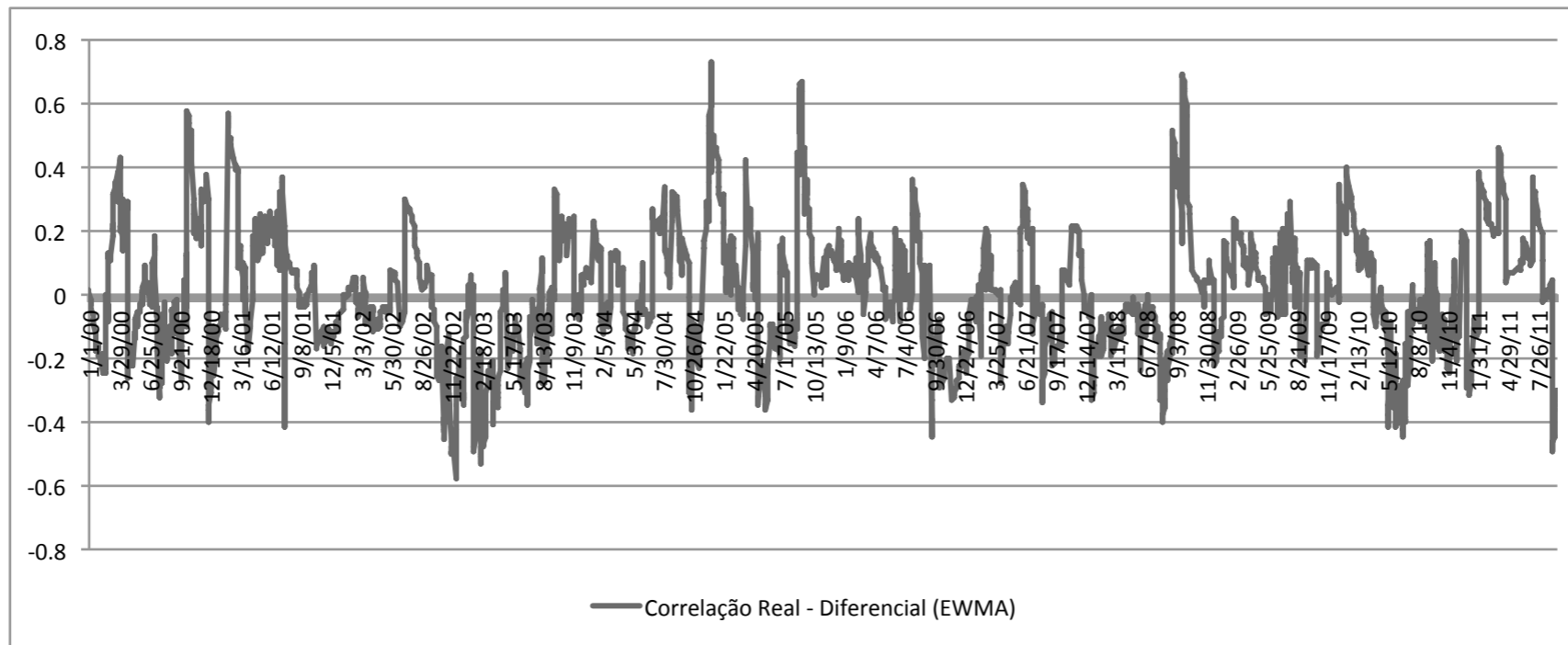
- ▶ Fórmula - Média móvel exponencial:

$$\rho_{ewma,t} = \frac{(1-\lambda) \sum_{t=1}^n \lambda^{t-1} (r_{x,t} - \bar{r}_x)(r_{y,t} - \bar{r}_y)}{\sqrt{(1-\lambda) \sum_{t=1}^n \lambda^{t-1} (r_{x,t} - \bar{r}_x)^2} \sqrt{(1-\lambda) \sum_{t=1}^n \lambda^{t-1} (r_{y,t} - \bar{r}_y)^2}}$$

$$\sigma_{12,t+1|t}^2 = \lambda \sigma_{12,t|t-1}^2 + (1-\lambda) r_{1t} \cdot r_{2t}$$

- ▶ Fator de decaimento:
  - ▶ 0.94 - Risk Metrics para dados diários
  - ▶ Quanto mais próximo de 1:
    - ▶ Menor a resposta a dados recentes
    - ▶ Mais suave é a série

# FATOR DE DECAIMENTO 0.94 X 0.99 - DIFERENCIAL - BRASIL



# FATOR DE DECAIMENTO 0.94 X 0.99 - DIFERENCIAL - MÉXICO

