



# Inflation Risk Premia: Why breakevens are not what you expect

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# Inflation risk premia

## Why breakevens are not what you expect

- Why the Fisher equation is wrong, both in theory and practice
- Beta is not just for equities
- Beta and breakevens: critical linkages and spread dynamics
- Dynamics of premia, drivers and cyclicalities
- Deriving 'market expectations' from breakevens - a dangerous game

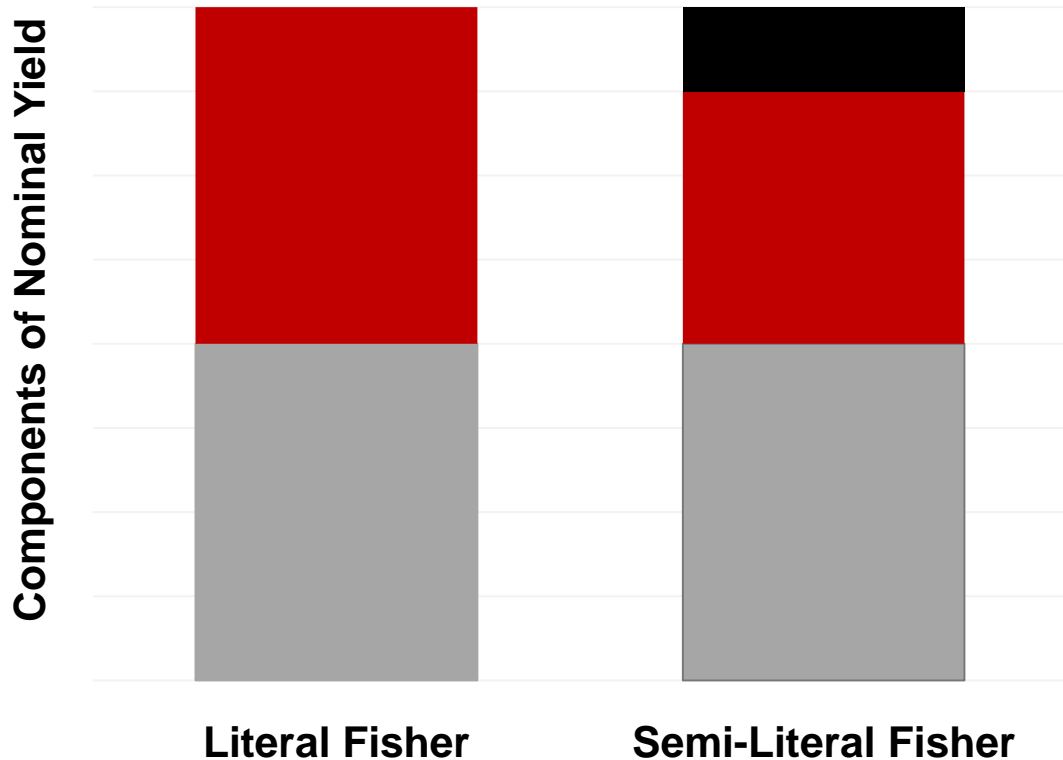
# Typical views of breakevens

▶ Irving Fisher's equation still dominates, consciously or not

- Literal Fisher
  - Real Yield
  - Expected Inflation

- Semi-Literal Fisher
  - Real Yield
  - Expected Inflation
  - Risk Premium
    - Small
    - Positive
    - "Stable"

■ Real Yield ■ Expected Inflation ■ Risk Premium



Source: Nomura (May 2010)

## Is there a problem? Yes

► Irving Fisher's equation is rejected by both data and theory

### ■ Data

- Risk premia exist
- High absolute level
- High volatility

### ■ Theory

- Stanley Fischer (1975)
  - Premia/Discount depends on correlation with real equity returns
  - Beta
- Robert Lucas (1990)
  - Breakevens much more volatile than inflation
  - Nothing to do with Irving Fisher's fundamentals

## Does the problem matter? Yes

### ▶ The problems with believing in Fisher's equation

#### ■ Central bank policy

- Breakevens do **not** necessarily reflect actual expectations of inflation
- Widening breakevens do **not** necessarily mean loss of credibility
- Unwarranted tightening may result

#### ■ Issuers

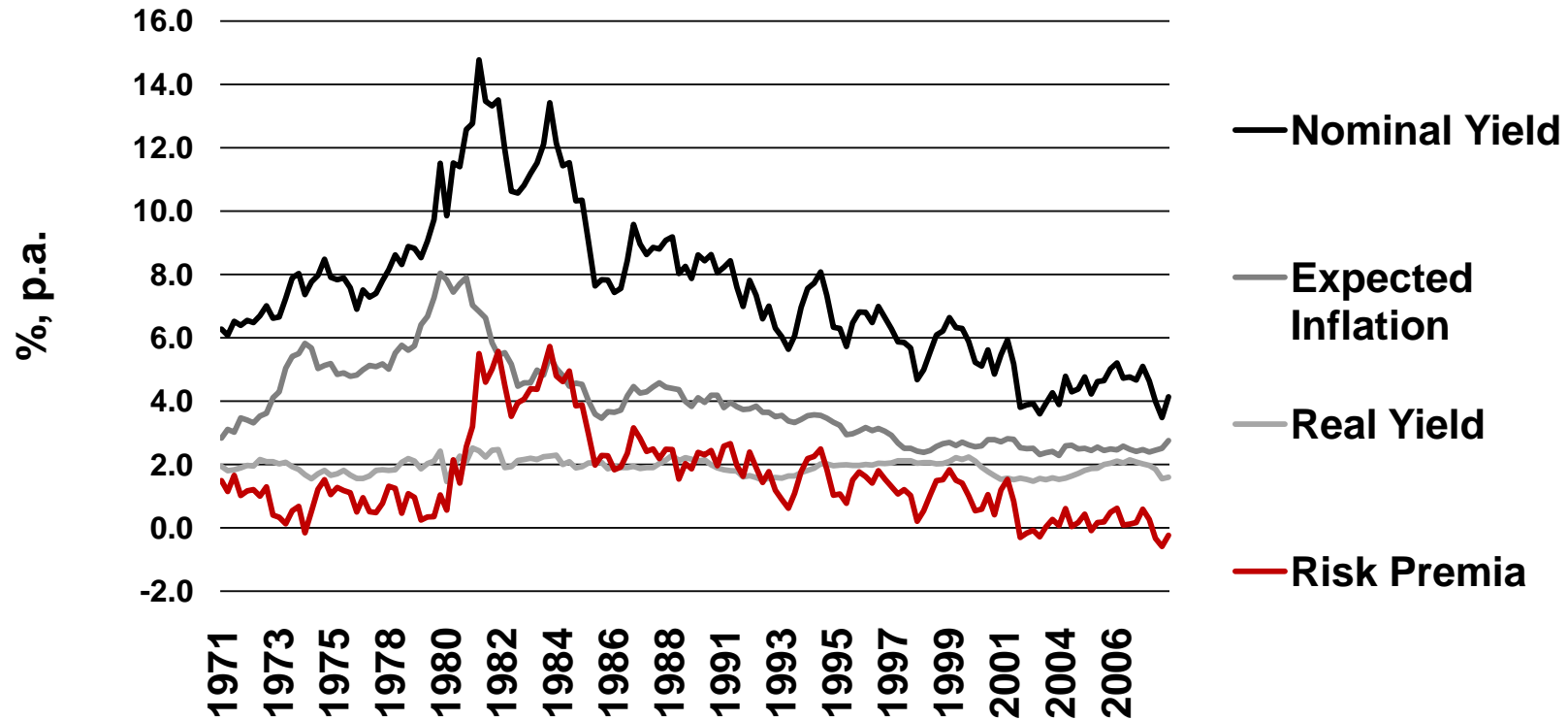
- Inflation-linked bonds may not always offer “cheap” funding
- Inflation-linked bonds may be priced at a discount rather than premium

#### ■ Investors

- Focusing on inflation forecasting is insufficient
- Understanding the drivers of risk premia is more important
- Breakeven positions may underperform for decades

# Problems with Fisher in the data (1970-2008)

► Risk premia may be low on average, but dominate volatility



Source: Chernov and Mueller (2010)

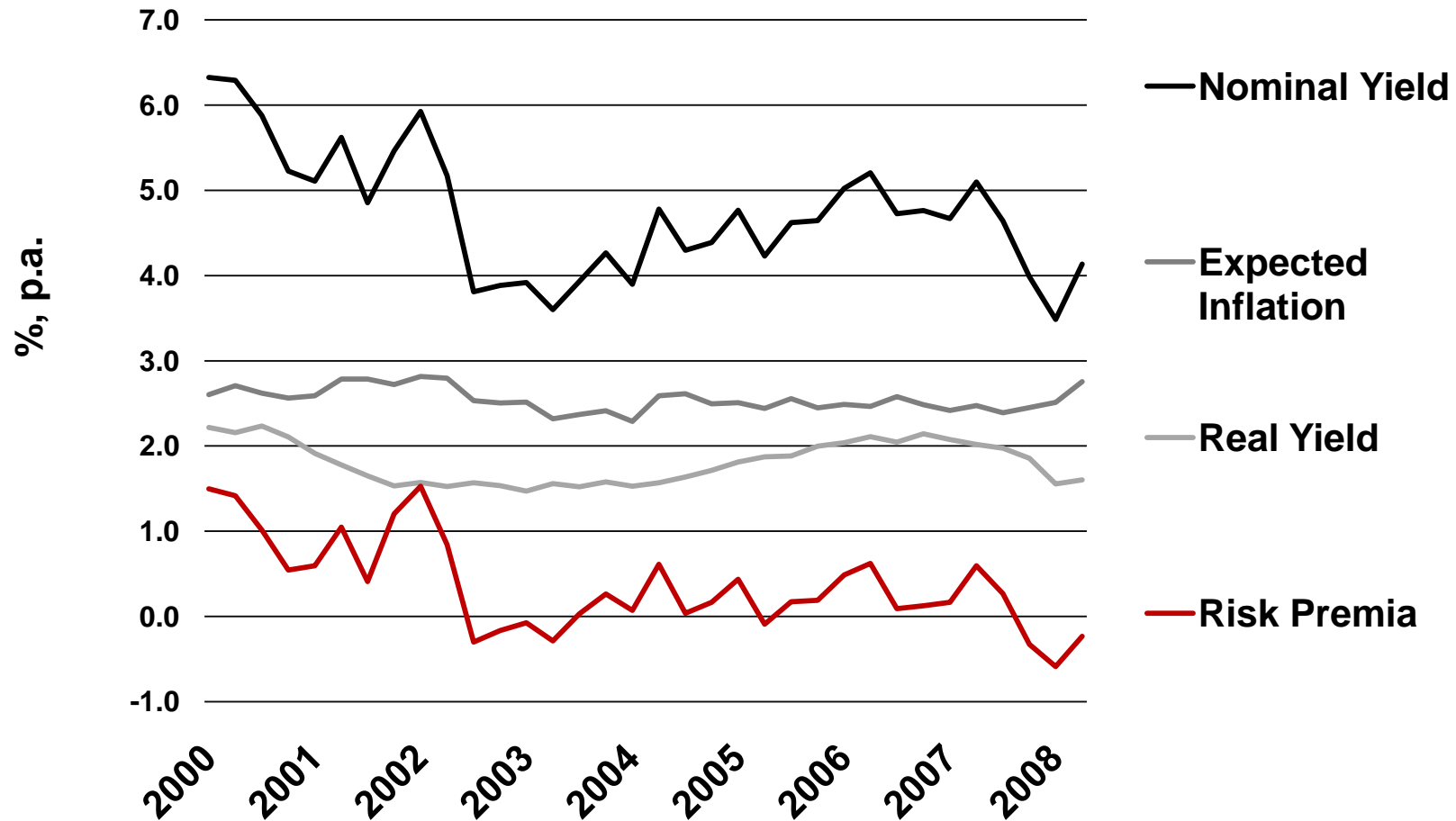
## Other findings in the data

### ▶ Irving Fisher's equation fails in the data

- Frederic Mishkin (1991): Is the Fisher Effect for Real?
  - “Although the Fisher effect is widely accepted for the period after the Fed-Treasury Accord in 1951 until October 1979 in the United States, this relationship between the level of short-term interest rates and future inflation is not at all robust.”
  
- Buraschi and Jiltsov (2005): Inflation Risk Premia and the Expectations Hypothesis
  - “At medium and long-term horizons, the Fisher Hypothesis is strongly rejected by the data.”

# Problems with Fisher in the data (2000-2008)

► Risk premia change between negative and positive



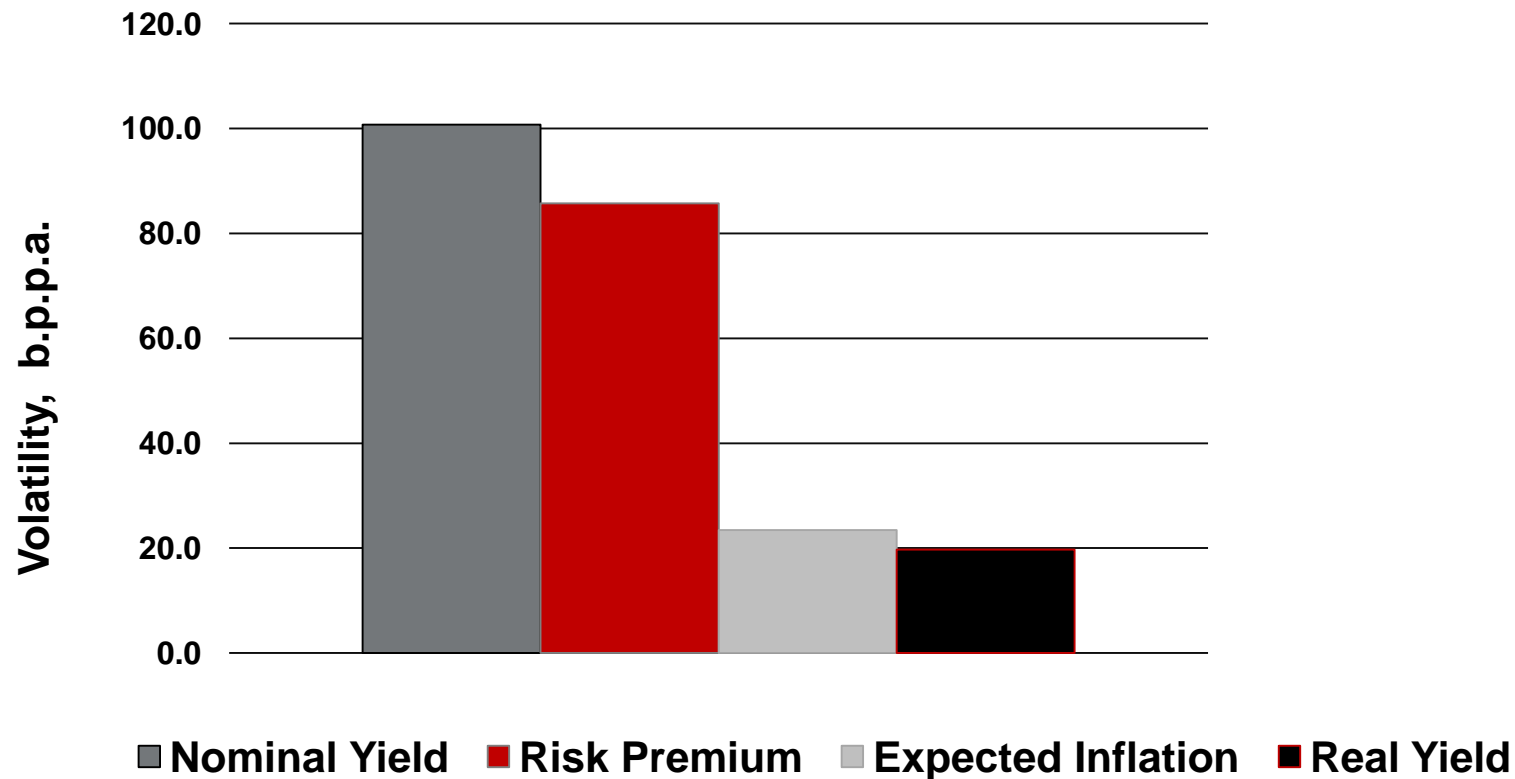
Source: Chernov and Mueller (2010)

## Problems with Fisher in theory

- ▶ Irving Fisher's equation dates from 1930, well before key advances occurred
  
- Stanley Fischer (1975): The Demand for Index Bonds
  - “Essentially, indexed bonds will command a real premium if real returns on equity have negative correlation with the rate of inflation.”
  
- Robert Lucas (1990): Liquidity and Interest Rates
  - “...the interest rate in this example is *much* more variable than one would predict on the usual Fisherian grounds...”
  
  - “...I have shown that liquidity effects can induce a serially correlated stochastic component to equilibrium interest rates that need not bear any definite relationship to fundamentals in the sense of Irving Fisher.”

## Robert Lucas' model was right (2000-2008)

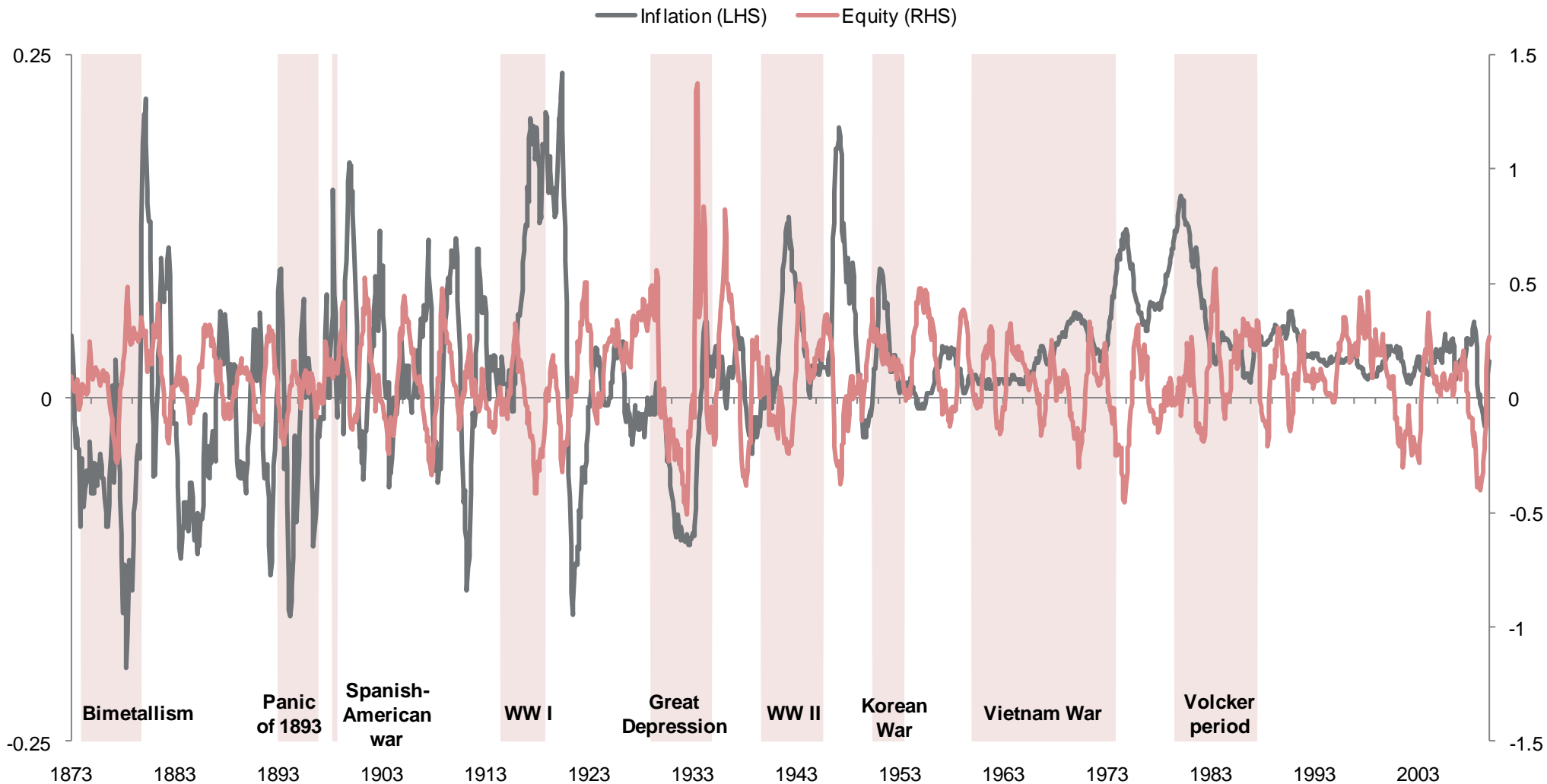
- ▶ Risk premium *much* more volatile than expected inflation or real yield



Source: Nomura, based on Chernov and Mueller (2010)

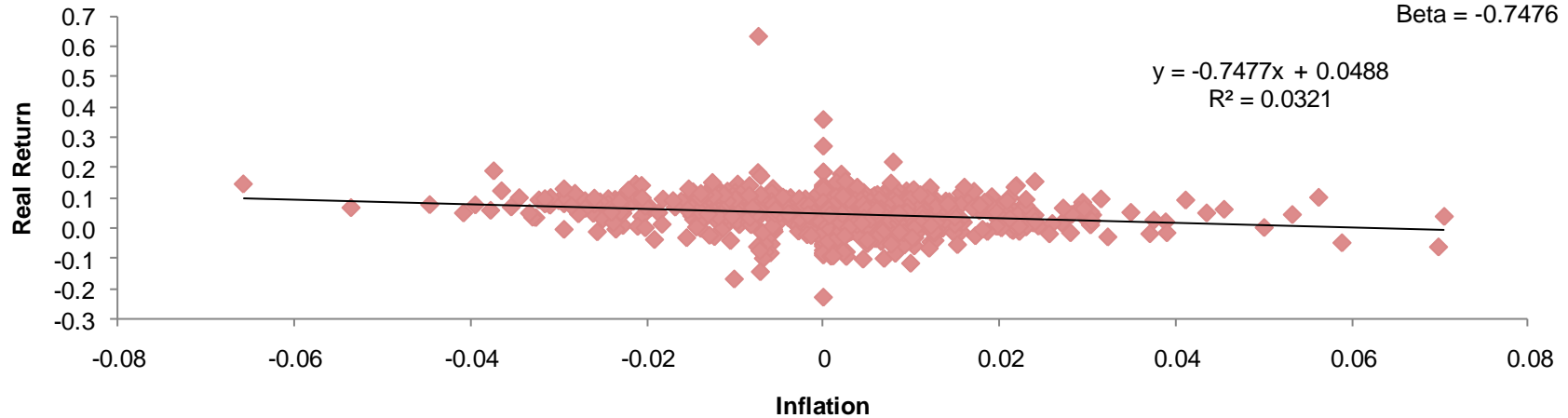
# Stanley Fischer was also onto something

Negative correlation between real equity returns and inflation

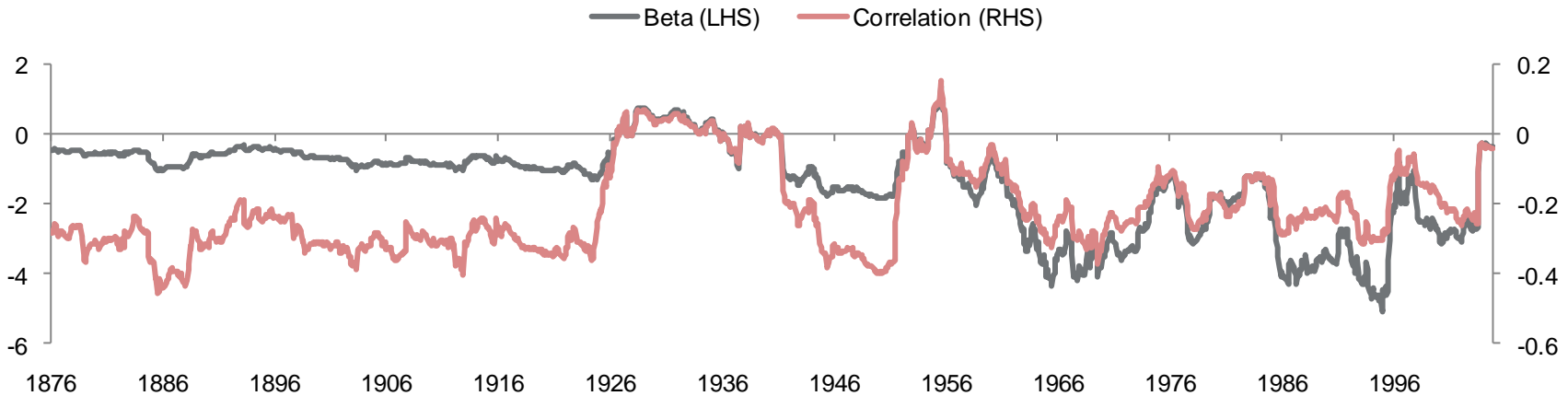


# But correlation changes over time, and can be positive

## Equity



## Moving betas and correlations (10y)



# CAPM: Not just for Equities

CAPM has many forms:

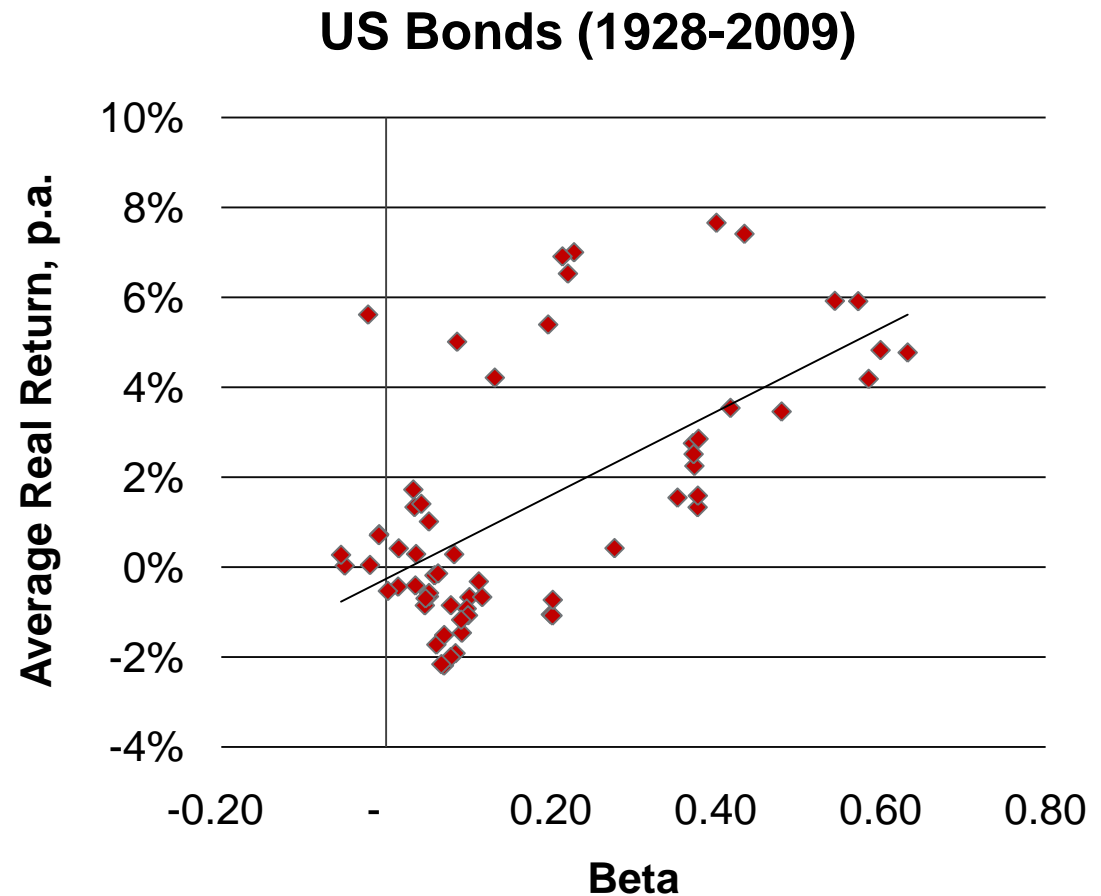
In real terms:

$$er_t = \beta(\text{mkt}_t - rf_t) + \varepsilon_t$$

$$E(er) = \beta(E[\text{mkt}] - rf)$$

High beta → High real returns

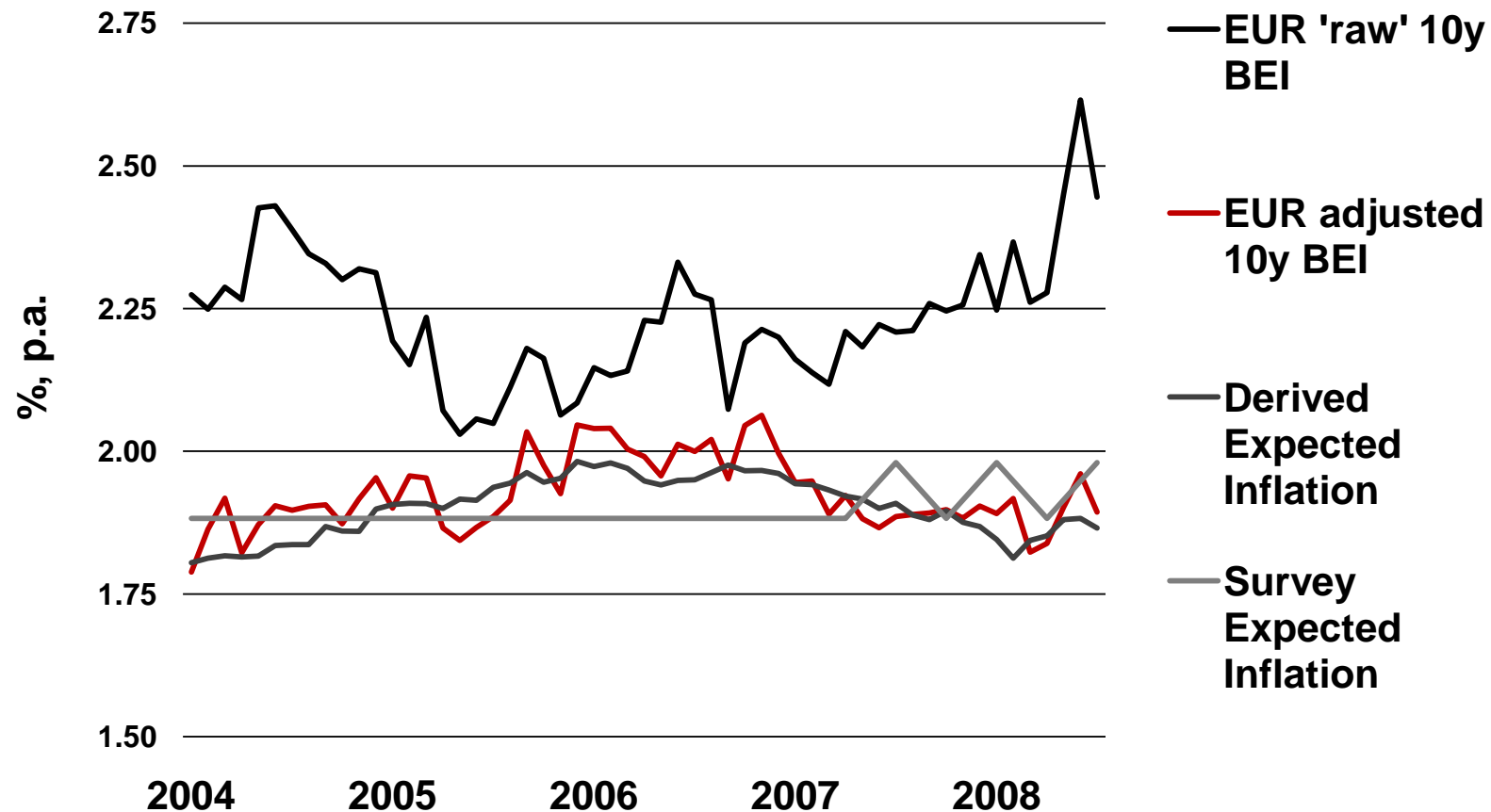
Low beta → Low real returns



Source: Nomura, rolling 20-year samples

# Impact: central bank policy may be too quick to tighten

► Beta changes can drive breakevens wider, even with “anchored” expectations



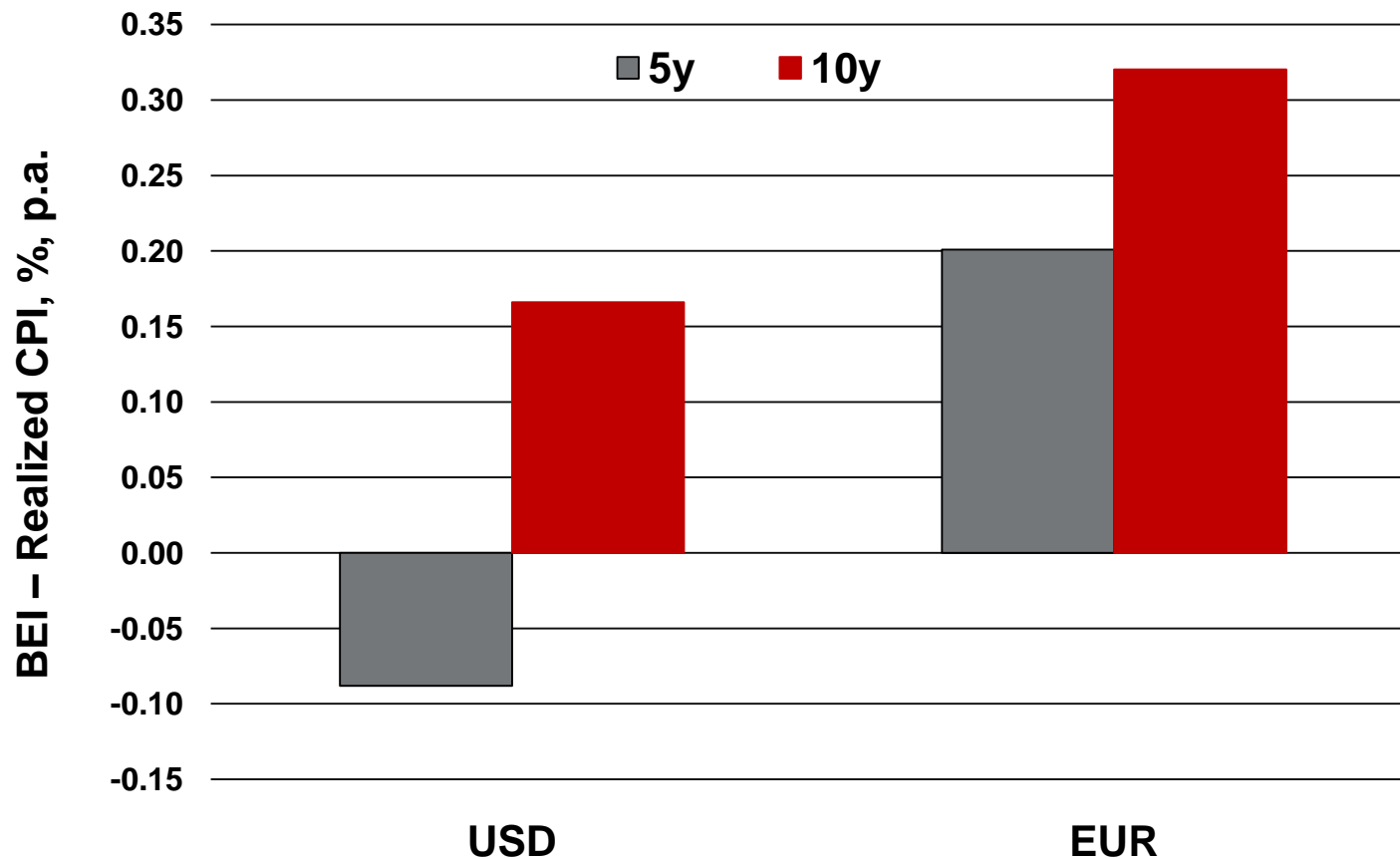
Source: Hoerdahl (2008)

## Not so great expectations

- ▶ How breakevens may mislead central bankers and others
- Hoerdahl and Tristani (2007): Inflation risk premia and the term structure of interest rates
  - “...the raw break-even inflation rate has often provided inaccurate information on inflation expectations. More specifically, our results suggest that fluctuations in the raw break-even rate have mostly reflected variations in the inflation risk premium, while long-term inflation expectations have always remained remarkably anchored from 1999 to date.”

## Impact: longer-term linkers priced at premium

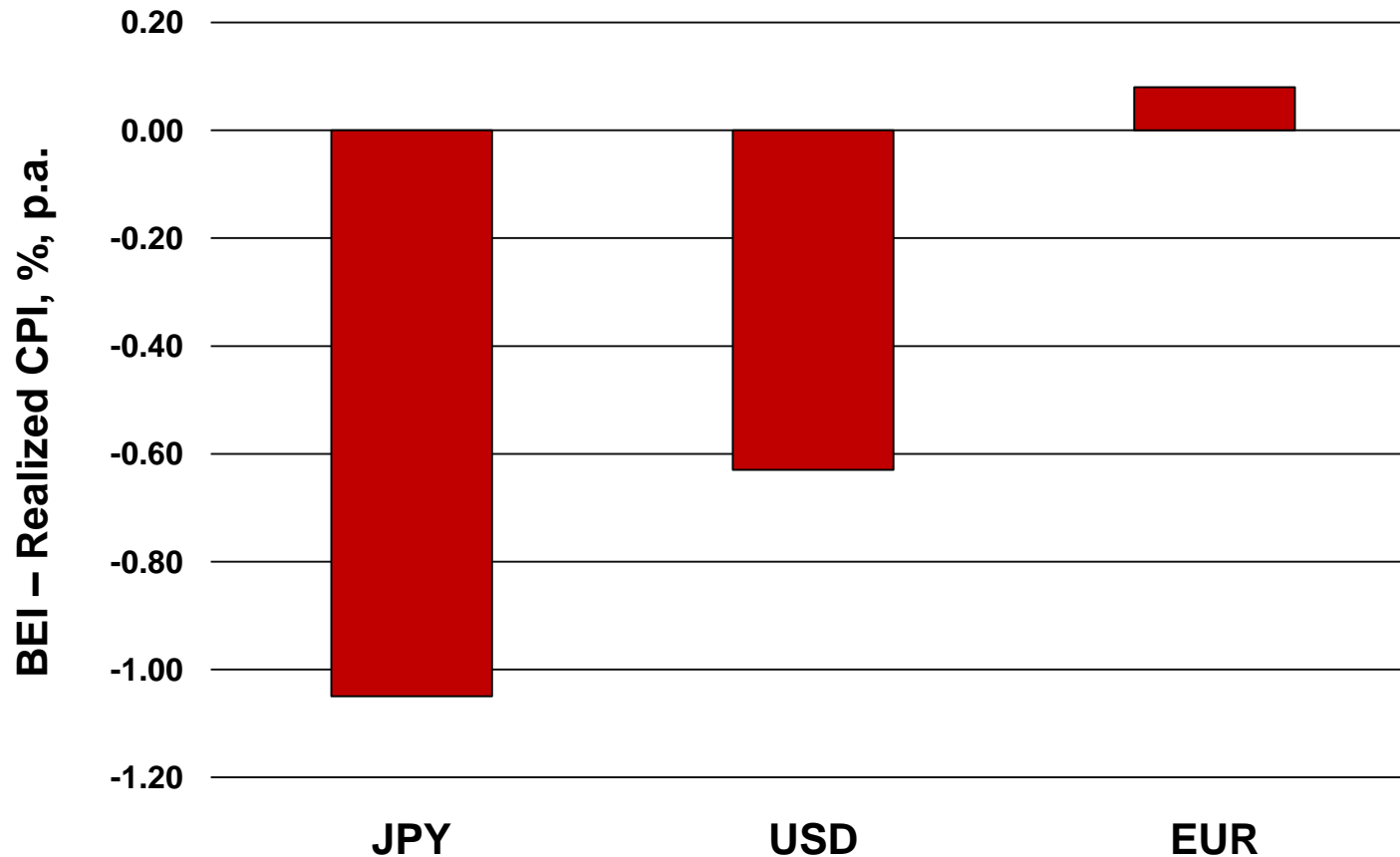
- ▶ Shorter-term BEI beta is higher, consistent with pricing discount



Source: Nomura

## Impact: European linkers priced at premium

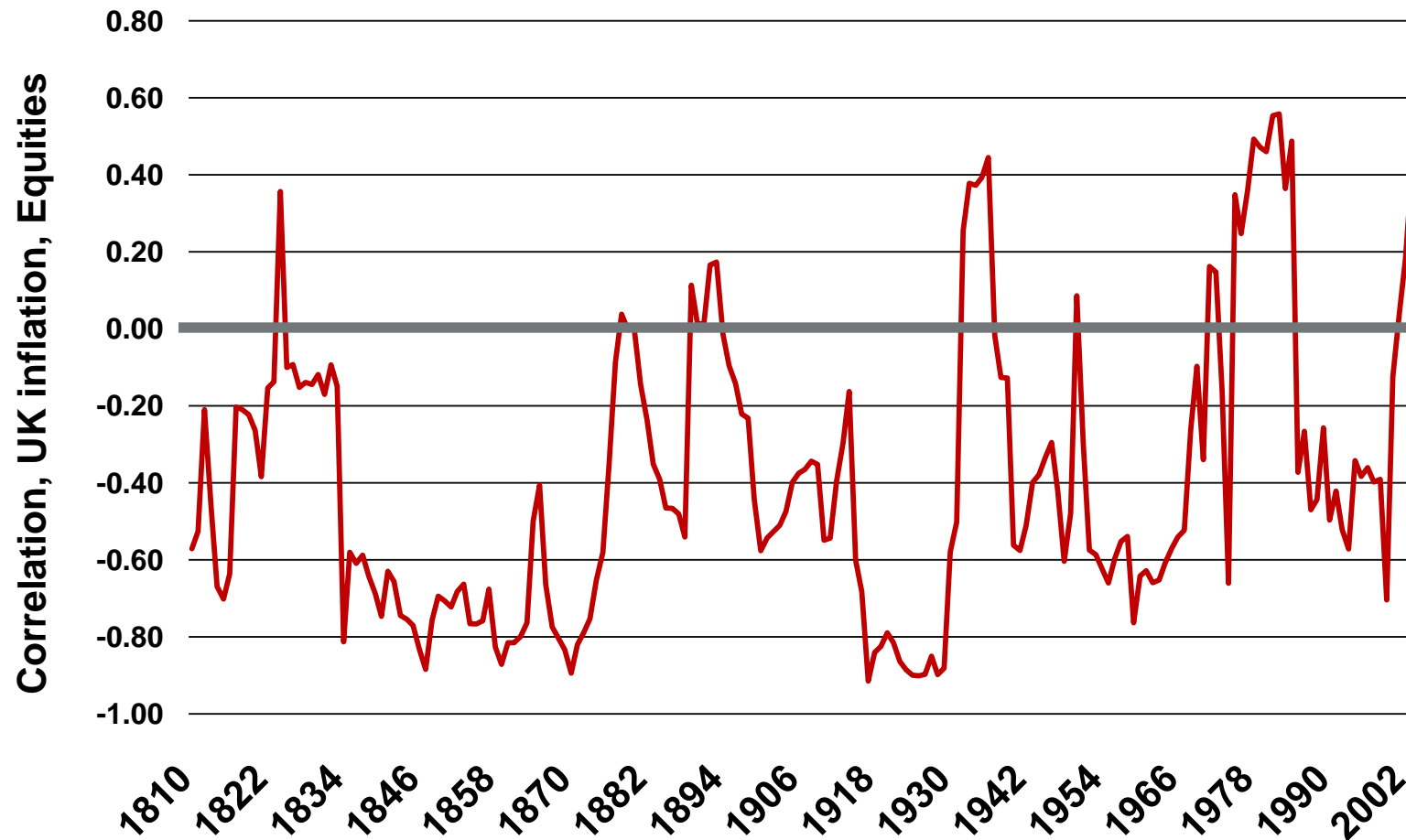
- ▶ JPY correlation with equities most positive, European the least



Source: Nomura

## Impact: Premiums can become discounts as beta changes

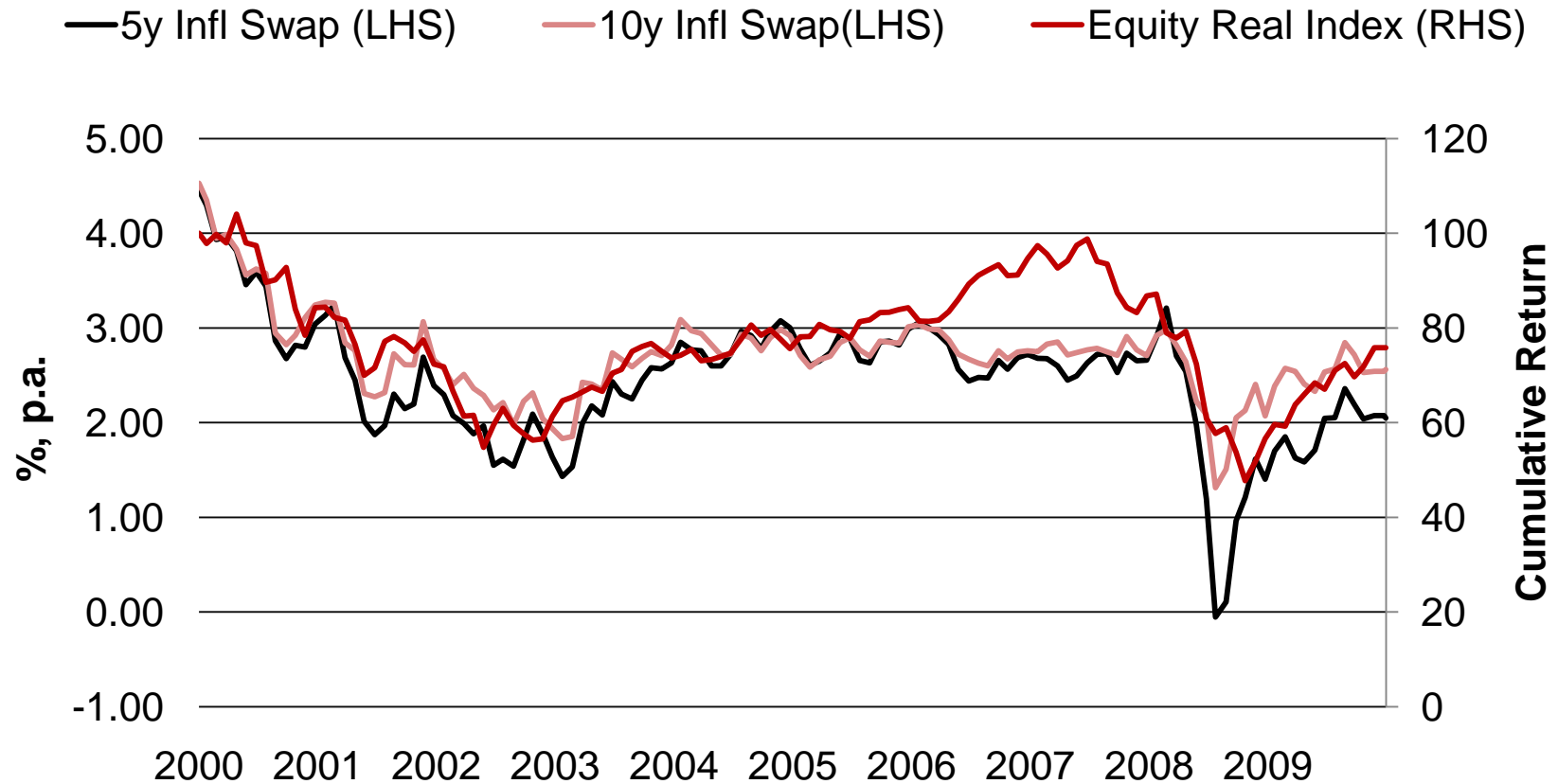
- ▶ Correlation between real equity returns and inflation is typically negative, but...



Source: Nomura

# Impact: Breakeven positions may underperform long-term

► US BEI beta has been positive for last 10 years, underperforming with Equity





Source: Nomura

## Where do we go from here

### ► Moving beyond Irving Fisher's equation

Understanding how beta changes over time

Business-cycle dependent

- Inflation uncertainty
- Supply shocks  Negative Correlation
- Demand shocks  Positive Correlation

Understanding the term structure of premia

- Inflation as an option -- Fischer Black (1995)
- Inflation uncertainty & Lucas Critique -- Lucas (1976)

# Where do we go from here

## ► Moving beyond Irving Fisher's equation

### ■ Central bank policy

- Raw breakevens can be seriously misleading
- Use adjusted breakevens to infer market expectations

### ■ Issuers

- Issuing linkers for genuine ALM hedging still makes sense
- Cheap funding experienced in past may not always exist
- Favour longer-end of curve, EUR market

### ■ Investors

- Inflation forecasting is insufficient
- Understanding the drivers of risk premia is more important
- Treat inflation curve like a yield curve
- Breakeven positions may underperform for decades
- Favour shorter maturities, USD, JPY rather than EUR

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