Measuring Investors’ Risk Appetite in Emerging Markets

Presented by Fatih Kiraz, MKK
Investor Risk Appetite Index

RISE CHANGE METHOD

RISE LEVEL METHOD

- All Investors
- Domestic Investors
- Foreign Investors
- Domestic Individuals
- Domestic Corporations
- Domestic Funds
- Qualified Investors

Graph showing the Investor Risk Appetite Index from 02.10.09 to 17.01.14 with different time periods available (Year-to-Date, 1 year, 3 years, 5 years). The index values range from 0 to 100,000.
The Theory: Developed vs Emerging Markets
Sentiment indices

Used to measure consumers, investors or managers’ expectations regarding future economic activity.

Types:

- **Consumer confidence**: Designed to measure consumer confidence defined as the degree of optimism on the state of the economy that consumers are expressing through their activities of savings and spending
  - University of Michigan Consumer Confidence Index
- **Economic activity**
  - Institute for Supply Management ISM
- **Investor Sentiment**
Investor Sentiment

- **Investor confidence and risk tolerance** are important concepts that investors are constantly trying to gauge. Yet these concepts are **notoriously hard to measure in practice.**

- Most attempts **rely on price or return data**, but these run into trouble when trying to disentangle whether an observed price change is attributable to a **shift in investor confidence or a change in fundamental value.**

- In RISE, we take an alternative approach by looking **at the holdings and trading of risky assets**. We model capital markets as the interaction between large **global institutional investors and smaller domestic investors.**
Relationship between Risk Concepts in DM: Bank of England

\[ p_t = \mathbb{E}_t(m_{t+1} x_{t+1}), \quad 1 = \mathbb{E}_t(m_{t+1}) \cdot \mathbb{E}_t(R_{t+1}) + \text{cov}_t(m_{t+1}, R_{t+1}). \]

\[ \mathbb{E}_t(R_{t+1}) - R^f_{t+1} = -R^f_{t+1} \text{cov}_t(m_{t+1}, R_{t+1}). \]

Risk premium

Riskiness of asset

Risk appetite

Risk aversion

Macroeconomic environment
Risk Appetite: The Willingness of Investors to Bear Risk

Two main channels

Risk Appetite depends on both the degree to which investors dislike such uncertainty and the level

Risk Aversion: is part of the intrinsic makeup of investors

• By December 2011, foreign ownership of Turkey’s 10 year maturity local currency-denominated bond, was nearly 50% ; this was only 4% in November 2007

Fundamentals: Improving Sovereign and Corporate Credit Quality

• Investment-grade countries represented in the JP Morgan Emerging Markets Bond Index (EMBI) Global Diversified Index jumped from less than 2% in 1994 to 57% in 2010.
Decomposition of **Foreign Risk Premiums**

- **Equity Risk Premium**
- **EM Currency risk**
- **EM Country Risk**
- **$ Equity Risk Premium**

**1990s**
- Invest in US Treasury
- Invest in EM **Hard Currency Debt**
  - Example: Turkey US Dollar Denominated Bond

**2000s and beyond**
- Invest in EM **Local Currency Debt**
  - Example: Brazil Local Currency (Real) Denominated Bond
Decomposition of Risk Premiums in EM Equity (tech proof)

- Assume an **US investor** buying **Turkish (TRY)** local currency **denominated** Equity
- Let $Q$ denote the real exchange rate in US good per TRY good.

$$P_t = E_t [M_{t+1} X_{t+1}]$$ imply that

$$P_t = E_t \left[ M_{t+1}^{US} \frac{X_{t+1}}{Q_{t+1}} \right]$$

- Assuming lognormality, we can then **decompose** the expected excess return of U.S. investors as the sum of **two risk premia**; **Credit and Currency Risk Premiums**

$$E_t \left[ r_{US}^{t+1} - r_{t}^{US} \right] + \frac{1}{2} \text{var}_t(r_{US}^{t+1}) = -\text{cov}_t(m_{t+1}, r_{t+1}^{US}) - \text{cov}_t(m_{t+1}, -\Delta q_{t+1}) + \frac{1}{2} \text{var}_t(\Delta q_{t+1})$$

- Credit Risk Premium
- Currency Risk Premium
Proxies for Credit and Currency Risk Premiums

\[ 1 = \underbrace{E_t(m_{t+1}) \cdot E_t(R_{t+1})}_{\text{risk-neutral component}} + \underbrace{cov_t(m_{t+1}, R_{t+1})}_{\text{risk adjustment}}. \]

- **Currency Risk (CuR)**: EM Local Currency Debt – CDS

\[ r_{t,n}^L = r_{t,n}^f + CR_{t,n} + CuR_{t,n} \]

- **Credit Risk Premium (CuR)** = CDS (or EM Hard Currency Debt – rf)
- **Data Source**: Marketit Partners
Credit and Currency Risks Premiums

2 year

3 year

5 year

Currency Risk

Weak Coupling: Local Factos

Country Risk

Strong Coupling: Global Factos
# Cross Sectional Analysis: Global versus Local Factors

## Principal Components

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## Credit Risk Premium

- **Very strong co-movement** across the EM countries
- First factor (Global Factor) is more than 80%
- During the crises even stronger
- And as you move along the curve, this co-movement get stronger

## Currency Risk Premium

- **Weak co-movement** across the EM countries
- First factor is subsumed by **second factor** (Local Factor)
Presence of Institutional Investors

- **How the presence of institutions influences asset prices** (Momentum?)

- The presence of institutions may generate momentum of stock returns.

- Recently, the link between institutional fund flows and momentum has been established theoretically by Vayanos and Woolley (2010) and empirically by Lou (2009).
Hypothesis to be Tested: Foreign Investors (61% of Assets)

• A significant part of the trading volume in Borsa Istanbul is attributed to institutional investors. Trades by retail investors constitute only a large fraction of the trading volume.

• Empirical evidence indicates that trades by institutional investors have sizable effects on asset prices, generating phenomena such as index effects, asset-class effects.

• Institutions optimally tilt their portfolios towards stocks that comprise their benchmark index.

• By demanding a higher fraction of risky stocks than retail investors (?), institutions amplify the index stock volatilities and aggregate stock market volatility.

• Trades by institutions induce excess correlations among stocks that belong to their benchmark index, generating an asset-class effect.

• The importance of studying how the incentives of institutional investors may influence the prices of the assets they hold (further research).
Lessons learned

• Know the country (subject to an index): DM or EM?

• Differentiate between investor types if you can: Foreign vs Domestic / Institution vs Individual

• Think about the time aspect: short term, long term, or both?
RISE: Theory into Practice
Data Set

- We focus on almost **900,000 investors’ actual holdings** that can be decomposed mainly into two types:
  - **Domatic (98.5%)** and **Foreign Investor (1.5%)**
  - They represent %100 of **Borsa Istanbul Index**.
    - Domestic holds 73 Billion TRY of equity (38.6%)
    - Foreign holds 116 Billion TRY of equity (61.4%)
- **MKK** provide RISE on a weekly basis since 2008
- It is difficult to explain such phenomena within **standard representative-agent asset pricing models**.
Investor Risk Appetite Index: 24
How do We Define Investor Risk Appetite Index?

RISE Investor Risk Appetite Index® measures investor sentiment directly and quantitatively by

- assessing the levels and changes in investor holdings of equities, implementing a type of percentile method.

- RISE Index® measures the actual and changing levels of risk in investment portfolios. Other available measures are based on surveys of individuals or private investors and not actual investment decisions.
HOW DOES THE RISE INDEX CALCULATED?

1- The **risky holdings values are adjusted by their relevant days’ BIST-100** closing levels to capture only the trading activity. This is a crucial adjustment, since price movements alone, without any trading activity, can change the value of an investor’s holdings.

2- **Create actual histories for each investor at each t moment** and then assess individual ‘normal holdings levels’ for each of them at every t. Then we compute their all deviations from their own normal levels.

3- **By using a percentile method, assigning scores, between 0 and 100, to these deviations / changes.** While scoring a week’s change, its position relative to the past 52 weeks’ changes is the key. For the complementary version of RISE, we assign scores to ‘levels’ themselves instead of their ‘changes.’

4- At the final, **we aggregate these investors’ scores by using their relevant weights** (according to their portfolio sizes) at BIST.
HOW CURRENT IS THE INFORMATION FROM WHICH THE INDEX IS CALCULATED?

• The published index uses information collected at close of business the previous Friday, providing an extremely current snapshot of investor confidence levels.

• The methodology used to generate the RISE ® incorporates all relevant factors including the natural flow of portfolio allocations due to price shifts.

• Each RISE index is calibrated to a common benchmark, so they are comparable and a reading above 50 means (that specific group of) investors are deploying more exposure to risky assets.
Determinants of Credit and Currency Risk Premiums
Which of the following channels are significant?

LOCAL RISK?

GLOBAL RISK?

\[
\Delta Y_{j,t}^m = \alpha_j + \beta_1^m [\Delta \text{Local Risk}_t] + \beta_2^m [\Delta \text{Funding Risk}_t] + \beta_3^m [\Delta \text{Global Macro Risk}_t] \\
+ \beta_4^m [\Delta \text{Liquidity Risk}_t] + \beta_5^m [\Delta \text{Global Risk Premium}_t] \\
+ \gamma \times \Delta Y_{j,t-1}^m + \epsilon_{j,t}^m
\]
## Determinants of Risk Premiums: Global Factors

<table>
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<tr>
<th>Category</th>
<th>Components</th>
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| **Global Risk Premia**    | - VIX Index  
  Implied vol of SP500 options  
  - Sentiment Index  
  Closed-End Discount Fund of Emerging Markets |
| **Global Macro Risk**     | - Term Premia  
  10 year Treasury bonds minus 3 month LIBOR  
  - Ludvigson-Ng US Macro Factor  
| **Global Liquidity Factor** | - Fontaine- Garcia Liquidity Factor  
  Global Bond Market Liquidity Factor based on Fontaine-Garcia (2009) |
| **Global Funding Factors** | - Unsecured Funding:  
  LIBOR minus US OIS  
  - Secured Funding  
  US MBS minus US Treasury Repo |
## Determinants of Risk Premiums: Local Factors

### Local Macro Risk
- **Ludvigson-Ng EM Macro Factor**
  - Local Macroeconomic activity index using Ludvigson and Ng (2009) approach.

### Local Political Risk
- **ICRG political risk**
  - Quality of institutions and the investment profile

### Investment-Flow
- **The net new flows**
  - Into EM local currency denominated bonds.

### Trade Openness
- Sum of **exports and imports** as a share of gross domestic product

### Financial Development
- Incidence of observed **zero daily returns** as in Lesmond (2005), and Bekaert, Harvey, and Lundblad (2007)
Panel Regression: Credit and Currency Risk Premiums

- **Credit Risk Premium** is explained by **Global Risk Factors**: $R^2$ up to 65%

- **Currency Risk Premium** is explained by **Local Risk Factors**: $R^2$ up to 21%

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<td>0.8935</td>
<td>-0.7239</td>
<td>-2.5930</td>
<td>-8.2153</td>
</tr>
<tr>
<td>[0.20]</td>
<td>[0.31]</td>
<td>[0.14]</td>
<td>[2.08]</td>
<td>[0.25]</td>
<td>[0.82]</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>1.1635</td>
<td>1.2475</td>
<td>1.8004</td>
<td>3.9818</td>
<td>4.0740</td>
<td>3.8421</td>
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<tr>
<td>[0.33]</td>
<td>[0.37]</td>
<td>[0.53]</td>
<td>[0.82]</td>
<td>[0.75]</td>
<td>[0.74]</td>
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<tr>
<td>Lag(-1)</td>
<td>-0.1830</td>
<td>-0.1880</td>
<td>-0.2039</td>
<td>-0.0487</td>
<td>-0.1218</td>
<td>-0.0704</td>
</tr>
</tbody>
</table>

| R-Squares | 57% | 59% | 60% | 17% | 19% | 20% |
| Adj. R-Squares | 59% | 61% | 65% | 15% | 19% | 21% |
THANK YOU