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Outperforming in Emerging Markets:
Using Quantitative Models

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1. Goals

1. Explore the distributional characteristics of emerging market returns with an emphasis on time variation in risk measures.

2. Investigate the role of country attributes, such as political risk and credit risk, in determining the cross-sectional differences in country returns.
2. Resources

Country Risk WWW site:

http://www.duke.edu/~charvey/Country_risk/couindex.htm

Information on:
- Distribution of returns in 47 markets.
- Time-series graphs of political, economic, financial risk in 117 countries.
- Expected returns and volatilities for 135 countries.
- Analysis of risk-return relations in developed and emerging markets.
3. Defining Returns

Many vendors of emerging market returns:

- International Finance Corporation (IFC)
- Morgan Stanley Capital International (MSCI)
- Barings Emerging Markets Indices (BEMI)

Both IFC and MSCI offer 'Global' as well as 'Investible' indices.
3. Defining Returns

IFC and MSCI have different hierarchical selection criteria.

**IFC:**
1. 60% of coverage of total capitalization
2. 60% of the total trading volume
3. Industry

**MSCI:**
1. 60% of coverage of total capitalization
2. Industry weightings approximating total market weights
3. Liquidity
3. Defining Returns

In practice, there is not that much difference between IFC and MSCI returns.

Correlation between IFCI and EMI Composites:
July 1991-June 1996 = 98.0%

Analysis of Tracking Error of IFC, MSCI and BEMI in Bekaert, Erb, Harvey and Viskanta "The Cross-Sectional Determinants of Emerging Equity Market Returns"
3. Defining Returns

Beware of survivorship biases!

- IFC backfilled their indices in the early years inducing a lookback bias

- IFC/MSCI are adding markets to database that are "winners"

- Re-emergence bias detailed in Goetzmann and Jorion (1996). E.g. both Argentina and Brazil had stock markets in the 1880s. To estimate the mean return from 1976 is misleading.
4. Distribution of Returns

- Returns depart from normality.
- Deviations from normality have persisted in the period ending June 1996.
- Volatility, skewness and kurtosis time-varying

→ Implication: Standard quantitative approaches could fail.
Distribution of Returns

IFCG Argentina - US$

Monthly: January 1976-March 1996

Number of Monthly Observations

Monthly Total Return

+ 1 obs at 180%

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Distribution of Returns
MSCI USA - US$
Monthly: January 1976-March 1996
Number of Monthly Observations

Monthly Total Return

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Emerging Markets Skewness
IFC Global Indices

*Sample starts after April 1991.
Emerging Markets Excess Kurtosis

IFC Global Indices


Excess Kurtosis

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*Sample starts after April 1991.
Figure 1

Emerging Market Returns
1980s vs. 1990s
IFC Global Indices - Total Returns US$

Average US$ Return (1980:01-1989:12)

Average US$ Return (1990:01-1996:06)

*Or inception, if later.
Figure 2
Emerging Market Volatility
1980s vs. 1990s
IFC Global Indices - Total Returns US$

*Or inception, if later.
Figure 3

Emerging Market Absolute Skewness
1980s vs. 1990s
IFC Global Indices - Total Returns US$

*Or inception, if later.
Figure 4
Emerging Market Kurtosis
1980s vs. 1990s
IFC Global Indices - Total Returns US$

*K or inception, if later.*
5. Asset Pricing Theory and Emerging Markets

There is no relation between the beta of the Capital Asset Pricing Model (CAPM) and expected returns in emerging equity markets.

This is not necessarily a problem with the CAPM as a theory.

One of the assumptions of the international version of the CAPM is violated:

- Many emerging markets are not integrated into world capital markets
5. Asset Pricing Theory and Emerging Markets

Market integration is very important in understanding the behavior of emerging market returns.

- Indeed, a market may be integrated now, but some of the data being used for model calibration might be from the pre-integrated regime.
5. Asset Pricing Theory and Emerging Markets

Bekaert and Harvey (1995, 1996) show that the changing degree of market integration affects the relative influence of world versus local information in determining both means and variances in emerging markets.
Figure 5
Emerging Market Correlations
1980s vs. 1990s
IFC Global Indices - Total Returns US$

Correlation with MSCI World (1990:01-1996:06)
Correlation with MSCI World (1980:01*-1989:12)

*Or inception, if later.
Figure 6
Emerging Market Betas
1980s vs. 1990s
IFC Global Indices - Total Returns US$
Figure 7
Risk and Return
IFCG Indices

Sample: 1980:01*-1989:12

- R Squared: 12%
- Adjusted R Squared: 7%
- T-Statistic: 1.5

Sample: 1990:01*-1996:06

- R Squared: 30%
- Adjusted R Squared: 27%
- T-Statistic: 3.2

Beta vs. MSCI AC World

Arithmetic Return

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Figure 8
Risk and Return
IFCG Indices

Sample: 1980:01*-1989:12

R Sq: 37%
Adj R Sq: 33%
T-Stat: 3.2

Sample: 1990:01*-1996:06

R Sq: 38%
Adj R Sq: 36%
T-Stat: 3.9

*Or inception, if later.

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6. What Matters in Emerging Market Investments?

Survey-Based Measures:
- International Country Risk Guide (ICRG) Political Risk
- ICRG Financial Risk
- ICRG Economic Risk
- ICRG Composite Risk
- Institutional Investor Country Credit Risk
- Euromoney Country Credit Risk
6. What Matters in Emerging Market Investments?

Macroeconomic:
- Inflation
- ICRG Economic Risk
6. What Matters in Emerging Market Investments?

Demographic:
- Average age
- Average age growth
- Population growth

Market Integration:
- Trade/GDP
- Market Cap/GDP
6. What Matters in Emerging Market Investments?

Persistence or Momentum:
- Lagged returns

Size:
- Market capitalization
6. What Matters in Emerging Market Investments?

Fundamental Valuation Measures:
- Price to book value
- Price to earnings
- Price to dividends
6. What Matters in Emerging Market Investments?

Asset Pricing Theory:
- Beta
- Volatility
7. Country Risk Attributes and the Behavior of Returns

- Many of these attributes are useful in explaining the cross-section of expected returns [see Bekaert, Erb, Harvey and Viskanta, 1996].

- It is likely that some attributes are correlated with the "risk" relevant for asset pricing theory, following Ferson and Harvey (1994, 1996).

- Attributes also account for some of the departures from normality found in many emerging market returns.
Explaining Volatility
IFCG Indices

Annualized Volatility

Average ICRG Composite Ratings
Explaining Correlation
IFCG Indices

Correlation - MSCI AC World

Average ICRG Composite Ratings

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Explaining Volatility
IFCG Indices

Annualized Volatility

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Explaining Volatility
IFCG Indices

Annualized Volatility

Average Price/Book Ratio

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Explaining Beta
IFCG Indices

Beta - MSCI AC World

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Explaining Correlation
IFCG Indices

Correlation - MSCI AC World

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8. Conclusions

Country attributes are useful in understanding the "risk" of emerging market investment.

Means, variances, covariance, betas, skewness and kurtosis are time-varying in potentially complicated ways.

In emerging market returns.

Time-varying market integration induces a complexity.