Emerging Markets: Unsolved Puzzles

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Duke University
and
National Bureau of Economic Research

The Setting

- How important is country selection for global investors?
- How do we measure risk?
- What drives emerging market returns?
- How do value, growth, momentum, liquidity play in emerging markets?
- How important is survivorship and other data problems?
- How important is skewness and kurtosis?
- When are emerging markets integrated?
- What do we do about currency risk?
- How much exposure should we have to emerging markets?
- Will the advantages of investing in emerging markets vanish?
- How do we predict which markets will emerge?
Global Investing Is A Reality
US Share of World Shrinking
GDP and Market Cap Share Shrinking

Annual Data: MSCI, OECD

Global Investing Is A Reality
US Share of World Market Cap Shrinking
Investable Countries Increasing

Monthly Data: MSCI, IFC
Country Returns Drive Active Returns
Market Adjusted Returns Best Explained by National Effects
Average: 67% World, 20% National, 12% All other effects

% of Adjusted R-Square Explained

Independent Variables: 20 Largest Morningstar Intl or Global Fund Returns
Dependent Variables (20): MSCI World, MSCI developed countries (18), IFC Comp.

Beta
Statistical Risk Measures Do Not Explain Returns

Annual Excess US$ Total Return

Adjusted R-Square: 1.3%

Annual Observations: 1980:03-1996:03
Unhedged US$ returns in excess of US Treasury Bill.
Source: MSCI & IFCG (first three annual IFC observations eliminated).
Returns and Volatility
Developed and Emerging Markets

Average Annualized Return

Average Annualized Volatility
Period: January 1970-March 1997, or inception if later.
Monthly Total Returns: MSCI & IFCG US$ (Unhedged).

Volatility
Statistical Risk Measures Do Not Explain Returns

Annual Excess US$ Total Return

Adjusted R-Square: 0.0%
Annual Observations: 1980:03-1996:03
Unhedged US$ returns in excess of US Treasury Bill.
Source: MSCI & IFCG (first three annual IFC observations eliminated).
### Expectational Risk

**Selected Risk Ratings for Countries with Equity Markets**

**As of: June 1996**

<table>
<thead>
<tr>
<th>Country</th>
<th>Moody's</th>
<th>S&amp;P</th>
<th>ICGR</th>
<th>EMCR</th>
<th>ICRG</th>
<th>ICRGP</th>
<th>ICRGF</th>
<th>ICRGE</th>
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<td>Austria</td>
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<td>85.9</td>
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<td>AA+</td>
<td>79.5</td>
<td>93.1</td>
<td>78.6</td>
<td>82.6</td>
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<td>42.0</td>
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<td>78.2</td>
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### How Similar Are Country Risk Ratings?

**Risk Rating Comparison**

- **Average Institutional Investor Country Credit Rating**
  - Bar graphs showing ratings for different countries.
  - Includes all countries with institutional equity markets.
  - As of June 1996

- **Average Sovereign Country Risk Rating**
  - Bar graphs showing ratings for different countries.
  - Includes all countries with sovereign equity markets.
  - As of June 1996

- **Average International Country Risk Guide Composite Rating**
  - Bar graphs showing ratings for different countries.
  - Includes all countries with sovereign equity markets.
  - As of June 1996
Forward Looking Expectations of Risk
Risk Through Time: Selected Country Risk Ratings

Institutional Investor Country Credit Ratings

Argentina
Kuwait
Italy
Switzerland

Iraq invades Kuwait


There Has Been A Pay-off To Forward Looking Risk
Positive Payoff to Country Risk

Risk Trilites Based on Institutional Investor Country Credit Ratings
What Drives Country Risk Ratings?
Inflation and Risk Ratings

CPI % 1997 Forecast - Log Scale

Adjusted R-square: 61%
Observations: 62

Inflation Data: Consensus Economics, September 1996.

What Drives Country Risk Ratings?
Country Risk Ratings vs. Real GDP Per Capita

Real GDP Per Capita (in constant US$) - 1992

Observations: 74
Adjusted R-Square: 82%

Real GDP Per Capita - Penn World Tables V. 5.6
Critical Factors in Institutional Investor’s Country Credit Ratings

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<td>8</td>
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<td>5</td>
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<td>8</td>
<td>7</td>
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<td>8</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>9</td>
<td>7</td>
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Explaining Risk Measures with Economic Variables:
Cross-Sectional Regression Results

T-stats

<table>
<thead>
<tr>
<th></th>
<th>Log(IICCR)</th>
<th>Dependent Variables: Log(EMCRR)</th>
<th>Log(ICRG)</th>
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<tr>
<td>Constant</td>
<td>(1.83)</td>
<td>2.10</td>
<td>14.23</td>
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<td>Log(RGDP:1992)</td>
<td>7.50</td>
<td>6.00</td>
<td>6.64</td>
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<td>Log(Population:1992)</td>
<td>4.32</td>
<td>2.29</td>
<td>(0)</td>
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<td>Log(RGDP:1992/1979)</td>
<td>2.59</td>
<td>3.57</td>
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<td>Log(Pop.1992/1979)</td>
<td>(0.81)</td>
<td>(0.46)</td>
<td>(0.54)</td>
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<td>Investment/GDP%</td>
<td>2.49</td>
<td>2.27</td>
<td>2.32</td>
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<tr>
<td>Government/GDP %</td>
<td>1.13</td>
<td>0.17</td>
<td>0.29</td>
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<tr>
<td>Openness</td>
<td>(0.09)</td>
<td>(0.97)</td>
<td>(1.31)</td>
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<tr>
<td>Adjusted R-squared</td>
<td>0.84</td>
<td>0.82</td>
<td>0.76</td>
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Openness: (Exports + Imports)/GDP
Dependent Variables: Risk Ratings as of year end 1993.
T-stats use a heteroskedasticity consistent (White) covariance matrix
Growth, Return and Risk: A Macroeconomic Framework

Initial Conditions/Conditional Convergence → Economic Growth
Country Risk → Financial Returns

Solid lines: theoretical or empirical relationships
Dotted lines: hypothesized relationships

Growth, Return and Risk: A Macroeconomic Framework

Table 1
Explaining Cross-Sectional Economic Growth

Dependent Variable:
Growth in Real GDP per Capita - 1960-92

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>Coefficient</th>
<th>Std. Err</th>
<th>t-Statistic</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.62</td>
<td>0.24</td>
<td>1.62*</td>
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<tr>
<td>Log(Real GDP Per Capita: 1979)</td>
<td>-0.17</td>
<td>0.03</td>
<td>-5.67</td>
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<td>Log(IICCR 79:09)</td>
<td>0.33</td>
<td>0.07</td>
<td>4.44</td>
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<td>Log(IICCR 92:09)/IICCR 79:09</td>
<td>0.55</td>
<td>0.08</td>
<td>7.03</td>
</tr>
</tbody>
</table>

Observations: 61
R-squared: 0.61
Adjusted R-squared: 0.59
S.E. of regression: 0.17
F-statistic: 29.67
Prob(F-statistic): 0.00

Real GDP per Capita - Penn World Tables v 5.6
IICCR: Institutional Investor Country Credit Rating
Standard errors use a heteroskedasticity consistent (White) covariance matrix.
Growth, Return and Risk: A Macroeconomic Framework

Table 2
Explaining Cross-Sectional Equity Market Returns

Dependent Variable:
Log of Total US$ Equity Market Returns (Unhedged) - 1980-92

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-1.78</td>
<td>1.51</td>
<td>-1.18</td>
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<td>Log(Real GDP Per Capita -1979)</td>
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<td>0.19</td>
<td>-3.26</td>
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<td>Log(IICCR 79:09)</td>
<td>2.06</td>
<td>0.53</td>
<td>3.89</td>
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<td>Log(IICCR 92:09/IICCR 79:09)</td>
<td>0.39</td>
<td>0.26</td>
<td>1.52</td>
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</tbody>
</table>

Observations 28
R-squared 0.35
Adjusted R-squared 0.27
S.E. of regression 0.52
F-statistic 4.32
Prob(F-statistic) 0.01

Total US$ Equity Market Returns (Unhedged) - MSCI & IFCG
Real GDP per Capita - Penn World Tables v 5.6
IICCR: Institutional Investor Country Credit Rating
Standard errors use a heteroskedasticity consistent (White) covariance matrix.

Risk Premia from a US Investor's Perspective
Country Risk Ratings and Bond Yields
Sovereign Real Yields and Risk Ratings

Real Yield (Yield - 1997 Consensus Forecasts CPI)

Adjusted R-Square: 76%

Institutional Investor Country Risk Rating

As of September 30, 1996
Developed: Salomon Bros. World Government Bond Indices
Emerging: Stripped Brady Bond Yields - Bank of Boston

The Pay-off To Risk Varies
Real Yields and Institutional Investor Country Credit Ratings
Monthly Sample: Developed Countries (1985-1996)

Slope of Risk Attribute

Adjusted R-Square

Real Yield = Salomon Bros. Bond Index Yield - Trailing 12 Month CPI
Higher Rating = Lower Risk
Country Risk Ratings and Cash Yields
Eurodeposit Real Yields and Risk Ratings

Real Yield (Yield - 1997 Consensus Forecasts CPI)

Adjusted R-Square: 61%

Institutional Investor Country Credit Rating

As of September 30, 1996
British Bankers Assoc. 12 Month Eurodeposit Fixings

Returns and Country Risk
Developed and Emerging Markets

Average Annualized Return

18% R2

Monthly Total Returns: MSCI & IFCG USS (Unhedged).
Volatility and Country Risk
Developed and Emerging Markets

Average Annualized Volatility

Monthly Total Returns: MSCI & IFCG US$ (Unhedged).

Correlation and Country Risk
Developed and Emerging Markets

Correlation with MSCI USA

Monthly Total Returns: MSCI & IFCG US$ (Unhedged).
Long-term Pay-off To Risk
Time Horizon and Country Risk
Change in IICCR and Returns

Expected Return and Risk Are Positively Related
US$ Equity Excess Returns (One Year US Treasury)
Annual Observations: April 1979-March 1996

Expected Annual Return

Sample: 49 Countries (MSCI, IFC)
ICRG: International Country Risk Guide Composite Ratings
IICCR: Institutional Investor Country Credit Rating
Expected Volatility and Risk Are Positively Related
US$ Equity Excess Volatility (One Year US Treasury)

Expected Annual US$ Volatility

Sample: 49 Countries (MSCI, IFC)
ICRG: International Country Risk Guide Composite Ratings
IICR: Institutional Investor Country Credit Rating

Expected Correlation and Risk Are Negatively Related
US$ Equity Excess Correlation (One Year US Treasury)

Expected Correlation with World

*See Table 9 for model details.
ICRG: International Country Risk Guide Composite Ratings
IICR: Institutional Investor Country Credit Rating
Countries With Equity Markets Are "Less Risky" Country Risk Ratings Around Emergence

Median Year End Institutional Investor Country Credit Rating

MSCI, IFC = Countries already in respective database.
Emerging = Countries entering IFCG database.
Rest of World = Countries rated by II, but not in IFC or MSCI.

Stock Market Index Availability and Country Risk

Institutional Investor Country Credit Rating

IFC begins calculating daily Moroccan stock market index in September of 1996.
Country Risk and "Accepted" Equity Indices

Table 3
Country Risk and Equity Markets
Percentage of Countries with Equity Markets

<table>
<thead>
<tr>
<th>Risk Range</th>
<th>IICCR</th>
<th>EMCRR</th>
<th>ICRGC</th>
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<tr>
<td>100-90</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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<tr>
<td>89-80</td>
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<td>86%</td>
<td>84%</td>
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<td>79-70</td>
<td>100%</td>
<td>50%</td>
<td>52%</td>
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<td>69-60</td>
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<td>49-40</td>
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<td>39-30</td>
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<tr>
<td>9-0</td>
<td>0%</td>
<td>0%</td>
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# of Countries 135 178 129

Data as of September 1996.
IICCR: Institutional Investor Country Credit Rating
EMCRR: Euromoney Country Risk Rating
Includes all markets covered by MSCI & IFC.

Extrapolation Risk
Equity Markets and High Levels of Risk
Expected Return Models
US$ Equity Excess Returns

Expected Annual Return

IICCR: Institutional Investor Country Credit Rating
Hypothesis - assumes non-monotonic payoff to country risk.
Country Valuation and Risk
December 1987 to December 1996

Average Price / Book Ratio

Which view is more plausible:
- valuation drives perceptions of risk, or
- perceptions of risk drive valuations

Country Risk and Company Size
Developed Markets

Market Cap ($MM) per Company

Which view is more plausible:
- market cap drives perceptions of risk, or
- perceptions of risk drive market caps

Data as of: March 31, 1997
Source: MSCI
Summary

- New way to think about risk needed
- Models must incorporate higher moments
- Older emerging markets will look more like developed markets
- New research on dating the integration of capital markets needed
- Need an understanding of the drivers of expected returns and risk
- Need a model to predict when an economy will emerge
- Need to bridge the finance and economic development research