Institutional Investors: From Myth to Reality

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Development Research Group

Policy Research Talk
June 1, 2015
Background Work


Introduction: Some Myths

- Large institutional investors expected to play crucial role, thus they received significant push
- Manage long-term retirement (and voluntary) savings
- Invest in many companies, including SMEs, and countries
  - Diversify risk and foster access to finance
- Informed investors, able to make independent decisions
- Invest long term, including bonds and infrastructure projects
- Follow fundamentals
- Take advantage of arbitrage opportunities and provide liquidity
- Absorb shocks, particularly equity investors
- Help stabilize and develop the financial system
Introduction: Some Realities

- Big, but far away from model of capital markets as envisioned
- Invest differently than expected, even counter-intuitively
- Institutional investors invest in few companies and few countries
- Constraints not on lack of available funds: domestic/foreign savers
- Many assets available for investment not purchased by investors
- They hold large resources/investment in few large, liquid assets
- Institutional investors shy away from risk, including good ones
  - Forego higher risk-adjusted returns
- Incentives for asset managers seem to play an important role
- Delegated portfolios: trade-off between monitoring & risk taking
Organization of the Evidence

- Hard to have a unified framework to analyze the evidence
- Findings from many different sources and papers, using data from Chile, the U.S., and world financial centers
- Findings on different aspects of institutional investors’ behavior, in particular their asset allocation
- Emphasis on regulated investors (mutual funds & pension funds), for which data could and can be collected
- Relative to banks and households, we can observe their portfolios, goals, benchmarks, and injections/redemptions
- Different findings point to similar factors, offer food for thought
  - What to expect of institutional investors
  - Public policy discussion going forward
Evidence on Institutional Investors

- Overview
  - Size of institutional investors

- Pension funds in Chile
  - Trading and herding
  - Long-term investors?

- International evidence
  - Diversification
  - Pro-cyclicality
  - Benchmark effect
Evidence on Institutional Investors

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Financial Markets Size

Size of Financial System: Developed Countries

Median Country

Bank Claims on Private Sector
Equity Market Capitalization
Bond Market Capitalization

Financial Markets Size

Size of Financial System: Emerging Countries

Median Country

Growing Size of Institutional Investors

Assets under Management by Institutional Investors

Source: OECD. Only OECD countries included.
Growing Size of Institutional Investors

Institutional Investors vs Banks

Source: OECD. Only OECD countries included. Given data constraints, the figure does not include the following OECD countries: Czech Republic, Greece, Hungary, Portugal, Slovenia, Turkey, and United Kingdom.
Growing Size of Institutional Investors

Institutional Investor vs Bank, Assets

Source: OECD.
Evidence on Institutional Investors

- Overview
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- Pension funds in Chile
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  - Long-term investors?
- International evidence
  - Diversification
  - Pro-cyclicality
  - Benchmark effect
Is Chile Different?

- Yes, but for the good reasons
  - Innovative in macro and institutional policy, plus development of institutional investors – benchmark case
  - Has long history, rich data, and good collaboration with the Bank
  - Can compare different institutional investors within same framework

- No, because many countries have followed it and patterns present several similarities
  - Chile has been a model for many countries in pension fund reform
  - Regulations have improved and cannot be much different in other countries
  - When managers need monitoring, incentives play similar role
  - Defined contribution systems are expanding, similar to Chile
Defined Contribution Pension Funds Important

Share of Defined Contribution Assets, by Country

Source: OECD. Selected OECD countries in 2013.
Pension Funds Trade Infrequently

Fixed-income Instruments Bought Initially and Held Until Expiration

When They Trade, They Do It Similarly: Herding

Herding within Fund Types Across PFAs, by Fund Type

<table>
<thead>
<tr>
<th>Herding Statistic</th>
<th>Fund A</th>
<th>Fund B</th>
<th>Fund C</th>
<th>Fund D</th>
<th>Fund E</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td></td>
</tr>
<tr>
<td>All Asset Classes</td>
<td>5.87 ***</td>
<td>3.54 ***</td>
<td>7.99 ***</td>
<td>5.65 ***</td>
<td>4.67 ***</td>
</tr>
<tr>
<td></td>
<td>(0.92)</td>
<td>(0.65)</td>
<td>(0.49)</td>
<td>(0.66)</td>
<td>(0.84)</td>
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</tbody>
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<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td></td>
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<tr>
<td>Domestic Assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Corporate Bonds</td>
<td>13.61 ***</td>
<td>11.47 ***</td>
<td>20.80 ***</td>
<td>10.51 ***</td>
<td>13.02 ***</td>
</tr>
<tr>
<td></td>
<td>(1.93)</td>
<td>(0.85)</td>
<td>(0.08)</td>
<td>(0.88)</td>
<td>(1.06)</td>
</tr>
<tr>
<td>Financial-Institution Bonds</td>
<td>6.63 ***</td>
<td>10.78 ***</td>
<td>15.33 ***</td>
<td>9.49 ***</td>
<td>13.56 ***</td>
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<tr>
<td></td>
<td>(2.61)</td>
<td>(1.29)</td>
<td>(1.21)</td>
<td>(1.25)</td>
<td>(1.70)</td>
</tr>
<tr>
<td>Government Bonds</td>
<td>1.21</td>
<td>4.91 ***</td>
<td>2.96 ***</td>
<td>4.94 ***</td>
<td>2.08 ***</td>
</tr>
<tr>
<td></td>
<td>(1.72)</td>
<td>(0.84)</td>
<td>(0.44)</td>
<td>(0.67)</td>
<td>(0.80)</td>
</tr>
<tr>
<td>Mortgage Bonds</td>
<td>5.02 ***</td>
<td>2.89 ***</td>
<td>1.24 ***</td>
<td>2.52 ***</td>
<td>3.26 ***</td>
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<tr>
<td></td>
<td>(0.85)</td>
<td>(0.17)</td>
<td>(0.08)</td>
<td>(0.14)</td>
<td>(0.32)</td>
</tr>
<tr>
<td>Equity</td>
<td>6.32 ***</td>
<td>0.69 *</td>
<td>10.43 ***</td>
<td>6.68 ***</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.43)</td>
<td>(0.45)</td>
<td>(0.60)</td>
<td>(0.64)</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Data from 2002-2005. The percentage of assets traded is calculated on a monthly basis. Source: Raddatz and Schmukler (2013).
Along with MFs, They Tend to Invest Short Term

Maturity Structure of Chilean Domestic Mutual Funds and PFAs vs. Insurance Companies

Note: This figure compares the maturity structure of Chilean insurance companies to that of Chilean domestic mutual funds and PFAs. Only medium- and long-term bond mutual funds are taken into account. Sample period: 2002-08. Source: Opazo, Raddatz, and Schmukler (2015).
Along with MFs, They Tend to Invest Short Term

Maturity Structure of Chilean Domestic Mutual Funds and PFAs vs. Insurance Companies

Pension Funds Not Exposed to Large Net Outflows

Net Inflows to Chilean MFs, PFAs, and US MFs


[Graph showing cumulative probability of net inflows as a fraction of fixed-term assets for US Multi-Sector Mutual Funds, Chilean Domestic Mutual Funds, and Chilean PFAs.]
Insurance Companies Bid More for Longer Bonds

Bids by Pension Funds and Insurance Companies in Government Bond Auctions

<table>
<thead>
<tr>
<th>Time to Maturity (Years)</th>
<th>Coef. (i)</th>
<th>Std. Error (i)</th>
<th>Coef. (ii)</th>
<th>Std. Error (ii)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.105</td>
<td>(0.082)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.168</td>
<td>(0.145)</td>
<td>0.053</td>
<td>(0.076)</td>
</tr>
<tr>
<td>5</td>
<td>0.218</td>
<td>(0.115)</td>
<td>0.184</td>
<td>(0.098)</td>
</tr>
<tr>
<td>10</td>
<td>0.119</td>
<td>(0.044)</td>
<td>0.167</td>
<td>(0.044)</td>
</tr>
<tr>
<td>20</td>
<td>0.609</td>
<td>(0.113)</td>
<td>0.609</td>
<td>(0.112)</td>
</tr>
<tr>
<td>30</td>
<td>3.473</td>
<td>(1.701)</td>
<td>3.473</td>
<td>(1.701)</td>
</tr>
<tr>
<td>No. of Observations</td>
<td>418</td>
<td></td>
<td>666</td>
<td></td>
</tr>
</tbody>
</table>

Even When Investing Long Term Pays Off

Indices of Chilean Government Inflation-Indexed Bonds

Return

Sharpe Ratio

Portfolios Tilted toward Deposits and Public Bonds

Composition of Pension Fund Investments in Latin America

Source: OECD, ABRAPP, AIOSFP, FIAP, and local sources.
Mutual Funds Also in Deposits and Public Bonds

Mutual Funds - Portfolio Holdings
Chile

Source: IMF’s IFS, FGV-Rio, Conasev, Superfinanciera, Andimia, and Banxico.
Evidence on Institutional Investors

- Overview
  - Size of institutional investors
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  - Long-term investors?
- International evidence
  - Diversification
  - Pro-cyclicality
  - Benchmark effect
Similar Number of Holdings Across Fund Types

Median Number of Stocks Held by Mutual Funds

Similar Number of Holdings Across Fund Types

Median Number of Stocks Held by Mutual Funds

## Changes Within Families

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Number of Countries</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asia</td>
<td>Developed Europe</td>
<td>Latin America</td>
<td></td>
</tr>
<tr>
<td><strong>Regional Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Number of Countries</td>
<td>8</td>
<td>12</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Drop in the Number of Countries in Each Region by Fund Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(In Percent, Relative to Regional Funds)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emerging Market Funds</td>
<td>-10%</td>
<td>-</td>
<td>-17%</td>
<td></td>
</tr>
<tr>
<td>Foreign Funds</td>
<td>-30%</td>
<td>0%</td>
<td>-72%</td>
<td></td>
</tr>
<tr>
<td>World Funds</td>
<td>-36%</td>
<td>-14%</td>
<td>-75%</td>
<td></td>
</tr>
</tbody>
</table>

Mutual Funds Hold Relatively Few Stocks

Mutual Fund Holdings as a Proportion of the Total Number of Listed Stocks

Having Managers in Common Increases Entropy

Entropy Measure by Number of Common Managers

### Family Effects Are Relevant

<table>
<thead>
<tr>
<th>Number of Stock Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>Adjusted R-squared</td>
</tr>
<tr>
<td>Independent Variables</td>
</tr>
<tr>
<td>Year Dummies</td>
</tr>
<tr>
<td>Fund Type Dummies</td>
</tr>
<tr>
<td>Family Dummies</td>
</tr>
<tr>
<td>No. of Observations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% of Net Assets in Top Ten Holdings</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
</tr>
<tr>
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<td>No. of Observations</td>
</tr>
</tbody>
</table>

### Holding Patterns Are Costly

<table>
<thead>
<tr>
<th>Type of Global Funds</th>
<th>Daily Data</th>
<th></th>
<th></th>
<th>Weekly Data</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Average Returns (Per Year)</td>
<td>Average Difference in Accumulated Returns</td>
<td></td>
<td>Average Returns (Per Year)</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Global Funds</td>
<td>Simulated Global Funds</td>
<td>Global Funds</td>
<td>Simulated Global Funds</td>
<td>Global Funds</td>
<td>Simulated Global Funds</td>
</tr>
<tr>
<td>World Funds</td>
<td>6.22%</td>
<td>11.01%</td>
<td>4.85%</td>
<td>6.28%</td>
<td>11.33%</td>
<td>5.08%</td>
<td>2.05%</td>
</tr>
<tr>
<td>Foreign Funds</td>
<td>6.03%</td>
<td>9.95%</td>
<td>4.03%</td>
<td>6.04%</td>
<td>9.70%</td>
<td>3.74%</td>
<td>2.25%</td>
</tr>
<tr>
<td>Pools of World or Foreign Funds</td>
<td>10.53%</td>
<td>15.23%</td>
<td>4.55%</td>
<td>10.54%</td>
<td>15.16%</td>
<td>4.44%</td>
<td>1.99%</td>
</tr>
<tr>
<td>Total</td>
<td>6.78%</td>
<td>11.14%</td>
<td>4.42%</td>
<td>6.80%</td>
<td>11.13%</td>
<td>4.36%</td>
<td>2.14%</td>
</tr>
</tbody>
</table>

Volatile Total Assets in Global Equity Funds

Source: Raddatz and Schmukler (2012).
Volatile Portfolios

Global Equity Funds

Developed Europe

North America

Emerging Countries

Average portfolio shares

Source: Raddatz and Schmukler (2012).
Volatile Portfolios

Global Bond Funds

Developed Europe

North America

Emerging Countries

Average portfolio shares

Source: Raddatz and Schmukler (2012).
Growing Number of Funds Follow Benchmarks

Equity Funds

Source: Raddatz, Schmukler, and Williams (2015).
Motivation: Israel upgrade from EM to DM

Explicit Indexing Funds

Global Emerging Funds and MSCI Emerging Markets Index

Country Weight

Announcement Date

Effective Date

<table>
<thead>
<tr>
<th>Announcement Date</th>
<th>Effective Date</th>
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<tbody>
<tr>
<td>Jan-09</td>
<td>May-09</td>
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<td>May-09</td>
<td>Sep-09</td>
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<td>Jan-10</td>
<td>May-10</td>
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<td>Sep-10</td>
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<td>Jan-11</td>
<td>May-11</td>
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Global Funds and MSCI World Index

Country Weight

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Truly Active Funds

Global Emerging Funds and MSCI Emerging Markets Index

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</table>

Source: Raddatz, Schmukler, and Williams (2015).
Benchmarks Help with Identification

- Benchmarks important beyond country-time (fundamentals) and industry-time effects
- Changes in benchmark weights relate to relative returns

\[
W_{ct}^B = W_{ct-1}^B \left( \frac{R_{ct}}{R_t^B} \right) + E_{ct}^B
\]

- Weights can move in opposite directions in different benchmarks (same country, same time)
- Exogenous shocks that shed light on identification

Source: Raddatz, Schmukler, and Williams (2015).
Mutual Fund Weights vs. Benchmark Weights

Explicit Indexing: $w_{ict} - \hat{w}_{ct}$ vs. $w^B_{ict} - \hat{w}^B_{ct}$

Closet Indexing

Mildly Active

Truly Active

Source: Raddatz, Schmukler, and Williams (2015).
Effects on Capital Flows

- Benchmark weights and capital flows linked through identity

\[ F_{ict} = \frac{w_{ict}F_{it}}{\text{Net Inflows}} + \tilde{A}_{it}(w_{ict} - w_{ict}^{BH}) \]

- Direct benchmark effect
- Sensitivity effect
- Amplification effect
- Contagion effect

Source: Raddatz, Schmukler, and Williams (2015).
Direct Benchmark Effect: Israel’s Upgrade (5/2010)

Source: Raddatz, Schmukler, and Williams (2015).
Direct Benchmark Effect in Israel’s BoP

Source: Raddatz, Schmukler, and Williams (2015).
Direct Benchmark Effect in Colombian TES bonds

Participation of Foreigners in TES bonds

Source: Raddatz, Schmukler, and Williams (2015).
Amplification and Sensitivity Effect

MSCI Emerging Markets Index ETF

Price Effects: Israel's Upgrade and Stock Returns

Stock Market Prices of Israeli Firms Around Israel's Upgrade

Index (Jun 16, 2009=100)

June 2, 2009
June 4, 2009
June 8, 2009
June 10, 2009
June 12, 2009
June 16, 2009
June 18, 2009
June 22, 2009
June 24, 2009
June 26, 2009
June 30, 2009

Index (May 14, 2010=100)

May 10, 2010
May 12, 2010
May 14, 2010
May 18, 2010
May 20, 2010
May 24, 2010
May 26, 2010
May 28, 2010
June 1, 2010
June 3, 2010
June 7, 2010
June 9, 2010
June 11, 2010
June 15, 2010
June 17, 2010
June 21, 2010
June 23, 2010
June 25, 2010

Announcement date
Two weeks prior effective date
Effective date

Index Returns
Non Index Returns

Note: Index returns is a market capitalization price index of firms covered by MSCI. Non Index returns is a market capitalization price index of firms not covered by MSCI. Source: Raddatz, Schmukler, and Williams (2015).
Price Effects: Direct Benchmark Effect – Argentina

Argentina's Equity Market Around MSCI's Downgrade

Note: The figure illustrates the log difference between stock price of firms entering Argentina's MSCI index (ADRs) and the stock price of firms going out of the index. Source: Raddatz, Schmukler, and Williams (2015).
Price Effects: Direct Benchmark Effect – Colombia

Colombia's Sovereign Debt Market Around J.P. Morgan's Upgrade

Note: Index returns is a local currency debt index (in USD) containing all bonds entering the benchmark and non index returns is a local currency debt index (in USD) from bonds not affected by the benchmark change. Source: Raddatz, Schmukler, and Williams (2015).
Price Effects: Contagion in Frontier Markets

Impact on Frontier Countries Due to the MSCI Upgrade of Qatar and UAE

Announcement Date

Source: Raddatz, Schmukler, and Williams (2015).
Price Effects: Contagion in Frontier Markets

Impact on Frontier Countries Due to the MSCI Upgrade of Qatar and UAE

Source: Raddatz, Schmukler, and Williams (2015).
Price Effects: Contagion in Frontier Markets

Impact on Frontier Countries Due to the MSCI Upgrade of Qatar and UAE

Source: Raddatz, Schmukler, and Williams (2015).
Concluding Remarks: Bottom Line

- Constraints not on the supply side of funds
- Constraints not on the availability of investable assets
- Constraints likely not on specific regulatory issues
  - These get much attention at country level, but this is a cross-country issue
- Financial intermediation process more difficult than thought
  - Governments and large firms receive most of the financing
  - Incentives and organizational issues seem to play crucial role and restrict (good) risk taking options
  - Might not yield socially optimal outcome
  - Financial intermediaries brain of the economy ...
  - … but work differently than expected
Some General Policy Challenges

- Generate healthy competition among financial intermediaries and market discipline, consistent with intended goals
- Reduce fees and foster benchmarking without boosting short-termism, herding, coordination effects, pro-cyclicality, volatility
- Foster long-term risk taking while being able to monitor managers
- Generate contrarian behavior and long-term arbitrage opportunities without backlash due to negative outcomes
- Take advantage of useful international diversification
- Think of alternative ways of managing retirement assets
- How will the change come about?
Pension and Mutual Funds: Incentives

- Regulators in tight spot
- Regulatory incentives to minimize risk relative to benchmark
  - Having similar portfolios minimizes that risk (herding type of behavior)
  - Difficult to come up with very different regulatory structure
- Why is the industry tilted toward low (idiosyncratic) risk with short maturity, as one example of low risk taking?
  - Some factors have pushed equilibrium to short term, kept it there
  - Equilibria can be quite persistent, displaying hysteresis
  - Can long-term benchmarks shift portfolios to the long term?
Pension and Mutual Funds: Incentives

- Investor side – Market discipline
  - Outflows (or the threat of) / redemptions
  - Based on short-term returns
  - Outflows potentially more important for MFs – systemic
- Pay structure (tracking error)
  - Tracking error investment model (tracking the mean)?
- Asset return volatility
  - Incentives to produce stable returns in the short run
  - Link to “liability structure”
  - Loss aversion by underlying investors?
- Cost of information acquisition?
  - Focus on low information intensity assets
Features Not Country Specific

- Patterns not exclusive of developing countries
- Unexpected patterns even in U.S. and develop countries
  - Invest in few stocks
  - Do not share information within companies
  - Are pro-cyclical even when investing in equities and even when shocks have already hit them
  - Are subject to significant redemptions from investors
  - Follow benchmarks and behave passively, which can add to pro-cyclicality through coordination effects
- Organizational factors seem key to understand behavior
- However and unfortunately, not clear alternative model
Directions for Future Work

- Benchmarks
  - What determines the intensive and extensive margins?
  - Effects on cost of capital to corporations and corporate financing
  - Effects on domestic institutional investors

- Active management
  - What determines deviations from the benchmarks?
  - Are there arbitrage/investment opportunities?

- Asset managers and financial stability (BIS, FSB, IMF)
  - How do funds manage their liquidity?
  - To what extent do asset managers generate pro-cyclicality in capital flows and investments?
Directions for Future Work

- Prospects for financial development
  - Experiences with long-term and illiquid financing
  - Infrastructure finance and SME finance by institutional investors?

- Different models of institutional investors?
  - Different results?
  - Domestic investors vs. foreign investors in long-term finance
  - Others institutional investors (SWF, PE, VC, HF)

- Government role
  - Role of public sector in managing/regulating retirement savings
  - Scope for new regulation and tradeoffs
  - Institutional investors and big data
Thank you!