

MEASURING RISK IN ILLIQUID ASSETS

Peter Shepard

HIGH RETURNS, LOW RISK?

*“Returns from debt secured against real assets are high relative to similarly rated corporate or sovereign bonds. Financial instruments linked to infrastructure are typically **hedged against inflation** and offer **stable returns**, with **low volatility** and **little correlation** with other asset classes.”*

-Economist, March 22 2014



A NEW ASSET ALLOCATION PARADIGM IS EMERGING

CalPERS Alternative Asset Classification

Risk Class	Translating into Asset Class	Purpose	Share (In percent)	
			June 2009	July 2011
Income	Global fixed income	Deliver stable income	20	16
Growth	Public and private equity	Positively exposed to economic growth	63	63
Real	Real estate, infrastructure, and forestland	Help preserve the real value of the pension fund	10	13
Inflation-linked	Commodities and inflation-linked bonds	Provide hedging against inflation	5	4
Liquidity	Cash and nominal government bonds	Supply liquidity when needed	2	4

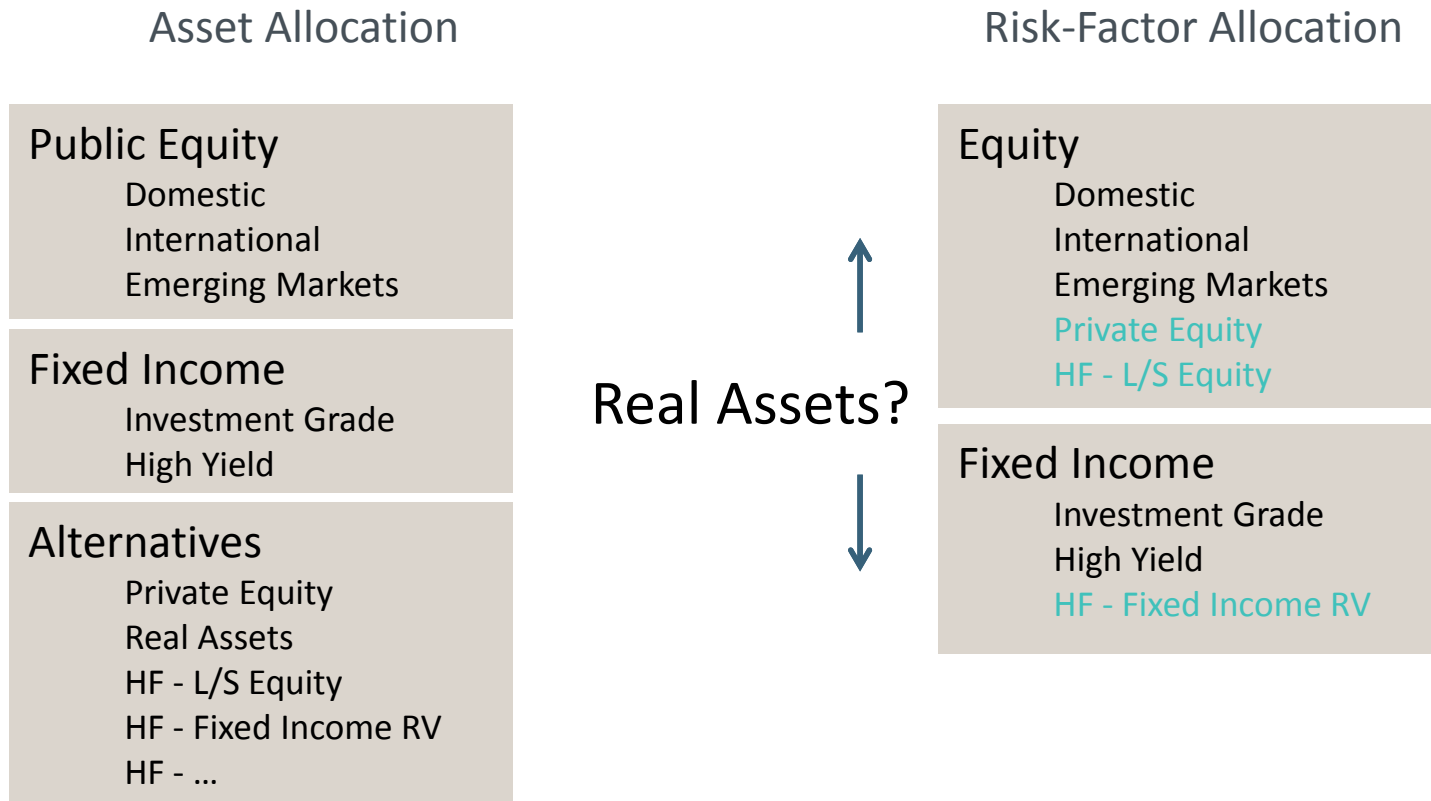
Source: CalPERS.

Alaska Permanent Fund Corporation Asset Allocation

Risk Class	Translating into Asset Class	Purpose	Share, FY2010 (In percent)
Cash	Short-term liquid investments	Meet expected liabilities and manage liquidity needs	2
Interest rates	U.S. government bonds and international government bonds of other advanced economies	Provide insurance against severe equity market corrections	6
Company exposure	U.S. and non-U.S. stocks, corporate investment-grade	Benefit in times of growth	53

Source: IMF Global Financial Stability Report, <http://www.imf.org/external/pubs/ft/gfsr/2011/02/pdf/text.pdf>

... BUT THE ROLE OF REAL ASSETS HAS BEEN UNCLEAR



How are Alternatives related to liquid assets?

AND RISK MANAGEMENT HAS BEEN SLOW TO CATCH UP

FINANCIAL TIMES

February 11, 2014 3:05 pm

Investors warned over real estate risks

By Kate Allen



Some buyers are too eager to spend, a report says

Real estate investors are **pouring into property assets** around the world but do not properly understand the risks of doing so, according to new research.

Investors in North America, Europe, Asia and Australia do not have sufficiently strong risk management procedures and have not integrated their real estate teams into their

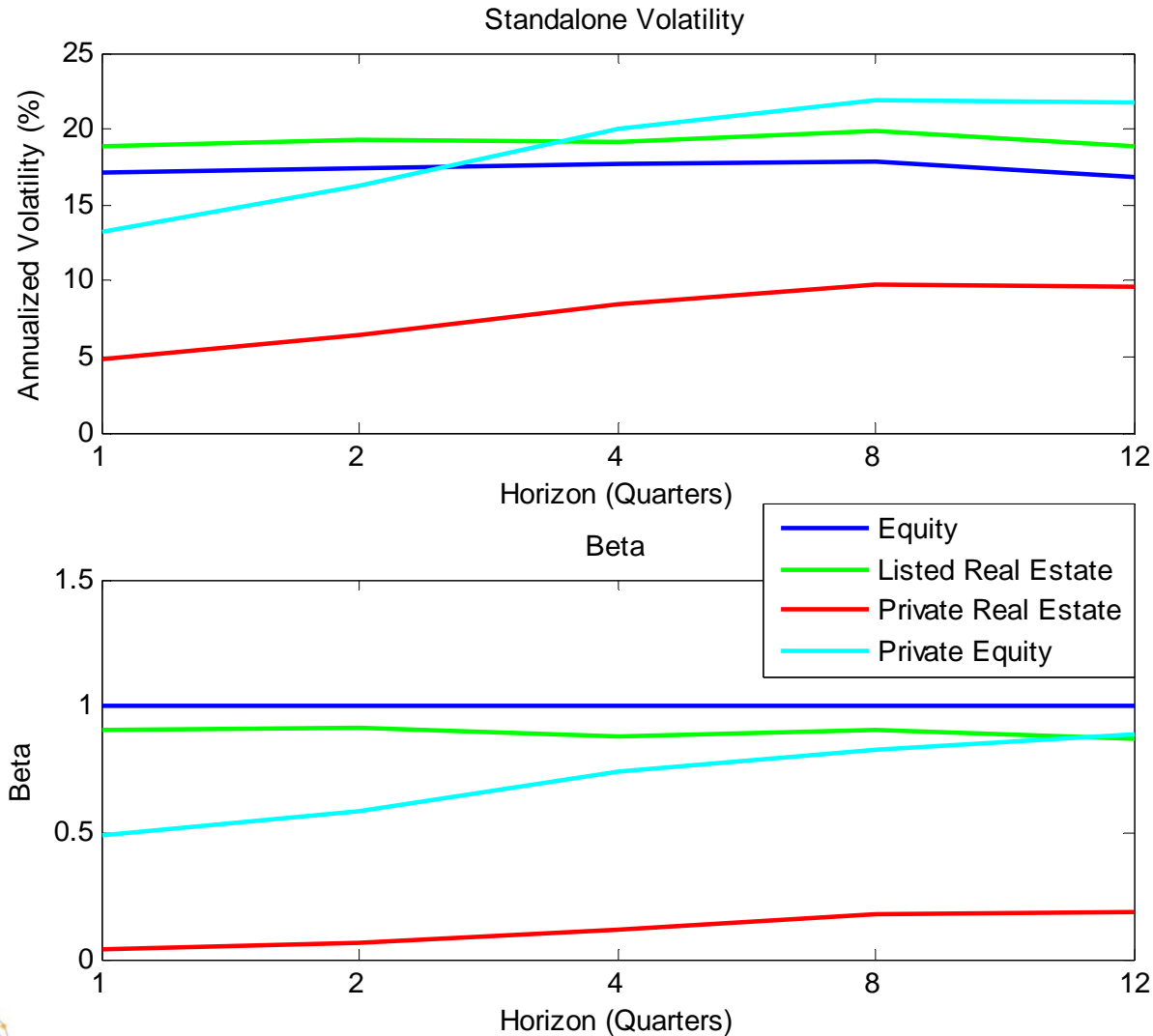
wider asset allocation systems, the report by property data specialists IPD/MSCI found.

“The investment world has begun to take up investment into real estate, but hasn’t yet got the governance processes in place to do it well. At the board level there isn’t sufficient clarity about real estate assets’ contribution to the overall risk mix.” **Roger Urwin,**
Towers Watson

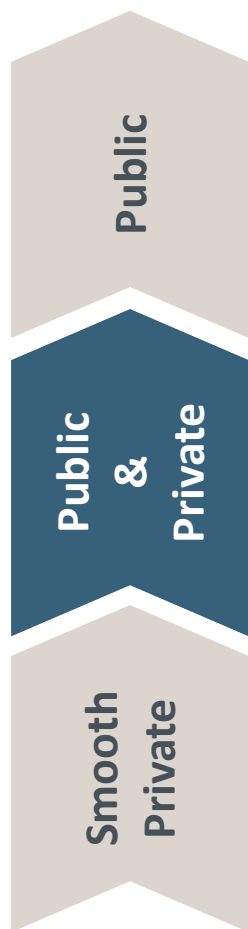
QUESTIONS

- How much do alternatives actually diversify?
- Must alternatives be managed in a silo?
- What's the affect of the home bias?
- Is performance from liquidity premium/skill or standard risk premium?
- What is real estate, anyway?
 - Bond-like?
 - » Similar exposures?
 - » Similar risk management?
 - A play on local industries?
 - Location, Location, Location?

SMOOTH VALUATIONS HIDE LONG-RUN RISK



RISK ESTIMATES FOR ALTERNATIVES



				Risk	
Public Proxies	Weight	Total Risk	Correlation	Contribution	Diversification
Total	100	8.0	1.0	8.0	1.6
Bonds	40	3.8	0.2	0.3	1.2
Public Equity	40	14.5	1.0	5.7	0.1
Private Equity	6	17.2	0.9	0.9	0.1
US Real Estate*	10	10.8	0.9	1.0	0.1
Hedge Funds	4	4.8	0.8	0.2	0.0
MSCI Model					
Total	100	7.8	1.0	7.8	2.0
Bonds	40	3.8	0.2	0.3	1.2
Public Equity	40	14.5	1.0	5.6	0.2
Private Equity	6	22.0	0.7	1.0	0.3
US Real Estate	10	10.2	0.7	0.8	0.3
Hedge Funds	4	4.8	0.8	0.2	0.0
Raw Returns					
Total	100	6.5	1.0	6.5	2.0
Bonds	40	3.8	0.2	0.4	1.2
Public Equity	40	14.5	1.0	5.6	0.2
Private Equity	6	10.2	0.4	0.2	0.4
US Real Estate	10	3.1	0.3	0.1	0.2
Hedge Funds	4	4.8	0.8	0.2	0.0

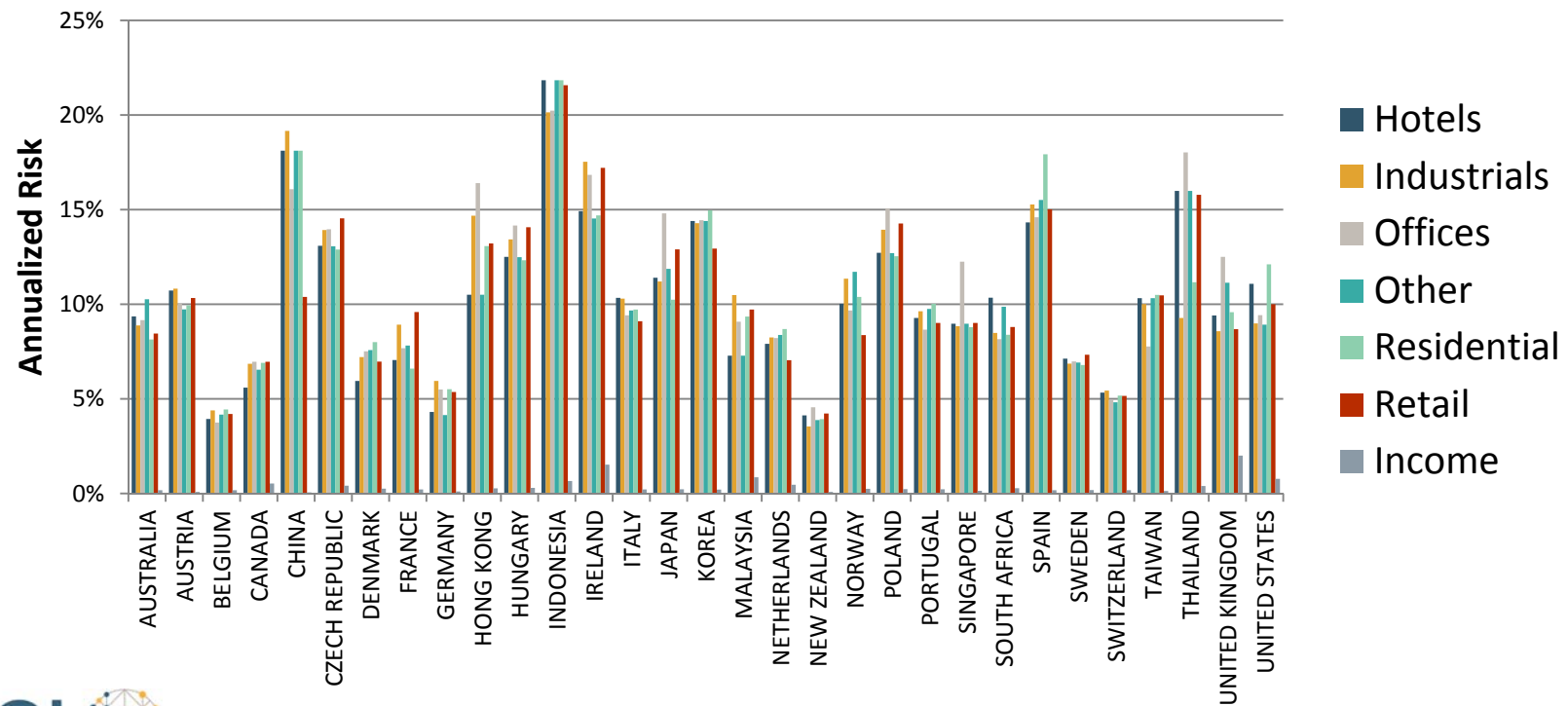


* Public risk proxies for private real estate are based on delevered REIT returns.

COUNTRY, COUNTRY, COUNTRY?

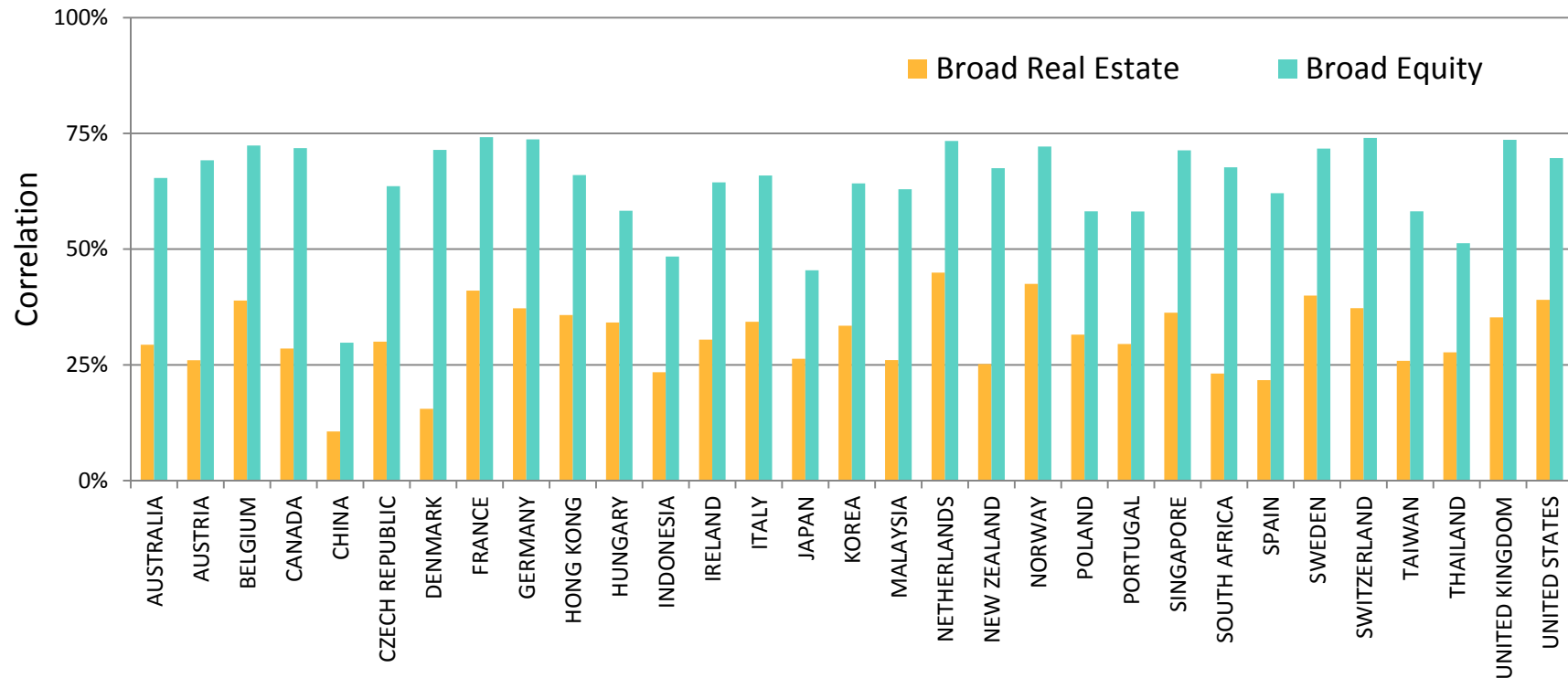
- Commonality within countries
- Global real estate is fragmented
- Income stream a smaller source of risk

Risk by Factor Type



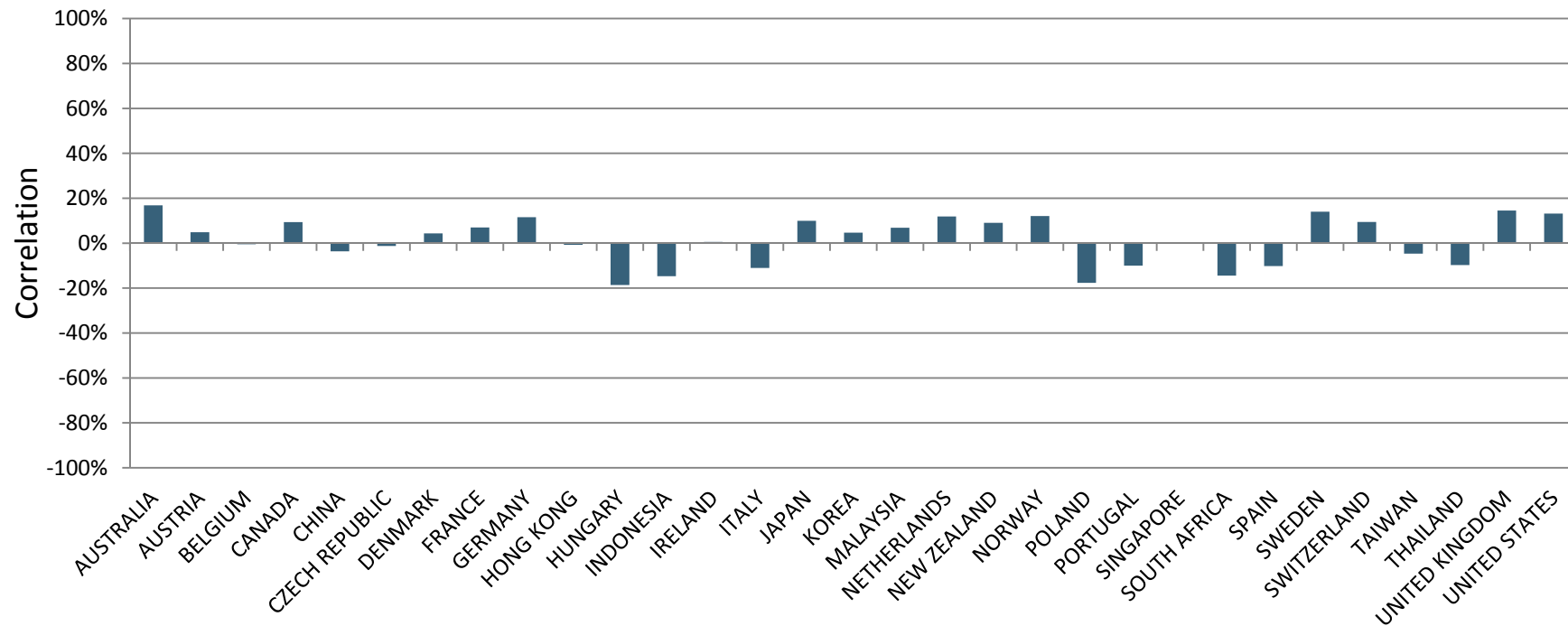
GLOBAL REAL ESTATE IS FRAGMENTED

Cross-Country Correlations



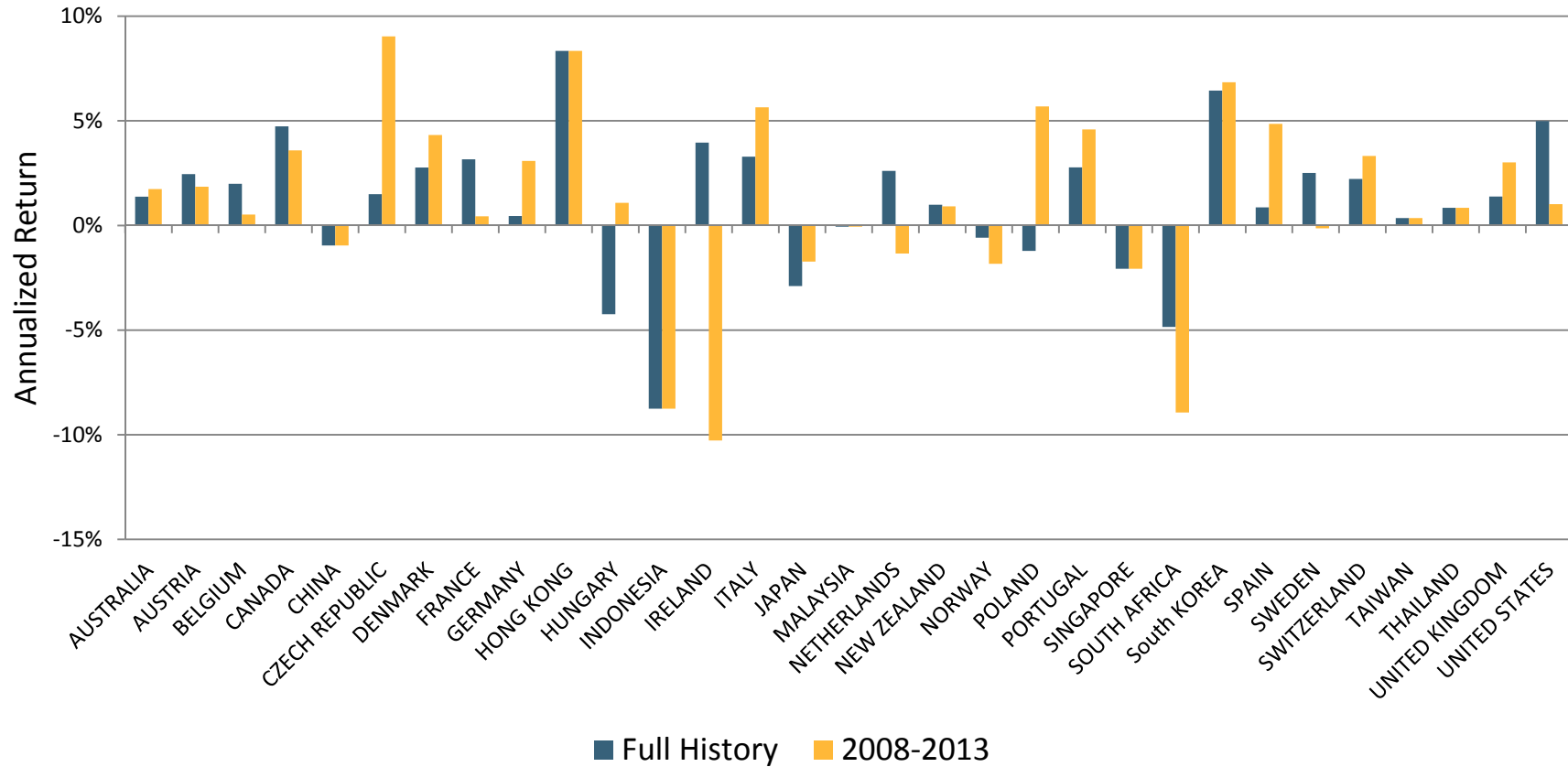
REAL ESTATE IS NOT BOND-LIKE

Correlation With Interest Rates



OUTPERFORMANCE, EVEN WITH HIGHER BETAS

Real Estate: Risk Adjusted Excess Return



QUESTIONS

- How much do alternatives actually diversify?
*At home: A little
Globally: A lot*
- Must alternatives be managed in a silo?
*No: Alternatives can be viewed
alongside traditional assets*
- What's the affect of the home bias?
Significant; more than equity
- Is performance liquidity premium/skill or standard risk premium?
*Much is risk
premium... but not all*
- What is real estate, anyway?
 - Bond-like?
Real estate is cyclical/growth-sensitive
 - » Similar exposures?
 - » Similar risk management?
 - A play on local industries?
 - Location, Location, Location?
Top-down risk factors are important

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