

**FTSE
Russell**

FTSE Russell

**Global Trends in Asset Management
Index Provider Perspective**

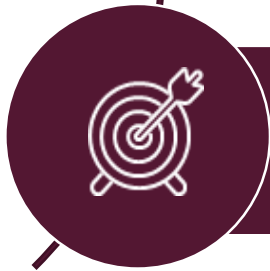
Introduction to FTSE Russell Benchmarks

Benefits of Indexing



Indexes serve as:

- Market indicators of growth potential, volatility, or trends
- Performance measurement of a fund or as reference for investment decisions
- Inputs for economic, risk, investment, and commercial research



Indexes are composed of representative instruments, so they provide real-time information on the state of the financial markets and the direction of the market

**Transparency
& Reliability**

**Market Breadth
&
Cohesiveness**

Diversification

**Smart
Investing**

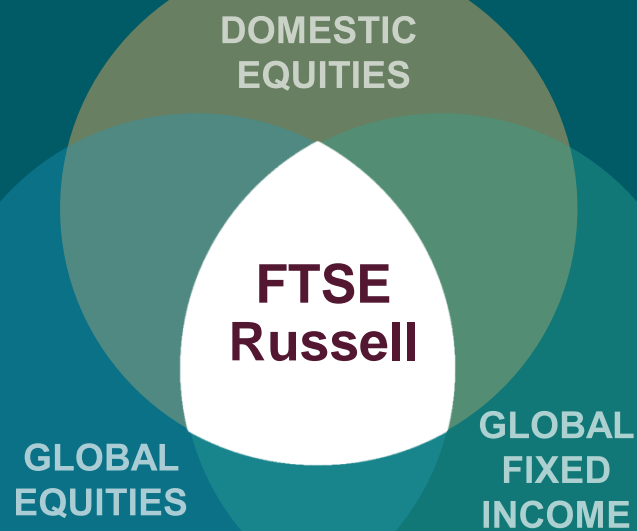
**Usability &
Accessibility**

A global leader in investment information

With industry-leading multi-asset capabilities, FTSE Russell is uniquely positioned to serve your index, analytics and investment data needs across equities and fixed income in both global and local markets world-wide.

The leader across asset classes
in both global and local markets

Provider to top investors and issuers
around the world



98/100

top asset
managers use
FTSE Russell
indexes¹

Top 10

investment
banks use
FTSE Russell
indexes²

19/20

Top global ETF
issuers work
with FTSE
Russell³

\$15T

in reported
fund AUM for
FTSE Russell
benchmarks⁴

\$3.5T

...of which
tracks our
fixed income
benchmarks⁴

72 COUNTRIES

clients served
in countries
around the
world⁵

All data in the table above are estimated by FTSE Russell.

1. Based on FTSE Russell clients as of April 2019 and Pension & Investments list of top 100 worldwide asset managers.

2. Based on FTSE Russell clients as of April 2019 and Dealogic list of top 10 investment banks.

3. Morningstar, April 30, 2019.

4. Data as of December 31, 2018 as reported on April 1, 2019 by eVestment for institutional assets, Morningstar for retail mutual funds, insurance products, and ETFs, and additional passive assets directly collected by FTSE Russell. AUM data includes blended benchmarks and excludes futures and options. AUM data will not include active and passive assets not reported to a 3rd party source or FTSE Russell. Passive assets directly collected by FTSE Russell have been removed from third party sources to prevent double counting. No assurances are given by FTSE Russell as to the accuracy of the data.

5. FTSE Russell, 2019

As global markets change, clients' needs are changing

Fixed income index-based investing is becoming more prominent

Growth in ETFs and Passive Investing

Total global ETF AUM \$4.4T as of October 2017, up 10% from end 2016. Fixed income products total \$796B, up 20% over same period.

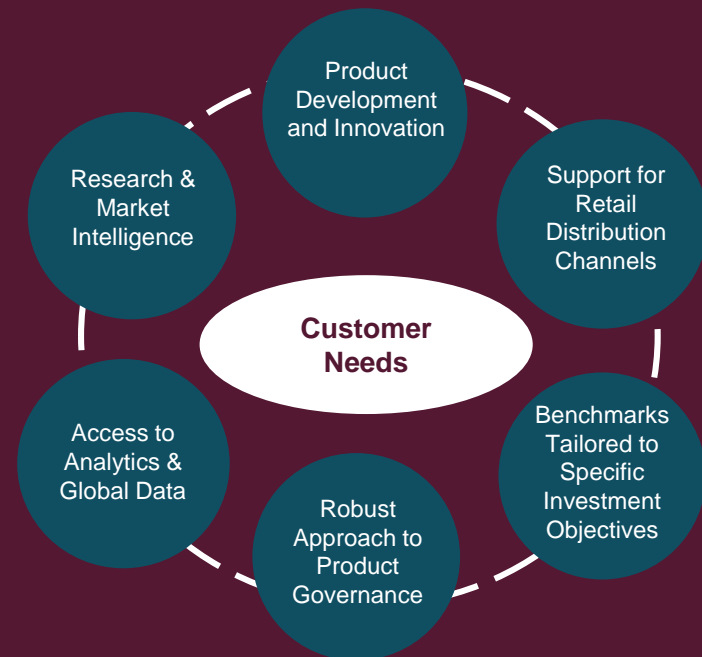
More Linkage Across Investment Types

Asset types are becoming more interrelated requiring smarter diversification and sophistication of tools to help make investment decisions.

Rise in Multi-Asset Approach

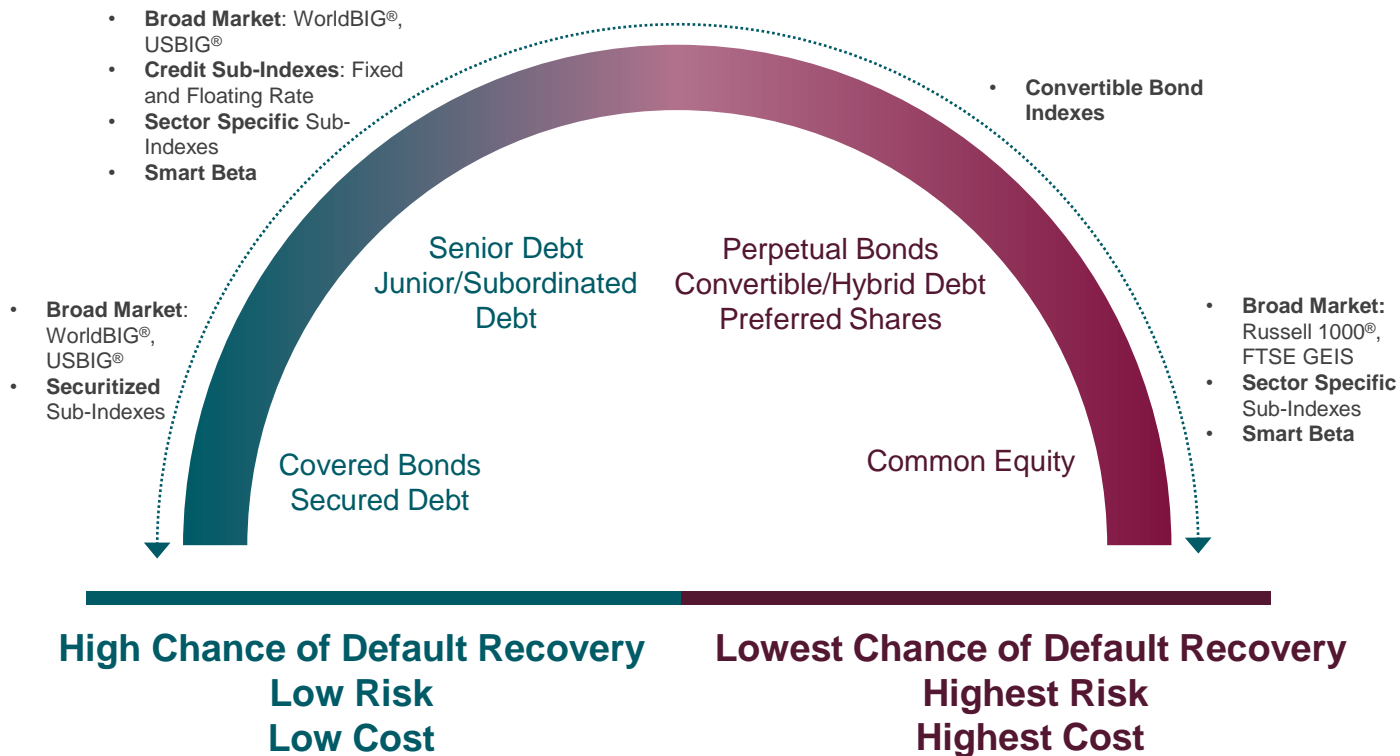
Investment themes such as ESG, smart beta, inflation and currency risk play across the equity and debt markets requiring multi-asset solutions.

As the client base for fixed income indexes expands, and shifts from institutional to retail, index providers can offer tools to help connect the dots for end users as global multi-asset partners



Having a complete picture is essential...

A comprehensive view across markets & asset classes is now necessary. FTSE Russell Index Families provide the global scale and regional expertise to meet your benchmark needs across asset classes, styles and strategies.



For Equity and Fixed Income markets:

- Headline global benchmarks
- Key local market benchmarks
- Established smart beta and factor benchmarks
- Thematic, industry specific and ESG benchmarks

Source: FTSE Russell

Against this backdrop, the industry is changing

The data and benchmark industry is consolidating as investment banks focus on their core business lines and divest benchmarking / analytics software assets



Source: FTSE Russell. For illustrative purposes only. All industry participants are not shown. Participants shown were chosen to demonstrate major acquisitions from April 2014 to June 2019. Dates shown represent when agreements to acquire were announced.

Industry Trends

Industry Trends

From a market standpoint, fixed income has grown increasingly more complex and challenging. Bond investors contend with the dual challenge of historically low yields with renewed market volatility, an inverted yield curve, trade war pressures and low inflation.

As the fixed income market has become more complex, we see an increased interest from investors in indexes that represent more sophisticated strategies.

Climate / ESG

Investors are increasingly incorporating Climate/ESG risk into their investment thesis, across asset classes.

Investors may need to diversify from domestic markets, or “green” their portfolios, with the help of a global index suite.

Need for Transparency

Complexity and volatility of markets coupled with the need to have observable information, require depth in coverage and demand for cohesive, transparent way to assess markets. The FTSE Russell Fixed Income Country Classification Framework has paved the way to provide investors with tools for assessment and stakeholder engagement.

Multi-Asset

In a period of historically low yields with renewed market volatility, investors need to explore global markets and different asset classes for yield. The search for yield across different asset classes requires local expertise and global scale, which encourages opening up of the market and diversifying portfolios.

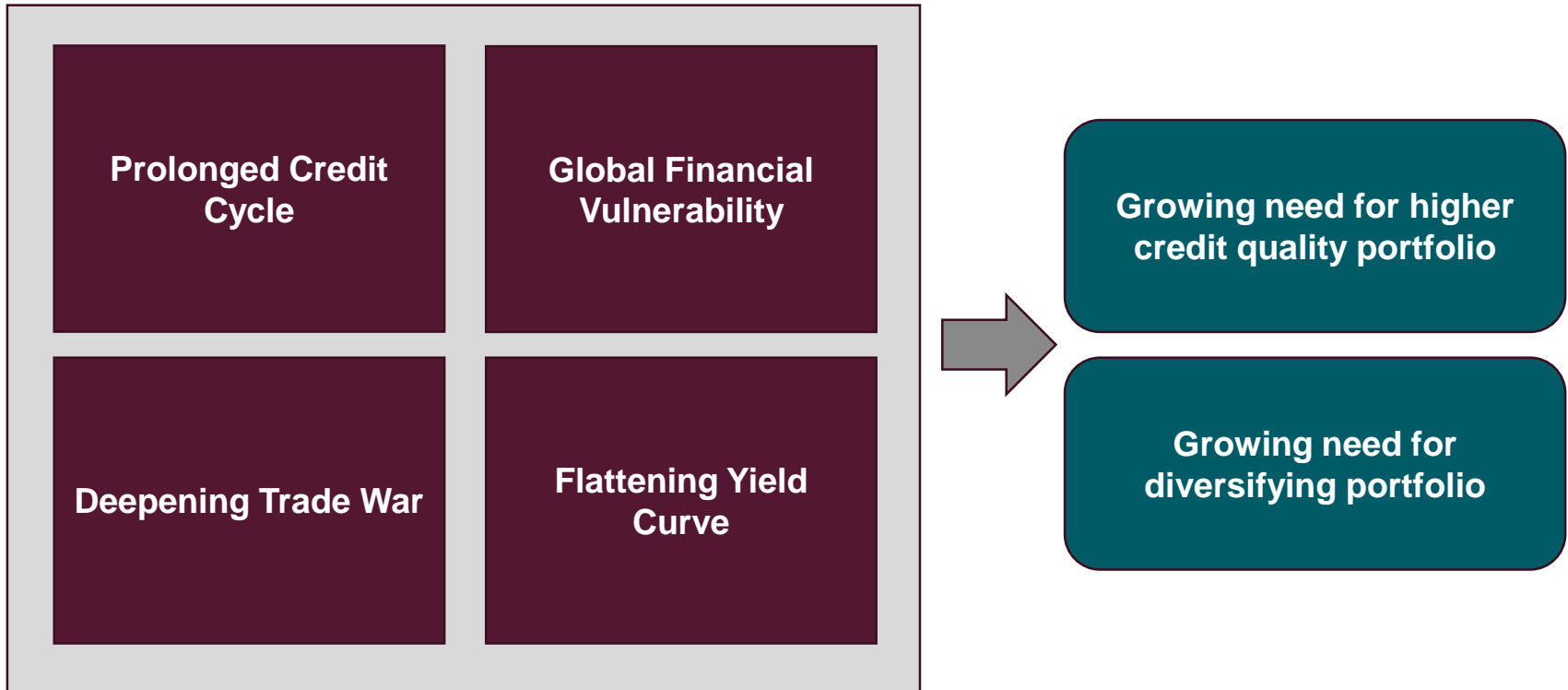
EM Investment

Global search for yield, in a low yield world, has driven investors seek yield pick up in emerging markets. This requires greater depth in coverage of both local currency and broader issuance markets, as well as understanding of structural country exposures. FTSE Russell approach to provide local market expertise and global benchmarks.

EM Fixed Income Market

Issuance by both EM Sovereigns in local currencies (LC), and EM Corporates externally, grew sharply from 2000s thanks to better macro policies and relaxation of capital controls. EM Bonds issued in 2009-14 tripled to \$1.5 Trillion, compared to \$500 Billion in 6 years pre-crisis.

Global search for yield, in a low-yield world, has driven yield convergence in EM bonds towards G7 yields, and particularly US Treasuries.



EM local currency govt. bonds and credit now a substantial asset class

	Conventional government bonds								Inflation-linked government bonds					
	Duration				Market Value				Duration			Market Value		
	3-5YR	7-10YR	20+YR	Overall	3-5YR	7-10YR	20+YR	Total	5-10YR	20+YR	Overall	5-10YR	20+YR	Total
US	3.8	7.5	18.0	6.3	1,999.7	939.1	1,543.2	9,033.1	7.2	21.2	8.1	603.42	241.96	1,388.7
UK	3.9	7.9	22.3	13.8	120.6	98.7	513.8	1,148.6	8.2	31.4	22.6	95.76	520.27	892.2
Japan	3.9	8.3	23.1	11.3	564.6	504.6	926.2	4,436.0	6.9	NA	6.6	67.71	NA	77.4
China	3.7	7.2	7.0	5.9	311.7	187.9	198.1	1,446.7						
EM	3.6	6.7	14.9	4.9	547.35	453.09	279.85	2,680.2	5.6	15.5	8.2	102.98	161.43	525.8
Germany	3.9	7.9	20.1	8.2	228.27	231.27	194.03	1,212.6	6.7	26.4	10.5	21.17	13.82	76.0
Italy	3.6	7.2	17.0	7.1	306.20	211.54	193.45	1,668.8	6.5	17.2	7.5	55.06	15.57	177.4
Spain	3.9	7.9	18.6	8.2	164.55	233.35	170.68	1,072.2	6.3	NA	7.6	30.36	NA	63.8
France	3.9	8.2	22.0	8.9	287.14	312.23	266.33	1,889.2	7.8	21.5	9.1	82.00	38.99	265.0
Sweden	4.2	7.7	NA	6.0	9.47	11.82	NA	64.3	7.4	NA	6.0	13.85	NA	25.1
Australia	3.7	7.7	19.1	7.0	52.76	111.58	14.57	373.1	6.4	22.7	9.8	11.19	6.38	34.6
NZ	3.4	7.5	NA	6.3	6.89	8.97	NA	37.0	5.8	17.1	11.2	4.08	3.32	14.7
Canada	3.7	7.9	19.9	7.0	67.52	48.02	57.99	364.5	6.4	22.5	15.2	6.41	22.48	15.2

	Investment grade bonds										High Yield	
	Duration					Market Value					Duration	MktVal
	AAA	AA	A	BBB	Overall	AAA	AA	A	BBB	Overall		
US	11.3	7.7	8.0	7.4	7.7	105.6	509.7	2,306.4	2,947.3	5,869.0	6.5	1,044.0
Euro	7.3	5.3	5.5	5.1	5.3	11.6	215.4	1,023.6	1,271.6	2,522.1	3.4	365.1
EM	NA	5.8	5.5	5.4	5.5	NA	26.37	214.91	417.9	659.2	7.1	334.8

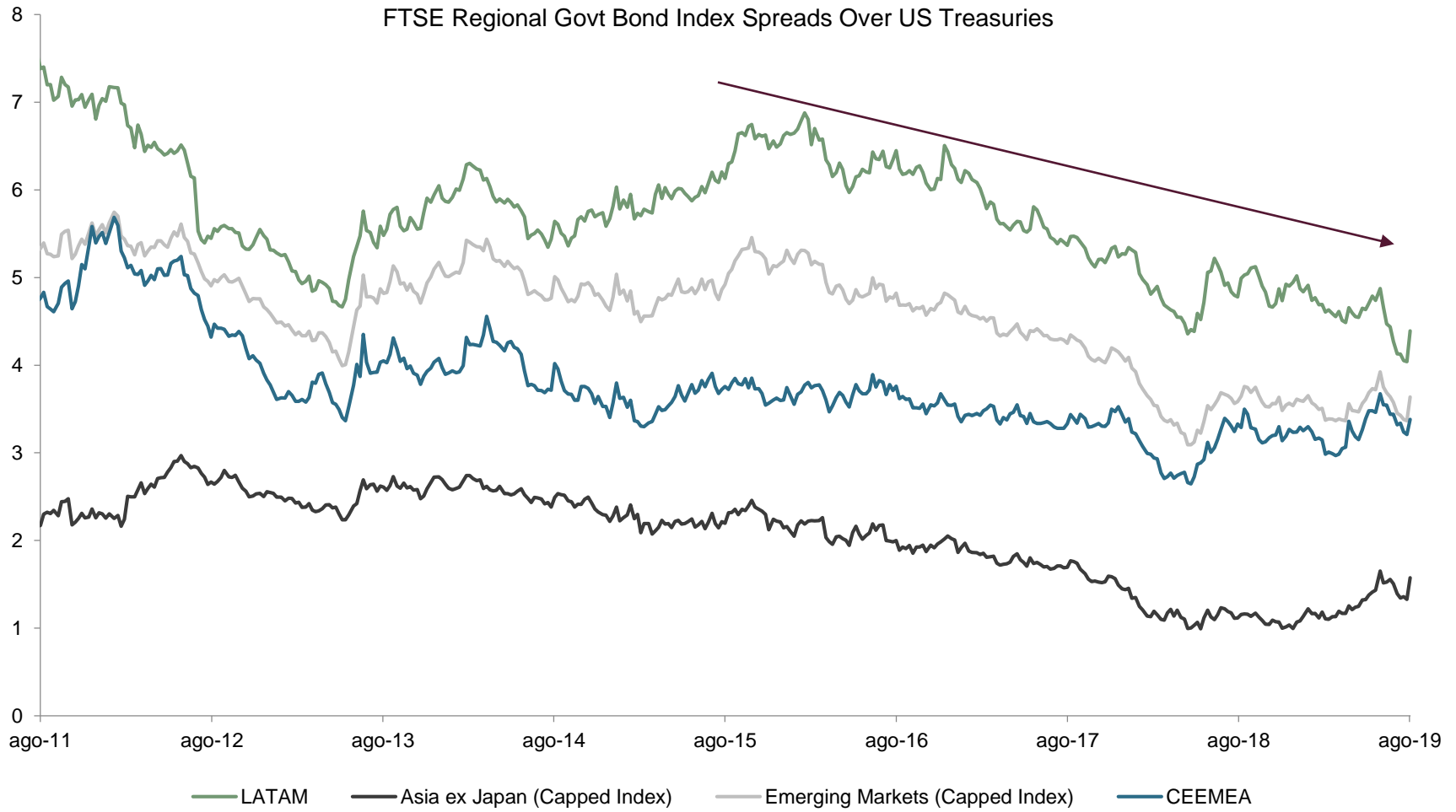
Source: FTSE Russell

Synchronized slowdown in global growth – with China as the exception

Consensus 2019 GDP Forecasts			
	Current	6 Months Ago	Change in GDP Forecasts
US	2.4	↓ 2.5	-10
UK	1.3	↓ 1.4	-10
Eurozone	1.2	↓ 1.8	-60
Japan	0.6	↓ 1.2	-60
China	6.3	↑ 6.2	10

Source: FTSE Russell, Refinitiv, April 2019. Past performance is no guarantee of future results. Please see end for important legal disclosures.

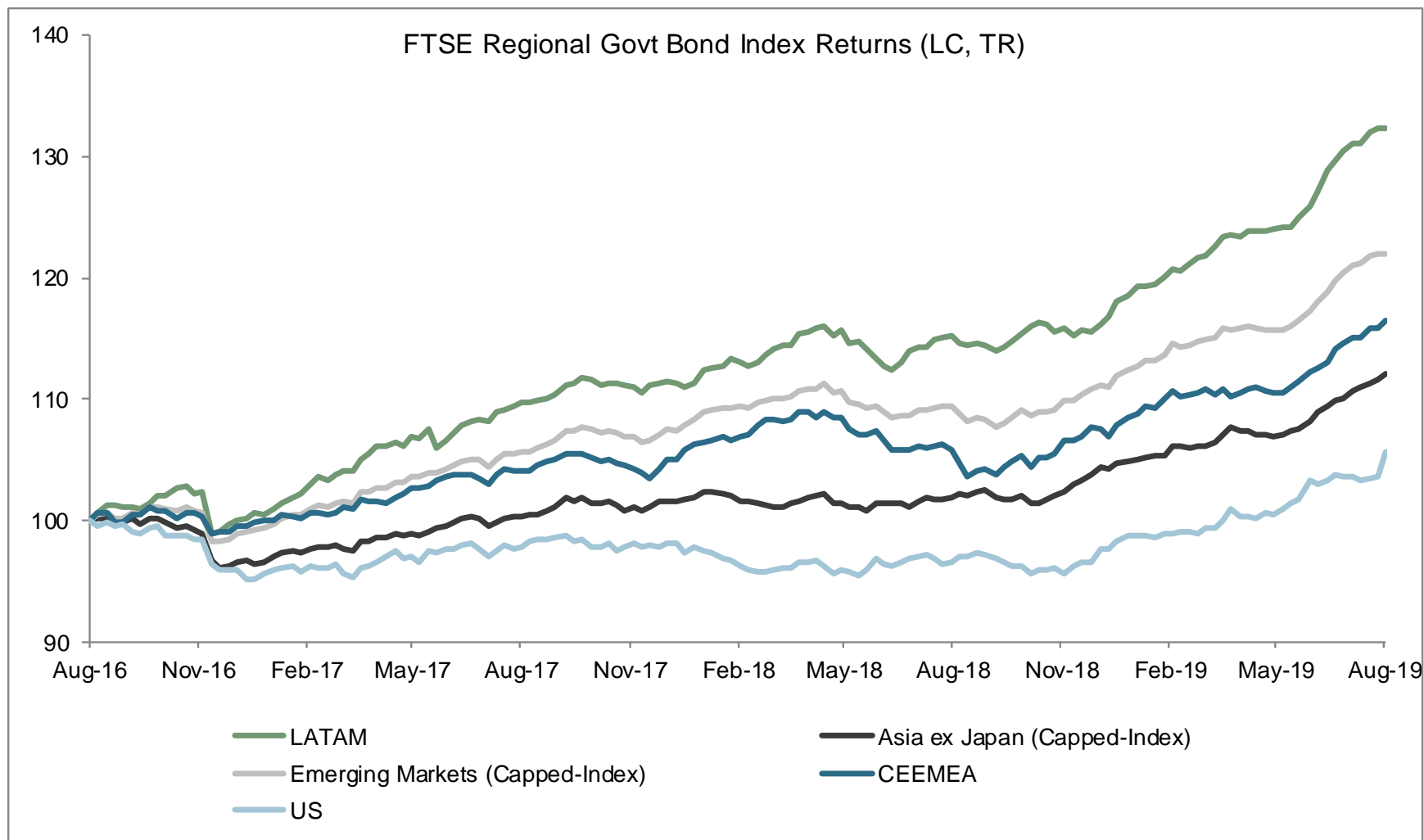
....so spreads versus US Treasuries fell, as global search for yield intensified



Source: FTSE Russell as of August 2019. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

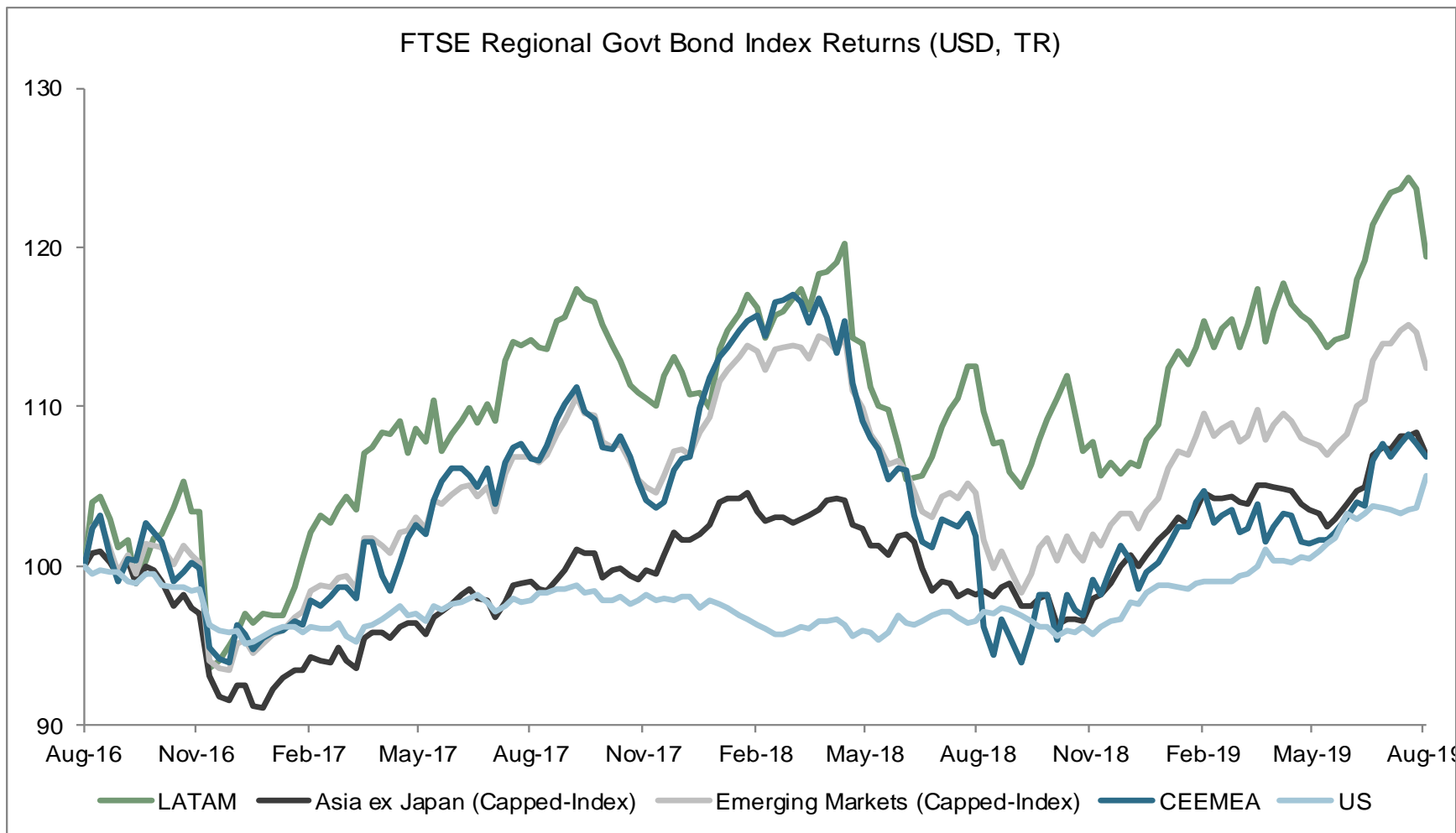
EM Bond Market

Outperforming US Treasuries since 2016, with LATAM strongest relative returns



Source: FTSE Russell as of August 2019. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

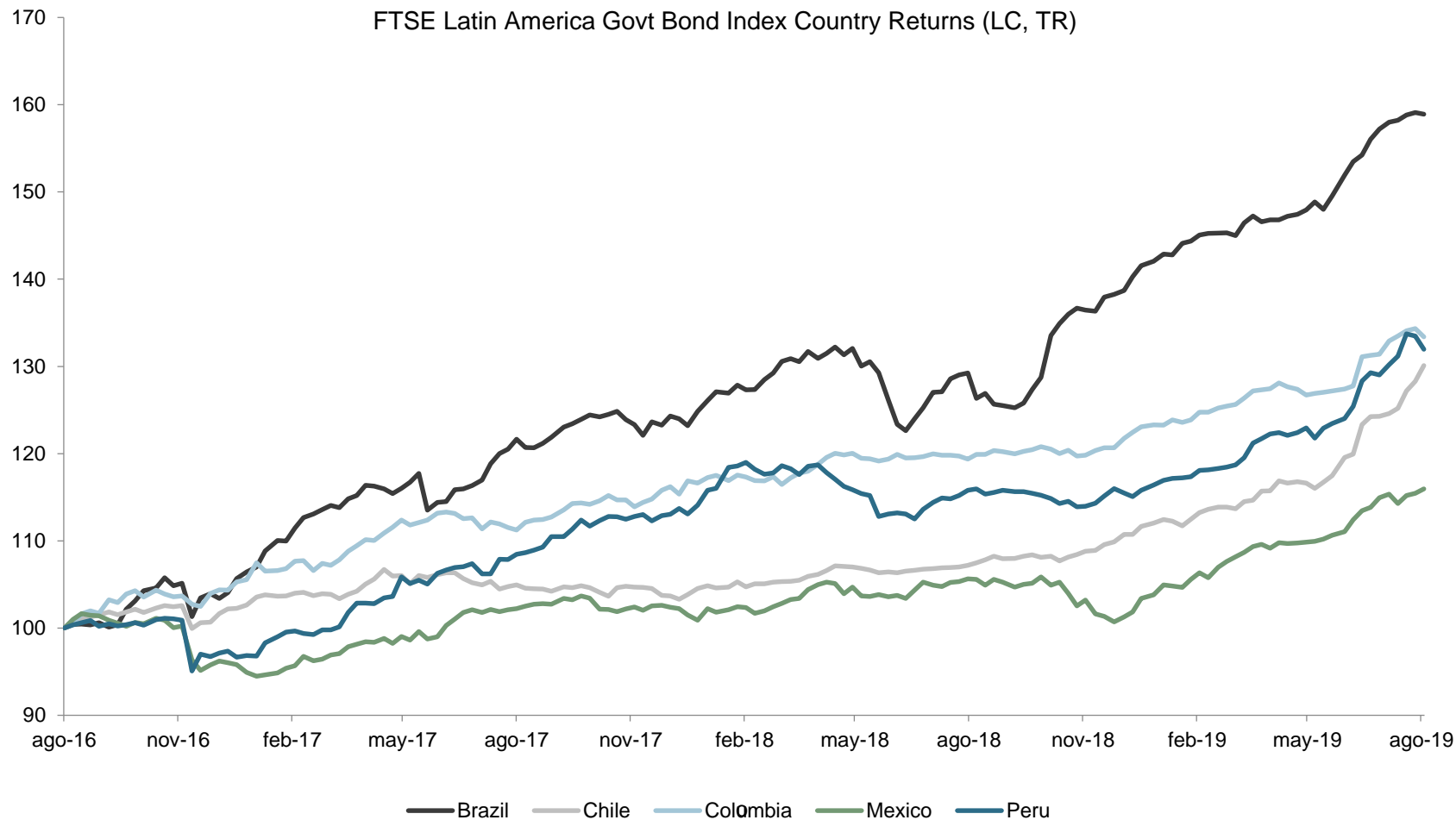
...and EM bond markets also outperformed in US dollar terms, since 2016, led by Latam



Source: FTSE Russell as of August 2019. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

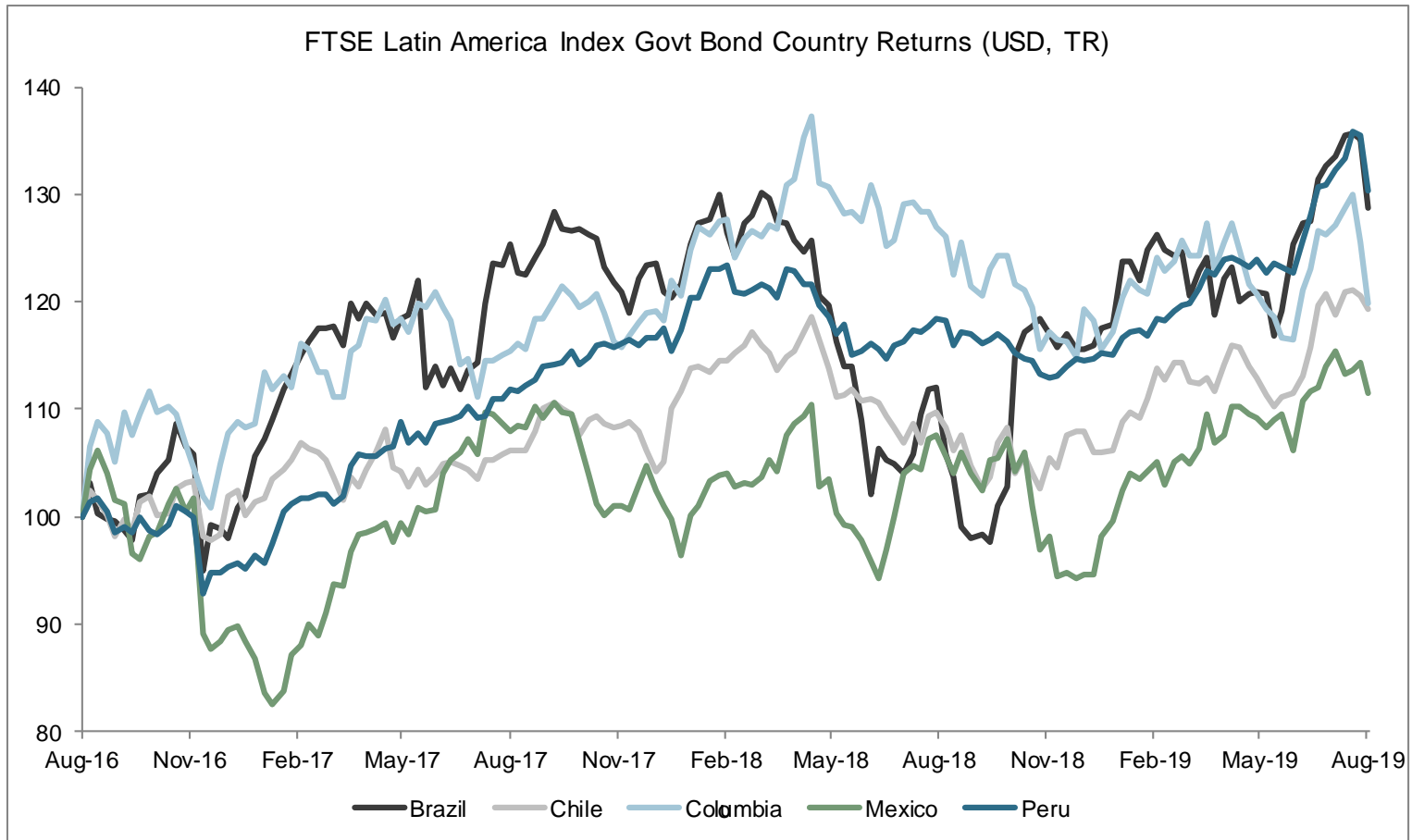
LATAM Bond Market

Brazil strongest, and Colombia outperforming other markets



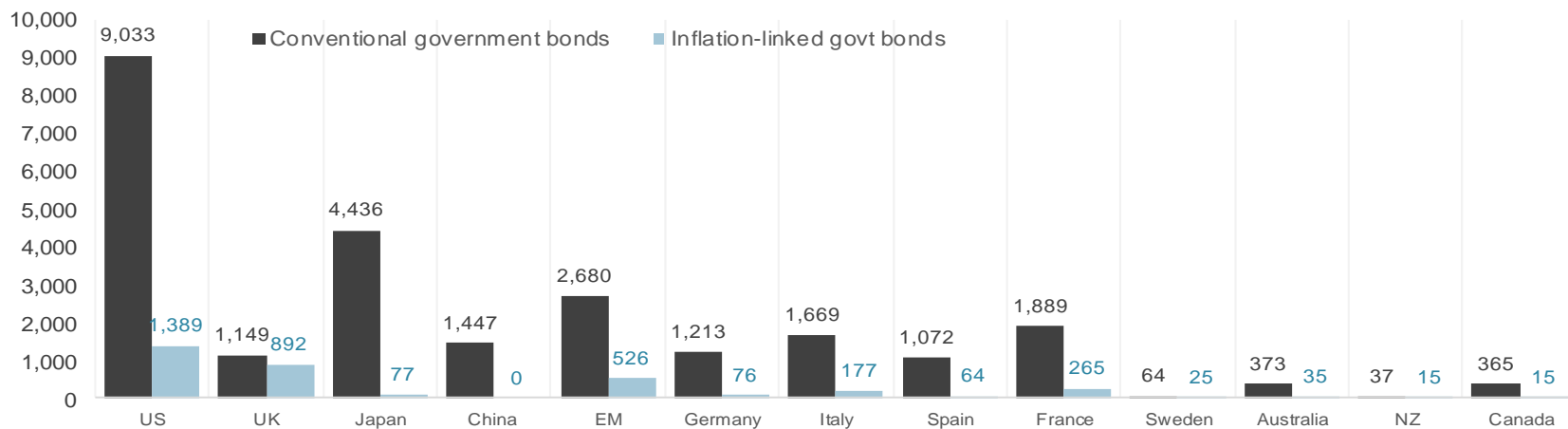
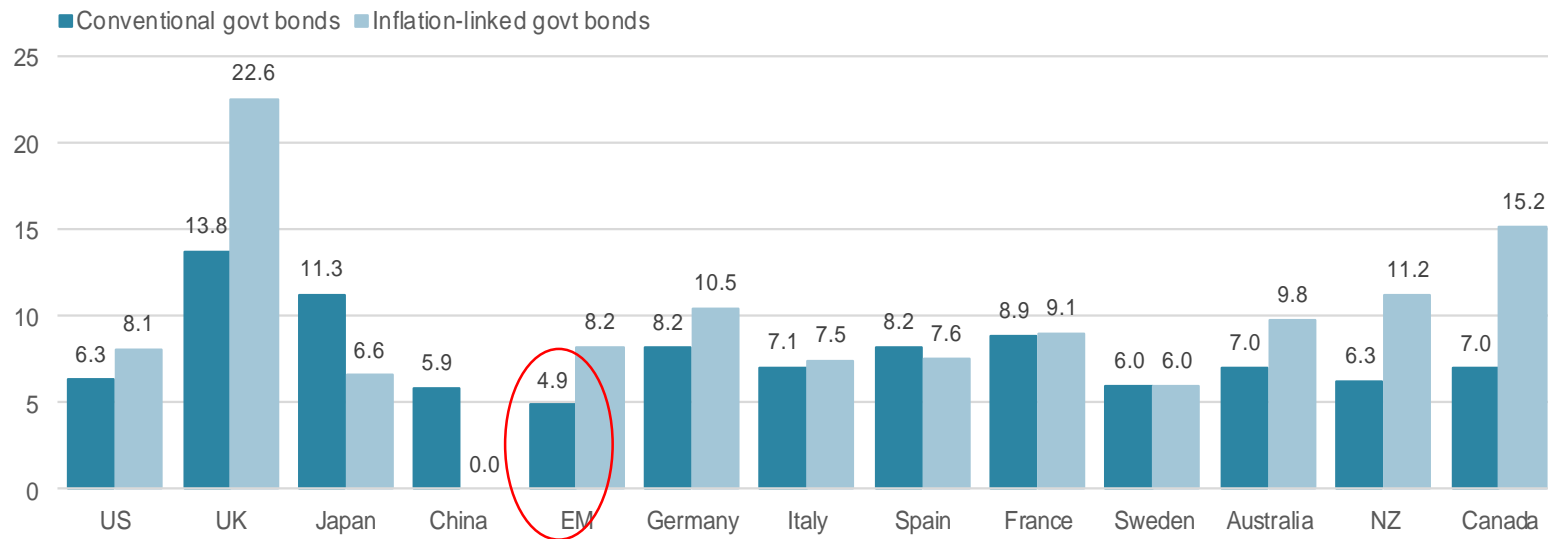
Source: FTSE Russell as of August 2019. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

...and also outperformed in US dollar terms

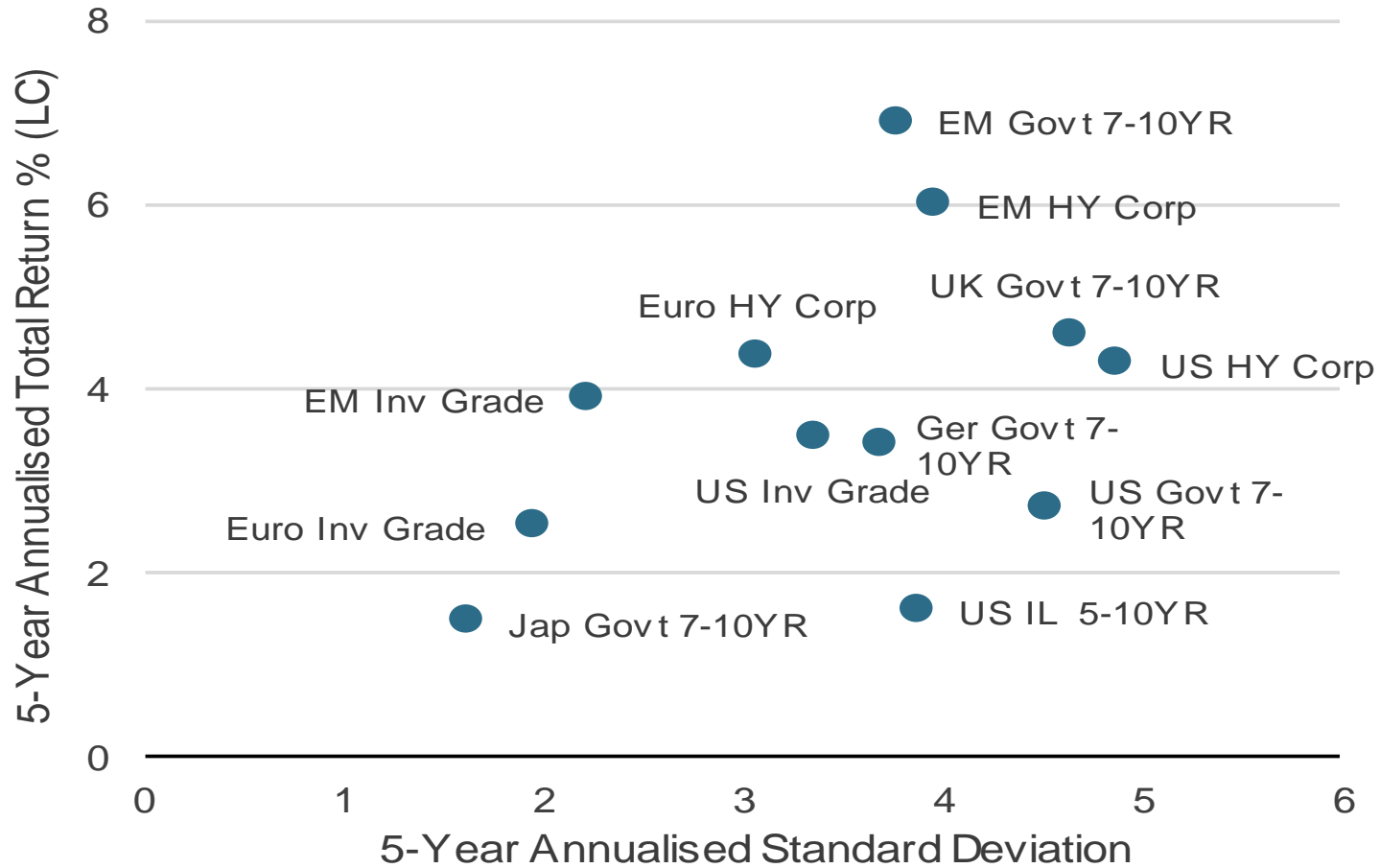


Source: FTSE Russell as of August 2019. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

EM (local currency) govt. bonds have shorter duration than US Treasuries, which helps explain lower volatility of returns



This is also evident in last 5 yrs' returns, and favourable EM risk/return profile



Source: FTSE Russell, Refinitiv, April 2019. Past performance is no guarantee of future results. Please see the end for important legal disclosures..

Fixed Income – LATAM Index Coverage

FTSE LATAM Broad Corporate Bond Index - Capped

FTSE Latin American Broad Corporate Bond Index – Capped

- Investment-grade and high-yield US Dollar denominated debt issued by corporations in Latin America & the Caribbean
- Eligibility criteria includes minimum maturity, minimum and maximum issue size, and credit quality
- The index caps the par amount of any single issuer at USD \$10bn to limit exposure to any single issuer
- The index is a broad benchmark for the corporate market in Latin America

FTSE LATAMGBI

FTSE Latin American Government Bond Index (LATAMGBI)

- Local currency government bonds
- The index is a broad benchmark for Latin American markets:
 - Brazil
 - Chile
 - Colombia
 - Mexico
 - Peru
- Each of the countries included is also available as a stand-alone index

FTSE PiP

The FTSE PiP Partnership

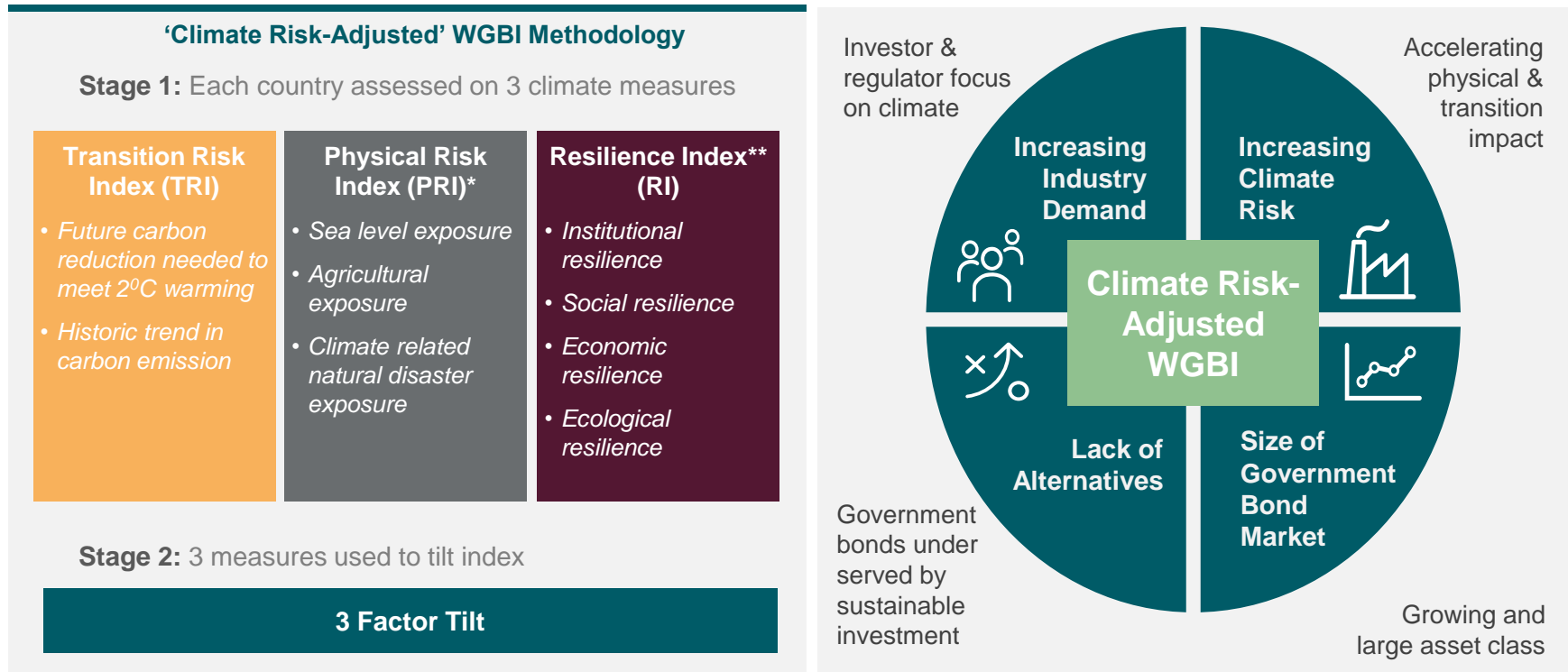
Exploiting local expertise to produce best in class coverage of LATAM markets: Colombia, Mexico, Peru.

Deep index coverage, in local market and global benchmarks, coupled with the growing role of benchmark driven investment, carries the benefit of increased access to diverse pool of finance

Climate / ESG

FTSE Climate Risk-Adjusted WGBI

Converging trends point to the need for a 'Climate Risk-Adjusted' government bond index product



- **50 countries** quantitatively assessed on these three climate pillars. The scores for the 22 countries in the WGBI are then used to tilt the index away from the market value weights
- The index aims to achieve a meaningful reduction in climate risk, retain replicability and minimize tracking error and turnover

Background & Objectives of Climate WGBI

Climate change is material and a growing source of risk for government bond investors

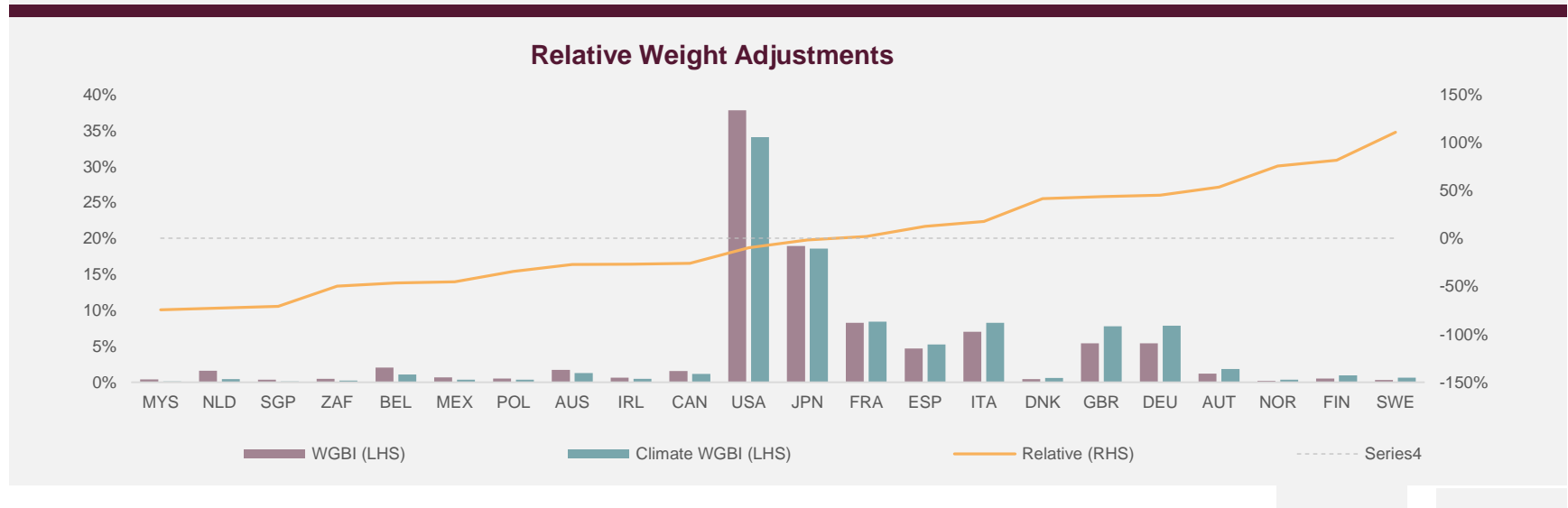
A quantitative approach can be used to assess the relative climate risk faced by countries

Climate WGBI has been designed as a Sustainable alternative for passive government bond investors

- Government bond investors are uniquely exposed to the cost and risks of climate change
- Therefore, Government bond investors should consider climate risk in their investment processes for government bonds, alongside traditional risk measures
- Quantitative assessments, using Beyond Ratings expertise, can be made across the three climate risk pillars of transition risk, physical risk and resilience
- The resulting country score has been used to finesse exposures to government bond markets on the basis of relative climate risk
- Offers a sustainable alternative to an under served and large financial market
- The index closely emulates the index characteristics of the conventional index, provides tangible GHG emissions saving without introducing an unacceptable tracking error

FTSE Climate WGBI Country Exposure

- **Country climate scores are adjusted annually**
- **Monthly market value weights are tilted by annual country scores**
 - Largest absolute weight impact comes from underweighting US (due to poor transition risk score)
 - The US treasury market is the largest government bond market in the world and accounts for 38% of WGBI market value weight
 - The Climate WGBI underweights US by 3%



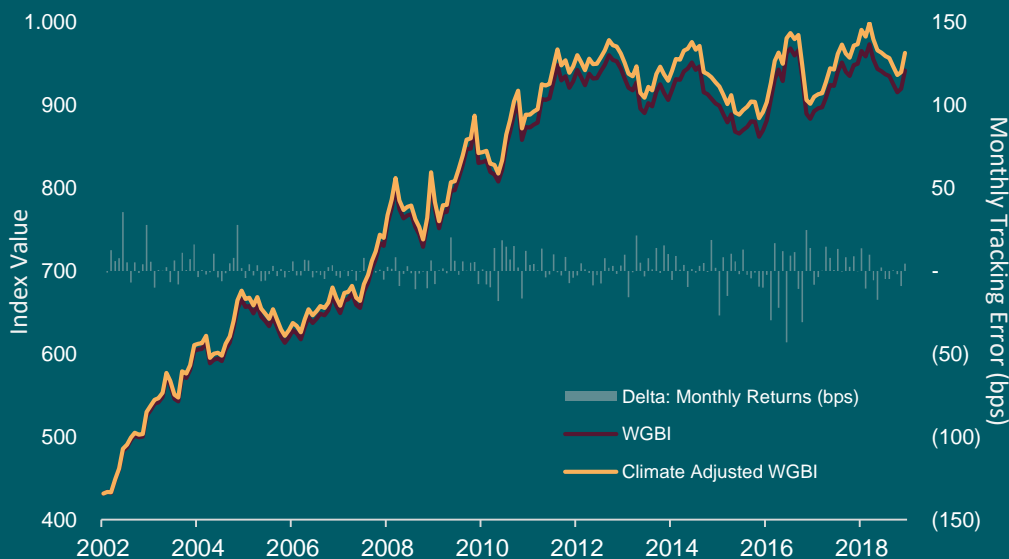
Source: FTSE Russell & Beyond Ratings as of July 2019.

Past performance is no guarantee of future results. Data shown represents hypothetical, historical data. Please see the end for important legal disclosures.

Performance of Climate WGBI vs WGBI

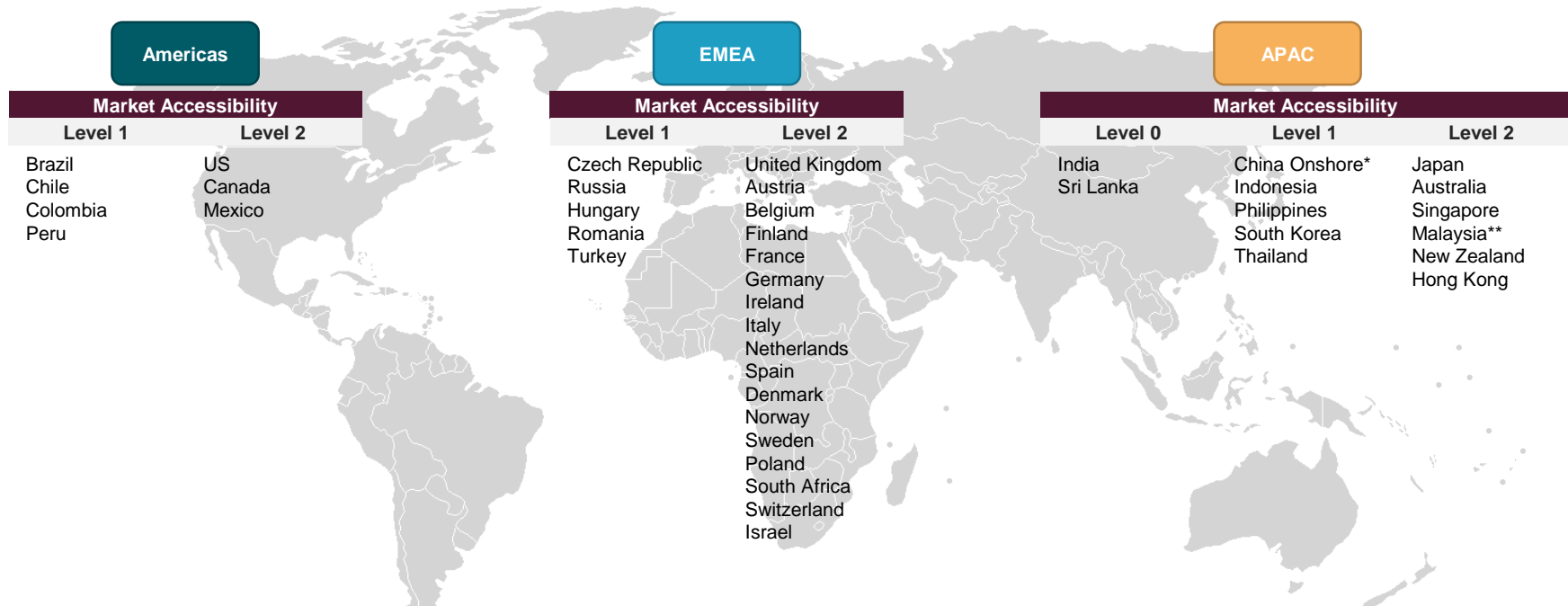
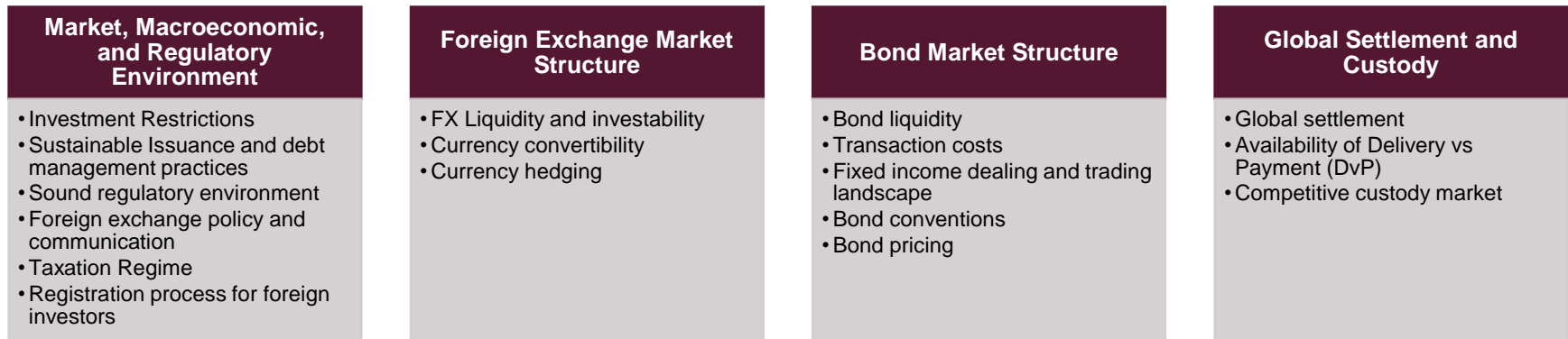
- **Climate WGBI has outperformed WGBI since 2002 (USD unhedged)**
- **Tilts of underlying climate factors aim to:**
 - Achieve meaningful Climate benefit for sensible deviations from the underlying index
 - Ensure other index characteristics do not deviate drastically from the WGBI e.g. index turnover, duration, underlying country weights
- **Potential to define custom indexes through adjustment of tilts to underlying Climate factors, to accommodate all investment objectives/preferences**

Performance of Climate Adjusted WGBI



Metric	WGBI	Climate WGBI
Annualized Return	4.70%	4.84%
Annualized Volatility	6.65%	6.76%
Risk Adjusted Returns	0.707	0.715
Tracking error		9.7bp
Av. Monthly Turnover	1.87%	2.03%
Sortino Ratio	1.16	1.19
Calmar Ratio	0.46	0.50
Max Drawdown (End date)	-10.26% (Nov 2015)	-9.60% (Nov 2015)
Av GHG Emissions	13,390	12,390
Av. GHG Emissions Reduction		1,000 (7.5%)

Fixed Income Country Classification Framework



*China Onshore: on Watch List for potential upgrade to Level 2

** Malaysia: on Watch List for potential downgrade to Level 1

*** Markets where FTSE Russell may introduce tracking: Nigeria, Vietnam, Saudi Arabia, Croatia, Argentina

Source: FTSE Russell, Classification as of July 2019

Fixed Income Country Classification Process

Elements of the FTSE Fixed Income Country Classification Approach

Determination of Market Accessibility Levels

- A “Market Accessibility Level” of 0, 1 or 2 is assigned for each fixed-rate government market based on its fulfilment of a set of transparent criteria. A level of ‘2’ is assumed to already satisfy the levels ‘1’ and ‘0’ thresholds
- Levels are assigned according to a framework of relevant criteria, covering: (1) Market, Macroeconomic and Regulatory Environment, (2) Foreign Exchange Market, (3) Bond Market Structure, and (4) Global Settlement and Custody
- These levels have been incorporated into the inclusion criteria of the multi-currency FTSE WGBI and EMGBI, and benchmarks that derive their membership from them, effective March 30, 2019
- Market Accessibility Levels are also available for use in custom indexes

Annual Review Cycle

- Market Accessibility Levels are evaluated annually each September, with an interim update in March
- Assessment is based on feedback from market participants on the degree to which countries meet the stated criteria
- Any changes to benchmark inclusion that result from changes to Market Accessibility Levels and corresponding implementation details will also be announced after the September review

Governance

- Governance Oversight by the Regional Fixed Income Advisory Committees, the Country Classification Advisory Committee, the FTSE Russell Policy Advisory Board and the FTSE Russell Product Governance Board

Watch List

- A Watch List of fixed income local markets that are on the cusp of meeting the criteria for either a higher or lower Market Accessibility Level is maintained to give asset allocators a clear view of expected future index evolution
- Inclusion of a market on the Watch List signals our intent to engage with governments, central banks and regulators to address specific feedback from investors on the fulfilment of the criteria for the proposed accessibility level























































Objective Criteria

- Effective March 30, 2019, the application of objective market inclusion criteria (market size and credit rating) for the FTSE WGBI and FTSE EMGBI will also be synchronized to the annual cycle of Market Accessibility Level review

EM Country List

- Publication and annual review of the FTSE fixed income emerging and developed market designations.

Criteria for Market Accessibility Levels

Criterion must be fully met:  Criterion may be partially met:  Criterion is not applicable: 	Level 2 (i.e., WGBI)	Level 1 (i.e., EMGBI)	Level 0
	Minimum Requirement	Minimum Requirement	Minimum Requirements
1. Market, Macroeconomic and Regulation			
No Unduly Investment Restrictions on Foreign Investors			
Sustainable Issuance and Debt Management Practices Supportive of Market Liquidity			
Sound Regulatory Environment			
Transparent FX Policy and Communication			
Taxation Regime not Burdensome to Foreigners			
Clear Registration Process for Foreign Investors			
2. Foreign Exchange Market Structure			
Sufficient FX Liquidity and Investability			
No Overly Prohibitive Currency Restrictions for Investment Purposes			
Currency Hedging Onshore or Offshore using NDF with Limited Divergence to Onshore			
3. Bond Market Structure			
Sufficient Bond Liquidity in Primary and Secondary Markets			
Competitive Transaction Costs			
Efficient Fixed Income Dealing and Trading Landscape			
Bond Conventions that Support Index Calculations			
Availability of Suitable Bond Pricing for Index Calculation			
4. Global Settlement and Custody			
Settlement Accommodative of Global Investors			
Availability of DvP			
Competitive Custody Market			

Local Market Tracking and Index Inclusion

Fixed-Rate Local Currency Government Markets Tracked by FTSE Indexes

Region	Country	Currency	EM vs DM Designation	Watch List	Market Accessibility Level	FTSE WGBI	FTSE EMGBI	FTSE EMGBI Additional Markets	Regional Benchmarks *	Index Credit Rating	Market Size AO USD bn*
Americas	US	USD	Developed		2	•				AA+	7,981.2
	Canada	CAD	Developed		2	•				AAA	319.0
	Mexico	MXN	Emerging		2	•	•		•	A-	135.8
	Brazil	BRL	Emerging		1		•		•	BB-	100.0
	Chile	CLP	Emerging		1		•		•	AA-	30.9
	Colombia	COP	Emerging		1		•		•	BBB	54.2
	Peru	PEN	Emerging		1		•		•	A-	28.7
EMEA	United Kingdom	GBP	Developed		2	•				AA	937.3
	Eurozone*	EUR	Developed		2	•				AA-	5,919.7
	Denmark	DKK	Developed		2	•				AAA	75.4
	Norway	NOK	Developed		2	•				AAA	38.8
	Sweden	SEK	Developed		2	•				AAA	60.6
	Switzerland	CHF	Developed		2	•				AAA	19.0
	Poland	PLN	Developed		2	•	•		•	A	104.9
	South Africa	ZAR	Emerging		2	•	•		•	BBB-	107.8
	Czech Republic	CZK	Developed		1				•	AA	40.0
	Israel	ILS	Developed		2				•	AA-	50.6
	Russia	RUB	Emerging		1		•		•	BBB	70.0
	Hungary	HUF	Emerging		1		•		•	BBB-	38.5
	Romania	RON	Emerging		1		•		•	BBB-	29.2
Turkey	TRY	Emerging		1		•		•	BB-	57.9	
APAC	Japan	JPY	Developed		2	•				A+	3,738.0
	Australia	AUD	Developed		2	•			•	AAA	331.5
	Singapore	SGD	Developed		2	•			•	AAA	66.2
	Malaysia	MYR	Emerging	•	2	•	•		•	A	78.7
	New Zealand	NZD	Developed		2				•	AA+	35.7
	South Korea	KRW	Developed		1				•	AA	468.1
	Hong Kong	HKD	Developed		1				•	AA+	11.1
	China Onshore	CNY	Emerging	•	1		•		•	A+	1,359.2
	Indonesia	IDR	Emerging		1		•		•	BBB-	119.3
	Philippines	PHP	Emerging		1		•		•	BBB	43.1
	India	INR	Emerging		0			•	•	BBB-	706.8
	Sri Lanka	LKR	Emerging		0			•		B	10.7
	Thailand	THB	Emerging		1		•		•	A-	92.3

*Source: FTSE Russell. Market Size as of December 2018. Eurozone markets eligible for the WGBI include: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Netherlands, and Spain.

Regional benchmarks include: FTSE Central and Eastern Europe, Middle East, and Africa Government Bond Index (CEEMEAGBI), FTSE Latin America Government Bond Index (LATAMGBI), FTSE Asian Government Bond Index (AGBI), FTSE Asia Pacific Government Bond Index (APGBI).

Multi-Asset Investment

The FTSE Russell Vision



Investment solutions increasingly require sophisticated and integrated data, analytics and investment strategies **across multiple asset classes**. To get ahead, investors need an indexing solution which meets these requirements.

Data

Integrated cross-asset provision of static, market, fundamental, ESG & alternative data, all consistently mapped & structured

Analytics

Fully integrated risk models covering major asset classes, alongside a full suite of supporting portfolio & security level analytics (risk, performance, optimisation)

Indexing

Strength in depth across all major public & private asset classes, supported by true bottom-up multi-asset indexing capabilities

Extensive Data Coverage

Full coverage of equity, FI, alternatives and private assets, fundamental, ESG, macro and alternative data sets.



Fully Integrated Database

Database solutions fully integrated across asset classes, including capital structure mapping.

Cross-Asset Risk Factors

Integrated risk framework with depth & specialism across all major asset classes. Full integration with index design.



Supporting Analytics

Supporting best-in-class analytics, including risk, performance, optimisation, VaR & TE etc.



Cross-Asset Indexing Platform

True 'bottom up' Multi-Asset indexing, combining major asset classes with associated risk & data support.



Sophisticated Solutions

Full suite of risk factors, scenario analysis, optimisation and other advanced features to support solution design.



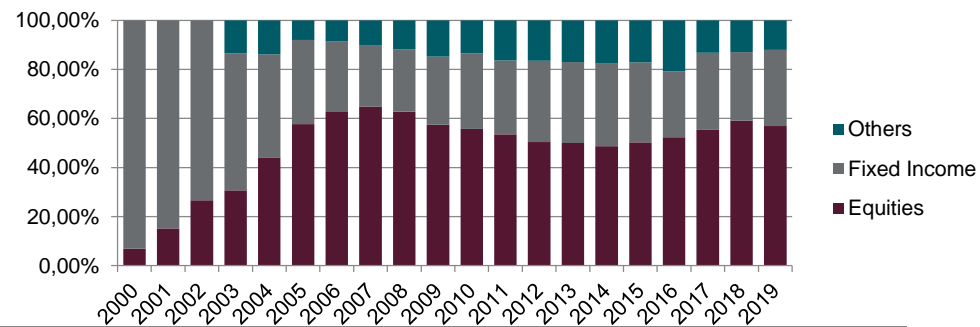
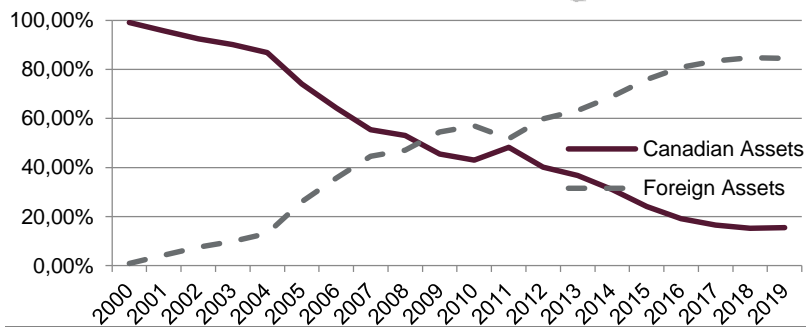
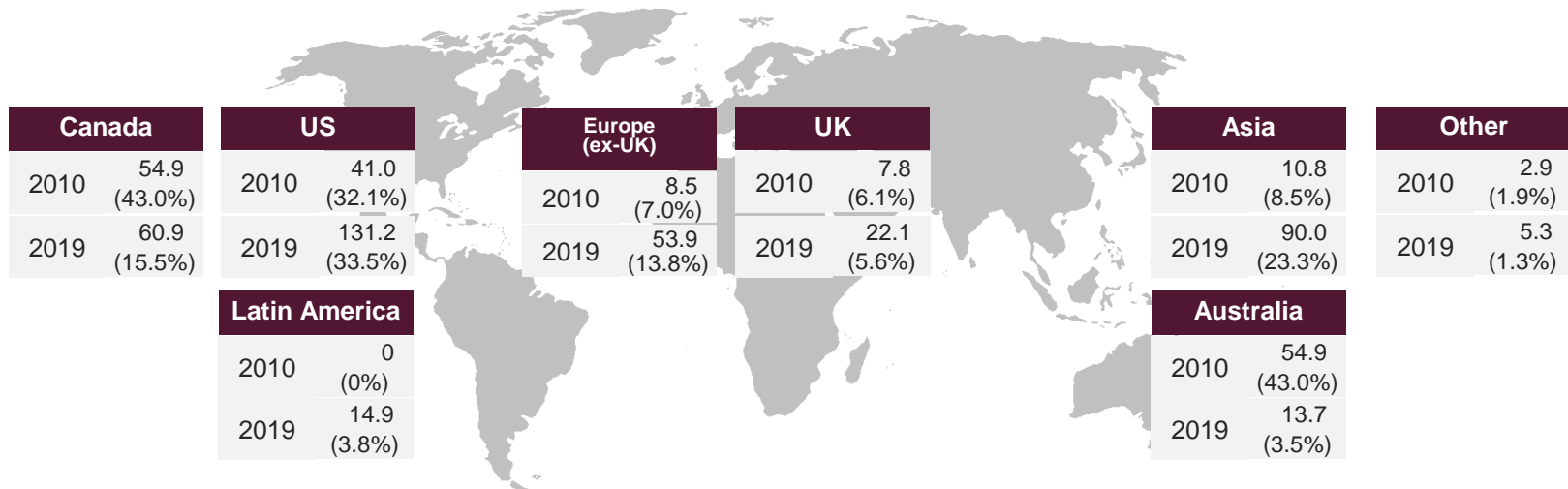
Canada Market Evolution

Case Study: Canada

Until 2005, Canada limited registered pension plans' investments to 30% non-Canadian assets, as an attempt to promote investment by registered plans in Canadian securities in exchange for the deductibility of contributions to these plans.

The FPR (Foreign Property Rule) was eliminated in 2005. As a result, pension funds are more actively managed and there are greater opportunities to diversify by both asset class and geography.

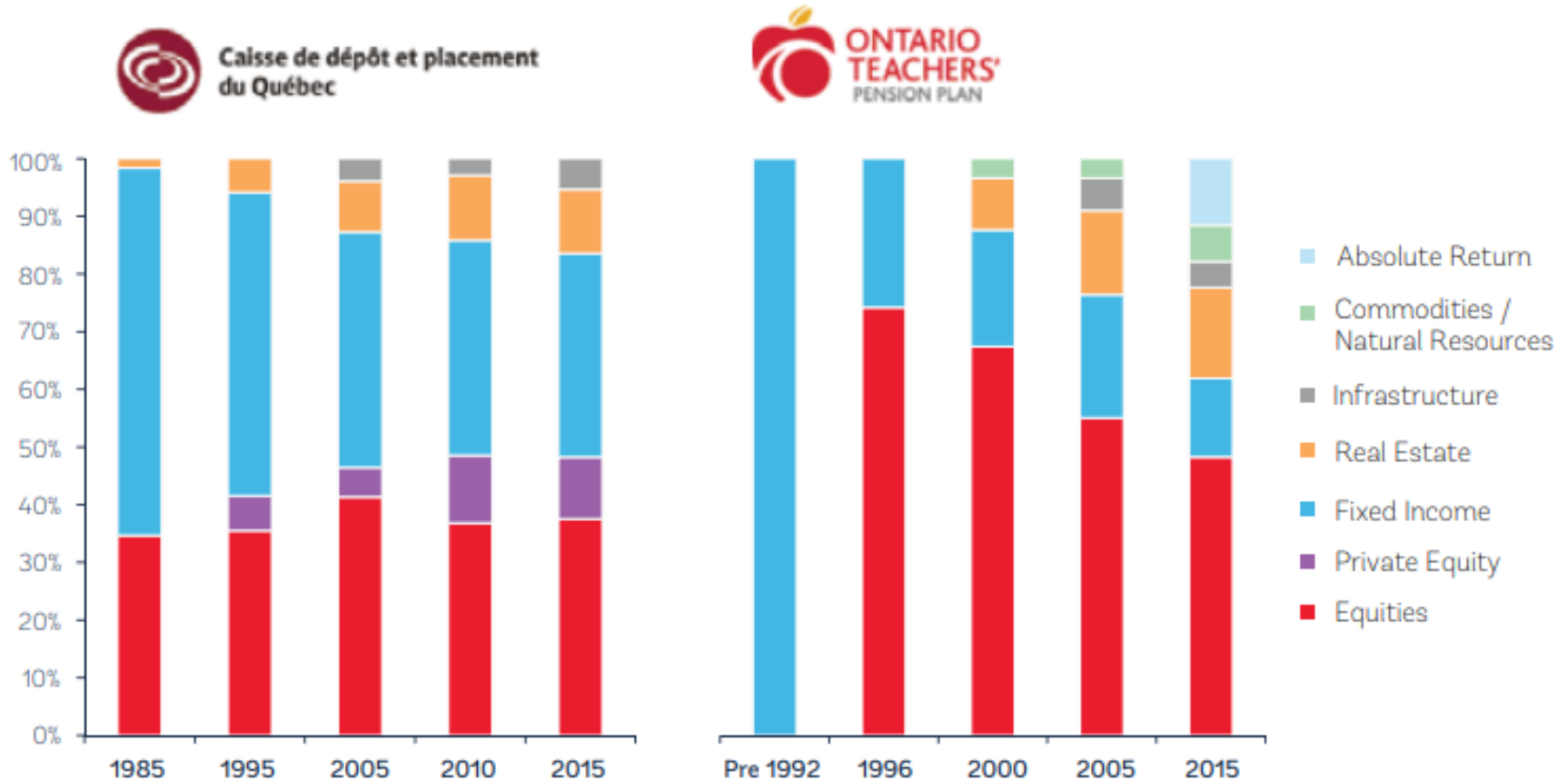
CPP Investment Board's portfolio in Canadian and foreign markets (\$billion)



Case Study: Canada

Asset mix for Canadian pension funds had diversified over time

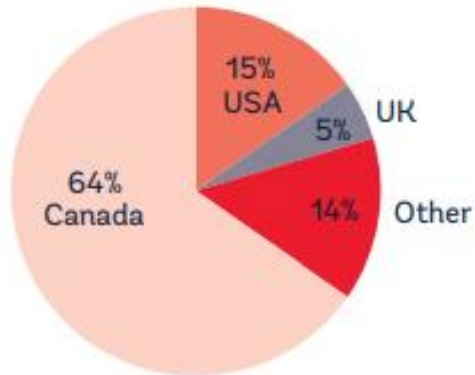
Asset type as a share of total AUM (%)



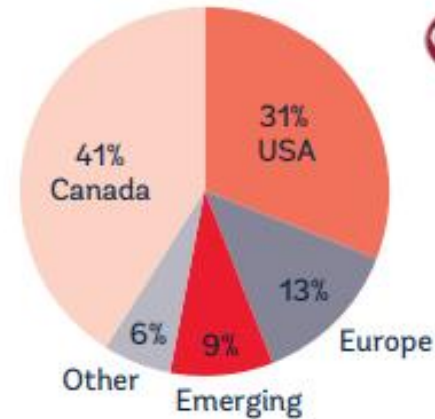
Source: World Bank, 2017, *The Evolution of the Canadian Pension Model*

Case Study: Canada

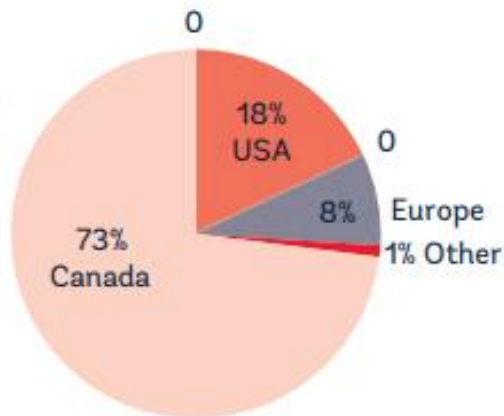
Asset allocation by geography of select Canadian pension funds (2016 figures)



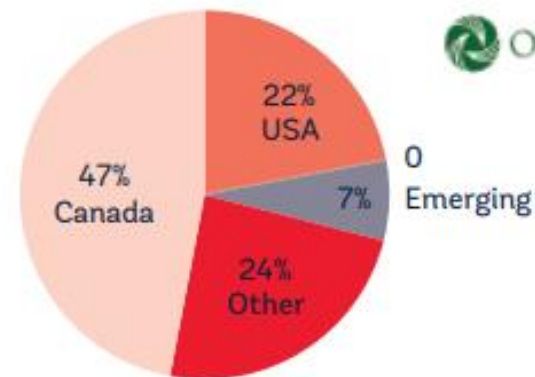
Caisse de dépôt et placement du Québec



HOOPP
Hospitality of Ontario
Pension Plan



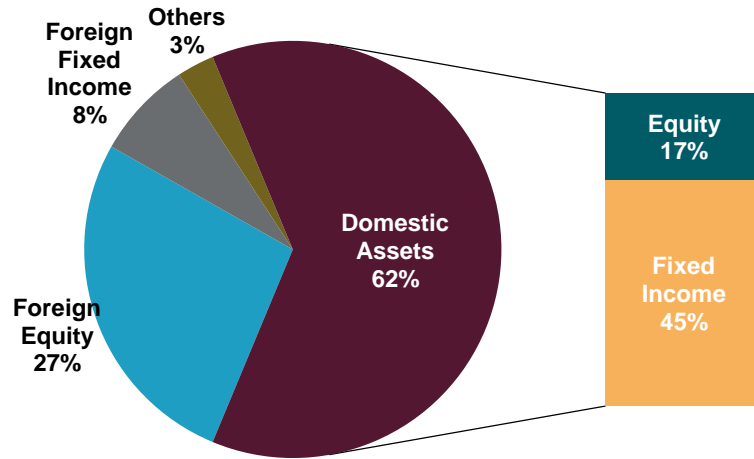
OPTTrust



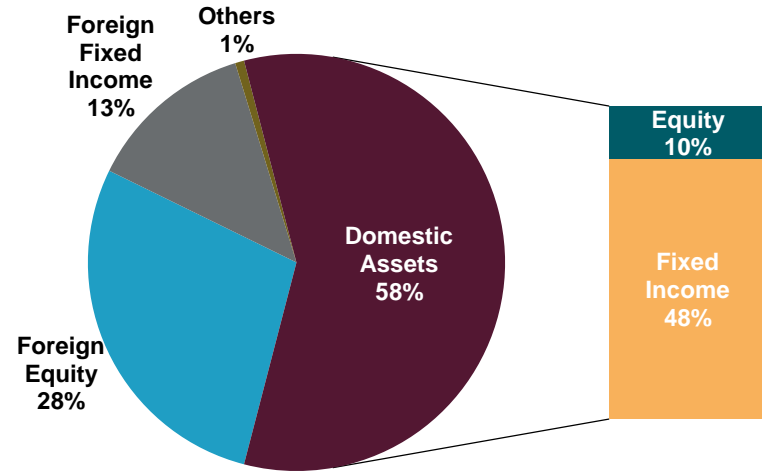
Source: World Bank, 2017, *The Evolution of the Canadian Pension Model*

LATAM Asset Mix

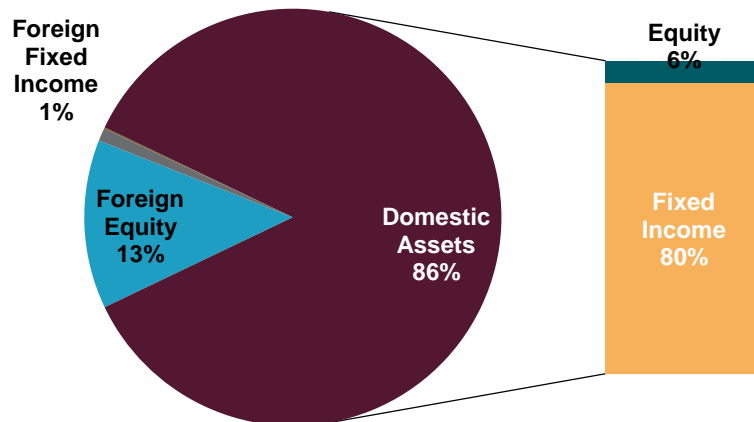
Colombia - Asset Mix



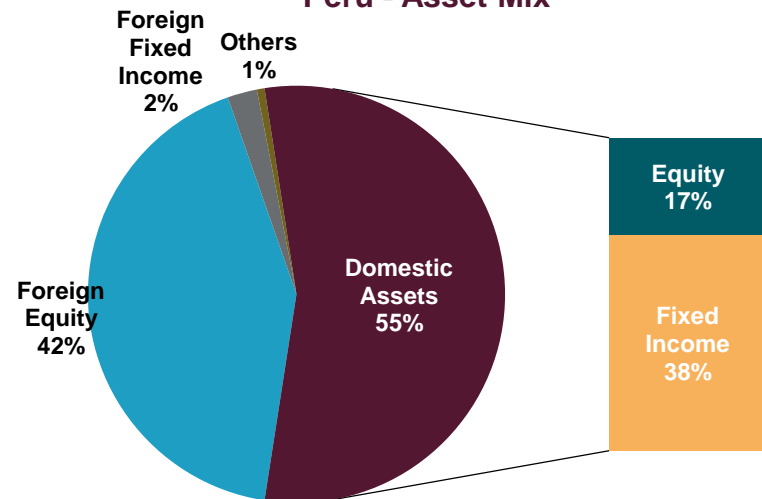
Chile - Asset Mix



Mexico - Asset Mix



Peru - Asset Mix



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