



DO LONG TERM INSTITUTIONAL INVESTORS CONTRIBUTE TO FINANCIAL STABILITY IN HONG KONG?

Key Points:

- *This study examines the potential impact of long term institutional investors (LTIIs) on financial stability in Hong Kong. Traditionally, these investors will rebalance their portfolios towards risky assets to chase long term investment returns during market downturns. The resulting impact can temper movements in asset prices and be counter-cyclical for financial markets.*
- *Using data on LTIIs with exposure to Hong Kong equities between 2001 Q1 and 2017 Q1, we find the LTIIs will increase these exposures when stock market prices decline in Hong Kong. This counter-cyclical investment behaviour is more prominent during market downturns than in normal market conditions. Similar results are also found in other EMEs, except the counter-cyclical effect is equally notable during the two different market conditions.*
- *In comparison, these LTIIs will behave pro-cyclically for some stock markets in advanced economies during market downturns, meaning these investors will decrease their equity exposures to these markets during downturns. The pro-cyclicality stance may arise from the fact that some AEs were at the epicentre of several major stock market crashes during the sample period. In addition, the influence of pro-cyclicality will be reinforced by the herding nature of the LTIIs.*

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The views and analysis expressed in this paper are those of the authors, and do not necessarily represent the views of the Hong Kong Monetary Authority.

I. INTRODUCTION¹

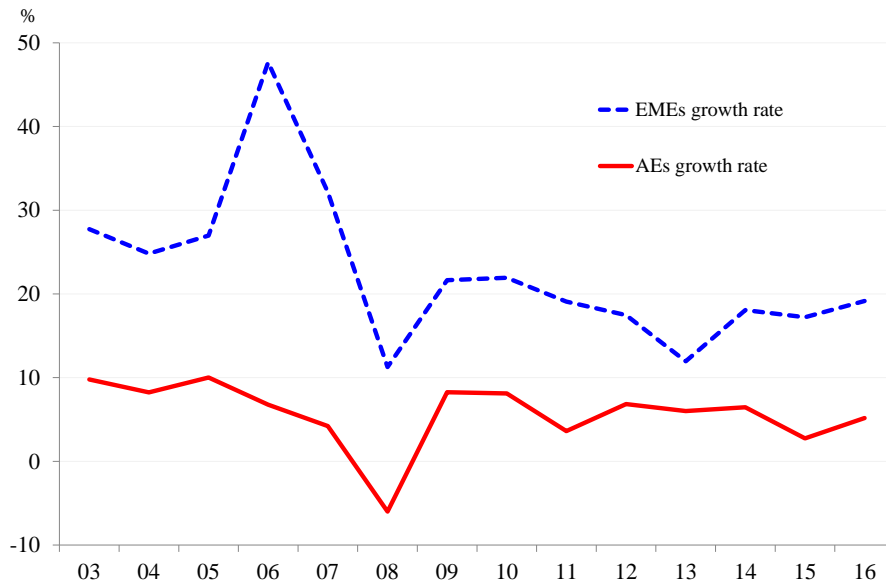
The contributions of long term institutional investors (LTIIs) to financial stability are debatable in literature. On the one hand, the LTIIs will rebalance their portfolios away from safer assets and towards riskier ones to chase long term investment returns during market downturns. Such a value-trading strategy can temper movements in asset prices, contributing a counter-cyclical impact to financial systems. On the other hand, the LTIIs will behave pro-cyclically (i.e., rebalancing their portfolios away from riskier assets and towards safer ones) in the face of financial market turbulence to meet regulatory requirements or short term liquidity needs. Such a flight-to-quality strategy can overvalue short term investment returns and undervalue long term returns, which can cause or exacerbate financial instability.²

Over the past decades, LTIIs have managed a substantial part of global financial assets, which can have a profound impact on financial market sentiment, particularly during periods of financial turmoil. According to the Financial Stability Board's global shadow banking monitoring report for 2017, the financial assets of LTIIs, measured by the sum of financial assets of insurance corporations and pension funds in 29 reporting jurisdictions, have grown robustly since 2009, with average growth rates of 6% and 18% for advanced economies (AEs) and emerging market economies (EMEs) respectively (See Chart 1). Their asset size totalled US\$60 trillion at the end of 2016, some 18% of global financial assets.

¹ The detailed results in this study are reported in Fong et al. (2018).

² For example, de Haan and Kakes (2011) find that Dutch institutional investors behave counter-cyclically based on a momentum trading measure, while IMF (2013) finds most of the global long term institutional investors contribute a pro-cyclical impact on international stock markets.

Chart 1: Growth in aggregate size of LTIIs



Source: FSB's Global Shadow Banking Monitoring Report 2017

As a result, this study examines the investment behaviour of LTIIs that invest in the Hong Kong stock market to shed light on the potential impact these investors' portfolio rebalancing activities have on Hong Kong. In short, we empirically find that the LTIIs will increase their exposures to the Hong Kong stock market in times of financial turbulence, playing a role in tempering the market volatility. However, they will decrease their equity exposures to AEs during downturns in these markets, thus contributing a destabilising effect on the developed stock markets.

The rest of the study is organised as follows. Section II discusses the data set we employed. Section III details our methodology, and section IV presents our empirical findings. The last section summaries and discusses the implications.

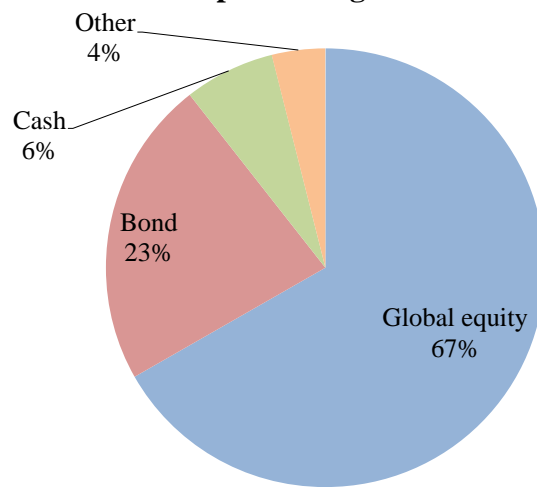
II. DATA SAMPLE

Our data is sourced from Morningstar,³ which covers investment funds in

³ Morningstar is a private data vendor tracking a vast number of funds invested in global financial markets. Note that Morningstar's data providers do not guarantee the accuracy, completeness or timeliness of any information provided by them and shall have no liability for their use.

56 AEs and 181 EMEs.⁴ Our full sample consists of 6,872 pension and insurance funds that had equity exposures to the Hong Kong stock market between the first quarter of 2001 and the first quarter of 2017. After screening out a large number of small funds to avoid overwhelming the final results, we consider a total of 1,010 funds, which already hold 95% of the total assets. These then constitute the final sample. At the end of 2016, these LTIIs had two-thirds of their assets invested in global equities (Chart 2), reflecting that equities were their primary investment assets.

Chart 2: LTIIs' exposure to global financial markets



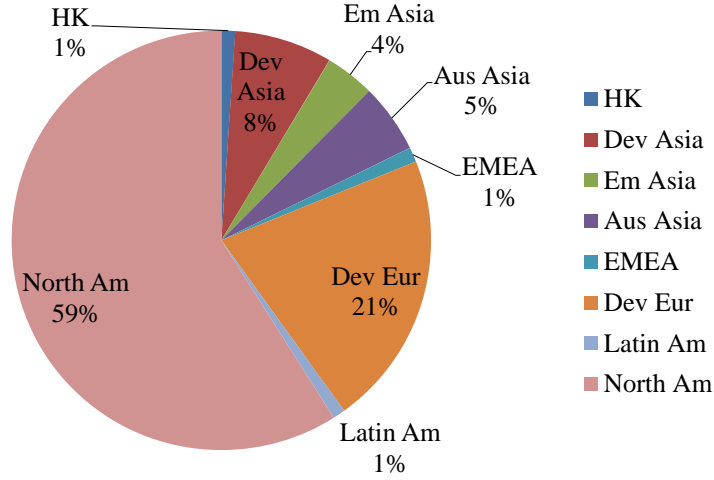
Source: Morningstar and HKMA staff calculations.

Of these global equities, the majority are invested in AEs, with North America's share being the largest at 59%, followed by developed Europe (21%), and Developed Asia (8%), while Hong Kong's share was about 1% (Chart 3). While this is a small share, the asset size is comparable to the daily stock market turnover in Hong Kong. At the fourth quarter of 2016, the asset size represented 79% of the average daily turnover of stocks listed on the Main Board of the Hong Kong Stock Exchange.⁵

⁴ Details of these economies are reported in Appendix A1.

⁵ Sourced from *HKEx Securities and Derivatives Markets Quarterly Report*, the average daily turnover was HK\$63.9 billion during the quarter.

Chart 3: Geographical distribution of LTIIs' equity assets



Source: Morningstar and HKMA staff calculations.

III. METHODOLOGY

One way of identifying the investment behaviour of LTIIs in literature is to check whether they will increase or decrease their equity investment substantially when equity prices decline. If the LTIIs increase (decrease) their equity investments during a stock market slump, changes in the LTIIs' exposures will be negatively (positively) correlated with the stock market returns, and thus, the contribution of LTIIs is regarded as counter-cyclical (pro-cyclical) to the stock market.

We first measure changes in their exposure to Hong Kong equities. Following major studies in literature,⁶ we use the net flows of each fund invested in a stock market measured by the percentage change in the LTIIs' total net assets (TNA) invested in the stock market in excess of the investment return.

Specifically, fund j 's TNA invested in the Hong Kong stock market ($TNA_{j,t}^{HK}$) at the quarter t is defined as

$$TNA_{j,t}^{HK} = TNA_{j,t} \times W_{j,t}^{HK} \quad (1)$$

⁶ Major studies using a similar measure include Del Guercio and Tkac (2002), Ferreira et al. (2013), Jotikasthira et al. (2012), and Raddatz and Schmukler (2012).

and fund flows to the Hong Kong stock market are defined as

$$f_{j,t}^{HK} = (TNA_{j,t}^{HK} - TNA_{j,t-1}^{HK}) / TNA_{j,t-1}^{HK} - r_t^{HK} \quad (2)$$

where $W_{j,t}^{HK}$ denotes the weighting of fund j on its equity investment in the Hong Kong stock market, $TNA_{j,t}$ denotes the TNA of fund j , and r_t^{HK} denotes the returns of the fund invested in the Hong Kong stock market, proxied by the return of the Hang Seng Index (HSI). This measure reflects changes in quantity (i.e., fund flows that rule out the price effect) which is more in line with changes in the LTIIs' asset allocation. Thus, a positive (negative) change in the fund flow of the LTIIs means they increase (decrease) their exposure to Hong Kong equities.

Based on this fund flow measure, we then investigate in two steps how LTIIs' investment decisions depend on past returns. First, we filter out the effects of major fund-specific variables and macro factors from the fund flows. Fund-specific variables include the individual fund return, cash ratio, debt-to-capital ratio and fund size, while macro factors include the 10-year government bond yield, inflation rate, real GDP growth and the short term interbank rate. More details of this step can be seen in Fong et al. (2018).

Secondly, we build a fixed-effect panel data regression model of these adjusted fund flows on past market returns.⁷ Specifically, the following fixed-effect panel data regression is considered in identifying the investment behaviour of the LTIIs:

$$\hat{f}_{j,t}^{HK} = \beta_0^{AHK} MR_{t-1}^{HK} \times (1 - V_{t-1}) + \beta_1^{HK} MR_{t-1}^{HK} \times V_{t-1} + \alpha_j^{HK} + \eta_{j,t}^{HK} \quad (3)$$

and

$$V_t = \begin{cases} 1 & \text{if } VIX_t > C \\ 0 & \text{otherwise} \end{cases}$$

⁷ The method is also employed by Abbassi et al. (2016) and Timmer (2018). The former regresses the logarithms of the buy and sell amount of securities on the lagged percentage change in price, while the later regresses the percentage increase in the nominal amount of debt securities held by institutions on the asset returns in the last quarter.

where $\hat{f}_{j,t}^{HK}$ is fund j 's adjusted fund flows to the Hong Kong stock market at quarter t , MR_t^{HK} is the stock market return in Hong Kong, α_j^{HK} is the fixed effect and $\eta_{j,t}^{HK}$ is the error term.⁸ The dummy variable based on the VIX index introduced to the regression as a proxy for global stock market uncertainty is to differentiate the effects between normal market conditions and market downturns.⁹ Thus, in the specification, β_0^{HK} and β_1^{HK} reflect the investment behaviours of the LTIIs in response to past returns in times of normal market conditions and market downturns respectively. A positive (negative) coefficient indicates that the LTIIs will decrease (increase) their equity investments in Hong Kong when observing stock market slumps, which implies a pro-cyclical (counter-cyclical) behaviour of the LTIIs concerned.

Empirically, we set the threshold C to be the 75th percentile of the VIX level in the sample period in this study. This threshold is selected for two major reasons: (i) it represents a 25% chance of seeing this event in the sample period which can be regarded as extreme but plausible in financial markets and (ii); a too extreme VIX level will result in a smaller number of events for estimation which may lead to bias in the empirical results. From an historical perspective, the threshold is considered useful to detect adverse market conditions, such as the recessions in Europe and the US in the early 2000s, the global financial crisis and the European debt crisis. All the variables are in normalised scales, thus we can compare the relative importance of the variables based on the magnitude of the coefficients.

IV. EMPIRICAL EVIDENCE

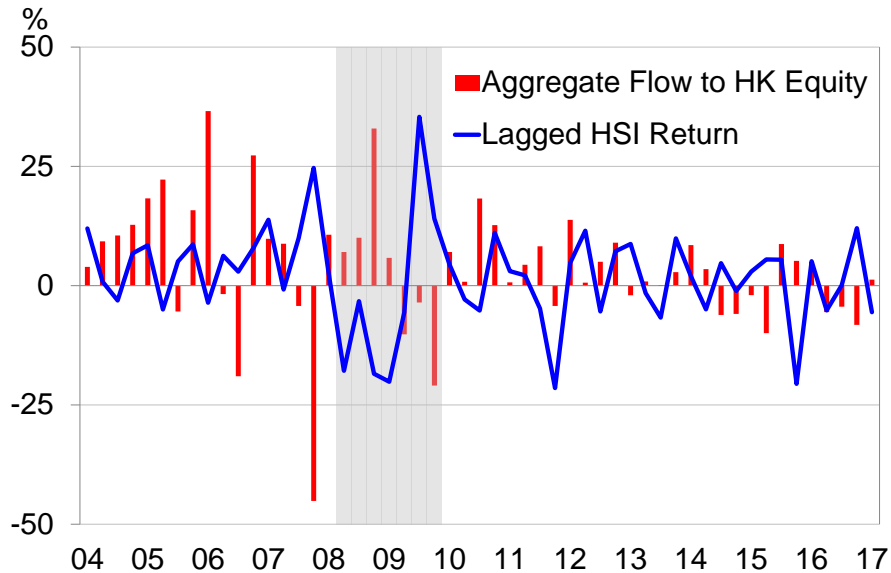
Chart 4 depicts the fund flows in aggregate and the lagged Hang Seng Index (HSI) return in quarterly frequency between 2004 and 2017. The aggregate flow is defined by the percentage change in aggregate Hong Kong equity assets in the sample in excess of the return of the HSI. As shown in the chart, the two

⁸ Note that the independent variables are all lagged by one quarter in order to: (1) prevent contamination of the results that trading decisions have a price impact; and (2) rule out the possibility that trading decisions are executed before the LTIIs observe the reported returns (Timmer, 2018).

⁹ The VIX index is the Chicago Board Options Exchange volatility index, which is the implied volatility of the S&P 500 index options over the next 30 day period. The index also reflects global liquidity conditions. Details can be seen in Bruno and Shin (2014).

variables appear to move in opposite directions often throughout the whole sample period, with a simple correlation of -0.32. Their negative correlation appears to be more apparent during the global financial crisis from 2008 to 2009 (the shaded area), with a correlation of -0.44. The negative correlation suggests that declines in the Hong Kong stock market in the previous quarter will be followed by an increase in LTIIs' exposures to Hong Kong equities in aggregate in the current quarter.

Chart 4: Aggregate flows and lagged market returns of Hong Kong



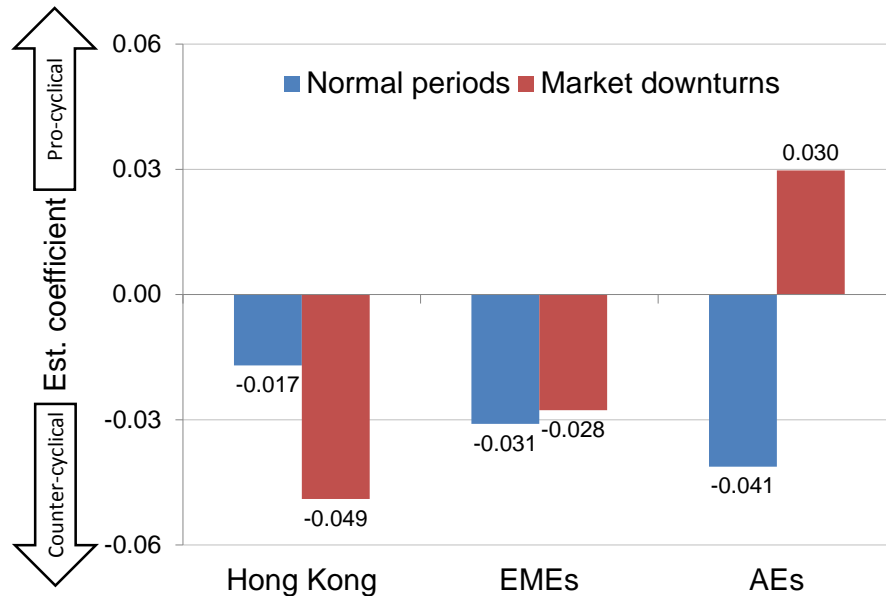
Note: The correlation between aggregate flows and lagged market returns are -0.32 for the whole sample period and -0.44 for crisis period.

Source: Morningstar, Bloomberg and HKMA staff calculation.

Chart 5 summarises the regression coefficients of the past market return for the Hong Kong stock market estimated by Equation (3). For comparison, we also estimate the coefficients for EMEs' (covering stock markets in Emerging Asia, Latin America, and Emerging Europe, the Middle East and Africa (EMEA)) and AEs' (covering stock markets in North America, developed Europe, developed Asia and Australasia).¹⁰ We report these coefficients as a group average for ease of discussion.

¹⁰ The stock market returns of the seven regions are measured by the corresponding MSCI regional indices. Details of these MSCI indices are reported in Appendix A2.

Chart 5: Responsiveness of the fund flows to past market returns in Hong Kong, EMEs and AEs



Note: These EMEs and AEs cover seven regions including developed Asia, emerging Asia, Australasia, EMEA, developed Europe, Latin America, and North America. Their stock market returns are measured by the corresponding MSCI regional indices. The coefficients of EMEs and AEs are the average values of the underlying regions.
Source: HKMA staff estimates.

Focusing on Hong Kong, we find that the coefficient is estimated to be negative in normal market conditions, with the coefficient being -0.017. In times of market downturns, the coefficient is -0.049, significantly larger in magnitude than that during normal market conditions.¹¹ These suggest that LTIIs will increase their equity exposures to Hong Kong when the stock market declines in any period, other things being equal.

Considering the two economy groups, we consistently find that all the average estimated coefficients during the period of normal market conditions are negative (i.e., -0.031 and -0.041 for EMEs and AEs respectively). During market downturns, the average estimated coefficient for AEs is positive (i.e., 0.030), suggesting that the LTIIs will decrease their equity exposures to AEs, *ceteris paribus*, when stock markets slump.

¹¹ The estimated fund flows (i.e., increases in LTIIs' equity exposures) are 0.9% and 2.5% respectively during the two market conditions, given a one-standard-deviation(SD) decline in the stock market (i.e., by around 10%) in one quarter. They are obtained by multiplying the estimated coefficients concerned by the SDs of the flows to Hong Kong equities, provided that all the variables in the regression are normalised in estimation, and so, the coefficients represent the number of SDs of the fund flows when the stock market declines by one SD.

V. SUMMARY AND DISCUSSION

In summary, our empirical findings show that LTIIs will contribute a counter-cyclical effect to stock markets in Hong Kong and EMEs in general. This effect can be significantly stronger during financial turmoil. Such a value-trading strategy can temper drastic movements in asset prices and have a positive contribution to financial stability in these economies.

In comparison, the LTIIs will be pro-cyclical for equities in AEs in times of financial turbulence.¹² Given that these economies were the epicentre of several major stock market crashes triggered by recessions in Europe and the US in the early 2000s, the 2008 global financial crisis and the European debt crisis, our findings suggest the pro-cyclical effect depends on where the shock originates. In addition, the influence of pro-cyclicality is reinforced by the LTIIs' herding behaviour. In some AEs, the herding effect can be the result of similar industry practices for the LTIIs' asset allocation decisions.¹³

There are three major limitations to this empirical analysis. First, the LTIIs' counter-cyclical behaviour in Hong Kong and EMEs during market downturns can stem from the absence of crisis events originating from these economies in the sample period. Secondly, our fund data comes from a single data source that collects survey-based data regularly. Therefore, the quality of the data is highly subject to the survey's response rates and the coverage of the fund managers. Finally, our sample may include some types of funds that are particularly illiquid in the sample period. That said, this study underscores the potential outcomes of the investment behaviour of these investors, which can be important for individual investors and policyholders as well as for the economy as a whole. Therefore, how these investors contribute to financial stability should be given careful scrutiny.

¹² Such pro-cyclicality is also evidenced in several studies. In particular, the effect is apparent in pension funds of the US, Portugal and Spain, and in insurers of the US, France, and the UK, although LTIIs in some OECD countries (e.g., Norway, Italy, Poland and Turkey) behaved counter-cyclically during 2008-2009 (BoE, 2014; IMF, 2013; OECD, 2010).

¹³ These practices include: (i) LTIIs have similar liability structure; (ii) they use asset managers who manage LTIIs assets as agents according to specific mandates which may include benchmarks that reference either other asset managers in the industry or industry-wide indices; (iii) the investment decisions of LTIIs are influenced by investment consultants who can have a significant effect on institutional asset allocation; and (iv) the LTIIs may face similar regulatory constraints. Details can be seen in BoE (2014).

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Appendix A1: Economies in each region

Developed Asia

Brunei	Hong Kong	Singapore	Taiwan
French Polynesia	Japan	South Korea	
Guam	Macau	New Caledonia	

Emerging Asia

Afghanistan	Fiji	Mongolia	Solomon Islands
American Samoa	Georgia	Nauru	Sri Lanka
Armenia	Heard & McDonald	Nepal	Tajikistan
Azerbaijan	India	Niue	Thailand
Bangladesh	Indonesia	Norfolk Island	Tokelau
Bhutan	Kazakhstan	North Korea	Tonga
Burma	Kiribati	Northern Mariana Isl.	Turkmenistan
Cambodia	Kyrgyzstan	Pakistan	Tuvalu
China	Laos	Palau	Uzbekistan
Christmas Island	Malaysia	Papua New Guinea	Vanuatu
Cocos Islands	Maldives	Philippines	Vietnam
Cook Islands	Marshall Islands	Pitcairn Islands	Wallis & Futuna Isl.
East Timor	Micronesia	Samoa	

Australasia

Australia	New Zealand
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Emerging Europe, Middle East and Africa

Albania	Egypt	Macedonia	Serbia & Montenegro
Algeria	Equatorial Guinea	Madagascar	Seychelles
Angola	Eritrea	Malawi	Sierra Leone
Bahrain	Estonia	Mali	Slovakia
Belarus	Ethiopia	Mauritania	Somalia
Benin	Gabon	Mauritius	South Africa
Bosnia & Herzegovina	Gambia	Mayotte	St. Helena
Botswana	Ghana	Moldova	Sudan
Bouvet Island	Guinea	Morocco	Swaziland
Bulgaria	Guinea-Bissau	Mozambique	Syria
Burkina Faso	Hungary	Namibia	Tanzania
Burundi	Iran	Niger	Togo
Cameroon	Iraq	Nigeria	Tunisia
Cape Verde	Israel	Oman	Turkey
Central African Rep.	Jordan	Poland	Uganda
Chad	Kenya	Qatar	Ukraine
Comoros	Kuwait	Reunion Island	United Arab Emirates
Congo	Latvia	Romania	West Bank and Gaza
Cote d'Ivoire	Lebanon	Russia	Western Sahara
Croatia	Lesotho	Rwanda	Yemen
Czech Republic	Liberia	Sao Tome & Principe	Zambia
Dem. Rep. of Congo	Libya	Saudi Arabia	Zimbabwe
Djibouti	Lithuania	Senegal	

Developed Europe

Andorra	Germany	Liechtenstein	Slovenia
Austria	Gibraltar	Luxembourg	Spain
Belgium	Greece	Malta	Svalbard
Cyprus	Greenland	Monaco	Sweden
Denmark	Iceland	Netherlands	Switzerland
Faroe Islands	Ireland	Norway	Vatican City
Finland	Isle of Man	Portugal	United Kingdom
France	Italy	San Marino	

Latin America

Anguilla	Chile	Guadeloupe	Peru
Antigua & Barbuda	Colombia	Guatemala	Puerto Rico
Argentina	Costa Rica	Guyana	St. Kitts & Nevis
Aruba	Cuba	Haiti	St. Lucia
Bahamas	Curacao	Honduras	St. Vincent & the Grenadines
Barbados	Dominica	Jamaica	Suriname
Belize	Dominican Republic	Martinique	Trinidad & Tobago
Bermuda	Ecuador	Mexico	Turks & Caicos
Bolivia	El Salvador	Montserrat	Uruguay
Bonaire	Falkland Islands	Netherlands Antilles	US Virgin Islands
Brazil	French Antilles	Nicaragua	Venezuela
British Virgin Islands	French Guiana	Panama	
Cayman Islands	Grenada	Paraguay	

North America

Canada	U.S.
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Source: Morningstar.

Appendix A2: MSCI Index for each region

Region	MSCI Index
North America	MSCI North America Index
Developed Europe	MSCI Europe Index
Developed Asia	MSCI AC Asia Index
Australasia	MSCI Australia Index and MSCI New Zealand Index (average return)
Emerging Asia	MSCI EM Asia Index
Latin America	MSCI EM Latin America Index
EMEA	MSCI EM Europe Middle East and Africa Index