Russell Investments

Russell Research

Title: **Downside protection strategies**

Considerations for Asian investors

Author: Sheela Veerappan, Senior Consulting Analyst

Lila Han, Senior Consulting Analyst, CFA

Date: January 2012

Synopsis: In an uncertain market environment, Asian Investors who are looking to protect against downside risk within their diversified portfolios should do so by understanding underlying asset class risk dynamics. The decision to mitigate downside risk can be made at the asset allocation level, as a portfolio overlay using derivatives, or through dynamic hedging or direct adjustment to the physical exposures held within the portfolio. Factors such as cost, liquidity and access as well as market environment are key considerations, particularly because the available protection instruments currently may not provide perfect hedges for sub-components of Asian portfolios, which typically have a large domestic asset allocation.

JANUARY 2012

Downside Protection Strategies

Considerations for Asian Investors

By: Sheela Veerappan, Senior Consulting Analyst (Singapore)
Lila Han, CFA, Senior Consulting Analyst

INTRODUCTION

Ongoing market turmoil has placed a greater focus on protecting portfolios against extreme market events. Any exposure outside of domestic, local-currency fixed income is not immune to downside short term investment risk[1]. A well defined downside-hedging framework can be a valuable tool, with the potential to deliver significant benefits to investors. However, the complexity in developing an appropriate hedging framework and the implementation costs of such strategies and instruments can be challenging.

In this paper using a hypothetical asset allocation for an Asian portfolio, we introduce what downside risk means for the average institutional investor in Asia, available hedging strategies and key considerations when implementing a downside protection program.

1.0 THINKING THROUGH DOWNSIDE RISK

1.1 DEFINITION OF RISK

For many Asian investors without explicit liabilities or simply with a large pool of assets, one of the primary (and in some cases the sole) investment objectives is to preserve capital and to mitigate or minimize losses resulting from exposure to capital markets. Market risk in this context is focused on the absolute downside volatility or potential mark-to-market losses that portfolios would experience.

The risk of not meeting this primary objective is magnified in the current environment of market uncertainties and negative sentiment. Any downside

[1] Domestic local-currency fixed income is generally not affected by equity risk however the asset class is still susceptible to systemic risk and the knock-on effects from domestic macro issues.

volatility can be exacerbated by left-tail events – the occurrences of which are associated with extreme negative returns. While institutional investors are long-term oriented, the ability and willingness to bear short-term market risk quickly disappear under extremely uncertain market conditions.

1.2 RATIONALE FOR DOWNSIDE PROTECTION

Some Asian investors are also grappling with a dual mandate to increase foreign exposure and diversify their investment portfolios beyond home markets and fixed assets, while maintaining the objective of principal preservation and inflation protection. The execution of such a mandate can appear daunting amidst extremely turbulent markets when asset class correlations increase (collapse to 1) and diversification strategies become less effective. A holistic assessment of portfolio downside risk can provide the basis for better safeguards of total portfolio value when asset class diversification appears to break down.

This assessment should include an accurate understanding of the total portfolio's underlying risk exposures and drivers, as well as analysis of the dynamic between asset allocation and risk contribution. It could also facilitate better accountability and responsiveness in times of market stress. Finally, the analysis should provide the investment team with relevant information to better gauge the impact of risk exposures on the portfolio's risk and return expectations over time.

1.3 DEFINING DOWNSIDE RISK MEASURES

A clearly defined portfolio-level risk objective is critical to framing the decision-making process for setting the scope of a downside protection program. We feel that traditional risk measures like standard deviation and tracking error do not adequately measure the likelihood of left-tail events.

The **value-at-risk (VaR)**[2] measure has become an industry standard in defining risk appetite at the total portfolio level. While we agree with its usefulness as a simple, comprehensive risk measure across asset classes, its underlying assumptions about normal market conditions become invalid during periods of increased systemic risk. We believe that downside risk can be better quantified through a combination of VaR and conditional VaR. The latter measure, also known as expected shortfall, presents an alternative that is more sensitive to the shape of loss distribution in the left-tail of a return distribution. It quantifies the magnitude of the expected portfolio loss if loss exceeds the VaR measure. It can also provide better insight into extremely low probability events that can severely impair portfolio value.

2.0 DECOMPOSING PORTFOLIO RISK

We mentioned earlier that the diversification benefit of allocating to multiple asset classes appeared to break down during the most recent crisis, with the exception of U.S. Treasuries and other domestic market fixed equivalent. However, we believe that this "failure" is not due to diversification per se but the implementation of diversification, which is typically achieved through asset allocation. A simple example would illustrate that evaluating risk from an asset perspective can mask a portfolio's actual risk exposures.

[2] VaR determines the value or percentage of the portfolio that could be lost within a given confidence or probability level.

2.1 A PORTFOLIO EXAMPLE

Recognizing that asset mixes can vary significantly across Asian investor portfolios, the example portfolio comprises Global fixed income, Global equity and Asian equity[3]. We begin with a 90/10 fixed income and equity allocation (the intra-asset class weighted as 90/5/5 Global fixed income/Global equities and Asian equities respectively), representing a fairly undiversified portfolio that evolves to a 60/40 allocation through four iterations.

Exhibits 1, 1a and 2 would show that an asset class' contribution to total portfolio risk rarely corresponds to its dollar allocation. Equity risk[4] tends to be a larger contributor to total portfolio risk relative to fixed income and to equity's allocated asset weight.

Exhibit 1: Contribution to portfolio risk by asset class

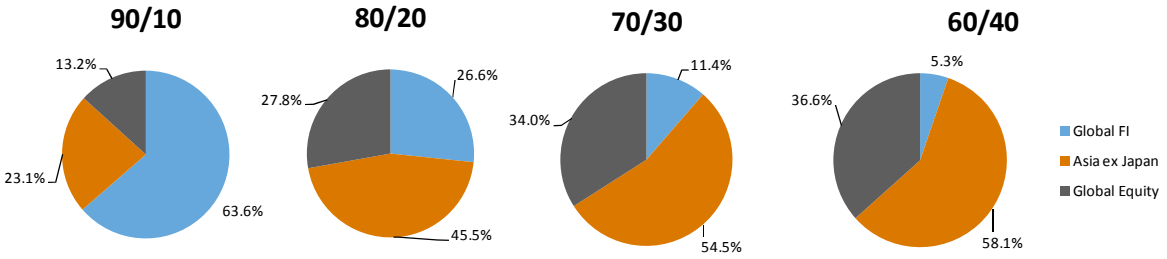


Exhibit 1a: Contribution to portfolio risk by each sector - equity and fixed income

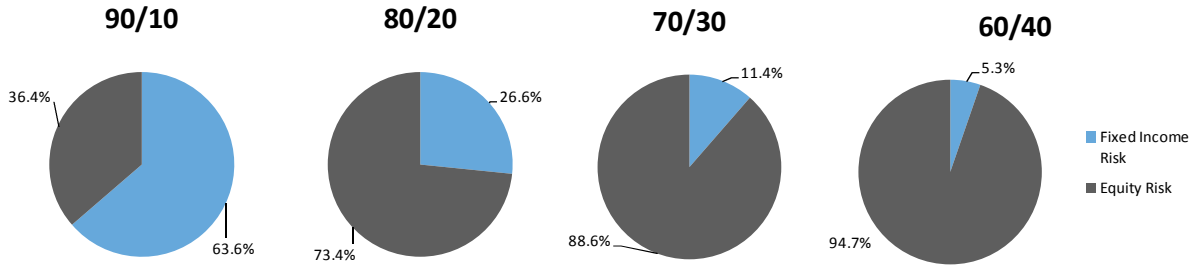
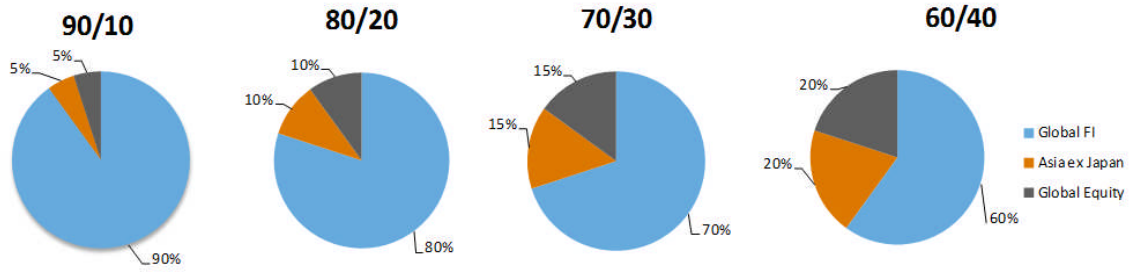


Exhibit 2: Contribution to portfolio risk by dollar allocation



For illustrative purposes only

[3] Each respectively represented by Barclays Global Aggregate Bond Index (BCGA), Russell Developed Equity Composite (RDEC), Russell Asia ex Japan Equity Index (RAxJI) as at November 2011.

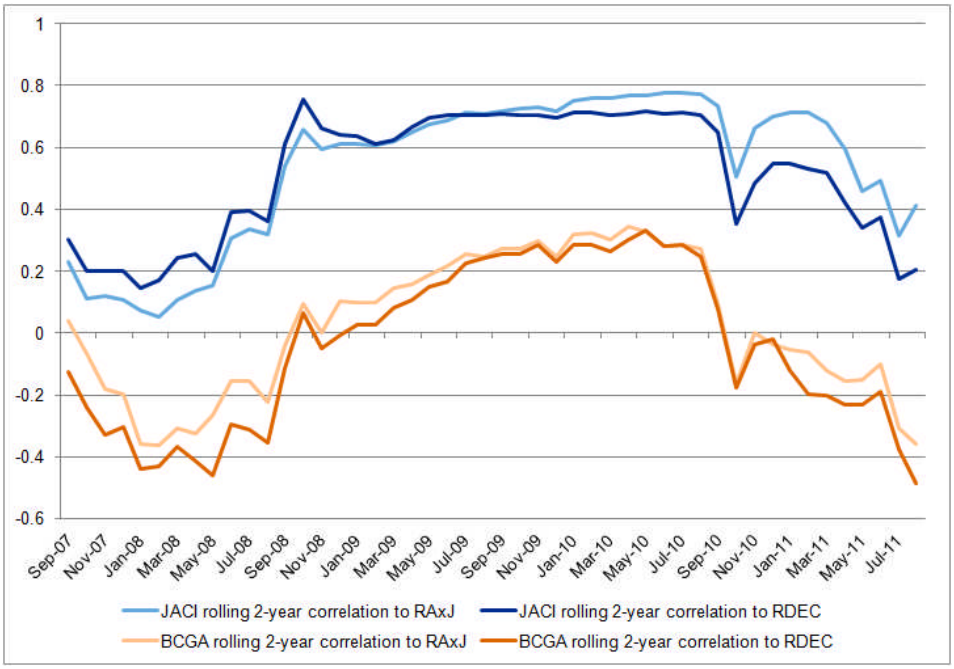
[4] Sensitivity to volatility in stock markets otherwise known as beta, systematic risk or market risk; because stocks are one of the most liquid forms of investment, stock markets often react the quickest to tail events, reflect the impact of broad market sentiments to those events and can facilitate the rapid spread of negative sentiments.

The 80/20 portfolio mix demonstrates that while equity represents 20% of the dollar allocation, it actually contributes close to three quarters, 73.4% of the overall portfolio risk. During periods of market stress, the losses generated by the equity component can easily overwhelm the risk derived from the fixed income component and it's important to understand this asset vs risk allocation relationship for the portfolio.

Across the asset mixes global fixed income's risk contribution remains fairly low and consistent. This is intuitive since fixed income is generally less risky than equity. However within fixed income, it is important to note that if the portfolio had an allocation to Asian fixed income (JACI)'s or High Yield, then the risk of these allocations would also be large relative to the dollar allocation. This can be better understood when we consider that an asset class' risk contribution is driven by the volatility of its returns and its interaction with other asset classes. It has been observed that the JACI and High Yield correlation to equity indices increased significantly during the crisis period (see exhibit 4). This is not surprising given JACI's heavy weight (on average 40%) to non-investment grade credits and investors' flight-to-quality behavior during the crisis. Consequently, an allocation to Asian fixed income can introduce significant unintended equity risk into the portfolio. More generally, any allocation to an asset class where correlation to equity can spike needs to be carefully assessed for its true downside risk exposure.

We view more granular measures of downside volatility related to sector- or security-specific events such as bankruptcy or default as less effective for portfolio-level protection strategies, unless those events cascade and trigger a spike in systemic risk. Invariably this idiosyncratic or issue specific risk within the portfolio, although worthwhile to measure and assess in aggregate to determine whether they fall within the investment objectives of the portfolio, is best managed on a day-to-day basis by the investment manager rather than through overlay downside protection.

Exhibit 4: Rolling correlation analysis of equity to fixed income



Source: Bloomberg, Russell Indices and Barclays Global Aggregate Index, November 2011

2.2 AN ASIAN MARKETS VIEW

We mentioned earlier that asset mixes across Asian investor portfolios can be quite diverse. Depending on the home country of the investor, there tends to be a component of single-country allocation or home country bias in a portfolio, partially because each Asian country has its own currency and set of regulations, with a focus on investing conservatively. Some portfolios may also be mandated to provide structural support to the development of local capital markets.

We do not believe it is possible to make generalizations about similarities among the single-country Asian markets[5]. However, investors in the region have started to diversify their portfolios that have historically been heavily weighted in domestic equity and fixed assets. Therefore, we believe that going forward more portfolios will exhibit similar risk and return profiles to the above portfolio example, which may at the very least elucidate the hidden portfolio risks as this diverse set of investors continue to fulfill their dual mandate over the course of the next decade.

3.0 IMPLEMENTING A DOWNSIDE PROTECTION PROGRAM

This section gives a high-level summary of implementation strategies to help mitigate risks particularly on the downside. It provides a comprehensive overview of the myriad offerings from various types of program providers.

3.1 STRATEGIES

3.1.1 Asset Allocation Strategies

Some traditional downside-protection strategies can be directly incorporated into the portfolio through diversification by risk. There are various approaches to this, such as via risk parity, or by asset weight and expected return optimisation, or through adding lower-correlated alternative investments like commodities. Low-beta stock selection, and other defensive-equity strategies, use stocks with low market risk (or low beta) exposures. Many managers will also look for “quality” companies, those that are expected to withstand a crisis event better than peers. Combining quantitative (low-beta) and fundamental (quality) measures can provide equity investors with less severe draw-downs while still providing exposure to some equity risk premium. These strategies may possibly require investors to reconsider their portfolio strategic asset allocation (SAA).

3.1.2 Derivative-Based Strategies

On the other hand, derivative-based strategies and dynamic allocation strategies are typically implemented as overlay strategies at the total portfolio level, without the need to alter the SAA. The decision-making process regarding the implementation of these strategies is often complicated by the use of derivative instruments and the need for a holistic understanding of portfolio risks, particularly those that are magnified during stress environments.

Derivative-based strategies, as the name would suggest, generally use derivatives to hedge the market risk of a portfolio and provide investors with hard or soft floors for certain asset losses and also can facilitate more control over portfolio volatility. Strategies that use options act much like an insurance policy. The purchaser pays a premium to protect against a possible loss. Common downside protection strategies that use options include long put, long collar and put spread, each designed to offer differing payoff structures within a predetermined time period. Credit default swaps (CDS) can also be used to hedge against credit risk in the event of a default, but may only be useful in

[5] At best, our analysis shows that market correlations have directionally moved somewhat in synchronicity over time.

hedging against portfolio downside risk when the credit issuer is a systematically important or tail-event sensitive entity.

Other derivative instruments have emerged over the last ten years that allow investors to target risk or portfolio volatility directly. A growing number of market participants regard volatility as an asset, offering investible exposure to volatility to both hedgers and investors. Volatility tends to spike during market corrections resulting in a natural negative correlation with risk-seeking asset prices. This relationship allows volatility to be used as a hedge when systemic risk spikes during tail-event occurrences. Volatility instruments include variance swaps, volatility swaps, VIX[6] futures and options. The tradable products on VIX are based on forward volatility, which is where spot VIX will be at some point in the future. VIX futures, options and exchange-traded notes (ETNs) on VIX forward volatility represent three tools available to gain exposure among exchange-traded instruments. VIX futures and ETNs are available as a delta-1 instrument and generally have a positively sloping term structure when volatility levels are low. VIX index options can be utilized to create symmetrical or asymmetrical payoff profiles which can be easily tailored for a wide range of risk budgets. These long volatility strategies can be applied either as a stand-alone uncorrelated strategic allocation or as a hedging overlay to an existing beta position.

3.1.3 Dynamic Asset Allocation Hedging Strategies

In contrast with traditional fixed weight SAA, dynamic hedging practices have evolved in recent years. These strategies are dynamic approaches utilized in the portfolio once the strategic policy has been set, with full-time specialists (either investment staff or external money managers) continually reviewing and adjusting the portfolio in response to global events that impact market behaviour. The decision remains high-level, but the allocation policy is no longer a set of fixed weights that are held constant until the next review. Rather, the asset mix can be designed to respond to changes in investor experience or to changes in market characteristics (eg volatility or valuation).

The use of fixed weights in strategic asset allocation policy does not result in a stable risk/return pattern over time, but rather leads to greater risk at times of high market volatility and lower risk in stable markets. Dynamic hedging addresses this problem by continually monitoring market and portfolio signals and adjusting risk exposure and/or asset allocation.

Dynamic hedging strategies can be implemented either in a subjective manner based on a manager's views of the market, or in an objective, rules-based manner. Such strategies set upper and lower buy and sell trigger points, determined by a cushion over a desired capital floor (maximum loss tolerance) or characteristic (eg overall portfolio volatility or VaR). Strategies that fall under this heading include:

- Constant and dynamic proportion portfolio insurance (CPPI and DPPI), which essentially sell risky assets such as equity in weak markets and buy them on strength;
- Volatility-targeting asset allocation, which is based on the premise that market volatility is itself volatile and may be actively managed to achieve a more consistent portfolio outcome[7]; and

[6] VIX measures implied volatility of the market for the next liquid listed expiry of the S&P 500 option series using actual market prices for options – expiry is set between 15 and 45 days.
[7] See Collie, Bob et al. 'Volatility-responsive asset allocation – A stronger link between asset allocation policy and the market environment', *Russell Research – Viewpoint,* August 2011, and

- Safety-first dynamic hedging, which automatically accommodates changes in levels of volatility by computing risk-seeking asset exposures based on updated volatility forecasts; the balance is invested in risk-free instruments.

It is worthwhile to note that these strategies typically perform best in trending markets and indeed, have raised criticisms for under-performance in volatile sideway markets. However, we would point out that maintaining a static policy allocation during periods when equity volatility spikes visibly only increases a portfolio's risk exposure but would not produce any higher risk-adjusted equity return. Moreover a dynamic strategy that actively manages volatility, if designed and monitored properly, can even add incremental value during oscillating markets[8].

3.2 KEY CONSIDERATIONS

In choosing an appropriate downside protection strategy for one's portfolio, Asian investors have several practical considerations to evaluate that could impact a strategy's effectiveness in hedging downside risk.

3.2.1 Cost

Derivative-based strategies using options and swaps as well as other over-the-counter (OTC) instruments tend to be more expensive than other protection strategies. Moreover, the instruments have an expiry date; so to continuously implement the strategy requires rolling over the instrument, the roll cost of which can be significant during certain market conditions. Consequently, cost-effective implementation of derivative-based strategies requires a targeted and specific objective with a full understanding of costs and benefits.

3.2.2 Liquidity and Access

Liquid exchange-traded derivatives exist for many major equity market benchmarks. However, for less liquid benchmarks such as small cap or regional emerging markets, the latter of which may well be significantly represented in Asian investor portfolios as a single, home country allocation, economically attractive exchange-traded derivatives are not always available. We also find lower correlations between those equity markets and the S&P 500, one of the most liquid equity indices used in the derivatives market. High correlation typically would imply that the use of derivatives based on standard market indices may capture most of the downside risk, and this is reflected in the correlations between regional market indices like Global Developed or Asia ex-Japan and the S&P 500. However, even if correlation is high for developed markets in Asia such as Hong Kong and Singapore (see exhibit 5), using an S&P 500-based derivative would introduce basis risk, which mitigates the certainty of derivative-based strategies.

Russell has extensive experience in structuring and operating derivative protection overlay strategies through their Russell Implementation Service.

Chen, Rudolf. 'Volatility-responsive asset allocation: An extensive study on Global, Asian and Singapore markets', *Russell Practice Note*s soon to be published.

[8] See Maidel, Scott et al. *Russell Strategy Spotlight*, August 2011.

Exhibit 5: Historical correlations of single-country Asian public equity markets and S&P 500, August 2000 to September 2011[9]

	Indonesia	Singapore	Malaysia	Taiwan	Thailand	Philippines	Hong Kong	Vietnam	S&P 500
Indonesia	1.00								
Singapore	0.65	1.00							
Malaysia	0.62	0.73	1.00						
Taiwan	0.47	0.72	0.60	1.00					
Thailand	0.59	0.65	0.54	0.63	1.00				
Philippines	0.56	0.57	0.46	0.44	0.54	1.00			
Hong Kong	0.57	0.81	0.65	0.70	0.57	0.49	1.00		
Vietnam	0.17	0.28	0.20	0.16	0.08	0.23	0.32	1.00	
S&P 500	0.48	0.73	0.51	0.63	0.54	0.46	0.68	0.34	1.00

Source: Bloomberg, November 2011

Similarly, volatility-based derivative products based on the S&P 500 in the U.S., Eurostoxx 50 in Europe, FTSE 100 in the UK, and the Nikkei 225 Index in Japan have by far the greatest depth and liquidity. Post 2008, there remains little liquidity in Asian variance swaps with the Hang Seng being the most liquid in relative terms. Yet again, hedging via these instruments would not be perfect for portfolios with exposure benchmarked to some other index. For our portfolio example, we found that the best sample hedge tested at the time used a combination of S&P 500 and Hang Seng options that resulted in an R^2 of 70%.

3.2.3 Market Environment

When volatility is high, Asian investors just like any other investor become very nervous about the risk that is in their portfolios and the ability to preserve principal value. Unfortunately, the choice to move to a less risky portfolio can often be timed poorly with a detriment to performance. Therefore, the timing of strategy implementation is critical to the success of any downside protection strategy especially one that targets volatility, which can spike and revert quickly during periods of market stress. Specialists hired to manage the process therefore need to be nimble.

The general demand increase for downside protection and volatility products during crisis periods can also be leveraged in another way. During those periods, we have found that the market's general aversion to risk can lead to a significant re-pricing of risk that is evident in the increased implied-to-realized volatility spread[10]. Investors who are able to short (i.e. take a seller position in) variance swaps can take advantage of this systematic re-pricing and potentially add incremental value to portfolios that may very well be declining in value due to long equity positions. Ultimately, whether and how Asian investors can capture the premium for providing short-term insurance should be discussed with an exposure management expert to tailor to the investment objective of the portfolio.

Finally, other factors that investors, **should consider include determining the level of downside protection**, predefining the hedging risk budget, and how best to consistently monitor the downside protection program once it has been put in place. For Asian investors in particular, lower liquidity and dearth of access to products that correlate well to the underlying portfolio may mean that those portfolios with a dominant allocation to Asian single-country equities would need to consider a more suitable approach when implementing downside protection strategies.

[9] Equity markets are represented by their respective single-country MSCI indices, all except Vietnam, which is represented by the Bloomberg Ho Chi Minh Stock Index TR.

[10] Maidel, Scott & Perek, Sylvia. *Russell Strategy Spotlight*, May 2011.

4.0 FINAL THOUGHTS

The pace, frequency and magnitude of today's market changes necessitate a detailed understanding of portfolio exposures. This includes clearly identifying the risk dynamics among different types of assets. This is also particularly important as Asian investors are considering how best to diversify and protect portfolio assets during a very volatile market environment globally.

We believe that for many Asian investors, an opportunity still exists to "get it right" at the outset. This means when determining or re-evaluating one's strategic asset allocation (SAA), it is important to look at both asset class diversification and risk diversification, especially cross-asset exposures within the context of one's overall objectives and constraints. From a downside protection perspective, this means incorporating it into the SAA decision-making process rather than as an after-thought when markets turn sour. By doing so, the selection of relevant implementation strategies is much more straightforward. With Russell's extensive advisory and implementation experience with downside protection strategies, we have and continue to assist our clients globally in their decision making process.

RELATED READING

Collie, Bob. ‘Basic Greeks: Essential knowledge for investors considering options’, *Russell Research*, April 2009.

Maidel, Scott & Sahlin, Karl. ‘Capturing the volatility premium through call overwriting’, *Russell Research*, December 2010.

Sahlin, Karl & Maidel, Scott. ‘Effective implementation of downside protection strategies’, *Russell Research*, May 2010.

Thomas, Michael & Nordquist, Greg. ‘Interest rate swaptions – downside protection you can live with’, *Russell Research*, June 2011.

Disclaimer

This material is not intended for distribution to retail clients. This material does not constitute an offer or invitation to anyone in any jurisdiction to invest in any Russell product or use any Russell services where such offer or invitation is not lawful, or in which the person making such offer or invitation is not qualified to do so, nor has it been prepared in connection with any such offer or invitation.

Unless otherwise specified, Russell is the source of all data. All information contained in this material is current at the time of issue and, to the best of our knowledge, accurate. Any opinions set forth herein are intended to serve as general information only and should not be relied upon by any individual or entity as advice or recommendations specific to that individual entity. Anyone using this material should consult with their own attorney, accountant, financial or tax adviser or consultants on whom they rely for investment advice specific to their own circumstances. Past performance or any prediction or forecast is not necessarily indicative of future performance.

Please remember that all investments carry some level of risk, including the potential loss of principal invested. They do not typically grow at an even rate of return and may experience negative growth. As with any type of portfolio structuring, attempting to reduce risk and increase return could, at certain times, unintentionally reduce returns.

Bond investors should carefully consider risks such as interest rate, credit, repurchase and reverse repurchase transaction risks. Greater risk, such as increased volatility, limited liquidity, prepayment, non-payment and increased default risk, is inherent in portfolios that invest in high yield (“junk”) bonds or mortgage backed securities, especially mortgage backed securities with exposure to sub-prime mortgages.

Diversification and strategic asset allocation do not assure profit or protect against loss in declining markets.

Nothing contained in this material is intended to constitute legal, tax, securities, or investment advice, nor an opinion regarding the appropriateness of any investment, nor a solicitation of any type. The general information contained in this publication should not be acted upon without obtaining specific legal, tax, and investment advice from a licensed professional and Russell does not make any representation or warranty as to its accuracy, completeness or correctness.

Russell Investment Group Private Limited of 16 Collyer Quay, #09-00, Singapore 049318, Registration No. 199901513K is a wholly owned subsidiary of Frank Russell Company, a Washington Corporation, United States of America which is in turn a subsidiary of The Northwestern Mutual Life Insurance Company of United States of America.

First used: January 2012

Russell Investments

For more information about Russell:

Call:
+65 6880 5900

Visit:
www.russell.com/asia

ABOUT RUSSELL INVESTMENTS

Russell Investments improves financial security for people by providing strategic investment advice, world class implementation, state-of-the-art performance benchmarks and a range of objectively researched, institutional-quality investments.

Russell serves individual, institutional and adviser clients in more than 47 countries.

Founded in 1936, Russell is a subsidiary of Northwestern Mutual. The firm, headquartered in Tacoma, Washington, U.S, has principal offices in Amsterdam, Auckland, Hong Kong, Johannesburg, London, Melbourne, New York, Paris, San Francisco, Singapore, Sydney, Tokyo and Toronto.