

# Russell Research

By: Daniel Gardner, Defined Contribution Analyst  
Josh Cohen, CFA, Defined Contribution Practice Leader

AUGUST 2011

## What's the right savings rate?

Give your participants a place to start - Target Replacement Income rate multiplied by 30%. Simply put: TRI 30

Defined contribution plan sponsors have helped their participants understand the need to save for retirement and encouraged plan participation through education and plan design features like auto enrollment. But participants still struggle with how much to save. This paper provides DC plan sponsors with a practical approach – TRI 30 – to guide participants towards appropriate individual savings rates.

The average savings rate in defined contribution (DC) retirement plans is around 7%.<sup>1</sup> Conventional wisdom dictates that 7% is probably not enough. But knowing this doesn't help us answer the question of "what is the right savings rate?" In a recent survey conducted by the Defined Contribution Institutional Investment Association (DCIIA), a plurality of plan sponsors (37%) said the optimal savings rate for the average investor is 10%–11%.<sup>2</sup> But what is that based on? Does this rate include the company match? Is it just a gut feeling plan sponsors have, or is it based on analysis?

Participants cannot guarantee retirement success. However, those who save adequately relative to their retirement spending expectations will greatly diminish their exposure to risk factors outside their control. Despite the development of new investment options for DC plan participants in recent years, such as target date funds, the best "hedge" against retirement inadequacy remains a consistent and adequate commitment to saving. Participants should focus on what they can control: the amount they save each year while working.

The question we will try to answer in this paper is: What *is* the right savings rate?

*TRI = Target Replacement Income rate. It is a specific percentage of one's final, pre-retirement salary.*

*TRI 30 = 30% of the TRI. It is a "rule-of-thumb" for an appropriate savings rate.*

<sup>1</sup> Vanguard, "How America Saves 2011." Average participant deferral rate for Vanguard record kept plans in 2010.

<sup>2</sup> Lucas, Lori, Pamela Hess and Cathy Peterson. "Plan Sponsor Survey: Structuring DC Plan Automatic Features to Pump Up Retirement Savings."

---

This is a difficult question, given that the answer differs for each individual participant. However, by exploring two distinct but related questions, we can provide a more structured framework for finding the answer. This framework will help plan sponsors better answer the question “are my participants saving enough?” and take appropriate steps, via plan design, to improve participant behavior.

**Question (1): How much should participants save for a high chance of achieving their desired replacement rate, or “TRI ”?<sup>3</sup>**

“Replacement rate” means a percentage of one’s final, pre-retirement salary. For example, a replacement rate of 60% would mean \$60,000 annually for someone who makes \$100,000 in the year before retirement. It turns out that for a given desired replacement rate, or TRI, generating a ballpark estimate of how much to save is fairly straightforward. Specifically, Russell’s research has yielded several rules of thumb that tell us what a given participant should save each year for a high chance of success. The “base case” for these rules of thumb, which applies to a new retirement saver, is called the “TRI 30” approach – whereby saving 30% of the TRI each year, including any employer contribution, leads to about a 90% probability of reaching the TRI.<sup>4</sup>

*...the best “hedge” against retirement inadequacy remains a consistent and adequate commitment to saving.*

**Question (2): What TRI is sufficient to fund one’s retirement?**

While this number is different for every individual, there is some interesting research that looks into answering this question for different income groups. We will highlight some of what we have found.

Once a plan sponsor understands TRI 30 and has established a TRI for a “typical” participant, that sponsor can begin embedding this knowledge directly in the plan’s design.

**THE ANSWER TO QUESTION (1) – HOW DO YOU DETERMINE THE RIGHT SAVINGS RATE TO ACHIEVE THE TRI?**

We simulated retirement outcomes in terms of income replacement rates for several hypothetical participants contributing at different rates, ranging from 2% to 20% each year (including any company match), throughout their careers.<sup>5</sup> The asset allocation for the participants was based on the Morningstar Lifetime Allocation Moderate Index.<sup>6</sup> In Exhibit 1, we graphed the participants’ chances of meeting a 40% replacement rate (blue line) as well as a 60% replacement rate (gray line) from the defined contribution plan.

---

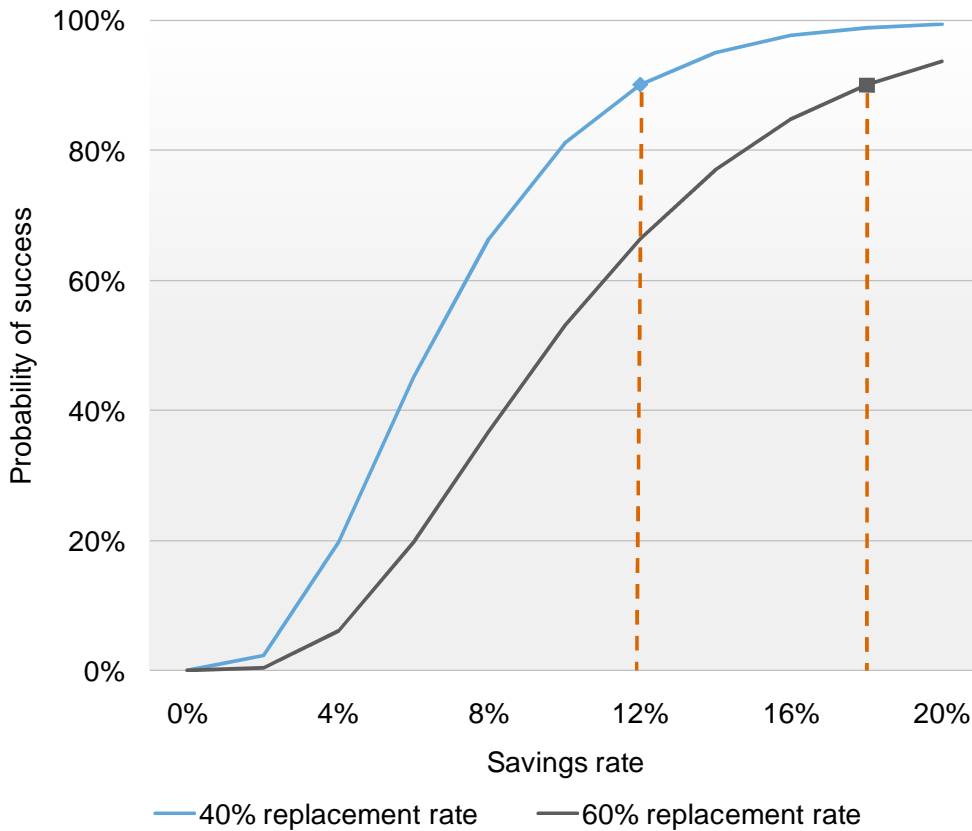
<sup>3</sup> Many thanks to Russell colleague Brandy Swift for suggesting a similar acronym.

<sup>4</sup> We define success in meeting that goal as purchasing a nominal fixed annuity that provides the desired income replacement. We choose this method because it mitigates longevity risk, simplifying the “how much is enough?” question.

<sup>5</sup> Salary growth rate, length of career, etc., are the “default” inputs outlined in Russell’s target date methodology paper, “Russell’s approach to target-date funds: Building a simple and powerful solution to retirement saving,” by Grant Gardner, Ph.D. and Yuan-An Fan, Ph.D., 2006 (revised 2011).

<sup>6</sup> Use of this input is not intended to be an endorsement of the Morningstar product. Rather, we want to focus on the *savings rate*, not the asset allocation, so we thought it sensible to use popular “benchmark” target date fund glide path.

Exhibit 1: Probability of replacement rate success as a function of savings rate: Baseline case with sponsor match



Source: Russell Investments, Morningstar. See Appendix for return and asset allocation assumptions.

Our analysis reveals that a savings rate of at least 12% will offer a very high probability (90% chance) of meeting the 40% replacement rate. Similarly, a savings rate of at least 18% will offer a very high probability of success for a 60% replacement rate.

Interestingly, both the 12% and 18% savings rates are 30% of the desired replacement rate. (Keep in mind that the rule is based on very specific assumptions – in this case, a 40-year savings horizon.) **This is a key insight: the amount the plan participant needs to save for retirement is a direct function of her TRI – in this case, 30% of that TRI, including the employer contribution.** Describing a participant’s retirement savings rate in terms of their TRI can greatly simplify the retirement savings puzzle. This is the basis of the TRI 30 approach.

TRI 30 allows us to find a good savings rate, not just for a 40% or 60% TRI, but for any TRI. Here are two quick examples of the math behind TRI 30:

- If TRI = 30% of pre-retirement income:  
 $TRI\ 30 = 30\% * 30\% = 9\%$  savings rate (participant and sponsor total)
- If TRI = 55% of pre-retirement income:  
 $TRI\ 30 = 55\% * 30\% = 16.5\%$  savings rate (participant and sponsor total)

*Describing a participant’s retirement savings rate in terms of their TRI can greatly simplify the retirement savings puzzle. This is the basis of the TRI 30 approach.*

---

## What about participants who do not fit the basic assumptions? What should they save?

That largely depends on the given participant's age and accumulated savings. Participants who wait to save likely will need to save more than participants who get started early.

Through our research, Russell has developed a solid understanding of the five key factors that influence the "savings rate question" for an individual. Factors that should be considered include a participant's:

1. Current age
2. Retirement age
3. Salary
4. Accumulated savings
5. **TRI**

## Two hypothetical case studies

Here we present two hypothetical case studies and show how our research applies to each case.

### CASE STUDY 1: MAYA, 35 YEARS OLD, \$50,000 SALARY

After years of spending a bit beyond her means, Maya has paid down her debt and is ready to begin saving for retirement. She plans to work for 30 more years, and will invest according to the last 30 years of the Morningstar index mentioned earlier. Our initial analysis suggests that she can follow a TRI 30 approach to saving each year and feel good about her retirement. In this case, however, Maya should consider saving even more. Per Exhibit 2, if her TRI is 40%, she should be saving 16.8% of her earnings, including any employer contributions, each year. This is a high target, but will help to solidify her ability to afford her desired lifestyle over a long retirement period.

Exhibit 2: Case study 1 – suggested savings rates for a 90% chance of reaching the TRI; 35-year-old participant with \$50,000 salary (Maya's savings rate in **bold**)

Current balance	TRI			
	20%	40%	60%	80%
\$0	8.4%	<b>16.8%</b>	25.2%	33.6%
\$50,000	5.3%	13.7%	22.1%	30.5%
\$100,000	2.2%	10.6%	19.0%	27.4%
\$150,000	0.0%	7.5%	15.9%	24.3%
\$200,000	0.0%	4.4%	12.8%	21.2%
\$250,000	0.0%	1.4%	9.8%	18.2%
\$300,000	0.0%	0.0%	6.7%	15.1%
\$350,000	0.0%	0.0%	3.6%	12.0%
\$400,000	0.0%	0.0%	0.5%	8.9%
\$450,000	0.0%	0.0%	0.0%	5.8%
\$500,000	0.0%	0.0%	0.0%	2.7%

**CASE STUDY 2: RANDY, 45 YEARS OLD, \$100,000 SALARY**

Randy decides to take out a hardship withdrawal from his DC plan to buy a house for his family, reducing his balance to \$100,000. Fortunately for Randy, he works for a company where he has a DB plan, so he does not need too much from the DC plan. He plans to work for 20 more years, and will invest according to the last 20 years of the Morningstar index. If Randy’s TRI is 20%, he should consider an 8.6% savings rate, including the employer contribution, in order to be confident that he’ll meet his TRI of 20%.

Exhibit 3: Case study 2 – suggested savings rates for a 90% chance of reaching the TRI; 45-year-old participant with \$100,000 salary (Randy’s savings rate in **bold**)

Current balance	TRI			
	20%	40%	60%	80%
\$0	13.3%	26.6%	39.9%	53.2%
\$50,000	11.0%	24.3%	37.6%	50.9%
\$100,000	<b>8.6%</b>	21.9%	35.2%	48.5%
\$150,000	6.3%	19.6%	32.9%	46.2%
\$200,000	3.9%	17.2%	30.5%	43.8%
\$250,000	1.6%	14.9%	28.2%	41.5%
\$300,000	0.0%	12.6%	25.9%	39.2%
\$350,000	0.0%	10.2%	23.5%	36.8%
\$400,000	0.0%	7.9%	21.2%	34.5%
\$450,000	0.0%	5.5%	18.8%	32.1%
\$500,000	0.0%	3.2%	16.5%	29.8%

*DC participants will certainly save more, and be better prepared for retirement, if sponsors educate themselves and teach participants about the importance of robust savings rates.*

**Isn’t adopting this approach asking a lot of participants?**

We know that the savings rate implied by the TRI 30 could be quite high – for example, in the case of a 60% TRI, it is 18%. Saving this much may be a lot to ask of the participant and the sponsor.

However, we also know that participants can and will “kick the can down the road” when it comes to saving for retirement. Further, 401(k) plans can be prone to leakage<sup>7</sup>, particularly when a participant changes jobs. Is it better for participants to think that they are saving enough and risk a very unpleasant surprise at retirement? Or should we keep expectations realistic, and let participants know that the task at hand is difficult? DC participants will certainly save more, and be better prepared for retirement, if sponsors educate themselves and teach participants about the importance of robust savings rates.<sup>8</sup>

For these reasons and others, we feel it is best to aim high.

**ADDRESSING QUESTION (2) – WHAT TRI WILL BE SUFFICIENT IN RETIREMENT?**

Now that we have a framework for determining a savings rate goal, the natural follow-on question is: how does one determine the correct TRI in the first place?

<sup>7</sup> Leakage refers to money coming out of DC plans due to cash-outs, hardship withdrawals and loan defaults, may include repaid loans and non-hardship withdrawals.

<sup>8</sup> Current limits to contribution amounts prevent many high-income participants from being able to save enough in the DC plan. These participants should look to invest in a supplemental, out-of-plan account, e.g. an IRA.

---

An often-cited replacement rate study by AON Consulting and Georgia State University<sup>9</sup> provides some conventional analysis on how to determine the correct TRI. For example, the study suggests that someone with a pre-retirement income of \$90,000 needs a total replacement rate of 78% to maintain a similar standard of living in retirement. Because 36% will come from Social Security, another 42% will need to come from savings, and thus a TRI of 42%. In contrast, someone with a pre-retirement income of \$50,000 needs a similar but slightly higher total replacement rate, 81%. Because Social Security replaces a greater percentage of lower-paid workers' pre-retirement incomes, – in this case, 51% – the study would suggest that the TRI for this individual is 30%.

However, many factors can influence what the goal should be. The numbers quoted above are the baseline case in a report that analyzes dozens of scenarios. In addition, there are other studies, including research from the Employee Benefit Research Institute, that cite different key factors.<sup>10</sup> Based on the available research, we've developed four key insights regarding considerations for determining an individual's TRI:

**1. Retirement is very expensive.**

For a 90% chance of retirement adequacy – meeting health care expenses and basic living expenses through retirement – a participant at the point of retirement likely needs a nest egg of at least \$500,000.<sup>11</sup>

**2. There is no single number that can guarantee retirement adequacy.**

The volatility of retirement risks (e.g., investment returns, longevity and health care) makes planning for retirement very difficult. Many retirement planning tools do not account for this volatility, which exacerbates the problem. For example, over a 20-year period, the average annual return on stocks could realistically be anywhere between zero and 17%.<sup>12</sup>

**3. The volatility of health care expenses is a primary driver of retirement adequacy heartburn.**

This comes in large part from unanticipated long-term care expenses. The average cost of a room in a nursing home is over \$70,000 annually.<sup>13</sup> Medicare and private health insurance generally do not cover long-term care. Medicaid may provide relief, but only for someone who has very little wealth, as Medicaid is means-tested. Long-term care insurance is a private market alternative, but it tends to be very expensive.

---

<sup>9</sup> AON Consulting's 2008 Replacement Ratio Study™: A Measurement Tool for Retirement Planning.

<sup>10</sup> VanDerHei, Jack. EBRI Issue Brief No. 297, "Measuring Retirement Adequacy: Calculating Realistic Income Replacement Rates," September 2006. Park, Youngkyun. EBRI Issue Brief No. 357, "Retirement Income Adequacy with Immediate and Longevity Annuities," May 2011.

<sup>11</sup> From EBRI. Based on a 65-year-old single male retiree. Certainly, this number is not realistic for some, particularly low income participants. However, this segment of retirees may have lower Medicare expenses as well as access to Medicaid.

<sup>12</sup> Ezra, Don, Bob Collie and Matt Smith. The Retirement Plan Solution: The Reinvention of Defined Contribution. Wiley, 2009. p. 42

<sup>13</sup> From Genworth 2011 Cost of Care Survey, published April 2011.

---

#### 4. Low to moderate income participants face an uphill battle in saving for retirement.

Lower income participants will receive a relatively more generous Social Security benefit and have to pay relatively fewer taxes in retirement (this is clear from the AON study). However, low to moderate income participants tend to have proportionately higher day-to-day expenses than higher income participants, which makes saving for retirement more difficult. Further, despite the progressive nature of Medicare,<sup>14</sup> health care expenses may not be linked to income levels, primarily due to long-term care needs. Higher income participants, with more assets and savings, will likely be better prepared to spend five figures annually on assisted living expenses in retirement than will lower income participants.

So, it is clear that coming up with a TRI is not as simple as looking it up in a single table. However, that doesn't mean we should just throw our hands in the air and ignore this issue. It is important for DC plan sponsors to combine the known research in the field with knowledge of their employees and specific total benefits programs to set TRI ranges for their participants.

*...the next step is to imbed that knowledge into the plan's design through the company match and auto-features.*

#### How to use TRI 30 and plan design features to improve participant outcomes

Once a sponsor has decided on a reasonable TRI range for plan participants and understands the TRI 30 method to saving, the next step is to embed that knowledge in the plan's design through the company match and auto-features.

Actions 1 and 2 in our recent paper "11 for 2011: 11 Actions Designed to Improve Your Defined Contribution Plans in 2011" relate to re-evaluating the plan's matching formula and automatic features. Both the match rate and the default contribution rate send a signal to participants about how much to save, and have a material impact on their behaviors. The match can be structured to encourage participants to save more, but without impacting the company's bottom line. Further, research from EBRI and the Defined Contribution Institutional Investment Association indicates that more aggressive implementation of auto-features can bolster retirement readiness.<sup>15</sup> So, sponsors need to approach these aspects of plan design in a thoughtful manner.

*Both the match rate and the default contribution rate send a signal to participants about how much to save, and have a material impact on participants' behavior.*

#### IMPACT OF TRI 30 ON THE MATCH FORMULA

Suppose a sponsor decides that a 50% TRI is appropriate for the "typical" plan participant. Per TRI 30, the sponsor could then conclude that a 15% savings rate, including the sponsoring organization's contribution, is a good goal for participants. This sponsor is willing to contribute at most 5% of pay to the DC plan. Traditionally, the match would be dollar for dollar on the first 5%. Instead, here's one possible alternative:

- 75% match on the first 5% (total contribution =  $5\% + 0.75 \times 5\% = 8.75\%$ )
- 25% match on the next 5% (total contribution =  $8.75\% + 5\% + 0.25 \times 5\% = 15\%$ )

This match would implicitly encourage a higher savings rate than a more traditional match and not change the company's contribution budget. A participant who maximized the match would be saving the full 15%. However, this match policy still significantly helps those participants who can't afford to save the 10% required for the full company match.

---

<sup>14</sup> Steuerle, C. Eugene; Carasso, Adam (1 October 2004). The USA Today Lifetime Social Security and Medicare Benefits Calculator: Assumptions and Methods. Urban Institute. <http://www.urban.org/publications/900746.html>.

<sup>15</sup> Source: Jack VanDerhei and Lori Lucas, "The Impact of Auto-enrollment and Automatic Contribution Escalation on Retirement Income Adequacy." EBRI Issue Brief, No. 349, and DCIIA Research Report (November 2010).

---

## IMPACT OF TRI 30 ON THE DEFAULT CONTRIBUTION RATE

To complement this alternative match formula, the sponsor could implement an auto-enrollment and auto-contribution escalation policy to get participants all the way up to a 15% savings rate:

- 6% in year 1 (total contribution = **10%**)
- 2% increase in year 2 (total contribution = **12.5%**)
- 2% increase in year 3 (total contribution = **15%**)

### Summary

The TRI 30 approach provides a framework that DC plan sponsors can use to help participants answer the question “what is the right savings rate?” We encourage you to take this information and put it into action:

- Conduct a comprehensive review of your plan’s demographics to fully understand your “typical” participant and determine a TRI for your plan.
- Use that information to review your plan’s features, such as match, auto enrollment, and auto escalation, and determine how you can best structure your plan to drive participants to save at the right level.
- Design a robust communications plan to help your participants better understand what they should be saving.

We understand that TRI 30 is not the answer for everyone, but a framework such as this can help plan sponsors have a smarter conversation about setting reasonable goals and designing a plan that better helps participants achieve retirement peace-of-mind.

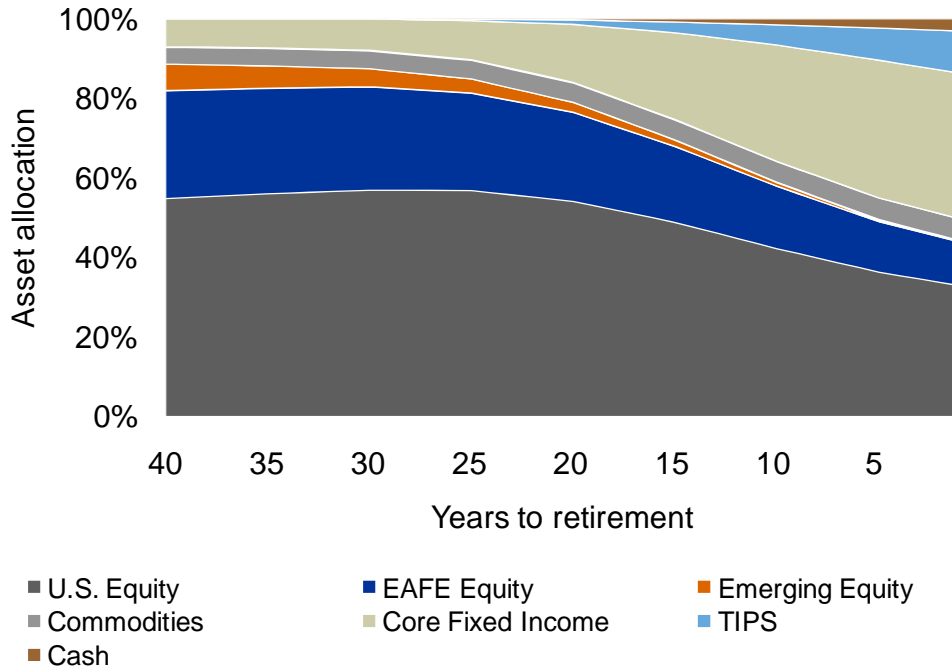
## Appendix

Return correlation matrix for Exhibit 1

Asset Class	Mean	Volatility	CORRELATION MATRIX							
			US Equity	EAFE Equity	Emerging Equity	Global REITS	Core Bonds	TIPS	Short Duration Bonds	
US Equity	8.6%	19.6%	1.00							
EAFE Equity	8.5%	21.0%	0.80	1.00						
Emerging Equity	9.9%	27.1%	0.69	0.69	1.00					
Global REITS	8.4%	22.4%	0.76	0.80	0.72	1.00				
Core Bonds	5.0%	5.8%	0.35	0.29	0.24	0.30	1.00			
TIPS	4.3%	8.8%	0.34	0.27	0.24	0.28	0.77	1.00		
Short Duration Bonds	4.0%	8.9%	0.33	0.24	0.23	0.27	0.82	0.91	1.00	

Source: Russell Investments. Analysis is based on 200,000 Monte Carlo simulations using March 2011 capital market assumptions.

Morningstar Lifetime Allocation glide path illustration for Exhibit 1



Source: Morningstar

---

**For more information:**

Call Russell at **800-426-8506** or  
visit **[www.russell.com/institutional](http://www.russell.com/institutional)**

**Important information**

---

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.

These views are subject to change at any time based upon market or other conditions and are current as of the date at the beginning of the document. The opinions expressed in this material are not necessarily those held by Russell Investments, its affiliates or subsidiaries. While all material is deemed to be reliable, accuracy and completeness cannot be guaranteed. The information, analysis and opinions expressed herein are for general information only and are not intended to provide specific advice or recommendations for any individual or entity.

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.

Although stocks have historically outperformed bonds, they also have historically been more volatile. Investors should carefully consider their ability to invest during volatile periods in the market.

Russell Investment Group, a Washington USA corporation, operates through subsidiaries worldwide, including Russell Investments, and is a subsidiary of The Northwestern Mutual Life Insurance Company.

The Russell logo is a trademark and service mark of Russell Investments.

Copyright © Russell Investments 2011. All rights reserved. This material is proprietary and may not be reproduced, transferred, or distributed in any form without prior written permission from Russell Investments. It is delivered on an "as is" basis without warranty.

First used: August 2011

USI-10533-08-13