THE EQUITY RISK PREMIUM IN THE U.S. AND CANADA: A NEW LOOK

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Abstract

This paper provides updated estimates of the equity risk premium as it applies to both large North American large cap stocks as well as small-caps over the past half-century. Some discussion of alternative explanations of the equity risk premium "puzzle" is also provided. Since the turn of the millennia, equity risk premia are shown to be declining, for the U.S., although not in Canada, and not for small-cap stocks. The time-varying nature of the equity risk premium is explored, with implications to valuations over short horizon periods, short-term forecasting, and tactical asset allocation decisions. The small-stock vs. large-stock equity

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risk premium in recent years is also studied, in the context of long-term valuations and strategic asset allocation decisions.

1. INTRODUCTION

The equity risk premium, defined as the incremental return to holding risky stocks relative to presumed "riskless" assets such as treasury bills or government bonds, has been of particular interest to academics as well as practitioners over the past two decades. Investment strategists require forecasts of the equity risk premium for short-term tactical asset allocation decisions, as well as for longer term strategic investment decisions. Estimates of the equity risk premium are essential for business valuators and for corporate decisions on capital expenditure and merger proposals. The equity risk premium offers an objective benchmark for firms for determining the hurdle rate for such decisions. The quality of decision-making will be enhanced, to the extent that the equity risk premium estimates convey valid information and are available in a timely fashion. However, since the appearance of the seminal paper of Mehra and Prescott (1985), the relevance and validity of the traditional historical measures of the equity risk premium have been severely challenged.[1] A virtual growth industry of academics in search of powerful and all-encompassing solutions to the "puzzle" of the long-term outperformance of equities relative to risk free assets has blossomed.

This paper briefly reviews the state of the equity risk premium over the past half century, as well as the academic work that has sought to explain and forecast its magnitude and significance. In the next section I will briefly present some recently updated estimates of the empirical equity risk premium for Canada and the U.S., as well as for small-cap stocks. The latter have attracted considerable attention of analysts and practitioners, since Banz (1981) and Reinganum (1981a, 1981b) identified what was deemed to be an anomaly in the finance literature, that is inconsistent with market efficiency: risk adjusted returns are higher for small firms than for large firms. In recent years, as I will show, Canadian small-cap stocks have performed particularly well, suggesting that the risk premium of this asset class may be worthy of separate investigation. In section 3, I will summarize some of the work that attempts to explain the behavior of the equity risk premium through time. In section 4, I will discuss various approaches for forecasting the equity risk premium for short-term horizons. Section 5 provides some further analysis of the "small-cap premium" effect, with some new evidence on the relevance of small-cap stocks as a distinct asset class for longer term horizons for strategic asset allocation decisions. The paper concludes with a summary in section 6.

1 Mehra and Prescott (1985) show that the high equity premium observed over long periods cannot be rationalized by the standard expected utility maximization paradigm of neo-classical financial economics.

2. THE BEHAVIOR OF THE EQUITY RISK PREMIUM THROUGH TIME

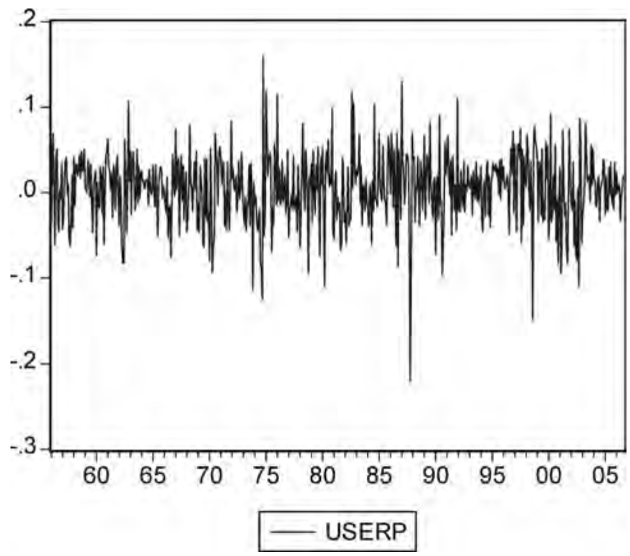
The initial equity risk premium "puzzle" article of Mehra and Prescott (1985) documents a long-term *ex post* annualized mean risk premium for the S&P 500 over U.S. treasury bills of 6.18%. This high estimate represents a puzzle for analysts: only a small premium of .35% per annum should be observed, given that the standard Arrow-Debreu equilibrium assumptions are adopted by the authors, and given that generally-accepted empirical estimates of risk and risk aversion are used in the model's calibration. Estimates of the equity risk premia using more recent data and longer time series for the U.S. since the Mehra and Prescott (1985) initial study show no diminution. For example, Mehra (2003) reports a mean risk premium for the U.S. of 6.9% over the period 1889-2000. Dimson, Marsh, and Staunton (2000) show a mean (arithmetic) risk premium of stocks relative to bills (bonds) for the U.S. of 7.14% (6.49%) and for the world as a whole of 6.07% (5.15%), over the period 1900-2005.

Figure 1 plots the equity risk premium series for U.S. and Canadian equities, for the 50-year horizon, 1956-2006. The U.S. series are the S&P excess return over the 1-month T-Bill return from Ibbotson. The excess of the returns of the S&P/TSX Composite Total Return over the short-term (91 day) Scotia Capital Treasury Bill Index Return are used for the Canadian series.

Figure 1

Panel A

U.S. Equity Return Premium (USERP: S&P 500 Total Return Index Relative to 1 Month T-bill Returns) January 1956-August 2006 (Monthly Excess Return of S&P 500 Total Return Index Over 1 Month T-Bills)



Panel B

Canadian Equity Return Premium (CANERP: S&P/TSX Composite Total Return Index Relative to Scotia Capital 91 T-bill Returns) January 1956-August 2006 (Monthly Risk Premium: Excess Return of S&P/TSX Composite Total Return Index Over 91 Day T-Bills)

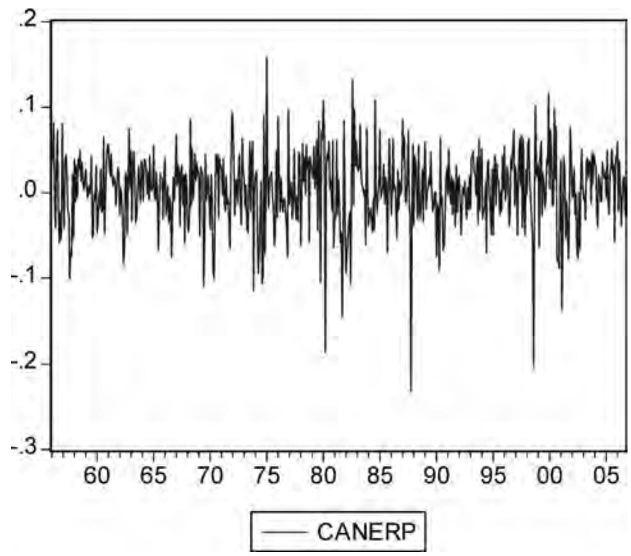


Figure 2 shows these estimates over the recent 6-year horizon, January 2000-August 2006.

Figure 2

Canadian (CANERP) vs. U.S. Equity Return Premium (USERP) January 2000-August 2006 (CANERP: S&P/TSX Composite Total Return Index Relative to Scotia Capital 91 T-Bill Returns; USERP: S&P 500 Total Return Index Relative to 1 Month T-bill Returns)

Monthly Risk Premium

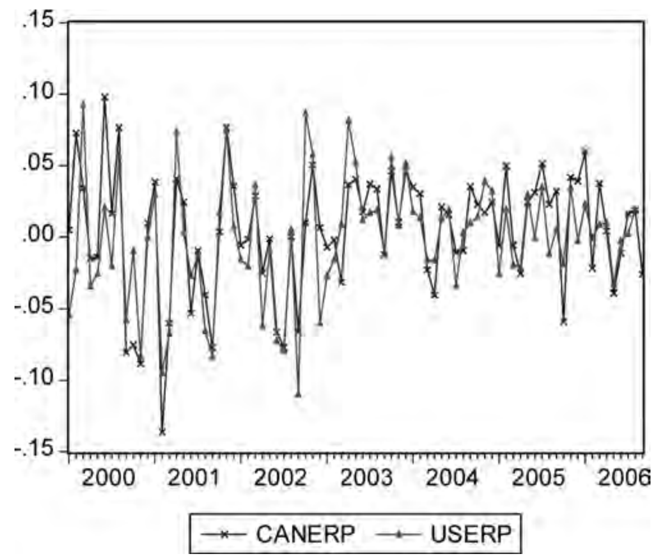
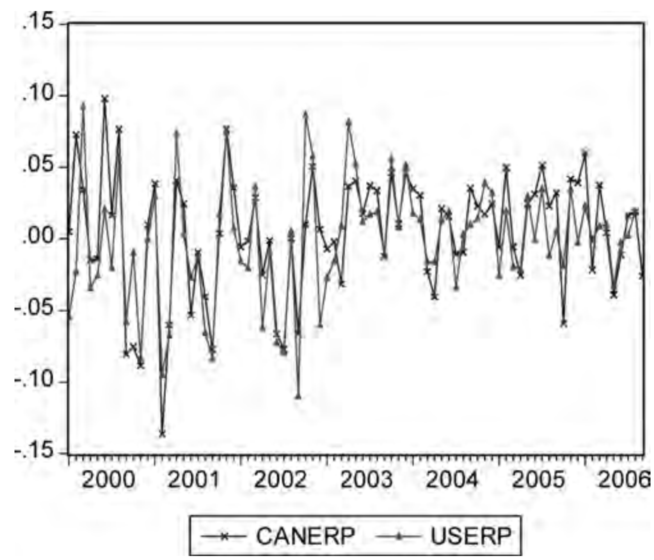


Figure 3 provides comparable 5-year estimates using long government bonds as the risk free asset class. The IMF Canadian Government Long Bond Return is used as the proxy for the Canadian risk-free asset, while the Ibbotson Government Long Bond return is used for the U.S. risk-free counterpart.

Figure 3

Canadian (CANERPLONG) vs. U.S. Equity Return Premium (USERPLONG) January 2000-August 2006 CANERPLONG: S&P/TSX Composite Total Return Index Relative to IMF Canadian Long-term Government Bond Returns; USERPLONG: S&P 500 Total Return Index Relative to US Long-term Government Bond Returns (Ibbotson)

Monthly Risk Premium



A striking feature in all of these plots is the large volatility of the premia for both Canada and the U.S. from one year to the next. In addition there is no evidence of any particular trend in any of the series.

Tables 1-3 below show the distributional properties of these series, as well as for the equity risk premium with the U.S. Ibbotson Small-cap Index series serving as a proxy for the risky asset. Table 1 provides estimates for the 50-year horizon period. Panel A shows that the monthly equity premia are large and volatile, with evidence of non-normality. Panel B shows that the annualized risk premia conform with previous studies for large cap markets, with an arithmetic (geometric) mean for the Canadian equity risk premium of 4.2% (3.0%) and for the U.S. an arithmetic (geometric) mean of 5.9% (4.9%). Especially noteworthy here is the large equity premium for small-cap firms over this long horizon (10.1% (8.3%) for the arithmetic (geometric) mean equity premium). Panel C shows that risk premia are correlated, though imperfectly so between countries, consistent with some segmentation across markets. This is especially the case for the U.S. small-cap premium. Panel D shows that notwithstanding the high volatility of each of the risk premia, they ***all behave as stationary series***, based on unit root tests.

Table 1

Statistical Distribution of Alternative Equity Premia Relative to T-bills, January 1956-August 2006. The Risk Premia represent alternative equity returns relative to short-term T-Bills: CANERP: S&P/TSX Composite Total Return Index Relative to Scotia Capital 91 day T-Bill Returns; USERP: S&P 500 Total Return Index Relative to 1 Month US T-bill Returns; USERPCAN: ESERP translated into Canadian dollars, USSMALLRA: the U.S. Small-cap Equity Risk Premium Relative to 1 month US T-Bill Returns; USSMALLRC: USSMALLRA translated into Canadian Dollars.

Panel A

Monthly Return Distributions of Alternative Equity Risk Premia

	CANERP	**USERP**	**USERPCAN**	**USSMALLRA**	**USSMALLRC**
Arithmetic Mean	0.003507	0.004899	0.005031	0.008423	0.008534
Geometric Mean	0.002510	0.004035	0.004201	0.006687	0.006853
Median	0.006472	0.007251	0.006631	0.009982	0.009871
Maximum	0.158698	0.159861	0.156098	0.269312	0.277918
Minimum	-0.231202	-0.21986	-0.2233	-0.296104	-0.299208
Std. Dev.	0.044326	0.04157	0.040793	0.058825	0.057982
Skewness	-0.651599	-0.38074	-0.325447	-0.254328	-0.187329
Kurtosis	5.445201	4.825661	4.800772	6.053326	6.10457

Panel B

Annualized Equity Return Premia

	CANERP	**USERP**	**USERPCAN**	**USSMALLRA**	**USSMALLRC**
Arithmetic Mean	0.042084	0.058788	0.060372	0.101076	0.102408
Geometric Mean	0.030435	.049344043	0.0514165	0.082978	0.085117
Median	0.077664	0.087012	0.079572	0.119784	0.118452

Panel C

Correlation Matrix

	CANERP	USERP	USERPCAN	USSMALLRA	USSMALLRC
CANERP	1.000000				
USERP	0.772706	1.000000			
USERPCAN	0.724346	0.962347	1.000000		
USSMALLRA	0.709041	0.724763	0.690513	1.000000	
USSMALLRC	0.675753	0.696215	0.715129	0.981153	1.000000

Panel D

Unit Root Tests of Alternative Equity Risk Premia

Augmented Dickey-Fuller Statistics	t-Statistic	Prob.*
CANERP	-22.31626	0
USERP	-24.07727	0
USERPCAN	-24.20074	0
USSMALLRA	-20.51790	0
USSMALLRC	-20.53187	0

*MacKinnon (1996) one-sided p-values.

Table 2 shows qualitatively similar results, using government bonds as the proxy for the risk-free asset.

Table 2

Statistical Distribution of Alternative Equity Premia Relative to Government Bonds, January 1957-June 2006. The Risk Premia represent alternative equity returns relative to long-term government bonds CANERPLONG: S&P/TSX Composite Total Return Index Relative to IMF Canadian Long-term Government Bond Returns; USERPLONG: S&P 500 Total Return Index Relative to US Long-term Government Bond Returns (Ibbotson); USEPLONGC: USERPLONG translated into Canadian dollars.

Panel A

Monthly Return Distributions of Alternative Equity Risk Premia

	CANERPLONG	USERPLONG	USERPLONGC	USSMALLO	USSMALLOC
Arithmetic Mean	0.002508	0.004056	0.004273	0.007940	0.008135
Geometric	0.001550	0.003053	0.003285	0.005975	0.006207
Median	0.005086	0.007117	0.006634	0.007009	0.008269
Maximum	0.162359	0.145932	0.176697	0.257070	0.257111
Minimum	-0.273369	-0.261213	-0.264471	-0.333416	-0.336356
Std. Dev.	0.043281	0.044480	0.044216	0.062416	0.061944
Skewness	-0.711419	-0.475142	-0.367409	-0.186490	-0.094196
Kurtosis	6.731847	5.648058	5.658655	5.508923	5.531349
Jarque-Bera	393.4616	195.2429	187.6739	158.7006	158.9327
Probability	0.000000	0.000000	0.000000	0.000000	0.000000

Panel B

Annualized Equity Return Premia

	CANERPLONG	USERPLONG	USERPLONGC	USSMALLO	USSMALLC
Arith.Mean	0.030096	0.048672	0.051276	0.09528	0.09762
Geom.Mean	0.018759	0.037260	0.040141	0.07410	0.07708
Median	0.061032	0.085404	0.079608	0.084108	0.09923

Panel C

Correlation Matrix

	CANERPLONG	USERPLONG	USERPLONGC	USSMALLO	USSMALLOC
CANERP-LONG	1.000000				
USERPLONG	0.735347	1.000000			
USER-PLONGC	0.691701	0.967068	1.000000		
USSMALLO	0.704472	0.760561	0.730050	1.000000	
USSMALLOC	0.676117	0.739436	0.756032	0.983113	1.000000

Panel D

Unit Root Tests of Alternative Equity Risk Premia

Augmented Dickey-Fuller Statistics	**t-Statistic**	**Prob.***
CANERPLONG	-21.06585	0
USERPLONG	-23.60840	0
USERPLONGC	-23.56357	0
USSMALLO	-20.17209	0
USSMALLOC	-20.15361	0

*MacKinnon (1996) one-sided p-values.

As shown in Table 3, below, the behavior of the equity risk premia since the beginning of the millennia (corresponding to Figure 3) has shown some dramatic changes. Indeed, over this period, the traditional, Ibbotson measure risk premium was negative for U.S. stocks. However, the ***Ibbotson equity risk*** premium is based on the S&P 500, which is a ***large-cap portfolio***. The average (arithmetic and geometric) ***small-cap risk premium*** for the U.S. (measured in U.S. dollars) over this period is positive, but its variance was high.

Table 3

Statistical Distribution of Alternative Equity Premia Relative to T-bills, Jan 2000-Aug 2006. The Risk Premia represent alternative equity returns relative to short-term T-Bills: CANERP: S&P/TSX Composite Total Return Index Relative to Scotia Capital 91 T-bill Returns; USERP: S&P 500 Total Return Index Relative to 1 Month US T-bill Returns; USERPCAN: ESERP translated into Canadian dollars, USSMALLRA: the U.S. Small-cap Equity Risk Premium Relative to 1 month US T-Bill Returns; USSMALLRC: USSMALLRA translated into Canadian Dollars; CANSMALL: MSCI Canadian Small-cap Index Relative to Scotia Capital 91 T-bill Returns.

Panel A

Monthly Return Distributions of Alternative Equity Risk Premia

	CANERP	USERP	USERPCAN	USSMALLRA	USSMALLRC	CANSMALL
Arith.Mean	0.004050	-0.001680	-0.005239	0.008602	0.004972	0.006981
Geom. Mean	0.003117	-0.002567	-0.005988	0.006436	0.002984	0.006123
Median	0.010100	0.002539	-0.003334	0.003745	-0.005285	0.014552
Maximum	0.098134	0.092716	0.092038	0.230492	0.232022	0.083240
Minimum	-0.136540	-0.109960	-0.093798	-0.146121	-0.114512	-0.090832
Std. Dev.	0.043059	0.042176	0.038832	0.066618	0.064156	0.041555
Skewness	-0.699176	-0.202571	0.022717	0.214356	0.527484	-0.391840
Kurtosis	3.555383	3.097246	2.617406	3.540558	3.599283	2.423127
Jarque-Bera	7.546137	0.578655	0.494809	1.586657	4.906990	3.156452
Probability	0.022981	0.748767	0.780825	0.452337	0.085992	0.206341

Panel B

Annualized Equity Return Premia

	CANERP	USERP	USERPCAN	USSMALLR	USSMALLC	CANSMALL
Arith.	0.0486	-0.02016	-0.062868	0.103224	0.059664	0.083772
Geom	0.0380519	-0.030369	-0.069538	0.0800257	0.0363976	0.0760069
Median	0.1212	0.030468	-0.040008	0.04494	-0.06342	0.174624

Panel C

Correlation Matrix

	CANERP	USERP	USERPCAN	USSMALLRA	USSMALLRC	CANSMALL
CANERP	1.000000					
USERP	0.769408	1.000000				
USERPCAN	0.637853	0.876115	1.000000			
USSMALLRA	0.600182	0.434136	0.328587	1.000000		
USSMALLRC	0.505089	0.326786	0.374554	0.951438	1.000000	
CANSMALL	0.706412	0.566972	0.463945	0.490860	0.420808	1.000000

Panel D

Unit Root Tests of Alternative Equity Risk Premia

Augmented Dickey-Fuller Statistics	**t-Statistic**	**Prob.***
CANERP	-7.711198	0
USERP	-9.065544	0
USERPCAN	-8.814833	0
USSMALLRA	-7.788821	0
USSMALLRC	-7.802377	0
CANSMALL	-7.510300	0

*MacKinnon (1996) one-sided p-values.

The equity premia between countries are less correlated in recent years. Both the Canadian overall stock market premium and the MSCI Canadian small-cap index premium are positive and large in magnitude in this more recent period. Whether the differential performance observed for small-caps asset in recent years suggests that this asset class warrants renewed focus from a long-term, strategic asset allocation perspective is a matter that we will address further on in this paper.

3. EXPLANATIONS FOR THE HIGH EQUITY RISK PREMIUM

The high equity risk premium "puzzle" has been addressed in several theoretical papers over the past two decades. An excellent summary of recent work that has sought to rationalize the equity premium is provided by Mehra (2003). Mehra highlights the restrictive assumptions on preferences (isoelastic, constant relative risk aversion) and on probability distributions for consumption, dividends, and the return on equity in the Mehra-Prescott (1985) model. However, he also concludes that most studies that have tried to resolve the puzzle using alternative assumptions have been largely unsuccessful.[2]

2 Such modifications include allowing for habit formation in utility functions (Constantinedes (1990)), adjusting probability distributions to provide for catastrophes (Reitz (1988), survivorship bias (Brown, Goetzman and Ross (1995)) , imposing borrowing constraints (Constantinedes, et al (2003), allowing for incomplete markets and market imperfections (Heaton and Lucas (1996, 1997), liquidity and transactions costs (e.g. Bansl and Coleman 1996), and behavioral explanations. Regarding the latter, Benarzi and Thaler (1995) suggest that when investors are assumed to be "loss averse," and evaluate their portfolios frequently (long-term investors as well – i.e. they are "myopically loss averse") the high equity premium can be replicated in their simulations which use previously estimated parameters of prospect theory and annual evaluations of portfolios by investors. However, it should be noted that the authors demonstrate an inverse relationship between the estimated risk premium and investment evaluation period. During periods of large conditional volatility, which have increased in frequency in recent years, investors might be expected to evaluate their portfolios on a more regular basis (e.g. daily, weekly, monthly), which would be expected to give rise to very high-equity risk premia that are not consistent with ex post data.

An alternative approach to the "puzzle" is to look at realized returns vs. expected returns based on a fundamental model, as in Fama and French (2002). Fama and French suggest that the high realized equity premium observed over the half century 1951-2000, is unlikely to persist into the future. Based on dividend and earnings growth model estimates, they compute an unconditional equity premia of between 2.55 and 4.32%, respectively which is considerably lower realized average return of 7.43% over this period. Hence, they project a period of low actual expected returns over the future.[3] Similar conclusions are also made by Arnott and Ryan (2001) and Arnott and Bernstein (2002). The latter attribute the high observed equity premia to major non-recurring factors.[4]

Dimson, Marsh, and Staunton (2006), also note that historical risk premia measures are misleading estimates of prospective risk premia, and may be sensitive to the measurement interval. In particular, they state that observed equity risk premium over a particular interval will not capture possible changes in risk or risk attitudes of investors, or diversification opportunities. Using a decomposition of the equity risk premium into its components in an approach similar to Fama and French (2002), with their comprehensive world-market database for the period 1900-2005, they also project what appears to be a consensus in time series models of this sort: a lowering of the expected equity premium. Their estimate of the equity risk premium (relative to bills) is 3-3.5% on a geometric mean basis, and of 4.4% to 5% on an arithmetic mean basis, which is again lower than the historical equity premium for the world index (4.74% and 6.07% on a geometric vs. arithmetic basis, respectively).

The high premia for small-caps that are observed are consistent with those first documented in Banz's (1981) path breaking paper. Banz provided some theoretical explanations for the observed abnormal performance of small firms. His premise is that the amount of information generated on a security is based on the company's size. Small firms are presumed to have less information generated. For example, they may not be well followed by analysts. With less information generated, extending the Klein and Bawa (1977) model, investors will not hold small-cap securities as a consequence of uncertainty about the true parameters of the return distribution (estimation risk). Furthermore, since securities deemed acceptable by only a subset of the investors have higher risk-adjusted returns than those considered by all investors. Overall, then, the Banz (1981) argument is information based: that limited information about small firms leads to limited diversification and higher returns. The "small firm" effect has been shown in

3 Fama and French (2002) suggest that variations in expected stock returns may be due to slow mean reversion (Fama and French (1989)), but do not preclude other factors such as changing participation in equity markets by individuals and institutions, changing costs of obtaining diversified portfolios from mutual funds (citing Diamond (1999), Heaton and Lucas (1999) and Siegel (1999), variation in macro economic factors (Fama and French (1989)), or even irrational fluctuations in investment sentiment (Shiller (1989)).

4 These include: rising nominal yields that have hurt bondholders relative to stockholders, a rise in valuation multiples, survivorship bias (which Li and Xu (2002) question), and accelerated growth in dividends and real earnings. See Arnott and Bernstein (2002).

subsequent studies, including Hawawini and Keim (1999) and Christopherson, Ding and Greenwood (2002). Dimson and Marsh (1999, p. 64) in fact go as far as to state that the striking out performance of small-cap companies is "the premier stock market anomaly." Fama and French (1995) incorporate size as a separate risk factor, in addition to book to market (to capture value vs. growth effects) and overall market performance to explain the cross sectional returns of securities.[5]

Over the past three decades, researchers have investigated the abnormal performance of small-caps from various perspectives, and for different time horizons. Horowitz et al. (2000) find that small-cap portfolios underperformed large cap portfolios for 1980–1996 using data from NYSE, AMEX and NASDAQ. Dimson and Marsh (1999) find a small-cap discount for the U.S. and the U.K. for period after the launch of the Dimensional Fund Advisors (1982-83) through 1997. Similarly, Reilly and Wright (2002) find that large cap stocks outperform small-cap stocks over the period 1984–2000. However, as shown above using more recent data, small-cap stocks again outperform large cap stocks in the U.S. The large and persistent Canadian small-cap premium in recent years is also striking.

In sum, similar to the time variation in equity risk premium observed for large companies, there is considerable time variation in the behavior of the equity risk premium for small-caps. Whether such premia can be forecasted is an issue addressed in the next section.

4. FORECASTING THE EQUITY RISK PREMIUM

Aside from the fundamental approaches to extrapolating the equity risk premium from fundamental projections from dividends and earnings as in Fama and French (2002), Ibbotson and Chen (2003) and Dimson, Marsh, and Staunton (2006), researchers have taken two approaches to forecasting the equity risk premium:

(a) Survey approaches

(b) Time series approaches

Regarding (a), Welch (2000, 2001) provides some of the first evidence from deemed experts on their *ex ante* views on equity risk premium. More recently, Graham and Harvey (2005) survey American CFO's for similar expectational data. The "directional" estimates of both of these surveys are consistent with the Fama and French (2002) as well as the Dimson, Marsh, and Staunton (2006) projections of a lower equity risk premium going forward, relative to the historical ex post estimates over this century. The survey approach suffers from certain deficiencies. First, they can be quite sensitive to short run fluctuations in the market, as is evident from the results of the Welch (2000, 2001) studies. In addition, aside from their small sample basis, they may suffer from

5 The more recent Carhart (1997) includes four factors: the market, size, book to market, and momentum.

selectivity biases: there is no guarantee that they capture the sentiments of the "representative" or marginal investor.

An alternative tact is to try to use time series models to forecast the risk premium. For example, Goyal and Welch (2003) look at dividends and dividend yields and show that these are not reliable out-of-sample predictors. Goyal and Welch (2006) extend their analyses and show that dividend price ratios, dividend yields, earnings-price ratios, dividend payout ratios, corporate or net issuing ratios, book-market ratios, beta premia, various interest rates, also do not perform well. Campbell and Thomson (2005) demonstrate that the Goyal and Welch conclusions may be unwarranted: poor out-of-sample performance of a variable for an extended period of time is possible when "the variable genuinely predicts returns with a stable coefficient."

A novel approach to capture and forecast the time varying equity risk premium for short-term tactical asset allocation was first demonstrated by Nam and Branch (1994). Tactical asset allocation or dynamic asset allocation (Grossman,1995) seeks to capture the interaction of fundamental economic forces, movements of asset returns through time, and movements of relative returns across asset classes as well as derivative markets in order to (a) forecast the expected returns and risk levels of alternative investment strategies, and (b) generate optimal trading rules that adjust the allocation of portfolios (e.g. stocks vs. bonds vs. cash; long (short) positions of assets along with various combinations of underlying derivative securities) in a systematic and disciplined manner as the expectations on risk and return vary.

Such models can be premised on efficient markets in which returns reflect changing macro and fundamental data through time and rational responses to changing conditions. They can also be premised on inefficient markets/behavioral factors, similar to those underlying the size anomaly introduced by Banz (1981). For example, Lakonishok, Shleifer, and Vishny (1994) argue that a value anomaly exists in the markets because of suboptimal behaviour of a typical investor who consistently overestimates the future growth rates of glamour stocks while underestimating the growth rates of value stocks. Barberis and Shleifer (2003) introduce an inefficient market model in which there are two categories of investors: (a) "switchers" who allocate funds at the level of a style, and who move funds to (or away from) a given style based on past performance relative to other styles, and (b) fundamental traders who act to keep asset prices close to their true values. The dynamics of the model have prices deviating substantially from fundamental values as styles become popular or unpopular.

The Nam and Branch (1994) model is designed to forecast the sign of the equity risk premium in a binary logit model, and is shown to have desirable out of sample performance features. Arshanapalli, Switzer, and Hung (2004) develop a model to capture the premium between the S&P 500 Index and the Morgan Stanley Capital International Europe, Australia and the Far East (MSCI EAFE) Index. More recently, Arshanapalli, Switzer and Panju (2007) extend the model to a multi-asset class style mix that includes both the size premium as well as the book to market premium. They demonstrate that style investing based on the model in which the premia are time varying,[6] can be profitable, earning superior risk-adjusted returns.

5. THE SMALL-CAP PREMIUM AND THE BENEFITS OF ADDING SMALL-CAP STOCKS TO THE STRATEGIC ASSET ALLOCATION MIX

Are small-cap stocks useful for strategic asset allocation decisions, and portfolio diversification? Given the high small-cap equity risk premium demonstrated in recent years, one might suggest that this is the case. However, to provide definitive evidence on this issue, one needs to include the full risk/return characteristics of assets, including their time-varying correlations. Switzer and Fan (forthcoming, 2007) provide recent estimates on this score using both a traditional spanning test and a step-down spanning test for spanning of small-cap stocks on mean-variance frontiers for U.S. and other G-7 international portfolios. Their tests results are compared with empirical measures for portfolio optimization for U.S. and small-cap portfolios over the period January 1989 to December 2004 and for the sub-period January 1999 to December 2004. They examine size-based indexes that are either replicable using exchange-traded funds (ETF's), or that involve positions in a tractable number of securities. For the U.S. portfolio, they examine the S& P 500 and Russell 2000 Index which trade as ETFs (S & P 500 iShares and the Russell 2000 ishare). They also employ the MSCI small-cap indexes which are adjusted for free float,[7] and use only 40% of the full market capitalization of the eligible small-cap universe within each industry group, for all G-7 countries. Using representatives, instead of entire sample, could reduce the replicating costs. The Russell and MSCI indexes are well accepted by industry professionals as benchmarks of the relevant market segments. Their results on indexes from the U.S. and other members of the G-7 group show that the composition of benchmark portfolios, the time of sample data covered, and investors' holding periods are all factors that determine whether or not a small-cap portfolio is a separate asset class (i.e. not spanned by a given benchmark portfolio). Short sale constraints and position limits do not necessarily reduce the diversification benefits of adding a small-cap index to a benchmark portfolio. However, they find only a few small-cap portfolios of G-7 countries that behave as separate asset classes with corresponding diversification benefits when benchmarked against the U.S. equity market or an international large cap portfolio. This suggests that the risk premium benefits of small-stocks are limited to only a few markets. For investors with U.S. market benchmark, only the Japanese and Canadian small-cap indexes are shown to expand the efficiency frontier. When the tests are conducted in which the initial reference portfolio is a G-7 large cap benchmark portfolio that includes the U.S., the U.S. small-cap portfolio is not

6 Time variation in the risk premia may be due to disequilibria associated with changes in the investor opportunity set and/or inefficiencies.

7 The MSCI small-cap equity universe in each country incorporates a free float adjustment, has a minimum capitalization of $100 million.

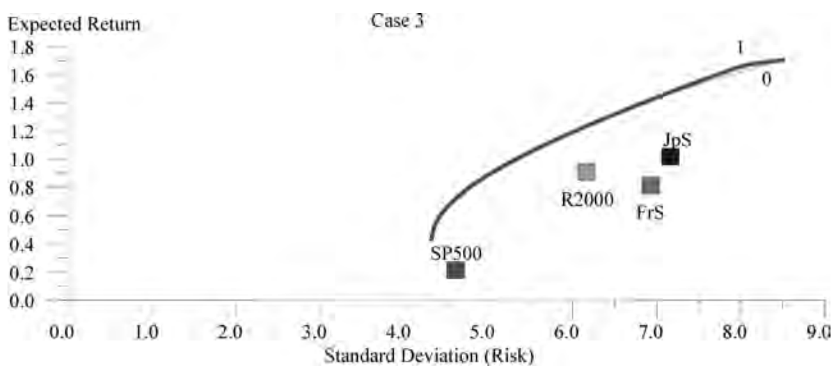
beneficial. However, the Canadian small-cap continues to show superior performance. Figure 4 below provides an illustration of the approach. Panels A and B show the efficient frontiers of cases corresponding to the incorporation of French (FrS) and Canadian (CaS) small-cap portfolios as test assets, against a U.S. market benchmark. Although CaS has a higher correlation with each of the benchmark assets than FrS, CaS greatly increases the portfolio's efficiency. In contrast, FrS provides little diversification benefit for the benchmark portfolio.

Figure 4

Testing the Benefits of Small-caps in Strategic Asset Allocation, based on Monthly Returns, January 1999-Decemeber 2004.

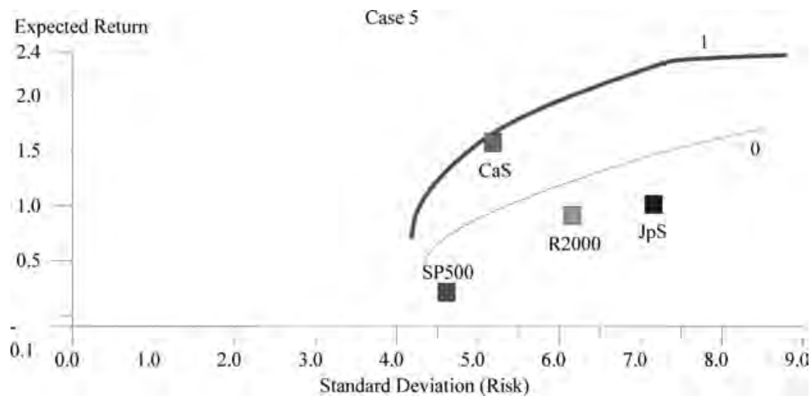
Panel A

Efficient Frontier changes when adding small-caps from France to a U.S. benchmark portfolio



Panel B

Efficient Frontier changes when adding small-caps from Canada to a U.S. benchmark portfolio



Note: Frontier 0 is the benchmark portfolio and Frontier 1 is the new frontier after the test asset is included.

Source: Switzer and Fan (forthcoming, 2007).

6. CONCLUSION

This paper examines the state of the equity risk premium over the past half century in Canada and the U.S., and surveys some of the work that has endeavoured to explain and forecast its magnitude and significance. The measured long run average historical equity risk premium is high, but also stable, when measured using conventional statistical tests and when captured over long periods, such as the last 50 years. However, as is documented herein, in recent years, equity risk premia are shown to be declining, for the U.S., although not in Canada, and not for small-cap stocks.

The time-varying nature of the equity risk premium is explored, with implications to forecasting valuations over short horizon periods. Some approaches for modeling the risk premia for tactical asset allocations are also presented. The small stock vs. large-stock equity risk premium in recent years is also studied, in the context of long-term valuations and strategic asset allocation decisions. The small-stock anomaly continues to prevail, although it appears to be more noticeable for Canadian small-cap firms.

REFERENCES

Arnott, R.D. and P. Bernstein, "What Risk Premium Is 'Normal'?," *Financial Analysts Journal*, Vol. 58, No. 2 (2002).

Arnott, R.D. and R. Ryan, "The Death of the Risk Premium: Consequences of the 1990s," *Journal of Portfolio Management*, Vol. 27, No. 3 (2001), pp. 61–74.

Arshanapalli, B., L.N. Switzer, and L.T.S. Hung, "Dynamic Asset Allocation for International Investment: Comparing Active versus Passive Strategies for EAFE and S&P 500," *Journal of Portfolio Management*, Vol. 30 (2004), pp. 51-60.

Arshanapalli, B., L.N. Switzer, and K. Panju, "Equity Style Timing: A Multi-Style Rotation Model for the Russell Large-Cap and Small-Cap Growth and Value Style Indexes," *Journal of Asset Management*, Vol. 8 (2007), pp. 9-23.

Banz, R.W., "The Relationship Between Return and Market Value of Common Stocks," *Journal of Financial Economics*, Vol. 6 (March 1981), pp. 103-26.

Barberis, N. and A. Shleifer, "Style Investing," *Journal of Financial Economics*, Vol. 68, (2003), pp. 161-99.

Benartzi, S. and R.H. Thaler, "Myopic Loss Aversion and the Equity Premium Puzzle," *Quarterly Journal of Economics*, Vol. 110 (Feb. 1995), pp. 73-92.

Brown, S., W. Goetzmann, and S. Ross, "Survival," *Journal of Finance*, Vol. 50 (1995), pp. 853–73.

Campbell, J.Y. and S.B. Thompson, "Predicting the Equity Premium Out of Sample: Can Anything Beat the Historical Average?," NBER Working Paper 11468 (July 2005).

Carhart, M.M., "On persistence in mutual fund performance," *Journal of Finance*, Vol. 52, (1997), pp. 57–82.

Chevalier, J. and G. Ellison, "Risk taking by mutual funds as a response to incentives," *Journal of Political Economy*, Vol. 105 (1997), pp. 1167-1200.

Christopherson, J., Z. Ding, and P. Greenwood, "The Perils of Success," *Journal of Portfolio Management*, Vol. 28 (Winter 2002), pp. 41-54.

Diamond, P.A., "What stock market returns to expect for the future?," Working Paper, Boston College Centre of Retirement Research (September 1999).

Dimson, E. and P. Marsh, "Murphy's Law and Market Anomalies," *Journal of Portfolio Management*, Vol. 25 (Winter 1999), pp. 53-69.

Dimson, E., P. Marsh, and M. Staunton, *The Millennium Book: A Century of Investment Returns*. ABN AMRO and London Business School, 2000.

__________________, "The Worldwide Equity Premium: A Smaller Puzzle," Working Paper, London Business School (2006).

__________________, *Triumph of the Optimists: 101 Years of Global Investment Returns*. New Jersey: Princeton University Press, 2002.

Fama, E.F. and K.R. French, "Business Conditions and Expected Returns on Stocks and Bonds," *Journal of Financial Economics*, Vol. 25 (1989), pp. 23-49.

__________________, "Size and Book to Market Factors in Earnings and Returns," *Journal of Finance*, Vol. 50 (1995), pp. 131-55.

__________________, "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay," *Journal of Financial Economics*, Vol. 60 (2001), pp. 3–43.

__________________, "The Equity Premium," *Journal of Finance*, Vol. 57 (2002), pp. 637–59.

Goyal, A. and I. Welch, "Predicting the Equity Premium with Dividend Ratios," *Management Science*, Vol. 49 (2003), pp. 639-54.

__________________ "A Comprehensive Look at the Empirical Performance of Equity Premium Prediction," *Review of Financial Studies* (forthcoming 2006).

Graham, J.R. and C.R. Harvey, "The Equity Risk Premium in September 2005: Evidence from the Global CFO Outlook Survey," Working Paper, Duke University (September 2005).

Grossman, S.J., "Dynamic Asset Allocation and the Informational Efficiency of Markets," *Journal of Finance*, Vol. 50 (1995), pp. 773-87.

Hawawini, G. and D. Keim, "The Cross-Section of Common Stock Returns: A Synthesis of the Evidence and Explanations," in D. Keim and W. Ziemba, eds, *Security Market Imperfections in World Wide Equity Markets.* Cambridge, Mass.: Cambridge University Press, 2000.

Heaton, J. and D.J. Lucas, "Evaluating the Effects of Incomplete Markets on Risk Sharing and Asset Pricing," *Journal of Political Economy*, Vol. 104 (June 1996), pp. 443-87.

__________________, "Market Frictions, Savings Behavior, and Portfolio Choice," *Journal of Macroeconomic Dynamics,* Vol. 1 (1997), pp. 76-101.

Ibbotson, R. G. and P. Chen, "Long-Run Stock Returns: Participating in the Real Economy," *Financial Analysts Journal*, Vol. 59 (2003), pp. 88–98.

Keim, D., "Size Related Anomalies and Stock Return Seasonality: Further Empirical Evidence," *Journal of Financial Economics*, Vol. 12 (1983), pp. 473-90.

Klein, R.W. and V.S. Bawa, “The Effects of Limited Information and Estimation Risk on Optimal Portfolio Diversification,” *Journal of Financial Economics*, Vol. 5 (August 1977), pp. 89-111.

Lakonishok, J., A. Shleifer, and R.E. Vishny, “Contrarian Investment, Extrapolation, and Risk,” *Journal of Finance*, Vol. 49 (1994), pp. 1541-1578.

Li, H. and Y. Xu, “Survival Bias and the Equity Premium Puzzle,” *Journal of Finance*, Vol. 57 (2002), pp. 1981–1995.

MacKinnon, J. G., “Numerical Distribution Functions for Unit Root and Cointegration Tests,” *Journal of Applied Econometrics,* Vol. 11 (1996), pp. 601-18.

Mehra, R. “The Equity Premium: Why is it a Puzzle?,” *Financial Analysts Journal*, Vol. 59 (2003), pp. 54–69.

Mehra, R. and E. Prescott, “The Equity Premium: A Puzzle,” *Journal of Monetary Economics*, Vol. 15 (1985), pp. 145–61.

__________________, “The Equity Risk Premium: A Solution?,” *Journal of Monetary Economics*, Vol. 22 (1988), pp. 133–36.

Nam, J. and B. Branch, “Tactical Asset Allocation: Can it Work?,” *Journal of Financial Research*, Vol. 17 (Winter 1994), pp. 465-79.

Reinganum, M.R., “Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings Yields and Market Values,” *Journal of Financial Economics*, Vol. 9 (1981), pp. 19-46.

__________________, “Abnormal Returns in Small Firm Portfolios,” *Financial Analysts Journal*, Vol. 37 (March/April 1981), pp. 52-56.

Shiller, R. *Market Volatility*. Cambridge, Mass.: MIT Press, 1989.

Siegel, J.J., “The Shrinking Equity Premium,” *Journal of Portfolio Management,* Vol. 26 (1999), pp. 10-17.

__________________, *Stocks for the Long Run*, 3rd ed. New York: McGraw Hill, 2002.

__________________, *The Future for Investors: Why the Tried and the True Triumph Over the Bold and the New*. New York: Crown Business, 2005.

Switzer, L.N. and H. Fan, “Spanning Tests for Replicable Small-cap Indexes as Separate Asset Classes: Evidence for G-7 Countries,” *Journal of Portfolio Management* (forthcoming, Summer 2007).

Welch, I., “Views of Financial Economists on the Equity Premium and Other Issues,” *Journal of Business*, Vol. 73 (2000), pp. 501–37.