THE EQUITY RISK PREMIUM IN AUSTRALIA (1900–2014)

Robert J Bianchi[a], Michael E Drew, Adam N Walk

Griffith University

a. Corresponding author:

Associate Professor Robert Bianchi, Griffith Business School, Griffith University

Tel: 07 3735 7078, Email: r.bianchi@griffith.edu.au

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ABSTRACT

The equity risk premium (ERP) remains one of the most hotly contested ideas in finance. The disagreement, in practical and theoretical terms, centres on how best to measure the risk of an investment, how to convert this risk measure into an expected return that compensates the investor for holding that risk, and its degree of predictability. This paper provides Australian evidence for the period 1900 through 2014.

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Introduction

Perhaps one of the few things we can agree on in modern finance is the idea that the greater the investment risk, the greater the expected reward required to compensate for risk. We could say that the expected return on any investment can be written as the sum of the risk-free rate and a risk premium to compensate for that risk.[1]

And, alas, this is where the niceties end.

The equity risk premium remains one of the most hotly contested ideas in finance. The disagreement, in practical (and theoretical) terms, centres on how best to measure the risk of an investment, how to convert this risk measure into an expected return that compensates the investor for holding that risk, and its *degree of predictability*. A central number in this debate is the premium that investors demand for investing in the 'average risk' equity investment, that is, the *equity risk premium* (ERP) (Damodaran, 2015).

So why is this a debate that generates so much heat, but little light?

Let's look at the last 20 years of capital market history. For Australian investors, we have witnessed the Asian Financial Crisis (1997); the dotcom crash in 2000; the September 11 attacks (2001), Bali bombings (2002) and Second Iraq War (2003); to the Global Financial Crisis including the US subprime crisis (2007) and collapse of Lehman Brothers (2008); and more recently, sovereign debt concerns around the world, including the most recent focus on Greece (2015) and China (2015). This timeframe can be described as unsettled at best, and chaotic at worst.

The lived experience of investors over these two decades has resulted in serious contemplation on the matter of the ERP, more specifically, what might be a reasonable expectation of the premium investors expect to earn above the risk-free rate? Such rumination is not limited to Australia. Hammond and Leibowitz (2011) note that globally there has been, "renewed *uncertainty* about what may be the most important measure in all of finance – namely, the equity risk premium" (p.1).

Let's consider the most basic expression of the ERP (Hammond and Leibowitz, 2011).

$$ERP = E(r_e) - E(r_f) \quad (1)$$

where:

$E(r_e)$ = Expected return for equities; and

$E(r_f)$ = Expected return for the risk-free rate.

Investors are also interested in the inflation-adjusted or ERP(i) (or real ERP) which can take the form:

$$ERP(i) = (E(r_e) - E(i)) - ((Er_f) - E(i)) \quad (2)$$

1 For a contemporary survey of the literature, see Hammond and Leibowitz (2011) and Damodaran (2015).

We can also visualise how investors can consider the total return to equities as a long-run equilibrium concept, made up of various premiums. This approach, shown in Figure 1, is known as the 'build-up' method of Ibbotson and Siegel (1988)[2].

Figure 1: Components of the expected return for stocks, bonds and bills

Stocks		
Equity risk premium	**Bonds**	
Bond horizon premium	Bond horizon premium	**Bills**
Real risk-free rate	Real risk-free rate	Real risk-free rate
Inflation	Inflation	Inflation

Source: Ibbotson (2011), Ibbotson and Siegel (1988). Note that the first three terms (inflation, real risk-free rate and bond horizon premium) are typically combined into the long-term yield of a riskless bond because this yield is directly observable in the marketplace (Ibbotson, 2011).

In short, we can think of the ERP as the future compensation (or premium) to an investor for owning a risky portfolio of stocks rather than the risk-free asset. And therein lies the rub. From a theory perspective, there is an investable market portfolio (M) consisting of every asset (which is infinitely divisible). Moreover, there is a risk-free asset that is genuinely free of any risks. However, in the real world, investors cannot simply invest in M as suggested in the textbooks; we have to select proxies for each of these theoretical inputs in order to estimate the ERP[3,4]. We also know that interest rates are not constant[5]. These are some of the practical challenges investors face when formulating their views on the ERP.

2 It is important to note that Figure 1 says nothing about the respective time horizon required for investors to garner these premia. We will consider differing investment time horizons and the ERP later in the study.
3 One could argue that this line of argument is akin to the Roll (1977) critique.
4 When estimating, say the ERP in the U.S., the proxy for the universe of stocks is generally the S&P500 (or a similar broad index). It is also important to note that such exchange traded indices do not include other forms of equity (such as private equity, housing equity or human capital. Likewise in Australia, the proxy for the portfolio of stocks is the All Ordinaries Accumulation Index or the S&P/ASX 300 Index.
5 The proxy for the risk-free asset is generally the U.S. Government 30- or 90-day Treasury Bill or 10-year Treasury Bond. In reality, these zero-risk proxies are not genuinely 'risk-free' as investors remain exposed to factors including inflation risk, liquidity risk and the possibility of government default. In terms of the risk-free asset, the Australian Commonwealth Government Treasury Note can be used as a proxy, an Australian Government Treasury Bond, Bank Accepted Bills or the Bloomberg AusBond Bank Bill Index which is an index comprised of bank bill securities.

In this study, we will report historical estimates of the ERP over the last century. The great advantage of the historical method is that it provides evidence about the behaviour of the premium through time. The downside? Siegel and Thaler (1997) note that "one view is that history has just been kind to stock markets. According to this view, we have just experienced 200 years of good luck (p. 198)."[6]

The Historical Perspective

In many financial applications, historical data are used, rightly or wrongly, as an anchor for future expectations. In this section we consider the historical method for estimating the ERP. By doing this, we can observe both the general level of, and variation in, the ERP through time.

In considering historical data, we recommend the reader proceed with caution because any analysis inevitably ends up being backward looking (Damodaran, 2015). If we are to accept that the historical ERP in Australia, for example, is helpful in forming future expectations, we are implicitly making a number of assumptions about the future economic trajectory of the Australian economy. Historical data show us that the economic outcomes may vary widely. For example, in the year 1900, Canada and Argentina had very similar levels of wealth as measured by GDP per capita ($2,911 and $2,756 respectively, measured in 1990 US dollars) (World Economics Ltd, 2015)[7]. Fast forward to 2008 and we see that the relative wealth of these nations has diverged dramatically with Canada having an estimated $25,267 per capita versus Argentina with $10,955 per capita. The point we make at the outset is that the future realised ERP is in part a function of real economics (i.e. companies making profits by selling things), and real economic outcomes are by no means assured.[8]

6 For historical perspectives on the ERP, see Fisher and Lorie (1964, 1968, 1977), Ibbotson and Sinquefield (1976), Dimson, Marsh and Staunton (2003) and Siegel, (2005, 2007). For Australian perspectives, see Brailsford, Handley and Mahesawran (2012). While the evidence to date suggests that a long-term investment in a well-diversified portfolio of stocks typically provides investors with a premium (or compensation) for holding additional risk, this premium can, in some instances, take very (very) long periods of time to materialise (see Section 4).

7 Technically the GDP per capita data cited herein is measured in the Geary-Khamis dollar (GK$), which is also commonly known as the international dollar. It is a hypothetical unit of currency that has the same purchasing power parity that the US dollar had domestically at a given point in time, in this case in 1990.

8 This example might also act as a salutary reminder to policy-makers of the importance of their task, and the risks of policy errors.

Global returns

To examine the historical ERP, we use the well-known and widely-cited Dimson, Marsh and Staunton (DMS) (2002, 2015) database, covering 19 countries (and three regions: world, world ex-US, and Europe), all with index series covering the period 1900 through 2014[9,10]. To get a sense of the global ERP experience over the sample period, we first look at comparative numbers across the 19 countries and three regions in Table 1, which reports the real returns for equities in all countries and regions in local currency terms. The data show that investing in equities across all countries delivers an equity risk premium over the long-term. The results also reveal that the Australian sharemarket was the second best performing equities market in the world over the 115 year dataset earning 7.3% p.a., only marginally outperformed by South Africa with a real return of 7.4% p.a. Such an outstanding performance by Australian stocks is well worth remembering looking into the future. The question arises: what are the chances of reproducing such stellar performance over the next 115 years? We leave such a question for future work.

A second interesting observation about the results in Table 1 is that equity risk in Australia has been relatively modest compared to other nations, with Australian stocks exhibiting the third lowest standard deviation of returns of all nations listed (recall that these are in local currency terms)[11]. It is also noteworthy that for a number of economies (and the three regions) the year of the GFC, 2008, is the worst recorded calendar year for inflation-adjusted equity performance out of the 115-year history examined.

9 As noted by Dimson, Marsh and Staunton (2011), the database contains annual returns on stocks, bonds, bills, inflation, and currencies for 19 countries from 1900 to 2014. The countries comprise two North American nations (Canada and the USA), eight euro-currency area states (Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, and Spain), five European markets that are outside the euro area (Denmark, Norway, Sweden, Switzerland, and the UK), three Asia-Pacific countries (Australia, Japan, and New Zealand), and one African market (South Africa). These countries covered 98 per cent of the global stock market in 1900, and 91 per cent of its market capitalisation by the start of 2015.

10 Details about the data, the sources, and the index construction methods are presented in Dimson, Marsh, and Staunton (2008, 2011 and 2015).

11 Despite its widespread use, it is arguable whether standard deviation is the most appropriate measure of investment risk particularly when considering questions relating to long term investing (see, for example, Bianchi et al., 2014).

Table 1: Real (inflation-adjusted) equity returns in all countries, 1900-2014 (local currency returns)

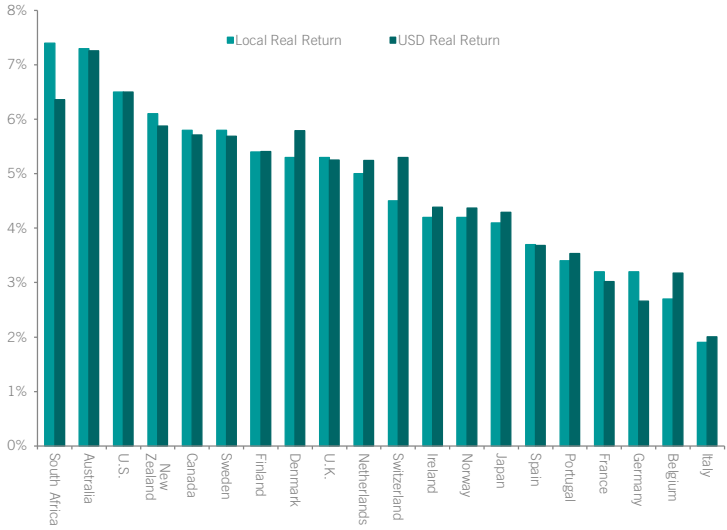
Country / Region	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Standard Error (%)	Minimum Return (%)	Year of Minimum	Maximum Return (%)	Year of Maximum
Australia	7.3	8.9	18.0	1.7	-42.5	2008	51.5	1983
Belgium	2.7	5.4	23.8	2.2	-48.9	2008	105.1	1919
Canada	5.8	7.1	17.0	1.6	-33.8	2008	55.2	1933
Denmark	5.3	7.2	20.8	1.9	-49.2	2008	107.8	1983
Finland	5.4	9.3	30.1	2.8	-60.8	1918	161.7	1999
France	3.2	5.7	23.2	2.2	-41.5	2008	66.1	1954
Germany	3.2	8.2	31.9	3.0	-90.8	1948	154.6	1949
Ireland	4.2	6.8	23.0	2.1	-65.4	2008	68.4	1977
Italy	1.9	5.9	28.7	2.7	-72.9	1945	120.7	1946
Japan	4.1	8.8	29.7	2.8	-85.5	1946	121.1	1952
Netherlands	5.0	7.1	21.5	2.0	-50.4	2008	101.6	1940
New Zealand	6.1	7.8	19.5	1.8	-54.7	1987	105.3	1983
Norway	4.2	7.2	27.0	2.5	-53.6	2008	166.9	1979
South Africa	7.4	9.5	22.2	2.1	-52.2	1920	102.9	1933
Spain	3.7	5.9	22.0	2.1	-43.3	1977	99.4	1986
Sweden	5.8	8.0	21.3	2.0	-42.5	1918	67.5	1999
Switzerland	4.5	6.3	19.6	1.8	-37.8	1974	59.4	1922
United Kingdom	5.3	7.1	19.7	1.8	-57.1	1974	96.7	1975
United States	6.5	8.5	20.1	1.9	-37.6	1931	56.3	1933
Europe	4.3	6.2	19.9	1.9	-47.5	2008	75.7	1933
World (ex-US)	4.4	6.2	19.1	1.8	-44.2	2008	80.5	1933
World	5.2	6.6	17.4	1.6	-41.0	2008	68.2	1933

Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Note: The statistics for Germany exclude the hyperinflamatory period of 1922-23

Figure 2 reports the inflation-adjusted performance of equities across all countries in both local currency and US dollar terms. Interestingly, Australian stocks are ranked second in the world based on local currency returns, but first in US dollar terms. It is also noteworthy that there are five English-speaking nations (Australia, Canada, New Zealand, UK and the US) who report returns in the upper half of the sample of countries. Overall, the evidence suggests that real equity returns have been strong and positive for most countries over the long-term regardless of their measurement basis.

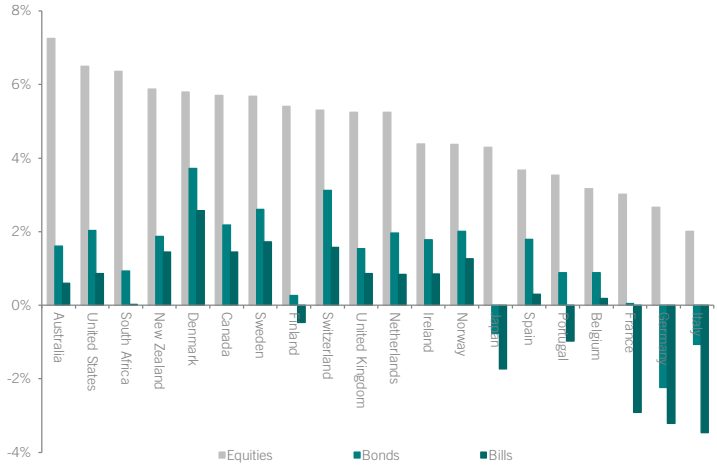
Figure 2: Real Annualised Equity Returns in Local Currency and US Dollars, 1900-2014



Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Figure 3 compares the long-term inflation-adjusted performance of stocks, bonds and bills in US dollar terms across countries. As we have already mentioned, Australian equities were the highest performing asset class across all countries in US dollar terms. At the other end of the spectrum, Italian equities report the lowest real return on stocks with a long-term real geometric rate of return of 2.0% p.a., demonstrating that equity returns can vary widely between countries over the same span of time. The real returns from bonds are positive for all countries with the exception of Japan, Germany and Italy. Bills earn a return greater than inflation for all countries except in Finland, Japan, Portugal, France, Germany and Italy. Overall, we can conclude that owning stocks and bonds in most countries delivered a return higher than the inflation rate over the long-term.

Figure 3: Real Annualised Returns on Equities, Bonds and Bills, All Countries, 1900-2014 (in US Dollars)



Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Let us now look at global ERPs, and then drill down on the Australian experience. To cater for different preferences, in Tables 2 and 3 we report the summary statistics for the equity risk premium calculated against both bills (Table 2) and bonds (Table 3) for each country in local currency terms. These results confirm that the equity risk premium has provided a strong and positive return over the long-term; however, this reward was associated with high levels of variability in returns (measured using standard deviation of returns). Furthermore, investors seeking the ERP must experience potential large annual losses as evidenced by the worst annual returns columns, which show losses in the range of -34% to -67% in a single calendar year.

While covering different periods and using different data, the estimated historical ERPs for Australia of 6.6% (and 5.6%) over bills (and bonds) are of the same order of magnitude as that found in Brailsford et al. (2012) who found ERPs of 6.5% and 6.1%, respectively (for data covering 1883-2010). Furthermore, our estimate of the ERP versus bonds for the US of 4.4% is, due to more recent returns, understandably lower than the 5.7% found by Arnott and Bernstein (2002) based on 75 years of data.

Table 2: Worldwide Equity Risk Premium Relative to Bills, 1900-2014 (local currency returns)

Country / Region	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Standard Error (%)	Minimum Return (%)	Year of Minimum	Maximum Return (%)	Year of Maximum
Australia	6.6	8.1	17.5	1.6	-44.4	2008	49.2	1983
Belgium	3.0	5.4	23.9	2.2	-49.7	2008	125.0	1940
Canada	4.2	5.6	16.9	1.6	-34.7	2008	49.1	1933
Denmark	3.2	5.0	20.5	1.9	-50.3	2008	95.3	1983
Finland	5.9	9.5	29.9	2.8	-53.3	2008	159.2	1999
France	6.1	8.7	24.2	2.3	-43.1	2008	85.7	1941
Germany	5.9	9.9	31.5	2.9	-44.7	2008	131.4	1949
Ireland	3.5	5.8	21.3	2.0	-66.3	2008	72.0	1977
Italy	5.7	9.5	31.6	2.9	-48.6	2008	150.3	1946
Japan	6.1	9.3	27.7	2.6	-48.3	1920	108.6	1952
Netherlands	4.4	6.5	22.5	2.1	-51.4	2008	126.7	1940
New Zealand	4.4	5.9	18.1	1.7	-58.3	1987	97.3	1983
Norway	3.1	5.9	26.1	2.4	-55.0	2008	157.1	1979
South Africa	6.3	8.4	21.7	2.0	-33.9	1920	106.2	1933
Spain	3.4	5.5	21.6	2.0	-39.3	2008	98.1	1986
Sweden	3.9	5.9	20.5	1.9	-40.8	2008	64.6	1999
Switzerland	3.7	5.3	18.7	1.7	-37.0	1974	54.8	1985
United Kingdom	4.4	6.1	19.7	1.8	-54.6	1974	121.8	1975
United States	5.6	7.5	19.6	1.8	-44.1	1931	56.6	1933
Europe	3.4	5.2	19.3	1.8	-48.3	2008	76.0	1933
World (ex-US)	3.6	5.2	18.6	1.7	-45.1	2008	80.9	1933
World	4.3	5.7	17.0	1.6	-41.9	2008	68.6	1933

Note: The statistics for Germany exclude the hyperinflamatory period of 1922-23

Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Table 3: Worldwide Equity Risk Premium Relative to Bonds, 1900-2014 (local currency returns)

Country / Region	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Standard Error (%)	Minimum Return (%)	Year of Minimum	Maximum Return (%)	Year of Maximum
Australia	5.6	7.5	1.9	20.0	-53.4	2008	66.3	1980
Belgium	2.3	4.4	2.0	21.1	-53.8	2008	80.1	1940
Canada	3.5	5.1	1.7	18.2	-40.7	2008	48.6	1950
Denmark	2.0	3.6	1.7	17.9	-54.3	2008	74.9	1972
Finland	5.1	8.7	2.8	30.1	-55.4	2008	173.1	1999
France	3.0	5.3	2.1	22.8	-49.2	2008	84.3	1946
Germany	4.9	8.4	2.7	28.6	-51.5	2008	116.6	1949
Ireland	2.6	4.5	1.8	19.6	-66.9	2008	83.2	1972
Italy	3.1	6.5	2.7	29.5	-48.1	2008	152.2	1946
Japan	5.1	9.1	3.0	32.6	-45.2	2008	193.0	1948
Netherlands	3.2	5.6	2.1	22.3	-56.4	2008	107.6	1940
New Zealand	3.9	5.5	1.7	17.9	-59.7	1987	72.7	1983
Norway	2.3	5.3	2.6	27.7	-57.8	2008	192.1	1979
South Africa	5.4	7.1	1.8	19.6	-36.1	2008	70.9	1979
Spain	1.9	3.9	1.9	20.7	-43.7	2008	69.1	1986
Sweden	3.0	5.3	2.0	21.5	-49.5	2008	84.3	1999
Switzerland	2.1	3.6	1.6	17.5	-41.3	2008	51.9	1985
United Kingdom	3.7	5.0	1.6	17.3	-38.4	2008	80.8	1975
United States	4.4	6.5	1.9	20.7	-50.1	2008	57.2	1933
Europe	3.1	4.4	1.5	16.1	-48.2	2008	53.6	1923
World (ex-US)	2.8	3.9	1.4	14.7	-48.1	2008	35.8	1999
World	3.2	4.5	1.4	15.5	-48.2	2008	37.5	1958

Note: The statistics for Germany exclude the hyperinflamatory period of 1922-23

Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Overall, analysis of the historical ERP across the countries in the sample suggests that it is strong and positive over the long-term (that is, over the last century). Whilst owning shares provides investors with a return premium (the ERP), investors must also be willing to accept high levels of return volatility and occasional very large capital losses over the course of a year (or even longer time horizons). A question that must be considered is whether stocks are a suitable investment for all investors? For example, do some investors – e.g. *retirees who are regularly consuming part of their capital* – have the capacity to take the risks of investing in stocks even if the ERP appears, at face value (using long *historical* datasets), attractive?

A further consideration that should be taken into account is that the ERPs reported herein are *estimates*. Again, we must stress that the ERP is not directly observable and is the outworking of two asset class returns. The academic literature suggests that there may be biases in historical ERPs – e.g. international survivorship bias, transaction costs, the extent to which investors correctly priced stocks given their risks, pension asset and taxes, and biases in historical bond returns (Siegel, 2005) – so the estimates reported herein should not be treated as guaranteed[12]. In fact, a sobering aspect of conducting this research has been the frequent reminder of its heavy reliance on assumptions and estimates. It is also worth an investor considering how these biases have evolved over time and whether this evolution has had any impact on trends in the ERP over time.

Australian returns

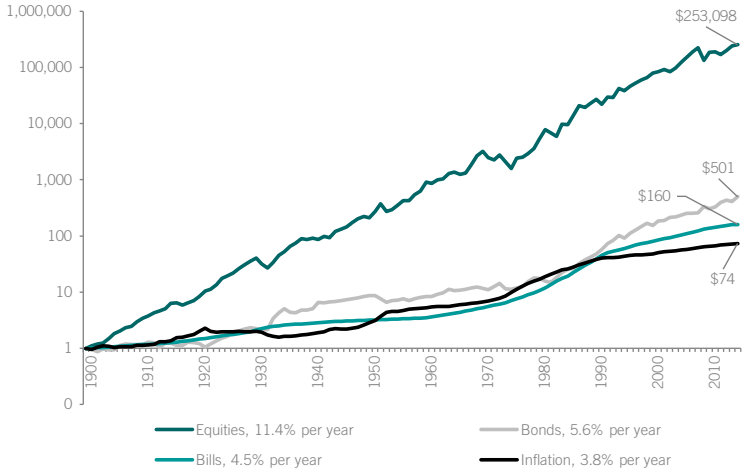
Having considered the global relative returns and two different ways of computing the ERP, we now look at the historical Australian experience in more detail. Panel A of Figure 4 plots the cumulative total nominal returns for Australian stocks, bonds, bank bills, and inflation from 1900 to 2014. As finance theory anticipates, stocks performed best with a $1 investment growing to $253,098 to the end of 2014. Australian stocks delivered a (geometric) mean return of 11.4% per year, more than double the return of Australian bonds which returned 5.6% p.a. Bills returned 4.5% per year which was marginally higher than the Australian rate of inflation which was reported at an annualised rate of 3.8% per year over the 115 year sample period.

To strip out the impact of the overall rise in prices over the period, Figure 4 Panel B reports the equivalent inflation-adjusted (or 'real') returns over the sample period. These results show that Australian equities earned 7.3% per year over and above the rate of inflation, which as we discussed earlier is relatively attractive versus the global peer group (see Figure 3). Australian bonds earned a real return of 1.7% per annum while bills marginally beat the Australian rate of inflation by only 0.7% p.a.

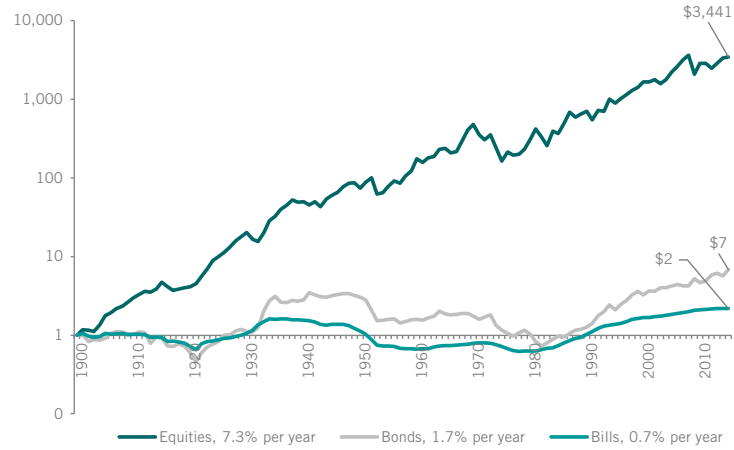
12 In the Australian context, the actual return from equities for a given investor will depend to a large extent on their tax status. For a discussion on the level the potential impact of dividend imputation on the returns earned by Australian investors, see Bianchi, Drew and Walk (2015).

Figure 4: Cumulative Returns on Australian Equities, Bonds, Bills and Inflation, 1900-2014 (1900 = $1; log scale)

Panel A: Nominal terms



Panel B: Real terms

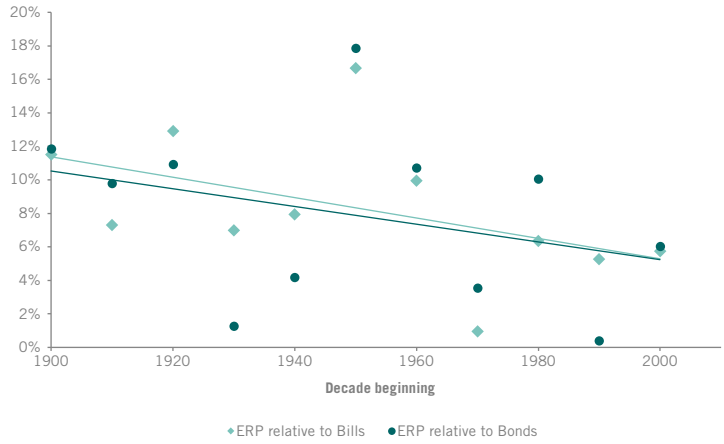


Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Now that we have looked at total nominal and real returns for our three asset classes (and inflation) let us looks at the Australian ERP in detail.

Figure 5 illustrates the ERP (over bonds and bills) on a decade-by-decade basis, with linear trend lines for each series. The results show that the ERP is volatile (i.e. varies widely around the trend) and declining over time (i.e. a downward sloping trend line) causing us to ask: if this is the trend, what might the future hold?

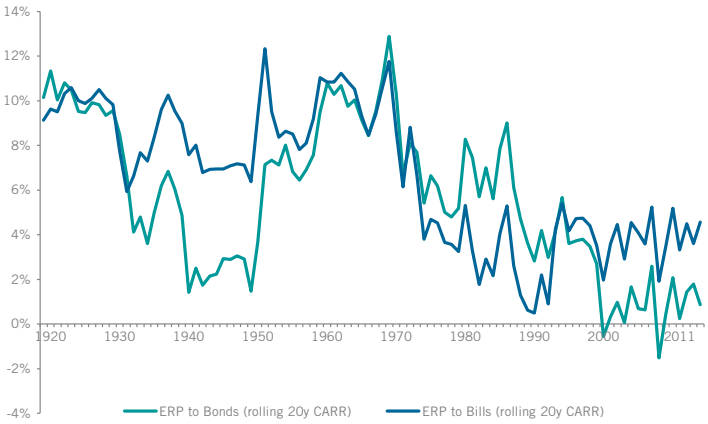
Figure 5: Realised Australian Equity Risk Premium – Average Annual Rate of Return, by decades (1900-2010)



Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

The trends of volatility in ERPs, and the overall downward shift in ERPs through time, are both confirmed in Figure 6 which shows rolling 20-year annualised ERPs for the entire dataset. Even with a 20-year investment horizon, we see that ERPs range from a maximum of around 13% p.a. to a minimum of around -2%. Looking at the data in this way also shows a more pronounced downward trend in ERPs, with the lowest ERPs being observed in the past 10-15 years. The exact nature of how these various factors have impacted (or otherwise) the ERP in Australia remains unknown; however, the data suggests the net effect has been negative through time. Whether or not this trend continues into the future is up for debate and is a potential area of future research.

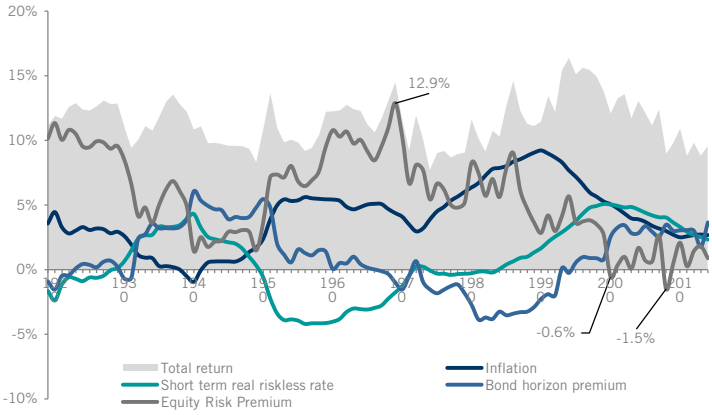
Figure 6: Rolling 20 year annualised ERPs, 1900-2014



Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Ibbotson and Siegel (1988) inform us of four (4) components that comprise total equity returns over the long-term. These components are: inflation; real riskless rate; bond horizon premium; and the equity risk premium. Figure 7 visualises how the rolling 20-year average of the four components of equity returns in Australia have varied through time.

Figure 7: Rolling 20 year components of annualised stock returns, 1900-2014



Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Figure 7 shows that each component of returns (the four line series) is relatively volatile with *all components being negative at some time* over the period shown (recall, we are showing 20 year averages). We also see further evidence of the downward trend in the ERP, especially since the 1960s. A 20-year time horizon is a long period for any investor. For instance, if an investor were 65 years of age, their life expectancy in Australia is around 85 years, which is roughly equivalent to a 20-year horizon. It has become conventional wisdom not to hold stock portfolios for short periods of time; the corollary is that stocks are usually the province of those with a long investment horizon.

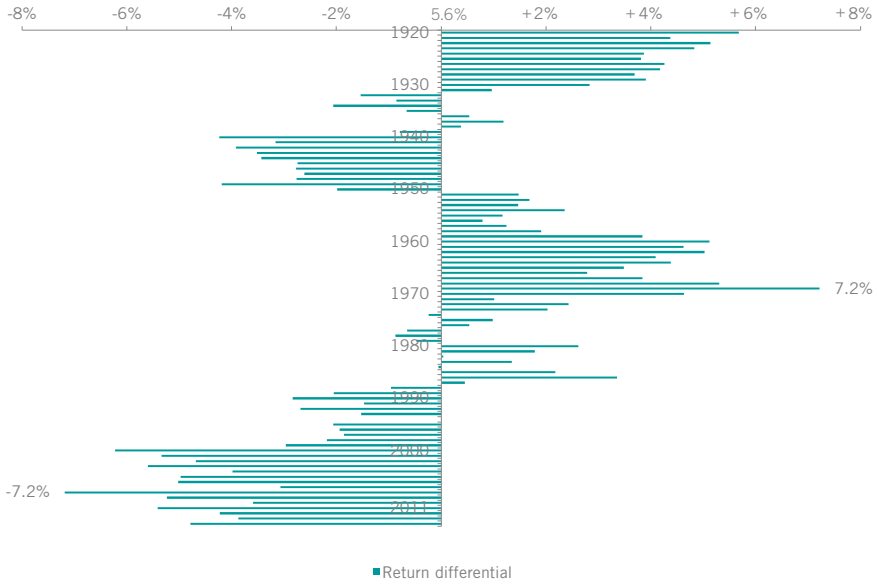
The historical evidence presented in Figure 7 underscores the risk that investors (even with a 20-year holding period) can experience a 'bad draw' (i.e. realised 'sequencing risk') when pursuing the ERP. In fact, two of these holdings periods delivered negative per annum ERPs when compared to bonds[13].

Returning to the opening remarks in the introduction of the study, "*… the lived experience of investors over the past two decades has resulted in serious contemplation on the matter of the ERP, more specifically, what might be a reasonable expectation of the premium investors expect to earn above the risk-free rate?*" We would go a step further and argue that the unpredictability of the ERP over the most recent 20 years is not all that extraordinary when compared to the larger dataset examined herein. We will consider the implications for retirement investors later in the paper.

We now turn specifically to the risk (or variability) of the ERP over rolling 20-year periods. In Figure 8, we illustrate the variability of the 20-year ERP around its long term average of 5.6% p.a. We see that, in the face of wide variability through time, measures of central tendency (that is, the 20-year average annual ERP) provide little insight as to the potential 'ride' investors may experience. There are prolonged periods of time (for instance over the last quarter of a century in Australia) where the ERP has been below its long term average. Comparing Figures 7 and 8 we see that, in recent times, the story isn't only about equities. In fact, total equity returns have been sound, but bond returns have been relatively strong making the ERP (the difference between the two) appear narrower. Again, this underscores the idea that the ERP is not simply a function of the performance of the equities asset class.

13 See Basu and Drew (2009) and Basu, Doran and Drew (2012) for an analysis of sequencing risk in a pension finance context.

Figure 8: ERP to Bonds (20 year rolling CARR) around the historical mean of 5.6% p.a.

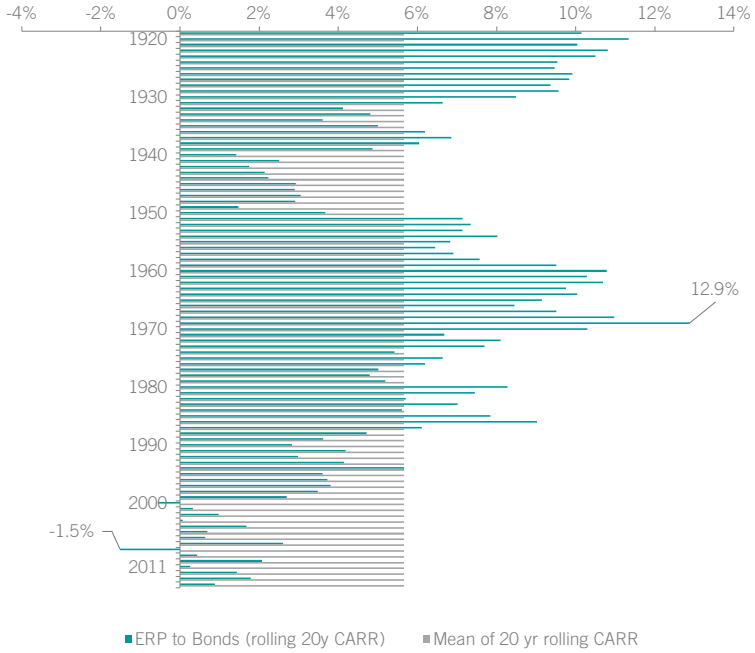


Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

We have also highlighted anecdotal evidence that suggest that investors take a set-and-forget approach to setting their forward looking expectations of the ERP. As the behavioural literature tell us, in the face of complexity and/or uncertainty, individuals tend to employ 'heuristics' (or rules-of-thumb) to simplify the decision making process. The evidence presented here underscores the complexity of the problem facing investors.

Figure 9 presents how many times over the last century the 20-year ERP has met and/or exceeded its long term average (i.e. how effective might the long term average be as a shortcut). The historical experience points to the idea that, using rolling 20-year windows, the ERP has ranged from a stellar 12.9% p.a. through to a dismal -1.5% p.a. In short, this is risk. We can illustrate that a prudent investor, even with a 20-year time horizon, faces an unpredictable and wide potential distribution of outcomes.

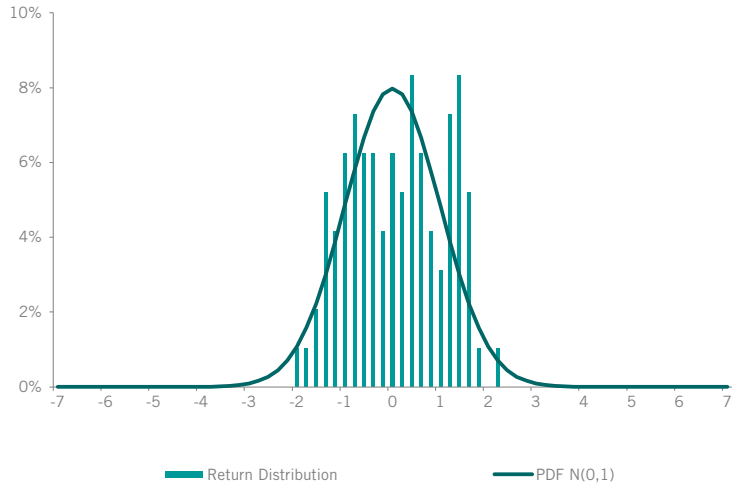
Figure 9: ERP to Bonds (20 year rolling CARR) versus the historical mean of 5.6% p.a.



Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

In the interests of completeness, we present a histogram of the distribution of rolling 20-year ERP outcomes (Figure 10). The distribution is striking in that it is platykurtic (a fancy way of describing a distribution that has a lower peak and 'thinner tails' than a normal distribution).

Figure 10: ERP to Bonds (20 year rolling CARR) – Full sample period



Source: Dimson, Marsh and Staunton (2015); Authors' own calculations

Concluding remarks

This study examined the returns and variability of the Australian and global ERP using the DMS dataset from 1900-2014. The findings reveal that Australian equities recorded one of the highest ERPs compared to sharemarkets of other countries. The Australian ERP exhibits a high degree of variability. Various time horizon analyses show that equity investors required very long investment horizons (of 20 years and more) to garner the historical ERP in Australia. This long time horizon that is required to capture the ERP is the challenge facing all equity investors (past, present and future).

With current Australian cash rates and government bond yields at record lows, it is difficult to foresee an expected ERP that is reflective of historical returns. Quite the contrary, yet, the prevailing question that cannot be answered is, what is the likely performance of the ERP in the future? Almost 20 years ago, Siegel and Thaler (1997) documented their future expectations of an ERP of 3 per cent p.a. in the U.S. for the next two decades. They very cleverly end their paper with the following note, "we are stressing long-term results and will not accept complaints for 20 years. Feel free to call us in 2017 (p. 199)." From an Australian perspective, our study illustrates the long-term performance of the ERP over many decades. The results suggest that investors may have to lower their long-term expectations of equity returns.

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