THE EQUITY PREMIUM

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Recent research on the equity risk premium has questioned the ability of historical estimates of the risk premium to provide reliable estimates of the expected risk premium. We calculate the equity risk premium for a number of countries over longer horizons than has been attempted to date. We show that the realised US equity premium is consistent with the premia obtained elsewhere. Furthermore, using well over a century of data, we find that current estimates of the equity premia are close to those observed during the pre-1914 era. This is of particular relevance given the argument that the financial environment during that period bears a closer resemblance to today than the 1914-1945 period, and possibly also the 1945-1971 period. This points to a current equity risk premium that is considerably lower than consensus forecasts (Welch 2001).

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1. Introduction

The equity premium (the difference between stock and risk-free returns) is central to many aspects of finance, including the estimation of the cost of capital. Mehra and Prescott (1985) measure the U.S. equity premium between 1889 and 1978. They argue that an average equity risk premium of approximately 6 percent is too large to be explained by reasonable estimates of relative risk aversion. Alternatively, the risk inherent in investing in the stock market is low given the low correlation between stock returns and consumption, or other important risks faced by individuals such as labour income or house price risk.[1] Such a large, and perhaps unwarranted, equity premium has a number of important implications for both investors and firms. For example, it provides a potential motivation for investing US Social Security funds in stocks rather than government bonds, while for firms it determines their cost of equity capital. A number of solutions have been proposed to what has been termed the equity premium puzzle. Given the difficulty in rationalising such a large premium in terms of what investors might reasonably expect to earn on equity, the focus of much of the research has attempted to justify the realised premium by distinguishing it from the premium that would have been expected.

Amongst these solutions is that proposed by Rietz (1988), who suggests that the equity premium will incorporate the probability of a substantial crash in output or consumption. Even a low probability crash may increase expected equity premiums significantly. Similarly, Brown, Goetzmann and Ross (1995) argue that survival bias is important, observed equity premia being biased upwards by the survival of the markets from which they are measured. A market, such as the US, will yield an

[1] See, for example, Heaton and Lucas (2000).

upwardly biased equity premium simply because it survives an absorbing lower bound. In their analysis, markets that do well will survive, and will therefore register equity premia that are substantially larger than markets that do not survive. This argument may seem plausible given that a feature of stock markets around the world during the last 100 to 150 years is the high proportion that have been subject to sustained periods of market closure. Consistent with this view is the finding by Jorion and Goetzmann (1999) that the real rate of capital appreciation has historically been higher in the US than in a number of other countries.

The implication of this is that perhaps the equity premium puzzle is not a puzzle after all. If an issue such as survival bias is important, then the equity premium appears excessive simply because it is based on estimates obtained from US stocks, and therefore based on a market that has survived continuously over the period. Such an argument may have been difficult to dispute given that the overwhelming focus of research attempting to explain or justify a substantial equity premium has been based on US stock returns. Dimson, Marsh and Stanton (2002) extend the previous research, and estimate equity risk premia for sixteen countries throughout the 20th century. They find that the equity premium realised in the US is consistent with premia estimates obtained for fifteen other countries. As a result, they are able to reject the survival bias argument supported by Jorion and Goetzmann (1999). In this paper, we also examine whether equity premia derived from the analysis of stock returns for a number of countries over long periods are consistent with those obtained from US data. Using some alternative data sources, we similarly show that there is no evidence that the US equity premium is unusual. In particular, our results imply that the realisation of a large equity premium has been relatively widespread, and is not

confined to the US stock market. As a result, it is not possible to distinguish between the realised and expected risk premium on the basis of survivorship.

The alternative approach to rationalising the equity premium puzzle is to explicitly determine if the historically large premium obtained by investors was anticipated. This approach uses fundamentals to yield measures of the expected equity premium. Two related points emerge. Firstly, estimates of the expected premium derived from fundamentals appear to deviate from those observed historically, particularly during the last fifty years. Secondly, current estimates of the expected premium are considerably lower than the historically realised premium. Fama and French (2002) suggest that both points are related to the de-coupling of the realised equity premium from that expected by investors. The most likely cause of this is the realisation of a substantial, but unanticipated, capital gain. This capital gain, they argue, is driven by a decline in the dividend-price ratio due to a fall in discount rates. In line with this, a consensus has emerged that the expected equity premium is much lower than the premium observed from past returns, and is confirmed by two surveys conducted by Welch (2000, 2001). Welch (2001) notably shows that there has been a marked decline in the expected equity premium during the three years between his two surveys.

The second aspect of our study is an examination of the variation over time in the respective country premia. Specifically, we seek to establish whether there is any evidence from the realised equity premia that might be consistent with the view that current expected premia are substantially lower than historically realised premia. Not only does our analysis illustrate how sensitive the measured premia are to the precise starting point of the data, but it also shows how the realised premia may be influenced by institutional factors such as the degree to which markets are integrated. Stulz

(1999), for example, suggests that equity premia will be directly influenced by globalisation. There is evidence that the extent to which economies, and markets, have been integrated has varied over time. We examine whether our estimated equity premia provide any evidence that is consistent with such factors having an impact on expected premia.

2. Literature

Following Mehra and Prescott's (1985) estimation of the US equity premium, and the resulting difficulty in rationalising such a large premium with theory, a number of studies have attempted to resolve the equity premium puzzle.[2] A predominant focus of the recent studies is the possibility that the observed or realised equity risk premium is not representative of the expected equity premium.[3] Perhaps foremost among the competing explanations is the view that measuring the equity premium over a long period must therefore require the market to have survived for a long period, and that this survival induces a bias in the realised equity premium.

Proponents of this view include Brown, Goetzmann and Ross (1995), who develop a model in which market failure is characterised by an absorbing lower

[2] For example, Barberis, Huang and Thaler (2003) argue that a large equity risk premium may be consistent with narrow framing – the evaluation of risks in isolation of risks already held by the individual.

[3] An alternative approach has been based on relating the risk of investing in equity to variations in consumption. Parker (2001) measures the medium-term impact of stock returns on consumption (rather than the contemporaneous impact), and argues that the risk of equity is increased considerably. Further, he argues that for the subset of householders that hold equity, the equity premium may be consistent with more realistic levels of risk aversion.

bound. This implies that market failure is anticipated by falling prices, although they do concede that market failure might also be consistent with alternative price paths. They suggest that a market with a zero equity premium and a 50 percent survival probability over the long term will yield a substantial equity premium if it survives. Thus the fact that the US market has survived is likely to have induced a significant survival bias in observed (or realised) equity returns, and therefore in the US equity premium.

Jorion and Goetzmann (1999) apply this argument, and suggest that it is supported by the evidence relating to stock returns estimated for 39 countries. Rather than estimate the equity premium, they calculate the capital return in excess of inflation (assuming that differences between the dividend and the real rate are small across countries). They argue that their results provide 'striking evidence in support of the survival explanation for the equity risk premium.' They contrast an annual real appreciation rate of 4.3 percent in the US with a median 0.8 percent. The median return is 2.4 percent among the 11 countries with continuous data back to 1921. Thus not only does market survival appear to be strongly related to the size of the real capital return, but this return appears to be highest in the U.S.

The importance of a survival bias is, however, disputed by Li and Xu (2002). They argue that market failure is unlikely to be confined to a scenario of market prices hitting an absorbing lower barrier. Market failure could equally result from prices hitting an absorbing upper barrier (in the case of hyperinflation) or may be independent of the level of stock prices (in the case of war etc.). As a result, the requirement in Brown, Goetzmann and Ross (1995) that stock prices hit a fixed lower absorbing barrier will generate minimal survival bias once the market has survived and prices risen. More importantly, Li and Xu show that a high survival bias requires

a high expected probability of market failure. As a result, a survival probability of just under one half (the approximate ratio of surviving to failing markets during the last one hundred years) induces a survival bias of just one percent. Furthermore, in order to generate consistently high survival bias, the probability of market failure has to be sufficiently high and therefore the probability of market survival very low. Thus, they argue that 'the real problem with the [Brown, Goetzmann and Ross (1995)] model, however, is not the fixed lower barrier, but that high survival bias requires an unrealistically high ex ante probability of market failure.'

There is some support for this view that survival bias may not be as significant as implied by Brown, Goetzmann and Ross (1995). An absorbing lower barrier, as modelled by Brown, Goetzmann and Ross (1995), would imply that the effect of survival bias should be greatest when the market is young and therefore stock prices are closest to the barrier (assuming that prices rise as the market survives). This would then imply a reduction in the survival bias the longer a market survives. Siegel (1998) shows that the equity premium in the United States has increased considerably over time. In particular, he finds that it has increased from 1.9 percent between 1802-1870 to 6.6 percent between 1926-1997.

An alternative, but related argument, is the risk of a large, albeit infrequent, crash proposed by Rietz (1988). Assuming that there is a nonzero probability of such a crash, and that this probability is incorporated into the market risk premium, the expected equity premium will be driven upwards. Moreover, the magnitude of this equity premium should be positively related to the probability of the crash. However, if this probability is itself related to the frequency of past crashes, then the fact that the market in the United States has survived should yield an expected equity premium in the U.S. that is lower than the equity premiums observed elsewhere.

Dimson and Marsh (2001) estimate the equity risk premium for the UK, US, Germany and Japan between 1955 and 1999. They obtain an arithmetic mean equity risk premium of 9 percent, 3 percent, 8.9 percent and 9.7 percent respectively. In a more comprehensive investigation of the equity risk premium, Dimson, Marsh and Staunton (2002) extend this to cover a total of sixteen countries between 1900 and 2000. They obtain corresponding arithmetic mean equity risk premia of 6.5 percent, 7.7 percent, 10.3 percent and 9.9 percent, and an average for the complete sample of 6.2 percent. Furthermore, they show that there has been a significant shift upwards in the realised equity premium during the second half of the 20th century. Pre-1950, premia were 7 percent and 3 percent in the US and the UK, whilst they were 9 percent and 10 percent between 1950 and 2000. This pattern was repeated in almost all the sixteen countries studied.

This shift in the realised equity premium has led recent research to emphasise the distinction between the expected premium obtained from fundamentals and the realised equity premium. Claus and Thomas (2001) determine the equity premium by estimating the discount rates that equate forecasted cash flows (as proxied by analyst forecasts) with current market valuations. They obtain an estimate of the mean US equity premium from an abnormal earnings model of 3.4 percent between 1985 and 1998. More importantly, they show that this estimate is consistent with those obtained for five other countries, Canada, France, Germany, Japan and the United Kingdom. Whilst they note that there is considerable variation in these countries' underlying fundamentals, the equity premium lies between two and three percent, except for Japan (where it is somewhat lower).

Fama and French (2002) also distinguish between measures of the equity premium based on the realised average return and fundamentals. They note that for

much of the 1872 to 2000 period, the alternative measures of the US equity premium produce similar estimates. For example, they show that between 1872 and 1950, the dividend growth model and the average stock return produce similar estimates of the equity premium (4.17 percent and 4.40 percent respectively). The corresponding estimates between 1951 and 2000 are 2.55 percent and 7.43 percent. Fama and French (2002) argue that the former measure obtained from fundamentals provides a better and more precise estimate of the expected return since 1950.[4] The high realised return since 1950 must therefore be significantly greater than the expected return over this period. They conclude that realised returns substantially in excess of expected returns is due to unexpected capital gains, which are in turn driven by a decline in expected future returns. The dividend-price ratio falls from 7.18 percent to 1.22 percent between 1950 and 2000. If, at the beginning of this period, the dividend-price ratio were expected to fall to its long-term average of 4.64 percent, then the remainder of this decline would add approximately 2.67 percent of unanticipated compound annual return each year.[5]

There appears to be a consensus emerging that the current expected equity premium is much lower than that observed historically. This would be consistent with the finding that the particularly high equity premia realised during the second half of the 20th century may have been driven by unexpected capital gains (possibly

[4] Ibbotson and Chen (2003) obtain an estimate for the realised equity premium of 5.24 percent from 1926 to 2000. They argue that a high price-earnings ratio at the end of the period indicates expectations of high earnings growth rates rather than low required returns (assuming that the equity premium is constant through time). As a result, their estimate of the equity premium obtained from an earnings based measure over this period is 3.97 percent.

[5] Jagannathan, McGrattan and Scherbina (2001) also argue that the US equity premium has fallen substantially. They suggest that it lies between 0 and 2 percent during 1970-99.

associated with larger than anticipated cash flows), together with a decline in the required risk premium. These factors cannot have been anticipated by investors, and therefore yield equity premia that are greater than would have been expected, or required, by investors. Perhaps as a result, current forecasts of the equity premium have fallen significantly. Welch (2000) surveyed financial economists in 1998 and found that the expected U.S. arithmetic mean equity premium was 7.1 percent. A follow-up survey in 2001 (Welch 2001) found that expectations had been revised substantially, the mean estimates having fallen to 5.5 percent. Whilst such a dramatic shift in expectations could have been induced by the research detailed above, it is equally possible that they are indicative of the judgemental biases to which individuals appear to be susceptible. For example, there is evidence that investors' expectations about future growth rates are based excessively on extrapolations of past growth rates.[6] That stocks yielded substantial positive returns during the late 1990's, followed by negative returns through 2000 and 2001, may therefore have impacted on the equity premium forecasts in Welch (2000, 2001). Perhaps consistent with such extrapolation is the difference in forecasts documented by Welch (2001) between those respondents classifying themselves as less expert than the average and more expert than the average. Their respective average forecasts of the equity premium were 4.9 percent and 6.2 percent.

3. Analysis

[6] See La Porta, Lakonishok, Shleifer and Vishny (1997).

Ibbotson (2000) defines the equity risk premium as the difference between the annual return of large capitalisation stocks and Treasury Bills.[7] The standard procedure used to estimate the equity premium is the arithmetic mean since this most accurately proxies what investors might expect to earn in any particular year. The arithmetic mean exceeds the geometric mean by approximately one half the variance (assuming that returns are lognormally distributed).

In Table 1 we calculate the arithmetic equity premium using both short and long risk-free rates – bills and bonds. It is standard practice to measure the equity premium using bills, since these most closely approximate risk-free investments. Bonds, on the other hand, are riskier than bills given their exposure to changes in either inflation or real interest rates. Long-term bonds, however, incorporate interest rate expectations over the long-term and not just over the very short term as is the case with bills. As a result, we would expect the equity premia to be larger when measured relative to the short risk-free rates.

Table 1

Two clear points emerge from the results in Table 1. Firstly, the equity premia are consistently large in magnitude. The means are 6.96 percent and 6.23 percent respectively. Associated with these relatively high premia are large standard deviations. Secondly, irrespective of the risk-free rate used, the equity premium for the US is below both the mean and the median. This, however, does not perhaps represent a fair comparison, since we need to bear in mind that the respective equity premia are measured using different starting points.

[7] Dimson and Marsh (2001) suggest that geometric differencing may be preferred when making international comparisons since it is independent of the choice of unit of measurement.

In order to account for this (and therefore to allow for the likelihood that the equity premium may vary over time), we measure the equity premia between 1900 and 2002 for the subset of countries with data available through this period. These resulting estimates are comparable to those reported in Dimson, Marsh and Staunton (2002). Table 2 presents the results for the nine countries with qualifying equity premia. Note that the data for Canada and the Netherlands starts at 1901.

Table 2

Our results confirm that the realised equity premium in the US is consistent with that for a number of other countries. Over the whole of the 20th century, the realised premium for the US is 6.88 percent and 6.15 percent relative to bills and bonds respectively. This compares with 5.23 percent and 4.96 percent for the UK. Overall, the US premium is marginally below the nine country mean equity premium relative to either bills or bonds. There is clearly no evidence to suggest that the historically observed US equity premium is significantly greater than that for the countries in our sample. This contrasts with the results presented in Jorion and Goetzmann (1999), who estimate the real capital appreciation for a large number of countries over a comparable period, and suggest that the US experienced a higher risk premium than that experienced elsewhere.

Table 3

Fama and French (2002) suggest that the expected and the realised equity premia have de-coupled since 1950. In particular, they argue that the high realised premium in the US since 1950 may have been induced by a significant, but unanticipated, reduction in the dividend-price ratio and with it an associated capital gain as expected returns fell. In Table 3 we split our sample into two, approximately representing the first and second halves of the 20th century respectively. It is clear that

there is again no evidence to indicate significant differences in the realised premia between the two periods. The respective estimates for the US premium are almost identical, as are those for the country means. This, however, does not refute a divergence between the realised and expected equity premium as proposed by Fama and French (2002). Whilst it is interesting to note that there is clearly greater dispersion in the realised country premia during the earlier period, the estimated standard deviations are comparable between the two periods. There are good reasons for arguing that the earlier period may have represented a considerably greater degree of risk for investors, incorporating as it did two world wars and the crash of 1929. Thus although the individual country measures of risk appear unchanged, there appears to be an increased degree of covariance between the markets during the latter half of the 20th century.

4. Market Integration

In this section, we suggest that the recent evidence of a significant reduction in the expected risk premium may be consistent with the evidence we detail of the equity risk premium over the period prior to the First World War. Despite the period prior to the First World War being significantly more distant in time, it may yield interesting insights into the equity premium that investors may require given the similarities that exist between that period and the more recent, post Second World War, period.

Table 4

As detailed by Fama and French (2002) and Claus and Thomas (2001), current estimates of the equity risk premium are significantly lower than those achieved historically by investors. Stulz (1999) suggests that the reduction in expected future

returns might be consistent with the increased globalisation evident during the latter part of the 20th Century. The impact of the changing nature of market integration over time is illustrated by Goetzmann, Li and Rouwenhorst (2002). They argue that variations in the correlation of equity returns over the last 150 years may be, at least in part, indicative of changes in the degree to which markets have been integrated.[8] Furthermore, they suggest that markets were integrated between 1872-1913 and 1972-2000, and were segmented between 1914-1971. They find that the average correlation between four major markets (France, Germany, the UK and the US) was 0.381 during integration and 0.146 during segmentation. The pattern of correlations is also different when markets are segmented. Consistent with this, the results in Tables 3 and 4 show substantial variation in county premia between 1900 and 1950, but not between 1871 and 1913.

More fundamentally, Bordo, Eichengreen and Kim (1998) suggest that the pre-1914 period also saw a high degree of market integration. They argue that international market integration did not reach the levels seen prior to 1914 until the 1990's. A number of factors contributed to this earlier period of integration, principal among them being the gold standard. Associated factors include the absence of currency risk induced by the gold standard, very substantial capital flows and the convergence of government bond yields. Bordo (2000) notes that prior to World War One, 'the ratio of both the stock and net flow of foreign investment relative to GDP was comparable to or even higher than today.' Rajan and Zingales (2002) argue that 'countries were more financially developed in 1913 than in 1980 and only recently

[8] Two markets are integrated if the expected return to an asset conditional on its risk is the same in the two markets. This means that the market does not influence the expected return. If markets are segmented, expected returns are likely to differ.

have they surpassed their 1913 levels.' Basu and Taylor (1999) argue that the dispersion of real interest rates is only now returning to pre-1914 levels. Obstfeld and Taylor (2002), using similar data to Jorion and Goetzmann (1999) (stock returns measured in terms of capital gains), find that the standard deviation of returns was low prior to 1914. Furthermore, they suggest there is some evidence of increased correlation of returns pre-1914.

As a result, it may be reasonable to regard the pre-1914 period as having more relevance for current equity premia forecasts than more recent periods, particularly those incorporating the two world wars.[9] It is therefore interesting to note that our estimates of the equity risk premium during the pre-1914 period are consistent with current forecasts of the premium from fundamentals. We find that the equity premium in the US between 1871 and 1913 was just 2.18 percent, whilst the mean for the five countries for which we have data available is 3.23 percent. This suggests that there may be no need to attempt to rationalise the apparent reduction in the equity premium by resorting to arguments based on changes in investor preferences or attitudes to risk. Rather, a reduction in the equity premium can be justified on the basis that it is consistent with the financial environment.

[9] We do not suggest, however, that the extent to which markets are integrated today mirrors or matches the pre-1914 era. Markets are clearly very different today. Rather we suggest that the current financial environment may bear a closer resemblance in many aspects to the pre-1914 period than it may do to more recent periods. This is particularly the case with respect to 1914-1945, but also perhaps to 1945-1971, during which time exchange rates were largely fixed and capital controls widespread.

5. Conclusion

Our research shows that the realised equity risk premia are fairly consistent when compared across countries. Furthermore, it is evident from our results that the experience of US investors over the last 130 years is fairly typical of the experience of investors in a number of other countries. Certainly there is no evidence to suggest that the US equity risk premium has been out of line with that observed in countries including Germany, France, Ireland and the UK. Perhaps more importantly, we suggest that there may be good historical reasons for the estimate of the current equity risk premium to be consistent with the forecasts proposed by, for example, Fama and French (2002).

On the one hand, it could be argued that researchers should rely on more recent estimates given that times change and history is unlikely to repeat itself. Furthermore, the current economic climate is relatively more stable than has been the case for possibly most of the 20th century. There are, however, good reasons to believe that aspects of the financial environment, including the degree of integration, stability and capital mobility today, is comparable to that seen prior to the First World War. Our research extends the analysis of historical estimates of the equity risk premium back to 1871, thereby enabling us to determine whether this pre-1914 period has implications for the current estimates of the equity premium.

References

Barberis, N., M. Huang and R. Thaler 2003 Individual Preferences, Monetary Gambles and the Equity Premium, Working Paper, University of Chicago.

Basu, S. and A. Taylor 1999 Business Cycles in International Historical Perspective, Journal of Economic Perspectives

Bordo, M. 2000 The Globalization of International Financial Markets: What Can History Teach Us? Mimeo.

Bordo, M., B. Eichengreen and J. Kim 1998 was There Really an Earlier Period of International Financial Integration Comparable to Today? Working Paper 6738, National Bureau of Economic Research.

Brown, S., W. Goetzmann and S. Ross 1995 Survival, Journal of Finance, 50, 853-873.

Claus, J. and J. Thomas 2001 Equity Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stocks, Journal of Finance, 56, 1629-1666.

Dimson, E. and P. Marsh 2001 UK Financial Market Returns 1955-2000, Journal of Business, 74, 1-31.

Dimson, E., P. Marsh and M. Staunton 2002 Triumph of the Optimists: 101 Years of Global Investing Returns, New Jersey: Princeton University Press.

Fama E. and K. French 2002 The Equity Premium, Journal of Finance, 57, 637-659.

Goetzmann, W., L. Li and K. Rouwenhorst 2002 Long-Term Global Market Correlations, Working Paper, Yale School of Management.

Heaton, J. and D. Lucas 2000 Portfolio Choice in the Presence of Background Risk, Economic Journal, 110, 1-26.

Ibbotson Associates 2000 Stocks, Bonds, Bills and Inflation Yearbook, Chicago: Ibbotson Associates.

Ibbotson, R. and P. Chen 2003 Stock Market Returns in the Long Run: Participating In the Real Economy, Financial Analysts Journal, 59, 88-98.

Jagannathan, R., E. Mc Grattan and A Scherbina (2001) The Declining US Equity Premium, Working Paper 8172, National Bureau of Economic Research.

Jorion, P. and W. Goetzmann 1999 Global Stock Markets in the Twentieth Century, Journal of Finance, 54, 953-980.

La Porta, R., J. Lakonishok, A. Shleifer and R. Vishny 1997 Good News for Value Stocks: Further Evidence on Market Efficiency, Journal of Finance, 52, 859-874.

Li, H. and Y. Xu 2002 Survival Bias and the Equity Premium Puzzle, Journal of Finance, 57, 1981-1995.

Mehra, R. and E. Prescott 1985 The Equity Premium: A Puzzle, Journal of Monetary Economics, 15, 145-161.

Obstfeld, M. and A. Taylor 2002 Globalization and Capital Markets, Working Paper 8846, National Bureau of Economic Research.

Parker, J. 2001 The Consumption Risk of the Stock Market, Brookings Papers on Economic Activity, 2, 279-348.

Rajan, R. and L. Zingales 2002 The Great Reversals: The Politics of Financial Development in the 20th Century, Working Paper, University of Chicago.

Rietz, T., 1988 The Equity Risk Premium: A Solution, Journal of Monetary Economics, 22, 117-131.

Siegel, J. 1998 Stocks for the Long Run: The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies, 2nd ed. New York: McGraw-Hill.

Welch, I. 2000 Views of Financial Economists on the Equity Premium and Other Issues, Journal of Business, 73, 501-537.

Welch, I. 2001 The Equity Premium Consensus Forecast Revisited, Working Paper, Yale School of Management.

Table 1 Arithmetic Equity Premia for 16 Countries (to end 2002)

Country	Start date	Short Rates		Long Rates	
		Equity Premium	Std. Dev.	Equity Premium	Std. Dev.
Australia	1882	6.99	15.8	6.57	15.9
Austria	1927	7.12	31.9	5.59	31.9
Belgium	1927	8.35	26.8	6.85	27.1
Canada	1901	6.22	18.1	5.17	17.9
Denmark	1922	3.80	22.7	3.52	22.7
France	1871	8.49	29.4	7.42	29.2
Germany	1871	7.73	45.0	6.68	47.5
Japan	1914	9.89	30.2	9.83	30.14
Ireland	1871	6.67	22.4	6.13	22.0
Italy	1900	8.68	34.5	8.40	34.2
Netherlands	1901	6.81	23.6	5.39	23.4
Spain	1940	8.32	25.9	8.10	25.8
Sweden	1919	6.95	24.5	6.33	24.4
Switzerland	1919	7.09	21.9	6.04	21.9
United Kingdom	1871	5.03	19.7	4.77	19.0
United States	1871	5.69	18.5	5.63	18.1
Mean		6.96	24.6	6.23	24.4
Median		7.09	24.5	6.57	24.4

This Table presents equity premia for 16 countries. These are calculated using both bills and bonds. Std. Dev. is the corresponding standard deviation. The start dates represent the point at which our data begin. The mean and median are the equally weighted averages respectively. The data for Germany excludes 1922-23.

Table 2 Arithmetic Equity Premia for 9 Countries 1900-2002

Country	Short Rates		Long Rates	
	Equity Premium	Std. Dev.	Equity Premium	Std. Dev.
Australia	6.93	16.7	6.44	16.7
Canada	6.22	18.1	5.17	17.9
France	9.92	33.0	8.85	32.7
Germany	5.18	30.0	3.36	29.7
Ireland	7.59	25.0	6.91	24.5
Italy	8.68	34.5	8.40	34.2
Netherlands	6.81	23.6	5.39	23.4
United Kingdom	5.23	22.0	4.96	21.2
United States	6.88	19.5	6.15	19.3
Mean	7.04	24.7	6.23	24.4
Median	6.88	23.6	6.57	24.4

This Table presents equity premia for 9 countries with data available between 1900 and 2002. These are calculated using both bills and bonds. Std. Dev. is the corresponding standard deviation. All data starts at 1900, except Canada and the Netherlands, which start at 1901. The mean and median are the equally weighted averages respectively. The data for Germany excludes 1922-23.

Table 3 Arithmetic Equity Premia for 9 Countries 1900-1950, 1951-2002

Country	Short Rates		Long Rates	
	Equity Premium	Std. Dev.	Equity Premium	Std. Dev.
		1900 - 1950		
Australia	7.98	9.3	7.80	9.24
Canada	7.71	19.0	6.88	18.9
France	11.48	38.4	10.17	38.4
Germany	1.37	30.5	-0.01	30.4
Ireland	6.41	14.8	5.52	14.5
Italy	11.51	38.4	11.69	37.9
Netherlands	3.99	24.0	3.0	23.9
United Kingdom	2.58	13.0	2.85	11.1
United States	6.92	21.1	6.58	20.8
Mean	6.66	23.2	6.05	22.8
Median	6.92	21.1	6.58	20.8
		1951 - 2002		
Australia	6.88	16.8	6.38	16.8
Canada	6.22	18.1	5.17	17.9
France	10.07	33.1	8.99	32.9
Germany	5.34	30.1	3.69	29.8
Ireland	7.67	25.1	6.98	24.6
Italy	8.84	34.6	8.56	34.3
Netherlands	6.81	23.6	5.39	23.4
United Kingdom	5.23	22.1	4.95	21.3
United States	6.81	19.6	6.07	19.4
Mean	7.10	24.8	6.24	24.5
Median	6.81	23.6	6.07	23.4

This Table presents equity premia for 9 countries with data available between 1900 and 2002. These are calculated using both bills and bonds. Std. Dev. is the corresponding standard deviation. All data starts at 1900, except Canada and the Netherlands, which start at 1901. The mean and median are the equally weighted averages respectively. The data for Germany excludes 1922-23.

Table 4 Arithmetic Equity Premia for 5 Countries 1871-1913

Country	Short Rates		Long Rates	
	Equity Premium	Std. Dev.	Equity Premium	Std. Dev.
France	3.26	6.7	2.39	6.6
Germany	4.29	15.5	3.81	15.3
Ireland	2.54	7.1	2.63	7.0
United Kingdom	3.89	5.8	3.87	5.5
United States	2.18	15.4	3.99	14.8
Mean	3.23	10.1	3.34	9.8
Median	3.26	7.1	3.81	7.0

This Table presents equity premia for 5 countries with data available between 1871 and 1913. These are calculated using both bills and bonds. Std. Dev. is the corresponding standard deviation. The mean and median are the equally weighted averages respectively.