The Long-Run Performance of the New Zealand Stock Markets:

1899-2012

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Abstract

We collect the longest available historical data series for the New Zealand equity market. We provide statistical properties of these series as well as the long term Equity Risk Premium over the entire sample period of 114 years and several sub-periods. The arithmetic mean of equity return is 10.75% per year, with a standard deviation of 20.17%. The New Zealand stock markets had 91 years of positive returns and 23 years of negative returns during the entire sample period. The highest return was recorded in 1983 at 122.19% and the lowest return was -42.483% in 1987. The 10-year government bond yield, over the entire period, has an arithmetic mean return of 5.76%. The Equity Risk Premium, the excess return of equities over the 10-year government bond yield, on average, is 4.99%.

Key words: equity market, bond market, inflation, risk premium, New Zealand stock market

JEL Codes: G10, G11

1. Introduction

Long run historical performance of stock markets is crucial in computing the "Equity Risk Premium", which is a key component in the empirical application of asset pricing models, calculation of cost of capital, and valuation of corporations. This study will provide an overview of New Zealand historical Equity Risk Premium, as well as bond returns and inflation, from 1899 to 2012.

There are several methods that can be adopted to measure the Equity Risk Premium (henceforth, ERP) see for instance, Ibbotson (2011). On the whole, these methods can be divided into two general categories: (1) Long term historical stock returns over long-term bond returns. (2) Implied or consensus based estimates. The first method is a straightforward way to measure the risk of equity in the long-run. It uses historical equity returns and government bond yields; therefore, it does not change often and swiftly over time and provide a realistic measure of how much stocks have outperformed bonds. However, it only shows the estimation based on historical view and it does not necessarily incorporate recent market realities. That said, it produces the most accurate estimate of the unconditional Equity Risk Premium. The second method is based on the overall opinions of participants in the marketplace and how they have priced securities traded therein. As these individuals set the prices in the stock market, they must also be the ones willing to buy or sell these stocks, reflecting their long-term prospects. While measuring Equity Risk Premium based on consensus models takes into account the current realities of the market, it has been shown that market participants have, on average, a rather short-term horizon and are prone to extreme optimism or pessimism affecting their judgement. These estimates are often very volatile and typically are used to "beat the market" when analysts believe markets are over- or under-

priced. As such, the consensus based estimates are not consistent for the purpose of long-term investments. In this study, we report the Equity Risk Premium of New Zealand stock market using the historical method.

The literature on the long-term performance of the New Zealand stock market is very limited. In fact, to this point, there has only been one original study by Chay, Marsden and Stubb (1993), and a follow-up study by Lally and Marsden (2002). Chay et al. (1993) calculate historical returns from investing in New Zealand equities and bonds for the period 1931 to 1992. They report an average equity returns of 12.8% p.a, and an arithmetic average equity risk premium (ERP) of 5.75% p.a. Lally and Marsden (2002) extending the above work, and using a tax-adjusted version of CAPM, find the ERP over the period 1931-2002, to be, on average, 5.5% p.a.[1]

The purpose of the current study is to gather and report the longest possible data series, including the recent financial crisis, on equity, bond and inflation. Our study covers the period of 1899 to the end of 2012. This long-term horizon could provide a valuable instrument for predicting future expected stock market returns and its movement in the long term. We hope this study will open up opportunities for further research to test a broad range of theories in regards to performance, risk premium, risk aversion, and volatility measures in New Zealand capital markets.

[1] Another factor affecting the calculation of the ERP is the impact of (differential) tax rates on interest, dividends and capital gains. We have, in the current version of our paper, intentionally stayed away from introducing taxes into our analysis, as different tax assumptions and the different models employed would result in different magnitudes of the ERP.

2. Data

2.1 Stock Market Index

2.1.1 Sample 1899-1929

Share price data and dividends for individual companies are collected from the records of the Wellington Stock Exchange (1899-1904, 1911-1929) and the Christchurch Stock Exchange (1905 to 1910). These records were obtained in print from the archives of the National Library of New Zealand in Wellington. Both exchanges produced a monthly share list and report under the authority of their respective Exchange Committee. These reports include the name of the company, market price of the share, the interest on investment (i.e. dividend yield at current market price),[2] the number of shares outstanding, latest dividend payments and various other details and announcements about the companies involved.

During this sample period, the New Zealand market hosted more than 200 different firms. At the start of 1899, there were 45 listings on the market. The number of listings grew steadily over time and reached a peak of about 119 listings in 1910. After this period there was a gradual decline in the number of listings until about 1920, when the number of listings levelled off at about 80 companies.

The record of share prices is almost continuous from 1899 to 1929. However, some data points were missing, e.g. September 1905 and April 1906 and a few months in 1914 at the onset of the 1st World War.

[2]Note that in this period it was common practice for firms to pay a fixed dividend rate set at a certain percentage of par value of the share. In that sense, these shares are similar to what currently is known as "preferred stocks". If the firm was particularly profitable in a given period, it sometimes paid out a bonus dividend in that period. Depending on profitability, a firm adjusted its dividend pay-out ratio.

Based on the market price and dividends, we calculate the capital gain, dividend yield and the holding period return for each stock in the sample. Next, we combine the individual returns into a single market index. Since we also know the number of shares outstanding, we can compute the total market value of each company in the sample. Using these market values, we are able compute the returns on a value-weighted basis for the New Zealand stock market during this sample period. We compute the value-weighted return index, in this section and the rest of the paper, based on total returns as follows,

$$r_{mt} = \sum_{i=1}^{N} w_{it} r_{it} = \sum_{i=1}^{N} \left(\frac{v_{it-1}}{\sum v_{it-1}} * r_{it} \right), \quad (1)$$

where r_{mt} is the return of the value-weighted market index for period t, r_{it} represents the return of security i for period t, and w_{it} is the weight of the security for time t, which is the market value of the security at $t - 1$ divided by the total market value. This provides us with a monthly value-weighted return index of the New Zealand stock market over the period 1899-1929.

2.1.2 Sample 1930-2012

For the sample period from 1930-2012, we obtain a monthly share price index for the period 1930-1968 from the New Zealand Official Yearbooks, which are published by the New Zealand Department of Statistics. This index was computed as a value-weighted capital gain index and was reported on a monthly basis. The selection of companies that were included in this index was based on their importance in the investment market. From 1930 to 1959, the index comprised of 43 to 49 stocks, and had a base value of 1000 in the year 1938. In 1960, there was a revision of the share price index. A new base year was chosen (1960 –base value

1000), and the index was broadened slightly, now including 66 companies. For the same period and companies, the New Zealand Official Yearbooks also contains a monthly index containing the dividend yields.

For the remaining period from 1969-present, stock market data are publicly available in the electronic format and are obtained from DATEX. DATEX contains data on both total return and capital gains indices. We collect the (value-weighted) Barclays capital gains index for the period 1969 – 1989, and dividends over this period are obtained from Statistics New Zealand. From 1990 to 2012, the NZX All index (total return index) is collected. These indices are available on a daily frequency.

Based on the total returns of these indices, we construct an overall value-weighted total return index for the New Zealand market from 1899-2012. Then, following Brailsford et al. (2008, 2010), we compute annual returns on this index, by taking the values of the index in December of each year, and base our statistics on these annual values.[3]

2.2 Government Bond

We use the New Zealand 10-year government bond yield as a proxy for the risk free rate in our analysis[4]. We obtain the relevant data from Global Financial Data for the period 1899-

[3]An alternative way is to use the monthly data and compute annual average by computing the compounded annual returns as in Chay et al. (1993) and Lally and Marsden (2002). Their calculation show slight differences in the annual returns. For sake of comparison with the two existing studies, we report our results for the same periods in the Appendix

[4] The choice of risk-free rate has proven to be a contentious issue in the literature. While some authors use the return on short-term government bonds, others adopt the return on long-term bonds leading to a difference of about 2%, for instance in the U.S. (Ibbotson Associates 2002). In our case, and in line with the existing paper such as Chay et al. (1993) and Lally and Marsden (2002) and various studies in different countries, we adopt 10 year government bonds.

2008 and from the Reserve Bank of New Zealand from 2009 to 2012.[5] While the Global Financial Data computes a monthly index for 10-year government bond yield since 1899, the data for the period December 1915 to January 1925 have been missing. To patch this data gap, we collect data on the Australian 10-year government bond yield (for which monthly data are available since 1865). We then perform a regression of the New Zealand government bond yield on the Australian government bond yield over the 10 year period prior to the data gap, i.e. January 1906 – November 1915. Over that period, this regression produces an R^2 of 0.73, and the intercept and slope coefficients are 1.71 and 0.47, respectively. Subsequently, we use these coefficients to compute estimated values of the New Zealand 10-year government bond yield for the period 1915-1925.

2.3 Inflation

Inflation data for New Zealand are obtained from the New Zealand Department of Statistics and from the Reserve Bank of New Zealand.[6] The Reserve Bank has inflation data going as far back as 1915. Prior to that inflation data are available in the long-term data series of Statistics New Zealand. From 1915 data are available at a quarterly frequency. Prior to that data are only available on an annual basis.

[5]The Reserve Bank of New Zealand only reports yields on 10-year government bonds from 1985 onwards. The correlation between the yields from Global Financial Data and the Reserve Bank of New Zealand over the period 1985-2008 is extremely high, 0.9986.

[6]www.rbnz.govt.nz

3. Empirical Results

In this section, we report the results for the analysis of this paper. We present the results for the full sample and various subsamples. Subsequently, we examine the volatility of the New Zealand stock market over the sample period. We further compare the long-term performance of the New Zealand market to the Australian and US equity market.

3.1 Full sample results

In Figure 1, we plot the log index value of the New Zealand stock market over the period 1899-2012. We can observe a clear trend that is close to a linear progression. One clear feature in this graph is the strong increase in the index in the early 1980s, which represented a period of exceptional performance of the stock market. This exceptional performance came to a hold in 1987, when the stock market collapsed. It can be seen from the graph this event represented the largest collapse in the history of the New Zealand stock market.

INSERT FIGURE 1 HERE

In Table 1, we provide summary statistics of our data over the period 1899-2012. In the first row of Table 1, we report the results for the total return of the market index. The mean arithmetic and geometric return from equities are 10.75% and 9.16% p.a., respectively, and the standard deviation of returns is 20.17% p.a. Over the entire sample period, there are 91 years with positive returns out of total 114 years. The highest return was recorded in 1983 at

122.19% and the lowest return was -42.483% in 1987. Overall, we observe that the index returns are non-normally distributed, displaying positive skewness and excess kurtosis.

Next, we decompose the total return into capital gains and dividend yield. As can be seen from the following two rows in Table 1, the contributions of capital gains and dividend yield to the total return are about equal. For the capital gains, we observe an arithmetic (geometric) average of 5.48% (3.87%). The standard deviation of the capital gains is close to the standard deviation of the total return, suggesting that a large part of the volatility in the index comes from price movements. Capital gains also have a skewness and excess kurtosis that is close to that of the total returns. For the dividend yield, we find an arithmetic (geometric) mean of 5.27% (5.26%). The standard deviation of the dividend yield is very low at 1.56%, and we further note that skewness, and excess kurtosis are close to zero, suggesting that dividend yields are close to normally distributed.

The data on the inflation rate are reported in the following row in Table 1. The arithmetic and geometric means of annual inflation rate are 4.14% and 4.01%, respectively. The inflation rate was positive in 100 years out of total 114 years with the standard deviation of 5.26%. Inflation peaked in 1986. After controlling for the inflation rate, we observe that the arithmetic (geometric) average real rate of return is 6.47% (4.96%) with a standard deviation of 18.79%.

INSERT TABLE 1 HERE

For the 10-year government bond yield, the arithmetic and geometric mean are 5.76% and 5.71%, respectively. As expected for this risk-free security, the standard deviation of 3.16% is much lower than that of equities. The highest government bond yield was observed in 1985 at 17% p.a.; and as was the case with the equity returns, we observe positive skewness and excess kurtosis in the bond data.

Lastly, the Equity Risk Premium, which is defined as the excess return of equities over the 10-year government bond yield, is 4.99% according to the arithmetic mean and 3.45% according to the geometric mean. The highest premium was 111.69% in 1983 and the lowest was -56.78% in 1987. The equity risk premium was positive in 73 years out of total 114 years, with a standard deviation of 19.58%.

To put the figures on the ERP obtained for New Zealand into perspective, we can compare our results to those of various international studies. For example, Brailsford et al. (2010) compute an arithmetic (geometric) average of the equity risk premium of 6.1% (4.8%) over the period 1880-2010, about 1.1% higher than our estimate for the New Zealand market. In addition to having a higher equity risk premium, they also show that there is considerably less volatility in the equity risk premium of the Australian market at 15.8%. Dimson et al. (2011) compute the equity risk premium for 19 countries including the US and the UK for the period 1900-2010. For the US they document an arithmetic (geometric) average equity risk premium of 6.4% (4.4%), more than 1% higher than our estimate for the New Zealand market. However, the equity risk premium in the US seems to have come at a higher standard deviation. The market return closest to the New Zealand market is the UK, which produced

an arithmetic (geometric) average equity risk premium of 5.2% over the period 1900-2010. However, the volatility of this premium seems to have been lower in the UK than in New Zealand.

Based on the data on the equity risk premium and the inflation figures, we are able to calculate the degree of risk aversion in New Zealand in a Mehra and Prescott (1985) context, known in the literature as the so called "Equity Premium Puzzle". In their model, a standard general equilibrium model, Mehra and Prescott assume investors have additively separable utility functions (i.e., the utility of consumption this year does not affect an investor's consumption in the future) and constant relative risk aversion. The equity risk premium is the difference between return on equity and return on risk-free asset in excess of the premium that can be explained on the basis of a "reasonable" degree of risk aversion. Based on our data, we observe a coefficient of relative risk aversion of around 33. The interpretation of this figure is that if consumption falls by 1 per cent, then the marginal value of a dollar income increases by 33 per cent. Mehra and Prescott (1985) observe that these values are far too high, for instance in the U.S it is about 40%, to explain historical equity risk premium, which normally should be less than 10%. Here, we can confirm that this puzzle seems to prevail in New Zealand as the figure of 33 is considerably outside the typically assumed range.

3.2 Subperiod Analysis

As a next step in our analysis, we examine the historical returns on the stock market over various subsamples, 1899-1929, 1930-1969, and 1970-2012.

3.2.1 Period 1899-1929

In Figure 2, we plot the times series for the log index over the period 1899-1929, a period not originally investigated in New Zealand, where 1899 is set at a base of 0. Overall, this period saw a steady growth in the value of equities in the New Zealand stock market. Notable is the peak in the stock market during the First World War. This peak relates to the increase in global commodity prices due to the War, which turned out to be beneficial for New Zealand. However, the post-war bubble burst in the early 1920 leading to an economic recession that lasted for about two year. From 1922 onwards, there was again a rise in equities up to late 1929 until the start of the Great Depression.

INSERT FIGURE 2 HERE

We present summary statistics for this first subsample in Table 2, Panel A. Over this period, the arithmetic (geometric) average nominal return was 7.31% (7.08%), with a standard deviation of 7.16%. Hence over this early period, the returns and standard deviation were considerably lower than over the full sample period. Breaking up the total return into capital gains and dividend yield shows that the arithmetic (geometric) average capital gain was 2.78% (2.60%), with a standard deviation of 6.24%, which is considerably lower than the arithmetic average capital gain for the full sample (5.48%). The arithmetic (geometric) average dividend yield over this period was 4.52% (4.52%) which is 75 basis points lower than what we observe for the full sample. Hence, in this early part of the sample, dividend yield was a more important source of return than capital gains. Inflation during the early part of the sample was also considerably lower than for the full sample at 2.24% and 2.14% for

the arithmetic and geometric average, respectively. With the nominal equity return and the inflation rate, we can compute the real return, which over this period was 5.11% (4.84%) for the arithmetic (geometric) average. Government bonds over this period of time had a very low standard deviation of only 0.62% and yielded 3.92% p.a. over this period. The equity risk premium is 3.38% (3.14%) for the arithmetic (geometric) average, which for the arithmetic mean is more than 1.5% lower than for the full sample.

3.2.2 Period 1930-1969

In Figure 3, we plot the times series for the log index over the period 1930-1969, where 1930 is set at a base of 0. From the start of this sample period, we notice the effect of the Great Depression on the New Zealand stock market, where the market was depressed for a period of about 4 years. From that point onwards, we observe a general increase in the index. The Second World War generally had a positive impact on the New Zealand stock market, as commodity prices were elevated during this period of time. However, there was a depression in the market in the early 1950s at the start of the Korean War. Finally, we notice a slowdown in the market in the 1960s due to depressed commodity prices and a pickup after this from 1968 onwards, after the devaluation of the currency.

INSERT FIGURE 3 HERE

In Panel B of Table 2, we present summary statistics for this second subsample. Over this period, the arithmetic (geometric) average nominal return was 8.91% (8.28%), with a standard deviation of 12.11%. This shows that over this second period, the average market return was higher than in the first period, but volatility was also higher. Still, these figures are below the values for the full sample. Splitting up the total return into capital gains and

dividend yield shows that the arithmetic (geometric) average capital gain was 4.31% (3.62%), with a standard deviation of 12.34%. Again, this is higher than the capital gain in the first sample period, but lower than the average capital gain for the full sample. The arithmetic (geometric) average dividend yield over this period was 4.60% (4.60%) which is about equal to the first subsample, but below the full sample. Inflation during this part of the sample was at 2.86% and 2.78% for the arithmetic and geometric average, respectively. This produced a real return over this period of 6.05% (5.35%) for the arithmetic (geometric) average, about 1% higher than over the first sample period, but still somewhat below the full sample average. Government bonds over this period of time again had a very low standard deviation of only 0.89% and yielded 4.21% p.a., producing an equity risk premium of 4.70% (4.03%) for the arithmetic (geometric) average, which for the arithmetic mean is lower than for the full sample, but for the geometric mean is higher.

INSERT TABLE 2 HERE

3.2.3 Period 1970-2012

In Figure 4, we plot the times series for the log index over the period 1970-2012, where 1970 is set at a base of 0. We notice that initially the market index remained relatively low, and observe the effects of the oil crisis in 1973-74. However, from the late 1970s and early 1980s onwards, there was a very strong increase in the stock market index (it should be noted that during this period of time inflation was also very high in New Zealand). The enormous growth in the market came to a halt in October 1987, when the New Zealand market collapsed and the index saw its largest decline in its history. From the early 1990s, we again observe an upward trend in the market, though at a much lower rate than what was observed in the early 1980s. Finally, we observe the effects of the global financial crisis in 2008.

Overall, this graph shows that the performance of the market prior to the crash in the 1980s was exceptional.

INSERT FIGURE 4 HERE

In Panel C of Table 2, we present summary statistics for this last subsample. Over this period, the arithmetic (geometric) average nominal return was 14.94% (11.54%), with a standard deviation of 29.86%. This demonstrates that this last period, was far more volatile than the previous periods and average returns exceeds the returns of the previous periods almost twofold. The increased performance of the market over this period was due to both capital gains, which on average were far above the capital gains of the previous periods (8.51% and 5.04% for the arithmetic and geometric average), and increased dividend yields, which were about 2% above those of the two previous periods at 6.4% on average. However, this period was also a period of high inflation, which averaged about 6.70% and 6.55% for arithmetic and geometric means. This meant that in real terms, the performance of the stock market (7.84% according to the arithmetic average) was only 1.8% above the real return of the previous period. Bond yields were also high by historical standards in this period, at 8.52% for the arithmetic mean, more than double the return of the previous periods. Finally, the equity risk premium is computed at an arithmetic average of 6.43% p.a., again substantially higher than what is observed for the previous two subperiods.

Overall, the analysis of subperiods shows that over time, there is quite some variation in the performance of the stock market in New Zealand. Especially, the last subsample periods seems to have been a period of exceptional performance.

3.3 Stock Market Volatility

We next investigate the time variation in volatility of the New Zealand stock market over the 114 years. To examine this time variation, we use the monthly data of the total return index, and compute the standard deviation of monthly returns over a 24-month rolling window. We plot this time varying volatility in Figure 5, where the y-axis represents the annualized volatility.

INSERT FIGURE 5 HERE

Figure 5 reveals various interesting pattern in periods that caused high volatility in the New Zealand stock market. We notice the increased volatility that appeared during First World War, and the increased volatility that was related to the collapse in the market that occurred in 1921. We then observe a large increase in market volatility during the Great Depression and at the onset of the Second World War. There were periods of heightened volatility during the Korean War in the early 1950s. Market volatility was also high during the first oil shock that occurred in 1973-74. However, the biggest upsurge in volatility occurred during the 1987 financial crisis, where market volatility exceeded 40%. Finally, we observe increase volatility at the burst of the dotcom bubble and at the start of the global financial crisis in 2008. Overall, the graph shows that, by historical standards, volatility has been elevated from the early 1980s onwards to the present time compared to its historical average.

4. Conclusions

We gather the longest available historical data series for New Zealand equity market, from 1899 to 2012. We analyse the statistical properties of these series and provide an estimate of the long term Equity Risk Premium for the entire sample period of 114 years and several sub-periods. The arithmetic mean of equity return is 10.75% per year, with a standard deviation of 20.17%. The New Zealand stock markets experienced 91 years of positive returns and 23 years of negative returns during the entire sample period. The 10-year government bond yield, over the entire period, has an arithmetic mean return of 5.76%. The average annual inflation rate is 4.14%. The Equity Risk Premium, the excess return of equities over the 10-year government bond yield, on average, is 4.99%.

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Figure 1. Log Price Index over the Period 1899-2012

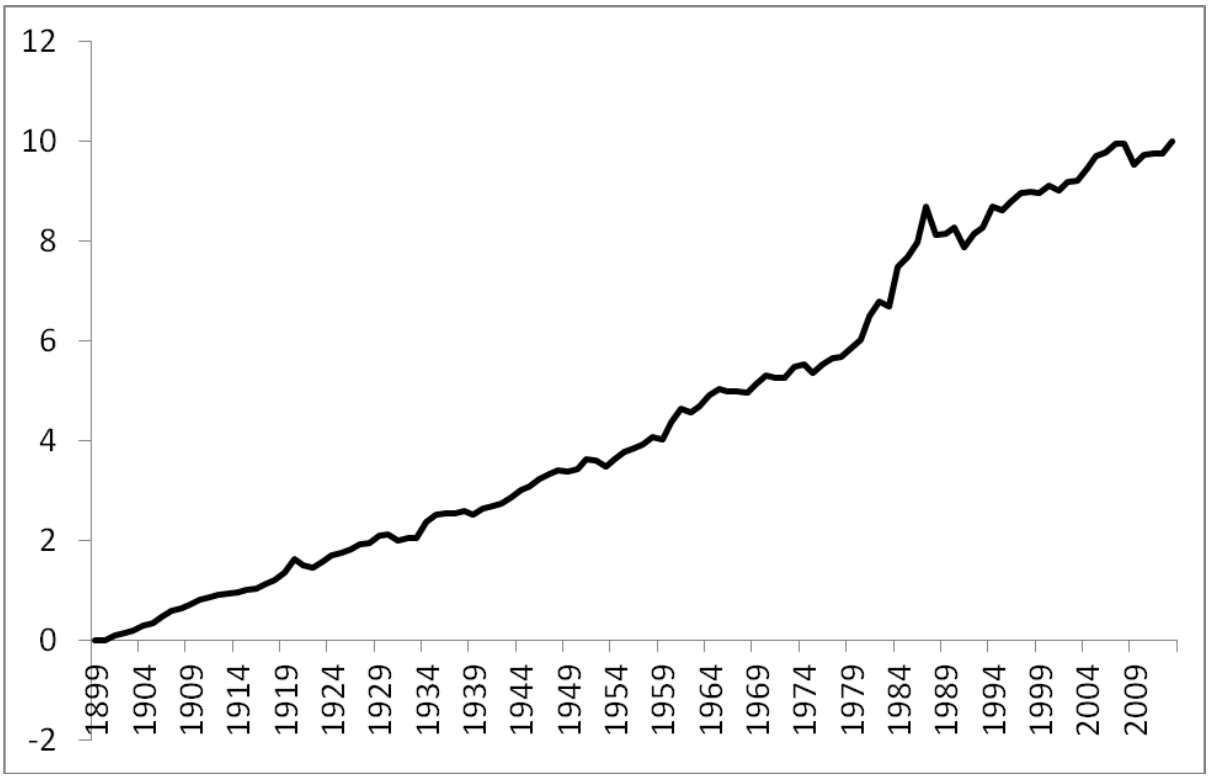
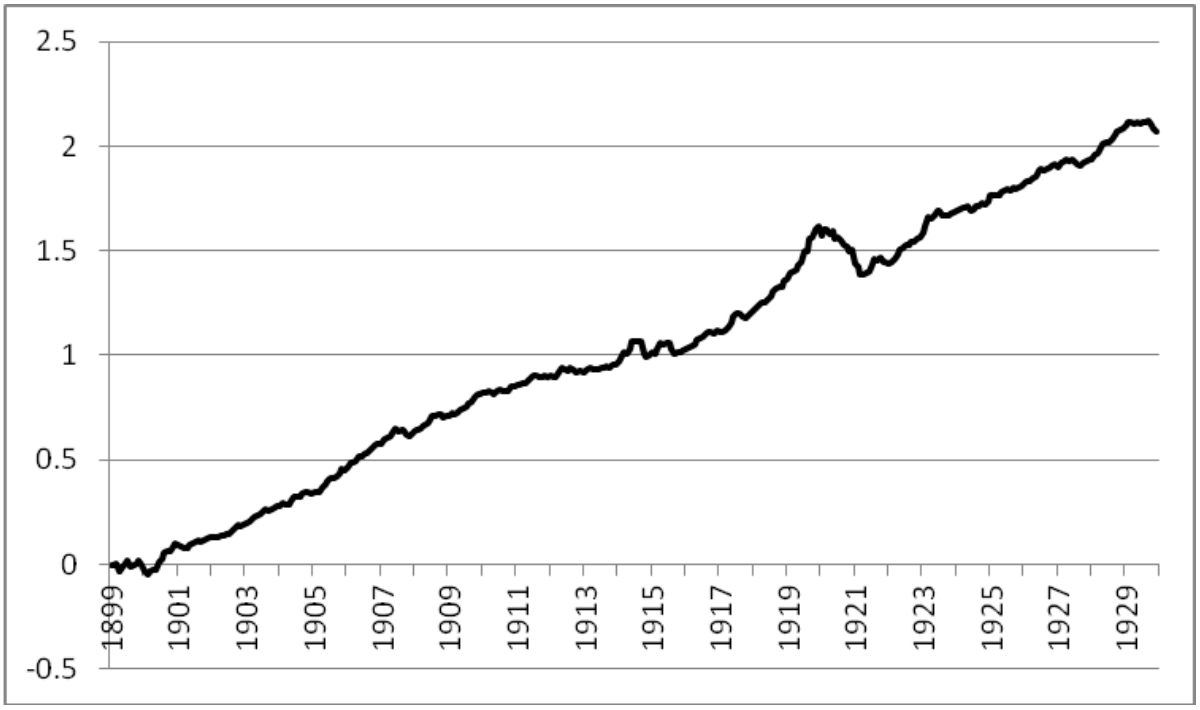
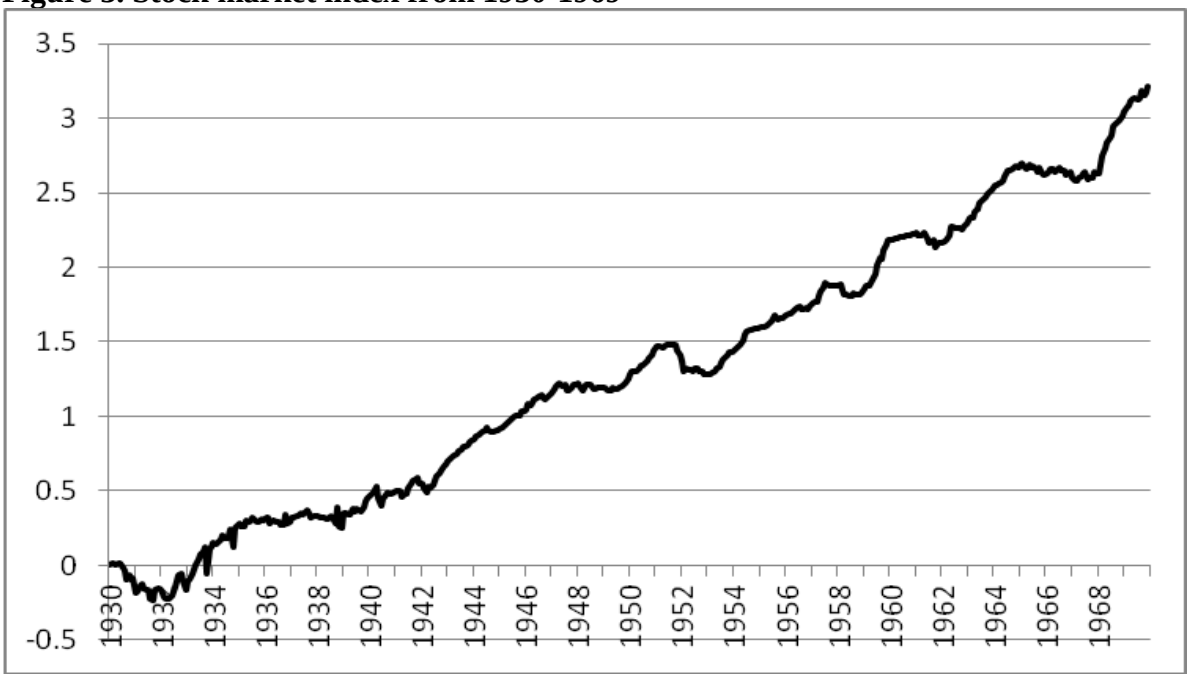


Figure 2. Log Stock market index from 1899-1929



Note. This Figure shows the value-weighted total return index over the period 1899-1929. The base value for the index is set at 1 in 1899.

Figure 3. Stock market index from 1930-1969



Note. This Figure shows the value-weighted total return index over the period 1930-1969. The base value for the index is set at 1 in 1930.

Figure 4. Stock market index from 1970-2012

Note. This Figure shows the value-weighted total return index over the period 1930-1969. The base value for the index is set at 1 in 1930.

Figure 5. New Zealand Stock Market Volatility (24-month rolling window)

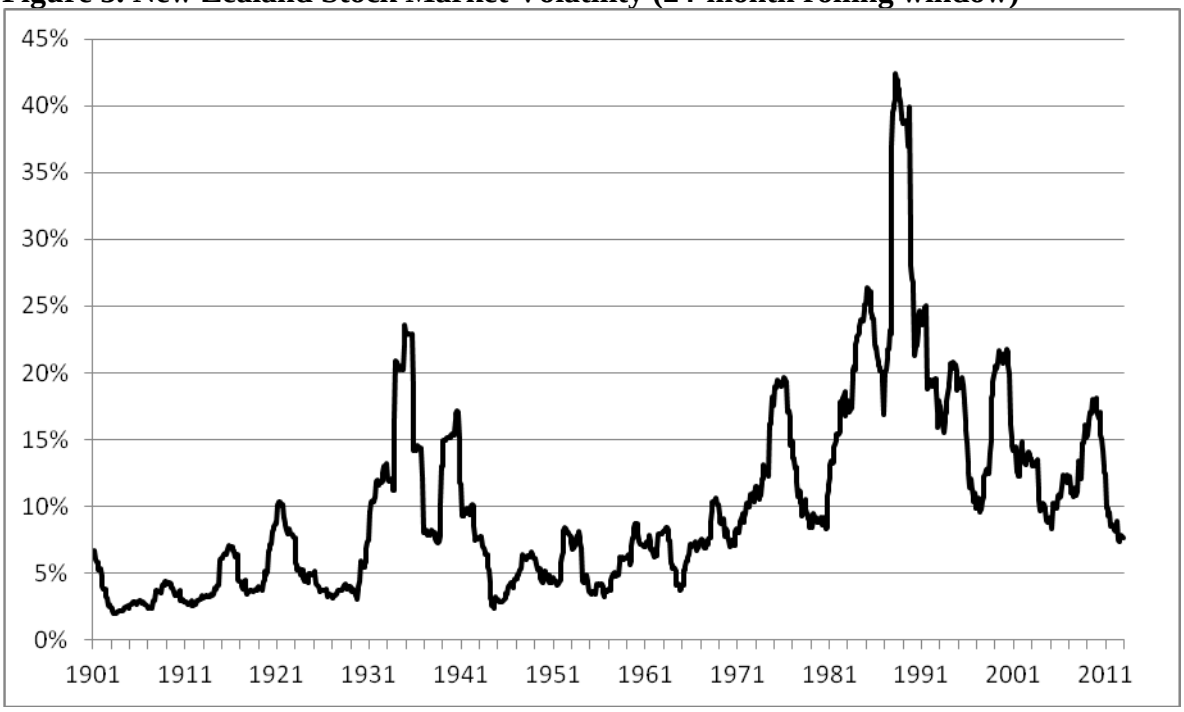


Table 1: Summary statistics from 1989-2012

SERIES	AM	GM	Standard Deviation	Number of Years Returns are Positive	Number of Years Returns are Negative	Highest Annual Returns (and year)	Lowest Annual Return (and year)	Skew	Kurtosis
Nominal Equity Returns	10.75%	9.16%	20.17%	91	23	122.19% (1983)	-42.483% (1987)	2.288	11.717
Nominal Capital Gain	5.48%	3.87%	19.84%	72	42	116.82% (1983)	-48.52% (1987)	2.352	12.438
Nominal Dividend Yield	5.27%	5.26%	1.56%	114	0	9.52% (2004)	1.42% (1920)	0.288	-0.10
Inflation rate	4.14%	4.01%	5.26%	100	14	18.24% (1986)	-9.23% (1932)	0.598	0.711
Real Equity Returns	6.47%	4.96%	18.79%	79	35	114.47% (1983)	-47.52% (1987)	1.822	10.554
10-Year Government Bond Yields	5.76%	5.71%	3.16%	114	0	17% (1985)	2.970% (1946)	1.931	3.270
Equity Risk Premium	4.99%	3.45%	19.58%	73	41	111.69% (1983)	-56.78% (1987)	1.785	10.573

Note: This table reports summary statistics of the historical equity returns, 10-year government bond yield, inflation rate and equity risk premium from 1899 to 2012. We report the arithmetic mean (AM), geometric mean (GM), and standard deviation (SD). We also report the number of years which returns are positive/negative, the highest and lowest annual return (and year), and the skewness and excess kurtosis.

Table 2: Market Statistics over various subsamples

	Arith. Mean	Geo. Mean	Standard Deviation	Highest Returns (and year)	Lowest Return (and year)	Skew.	Kurtosis
Panel A: Summary Statistics over the period 1899-1929							
Nominal Equity Returns	7.31%	7.08%	7.164%	29.52% (1919)	-10.31% (1920)	0.436	2.790
Nominal Capital Gain	2.78%	2.60%	6.24%	22.16% (1919)	-11.74% (1920)	0.388	2.882
Nominal Dividend Yield	4.52%	4.51%	1.62%	8.10% (1900)	1.42% (1920)	0.113	-0.349
Inflation	2.24%	2.14%	4.76%	12.18% (1918)	-7.90% (1922)	0.460	0.469
Real Equity Returns	5.11%	4.84%	7.55%	22.53% (1922)	-19.87% (1920)	-0.694	3.400
10-Year Govt. Bond Yields	3.92%	3.92%	0.62%	5.10% (1920)	2.97% (1899)	0.334	-0.960
Equity Risk Premium	3.38%	3.14%	7.21%	25.05% (1919)	-15.41% (1920)	0.184	2.804
Panel B: Summary statistics from 1930-1969							
Nominal Equity Returns	8.91%	8.28%	12.11%	41.53% (1959)	-11.47% (1930)	0.629	0.474
Nominal Capital Gain	4.31%	3.62%	12.34%	36.88% (1959)	-17.98% (1930)	0.566	0.359
Nominal Dividend Yield	4.60%	4.60%	0.85%	7.12% (1931)	3.39% (1946)	0.965	1.287
Inflation	2.86%	2.78%	3.99%	11.95% (1951)	-9.23% (1933)	-0.731	2.496
Real Equity Returns	6.05%	5.35%	12.56%	39.93% (1959)	-14.92% (1952)	0.709	0.759
10-Year Govt. Bond Yields	4.21%	4.21%	0.89%	5.75% (1931)	3.01% (1946)	0.086	-1.398
Equity Risk Premium	4.70%	4.03%	12.16%	36.78% (1959)	-16.37% (1930)	0.542	0.376
Panel C: Summary statistics from 1970-2012							
Nominal Equity Returns	14.94%	11.54%	29.86%	122.19% (1983)	-42.48 (1987)	1.513	4.666
Nominal Capital Gain	8.51%	5.04%	29.56%	116.82% (1983)	-48.52% (1987)	1.636	5.126
Nominal Dividend Yield	6.43%	6.42%	1.34%	9.52% (2004)	3.67% (2008)	0.155	-0.641
Inflation	6.70%	6.55%	5.71%	18.24% (1986)	0.37% (1998)	0.717	-1.024
Real Equity Returns	7.84%	4.68%	27.56%	114.47% (1983)	-47.52% (1987)	1.410	4.942
10-Year Govt. Bond Yields	8.52%	8.46%	3.65%	17.00% (1985)	3.56% (2012)	0.915	-0.286
Equity Risk Premium	6.43%	2.73%	29.21%	111.69% (1983)	-56.78% (1987)	1.311	4.478

Note: This table reports summary statistics of the historical equity returns, 10-year government bond yield, inflation rate and equity risk premium over various subperiods. We report the arithmetic mean (AM), geometric mean (GM), and standard deviation (SD). We also report the number of years which returns are positive/negative, the highest and lowest annual return (and year), and the skewness and kurtosis.

Appendix – Comparison with previous studies

Panel A: Summary Statistics over the period 1931-1992									
	AM	GM	SD	Number of Years Returns are Positive	Number of Years Returns are Negative	Highest Annual Returns (and year)	Lowest Annual Return (and year)	Skew	Kurtosis
Equity Returns	12.90%	10.63%	24.69%	48	14	122.19% (1983)	-42.48% (1987)	2.128	8.395
10-Year Government Bond Yields	6.59%	6.52%	3.93%	62	0	17.00% (1985)	3.01% (1946)	1.287	0.475
Inflation rate	5.82%	5.67%	5.73%	58	4	18.24% (1986)	-9.23% (1932)	0.247	0.219
Equity Risk Premium	6.31%	4.11%	23.96%	39	23	111.69% (1983)	-56.78% (1987)	1.703	7.811
Panel B: Summary statistics from 1931-2002									
Equity Returns	12.78%	10.54%	23.76%	55	17	122.19% (1983)	-42.48% (1987)	2.109	8.486
10-Year Government Bond Yields	6.61%	6.55%	3.66%	72	0	17.00% (1985)	3.01% (1946)	1.352	0.941
Inflation rate	5.29%	5.15%	5.49%	68	4	18.24% (1986)	-9.23% (1932)	0.478	0.443
Equity Risk Premium	6.16%	3.98%	23.14%	44	28	111.69% (1983)	-56.78% (1987)	1.697	7.797

Note: This table reports summary statistics of the historical equity returns, 10-year government bond yield, inflation rate and equity risk premium over various subperiods. We report the arithmetic mean (AM), geometric mean (GM), and standard deviation (SD). We also report the number of years which returns are positive/negative, the highest and lowest annual return (and year), and the skewness and kurtosis.