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Does the Stock Market's Equity Risk Premium Respond to Consumer Confidence or Is It the Other Way Around?

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Does the Stock Market's Equity Risk Premium Respond to Consumer Confidence or Is It the Other Way Around?

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Abstract

The increase in the equity risk premium during the 2007–2009 Great Recession and the aging of the baby boomers in the United States have led analysts and financial industry experts to believe that risk aversion among stock investors has moved to a more-permanently higher range. If so, stocks would cease being an attractive asset class to be investing in for the future. In the past few years private investors have by and large shunned equities, just when stocks have become attractively priced and offer long-term potential for superior above-historical-average returns. Our empirical findings show that the recent increase in the equity risk premium (ERP) primarily reflects a temporary collapse in consumer confidence and that the ERP will mean revert once confidence returns. As long as consumer confidence in the sustainability of the economic recovery remains low, today's elevated risk premium will persist. Once confidence starts to recover—as it has done after every recession since the 1960s—the required return premium among stock market investors also should diminish.

> **"Whether the recent jump in the equity risk premium proves enduring or temporary has important implications for stock investors and an entire generation of baby boomers planning to retire within the next generation."**

Introduction

During the 2007–2009 Great Recession, the equity risk premium associated with U.S. stocks (i.e., the difference between the stock market's earnings yield and the ten-year Treasury yield) sharply increased and has since remained significantly higher compared to its range during the past forty years (see figure 1). Some financial analysts have suggested that the crises of the past decade have led to a permanent reassessment of risk or an increase in the return required by investors from the stock market relative to safer assets (see Damodaran 2011 and the references therein). On the other hand, Paulsen (2011), among others, has argued that the recent rise in the stock market equity risk premium represents a cyclical phenomena rather than a secular shift.

Whether the recent jump in the equity risk premium proves enduring or temporary has important implications for stock investors and an entire generation of baby boomers planning to retire within the next generation. If it has been permanently boosted, the stock market already may be nearing a full valuation. On the other hand, any temporary elevation in the equity risk premium suggests that the stock market probably offers compelling investment prospects since future returns can be enhanced simply by a slow but steady revitalization in confidence in the economy.

To understand the nature of the jump in the equity risk premium, it is essential to determine what caused the sudden upward movement. This paper tries to empirically determine the factors that have affected the risk premium. The paper addresses the following:

- The history of the U.S. stock market risk premium
- The relationship between risk premium and consumer confidence highlighting the change in the relationship over time
- The data and the estimation results
- The results of dynamic simulation
- A summary with policy implications

History of the U.S. Stock Market Risk Premium

Until the late 1960s, the risk premium associated with the stock market was persistently higher than it has been in the past four decades. Figure 1 shows the trend in the equity risk premium during 1870–2011.

Between 1871 and 1965, the average stock market risk premium was 4.1 percent. In the late 1960s, however, the risk premium dropped below its range of the previous 100 years and established a new trading range whereby bond yields typically exceeded the earnings yield by 1.5 percent. Investing to an extent became democratized. Only since the beginning of the Great Recession in December 2007, and especially 2008, did the equity risk premium again undergo a shift in its trading range, returning to the much-higher range experienced before the late 1960s.

Why has the equity risk premium undergone such radical changes in its trading range? A number of factors, put forward in the financial media, probably have been important in establishing and sometimes altering the range of the equity risk premium. First, the frequency and length of U.S. recessions have dropped since the 1960s. Second, beginning in the late 1960s, the consumer price index advanced uninterrupted for at least three decades. Third, bond yields rose to all-time U.S. highs in the 1970s and remained elevated above historic norms for most of the next three decades. Finally, post-World War II economic policy has been much more supportive of economic expansions and much more aggressive in fighting recessions. Paulsen (2011) suggests that together, however, what they really represent is "confidence." Contemporary concerns about the potential for more-frequent recessions, the increased likelihood of deflationary pressures, the implications of a return to a near-zero interest-rate world, and fears about increasing impotency of economic policy-making is reflected in the current low readings of most economic confidence measures (Paulsen 2011).

Equity Risk Premium and Consumer Confidence

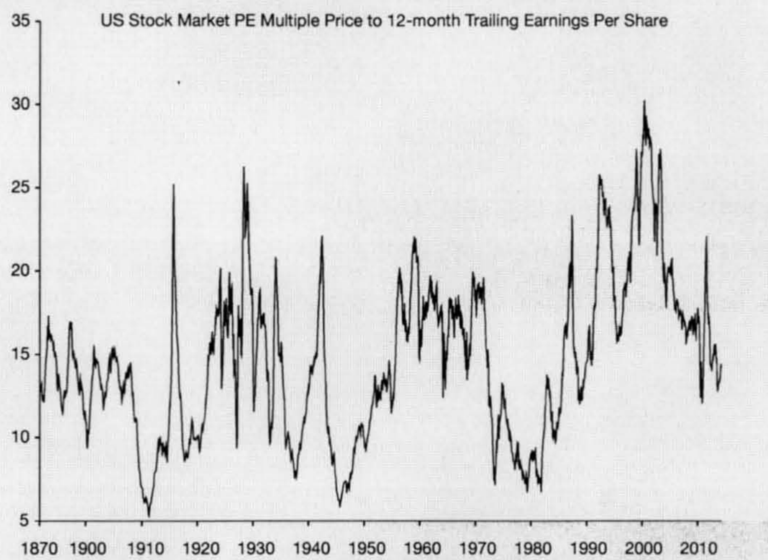
Is the equity risk premium mainly about confidence? Figure 2 compares the consumer confidence index published by the Conference Board with the U.S. equity risk premium since 1970.

The equity risk premium has moved closely with changes in the consumer confidence index. Between 1970 and 2007, the equity risk premium remained in a broad range between −5 percent and +2 percent, similar to the broad range of the consumer confidence index between about 50 and 150. Moreover, the equity risk premium has tended to rise and fall within its range in close approximation to changes in confidence.

With the onset of the Great Recession, the equity risk premium started to surge to a level not seen since the early 1960s while the consumer confidence level dropped to an all-time record low. In fact, the consumer confidence index dropped to its lowest recorded level of 25.3 in February 2009, far below its previous record low of 43 in December 1974. Is it really surprising, therefore, that the required return from the stock market jumped to its highest level in decades as consumer confidence suffered its biggest collapse of the post-war era?

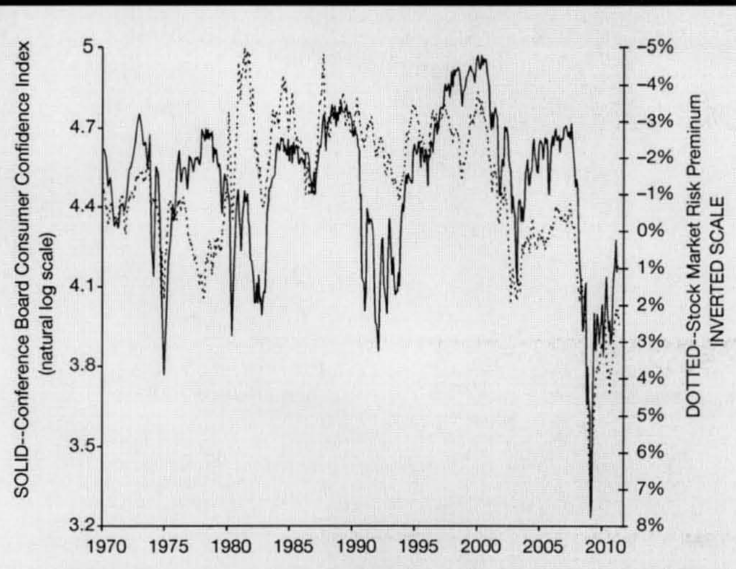
As figure 2 shows, since 2009, both confidence and the risk premium have recovered to levels associated with recessionary bottoms during the past forty years. The current level of the consumer confidence index is very similar to the lows reached at the bottom of

FIGURE 1: U.S. STOCK MARKET RISK PREMIUM* (1870–2011)



*S&P 500 Earnings Yield (based on the average trailing sixty-month reported earnings per share) less ten-year Treasury Bond Yield
Note: Dotted lines represent the mean and one standard deviation above and below the mean between January 1970 and December 2007.
Source: James W. Paulsen, PhD, Wells Capital Management - Economic & Market Perspective: Update May 31, 2011

FIGURE 2: CONSUMER CONFIDENCE INDEX VS. STOCK MARKET RISK PREMIUM*



*S&P 500 Earnings Yield (based on the average trailing sixty-month reported earnings per share) less ten-year Treasury Bond Yield
Source: James W. Paulsen, PhD, Wells Capital Management - Economic & Market Perspective: Update May 31, 2011

the 1980, 1982, early-1990s, and early-2000s recessions. Similarly, despite remaining in a much wider range since 2007, the equity risk premium also has recently contracted to a level not much different than it reached twice during the 1970s and again early in the past decade (Paulsen 2011).

This paper seeks to contribute to understanding this issue by using an innovative econometric methodology. This methodology studies the direction of causality between the equity risk premium and consumer confidence. Existing empirical work on the causality between two variables usually uses standard Granger causality-type tests to detect the direction of causality. This paper adopts a different methodological approach, the Toda-Yamamoto test for causality (Toda and Yamamoto 1995), which helps to derive more robust and practical conclusions. The methodology and the estimation results are described in the appendix.

Estimation Results

The sample period runs from January 1970 to March 2011. Monthly data on the consumer confidence index are collected from the Conference Board while data on the equity risk premium are collected from the database of Capital Market Consultants, Inc.[1] We consider equity risk premium as the realized return differentials between equity and some riskless or less-risky asset such as bonds or cash. To get a consistent data series over the entire sample period, we represent the risk premium by the S&P 500 earnings yield (based on the average trailing sixty-month reported earnings per share) less the ten-year Treasury bond yield.

We include two other variables in the equation—volatility in industrial production and inflation. The risk in equities as an asset class comes from more general concerns about the health and predictability of the overall economy (Damodaran 2011). Put in more intuitive terms, the equity risk premium should be lower in an economy with predictable inflation and economic growth than in an economy where these variables are volatile. Lettau et al. (2008) link the changing equity risk premiums in the United States to shifting volatility in the real economy. In particular, they attribute the lower equity risk premiums of the 1990s (and higher equity values) to reduced volatility (and hence perceived certainty) in real economic variables including employment, consumption, and gross domestic product growth.

A related strand of research examines the relationship between equity risk premium and inflation, with mixed results (Modigliani and Cohn 1979). Studies that look at the relationship between the level of inflation and equity risk premiums find little or no correlation. In contrast, Brandt and Wang (2003) argue that news about inflation dominates news about real economic growth and consumption in determining risk aversion and risk premiums. They show that equity risk premiums tend to increase if inflation is higher than anticipated and decrease when it is lower than expected. Reconciling the findings, it seems reasonable to conclude that it is not so much the level of inflation that determines equity risk premiums but uncertainty about that level. We measure volatility by the standard deviation of the moving average of the industrial production index; inflation volatility is measured by the standard deviation of the moving average of growth in the headline consumer price index.

TABLE 1: IMPULSE RESPONSE FUNCTION—IMPACT ON ERP OF A ONE-STANDARD-DEVIATION SHOCK TO DIFFERENT VARIABLES

Period	Shock to Consumer Confidence	Shock to Industrial Production	Shock to Inflation
1	0.020*	0.003*	0.041*
2	0.028*	0.001*	0.040*
3	0.025*	0.001	0.036*
4	0.025*	0.002	0.032*
5	0.023*	0.001	0.027*
6	0.016	0.000	0.024*
7	0.016	0.000	0.020
8	0.015	0.000	0.018
9	0.016	0.000	0.010
10	0.009	0.000	0.012

*The asterisk after the impact indicates that the impact is statistically significant.

To summarize, the paper uses the following four variables: equity risk premium (ERP), consumer confidence (CC), volatility in the industrial production index (IP), and volatility in the inflation rate (INF).

The causality test initially is performed between ERP and CC. The methodology and estimation results are described in detail in the appendix. In general, the optimal lag length of ERP in the CC equation is zero, suggesting that ERP does not influence CC. On the other hand, the optimal lag length of CC in the ERP equation is two. This indicates the presence of a unidirectional causality running from CC to ERP.

We also check for the robustness of the causality test results by recalculating the p-values obtained in the initial Wald test using a bootstrap test with 1,000 replications. The results confirm the findings that CC causes ERP but ERP does not cause CC. This confirms the robustness of the tests performed in this analysis.

Impulse Response Function

The impulse responses of the equity risk premium to shocks to the other variables under analysis also were generated. The shock is interpreted as the one-unit increase in the orthogonal error term of the "impulse" variable,[2] all other things being equal. Impulse responses are generated for a period of ten months and are reported in table 1.

The results show that a shock to the consumer confidence variable has an immediate impact on the equity risk premium. A one-percentage-point change in consumer confidence changes the equity risk premium by two-tenths of one percent. The peak effect occurs in the second month when a one-percentage-point change in CC changes ERP by almost three-tenths of one percent. The significant impact continues for the next three months. Then the impact loses significance. This has important implications for investors: They can expect the equity market to respond quickly to changes in consumer confidence with the most-pronounced changes in both directions in the early months of the change.

A shock to the industrial production variable has a small impact on the risk premium. A statistically significant impact occurs in the first two months and after that the impact fizzles out. Also, the magnitude of the impact is small. This indicates that general economic activity has very little impact on the risk premium.

A shock to inflation, on the other hand, has a significant impact on the risk premium. The peak effect of a shock to inflation on the risk premium occurs immediately when a one-percentage-point change in inflation changes the equity premium by four-tenths of one percent. The statistically significant impact continues for about six months. Changes in the level of prices have a significant and long-lasting impact on the level of risk premium. This has important policy implications. Unlike the consumer confidence and inflation variables, general economic activity as measured by industrial production has relatively less impact on the risk premium.

The above results could be used to develop a forecast for ERP. It is given in the following equation:

$$ERP_t = 1\% + 4\%(CC_{t-1}) + 4\%(INF_{t-1}) + 1\%(IP_{t-1})(1)$$

Data on the CC, INF, and IP variables are publicly available, so any investment advisor should be able to use this information and to adapt portfolios according to this model of the dynamic ERP. The reason for the lag in the forecast equation is that the data on the explanatory variables come out a month late (i.e., January's data is released in February) and so if practitioners test historically for their own benefit, they need to adjust for what we call the "release date lag."

"As long as consumer confidence in the sustainability of economic recovery remains low, today's elevated risk premium will persist."

Summary and Investment Policy Implications

The increase in the equity risk premium since the beginning of the 2007–2009 Great Recession has led many analysts to believe that risk aversion among stock investors has moved to a permanently higher range in recent years. Whether the equity risk premium stays within its new wider range—seen in the pre-1960s period—or returns to the range exhibited during the past four decades will prove critically important for stock investors.

Our empirical findings support the view of Paulsen (2011) that the recent increase in the equity risk premium primarily reflects a temporary collapse in consumer confidence. Empirical estimates show that the changes in consumer confidence caused changes in the equity risk premium over the 1970–2011 sample period. As long as consumer confidence in the sustainability of economic recovery remains low, today's elevated risk premium will persist. In fact, this has significantly improved the stock market's risk-reward profile because lower confidence has introduced a bigger buffer relative to competitive interest rates. Investors should track leading economic indicators (LEI) and their components closely if they want to gain comfort with the direction of the ERP. The higher risk premium seen in the past few years has significantly enhanced the risk-return profile of the stock market. Even if the risk premium remains in its newly elevated range for an extended period, the stock market still should provide long-term investors satisfactory returns with a relatively low downside risk.

Will the equity risk premium remain in a much higher range for several years? Our empirical analysis indicates that this is only likely if consumer confidence remains abnormally low. Indeed, our analysis provides support to the contention of Paulsen (2011) that if, during this economic recovery, consumer confidence eventually reaches the upper end of its range since 1970, the equity risk premium should return to the range that was common during much of the past four decades. JIC

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Endnotes

1. The authors both work for Capital Market Consultants, Inc., an investment management firm based in Milwaukee, Wisconsin.
2. For example, an impulse response of the ERP to consumer confidence shocks is interpreted as a one-unit increase in the orthogonal error term of the ERP.

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TABLE A1: STATIONARITY TEST RESULTS

	Augmented Dickey-Fuller Test		Kwiatkowski Test H_0:I(0)	
Variable	**H_0:I(1)**	**H_0:I(2)**	**Level**	**Trend**
ERP	−0.46	−5.10	0.462	0.298
CC	−1.02	−6.48	0.378	0.155
IP	−2.11	−8.30	0.233	0.156
INF	−0.87	−4.37	0.343	0.171

ERP and CC are the equity risk premium and consumer confidence, respectively; IP and INF measure the volatility in the industrial production and inflation, respectively.
Following Kwiatkowski et al. (1992), the null hypothesis of stationarity around a level and around a deterministic linear trend is tested.
The 5-percent critical value for the ADF statistic is −3.45 (Fuller 1976).
The 5-percent critical value for stationarity around a level and around a deterministic linear trend is 0.463 and 0.146, respectively.

TABLE A2: OPTIMUM LAG STRUCTURE USING AKAIKE'S MINIMUM FINAL PREDICTION ERROR CRITERION

	Dependent Variable			
Own Lags	**ERP**	**CC**	**IP**	**INF**
0	0.0085	0.0422	0.0202	0.1236
1	0.0087	0.0451	0.0211	0.1258
2	0.0080	0.0530	0.0187	0.1328
3	0.0083	0.0622	0.0186	0.1352
4	0.0089	0.0594	0.0187	0.1343
5	0.0086	0.0528	0.0188	0.1372
6	0.0090	0.0590	0.0162	0.1343
7	0.0092	0.0566	0.0176	0.1340
8	0.0096	0.0569	0.0193	0.1364

Note: ERP and CC are the equity risk premium and consumer confidence, respectively; IP and INF measure the volatility in the industrial production and inflation, respectively.

TABLE A3: TODA-YAMAMOTO TEST RESULTS AND MISSPECIFICATION DIAGNOSTICS

	Wald	**JB**	**LM1**	**LM2**	**LM3**	**RR**
ERP	0.629	0.556	0.790	0.962	1.098	0.015
	(0.448)	(0.722)	(0.684)	(0.560)	(0.492)	
CC	18.930	0.649	0.512	0.873	0.810	0.046
	(0.014)	(0.538)	(0.337)	(0.274)	(0.158)	

Note: The figures in parentheses are *p*-values.

TABLE A4: BOOTSTRAP TEST RESULTS

	Wald Statistic	***p*-value**
ERP causes CC	0.0832	(0.424)
CC causes ERP	0.0676	(0.018)

Toda, H., and T. Yamamoto. 1995. Statistical Inference in Vector Autoregressions with Possibly Integrated Processes. *Journal of Econometrics* 66, no. 1–2: 225–250.

APPENDIX

Methodology and Data Issues

The use of Granger causality tests to trace the direction of causality between two economic variables is quite common in empirical work. The direction of causality generally has been tested using either the Granger or Sims statistical tests (see Granger 1969; Sims 1972). However, as econometric research has shown, such tests focus on time precedence rather than causality in the usual sense. Therefore, they are particularly weak for establishing the relation between forward-looking variables as we wish to do in this investigation.

Estimation

In this paper we use the methodology of Toda and Yamamoto (1995) for testing the causal relationship between the ERP and CC. The Toda-Yamamoto method avoids the problems outlined above by ignoring any possible non-stationarity or co-integration between series when testing for causality, and fitting a standard Value-at-Risk (VaR) in the levels of the variables (rather than first differences, as is the case with the Granger and Sims causality tests). It also minimizes the risks associated with possibly wrongly identifying the orders of integration of the series, or the presence of co-integration, and minimizes the distortion of the tests' sizes as a result of pre-testing (Giles 1997; Mavrotas and Kelly 2001; Chowdhury and Mavrotas 2006) resulting in increased accuracy and robustness.

First, we test for the order of integration for our four variables: equity risk premium (ERP), consumer confidence (CC), volatility in the industrial production index (IP), and volatility in the inflation rate (INF). In the second step, we find out the optimum lag structure using the Akaike (1973) final prediction error (FPE) criterion (i.e., the amount of time between when the fit relationship is measured and when performance is affected). Third, we conduct diagnostic tests to determine the presence of any misspecification (i.e., potential sources of error) in the results. Finally, we conduct a bootstrap simulation to investigate the performance of the Toda-Yamamoto test.

To set the stage for the Toda-Yamamoto test, the order of integration of the variables is initially determined using the Augmented Dickey-Fuller (ADF) test with eight lagged differences. The results are given in table A1.

The variables are shown in column one. The unit root tests are performed sequentially. The results of the ADF tests for one- and two-unit roots are given in columns two and three, respectively. The results show that the ERP and the CC series are I(1) series. The null hypothesis of a unit root is not rejected. However, similar tests for the presence of two-unit roots reject the hypothesis at least at the 5-percent significance level. To check for the robustness of the ADF test results, the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test described in Kwiatkowski et al. (1992) also is reported. Here the null hypothesis of stationarity around a level and around a deterministic linear trend is tested. The results, shown in columns four and five in table A1, indicate that the null hypothesis of both level stationarity and trend stationarity can be rejected for all variables. Given the results of the ADF and the KPSS tests, it is concluded that the ERP and CC variables are integrated of order one.

Next, we specify the model for each variable by determining the optimal lag length of the levels of own and other variables in the model. Akaike's Minimum Final Prediction Error criterion is used to select the optimum lag. The results are presented in table A2.

The optimal lag length of ERP in the CC equation is zero, suggesting that ERP does not influence CC. On the other hand, the optimal lag length of CC in ERP equation is two. This indicates the presence of a unidirectional causality running from CC to ERP.

The next step involves the test to see if the data support the model assumptions. Following Giles (1997), Mavrotas and Kelly (2001), and Chowdhury and Mavrotas (2006), a battery of misspecification tests are performed. In particular, the Ramsey RESET test (RR; Ramsey 1969) is used to see if the coefficients of higher order terms added to the regression are zero. The Lagrange multiplier test (LM1–LM3) also is used to test whether the error terms are serially uncorrelated. Finally, the Jarque-Bera (JB; Bera and Jarque 1981) test is performed. The results are reported in table A3.

In general, the tests show that the model specification used in estimation is appropriate without any of the econometric model's assumptions being rejected. The Toda-Yamamoto test involves the addition of one extra lag of each of the variables to each equation and the use of a standard Wald test to see if the coefficients of the lagged "other" variables (excluding the additional one) are jointly zero in the equation. The results of the Wald test are given in column two in table A3. The assumption of non-causality from CC to ERP is rejected at least at the 5-percent level; however, we cannot reject the non-causality assumption from ERP to CC.

We also check for the robustness of the causality test results by recalculating the *p*-values obtained in the initial Wald test using a bootstrap test with 1,000 replications. The results are reported in table A4.

Given the nature of the test, both the Wald test statistics and the *p*-values would be different from those obtained and reported in table A3. The *p*-values in table A4 show the probability that the independent variable in the regression is equal to zero. The results confirm the findings reported in table A3, i.e., CC causes ERP but ERP does not cause CC. This confirms the robustness of the tests performed in this analysis.