WP/19/12

IMF Working Paper

The Present Value of Corporate Profits: A Forecasters' Survey Perspective

by Michal Andrle

INTERNATIONAL MONETARY FUND

 WP/19/12

IMF Working Paper

Research Department

The Present Value of Corporate Profits: A Forecasters' Survey Perspective[1]

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January 2019

Abstract

This paper presents and discusses the estimates of the present value of corporate profits in the United States from 1984 to 2018. To value the expected income stream, it uses the long-range forecasts of professional forecasters for pre-tax corporate earnings and long-term Treasury note yields, sourced from the Blue Chip Economic Indicators survey. The appraised value of corporate earnings can point in real time at periods where market prices are deviating from valuations implied by expected earnings and interest rates. Market participants' forecasts seem to interpret most of the earnings fluctuations as permanent, underestimating the cyclical fluctuations The over-reaction to transitory shocks and changes in long-term outlook leads to swings in the valuation, in line with swings in the observed market prices.

JEL Classification Numbers: G1, G12, E37

Keywords: asset prices, present value, corporate earnings

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[1] I would like to thank Ben Hunt, Patrick Blagrave, Thomas Le Brusq, Mika Kortelainen, and Miroslav Plašil for discussions and comments. All errors and omissions are mine.

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I. Introduction

In this paper, I estimate the present value of corporate profits in the United States from 1984 to 2018. To estimate it, I use the vintages of five-years-ahead forecast surveys of nominal corporate earnings' growth and long-term interest rates by professional forecasters. The question posed is: What is the estimated present value of expected future dividends (as a portion of profits) for a risk-neutral investor relying on the real-time long-range forecasts of market analysts? I compare the appraised value to observed stock price dynamics and discuss the assumptions and drivers of the valuation dynamics. I also estimate the time-varying equity risk premium that would reconcile the estimated valuation both with the observed data and observed expectations of macroeconomic fundamentals.

I also show that the expectations of fundamentals in the forecasters' surveys are not fully taking into consideration the cyclical nature of earnings. The forecasters seem to extrapolate forward the cyclical highs and lows. This gets translated to a more volatile appraisal of value, in contrast to results in Shiller (1981), where investors were endowed with perfect foresight. Valuation using the expected earnings and interest rate thus can be as much volatile as the observed market prices. The long-run expectations of corporate earning growth and their relationship to the long-run interest rate expectations, the '$r - g$', fundamentally affect the valuation, or the implied equity risk premium. A decline in long-run interest rate may increase valuations only as long as the long-run income growth expectations do not fall as well.

While keeping the valuation assumptions simple, the results suggest that valuation using professionals' forecast is useful for indicating periods of stock market prices over-valuation with respect to expected fundamentals in real time. In most of the periods considered, the market prices reflected the expected development in economic fundamentals. The present value of profits and observed stock prices diverge most 1998, with the Dot-Com bubble, and after 2015. As of March 2018, the markets seemed to overvalue the present value of expected corporate earnings, unless the equity premium has fallen below the values estimated in the last decade.

The structure of the paper is as follows. I link the present paper to the literature and introduce the valuation framework. Then I describe the data used and discuss the behavior of the corporate earnings and interest rate expectations. The valuation exercise and the computation of the implied equity risk premium follow.

II. Relationship to the Literature

I have no explicit forecasting model for corporate earnings or long-term interest rates in this paper. I do not forecast or 'fit' the observed stock market price. I do, however, appraise the value of the corporate earnings stream and draw a clear distinction between the observed *price* and an unobserved *value*. My goal is to provide a valuation from the stand-point of an investor with a long-term horizon, ample liquidity, and trust in consensus forecast.[1] The observed market prices do not enter into the valuation process at all, to avoid circular reasoning. In doing a partial-equilibrium analysis, no stock market prices wealth effects other than reflected in forecasters' outlook are thus considered.

By focusing on the actual value of equity stakes, I do not work in a *'return space'* unlike a large part of the modern finance literature. Echoing Cochrane (2011): "When did our field stopped being 'asset pricing' and become 'asset expected returning'?" A recent the paper in the literature that recognizes the need to focus on the value of assets rather than on ex-ante or ex-post period-by-period earnings is Greenwald, Lettau, and Ludvigson (2016), where the authors attempt to explain the shocks driving the level of stock prices using time-series models.[2]

Policy institutions, regulators, and long-term investors usually do not need to forecast stock prices at high frequency but should have a view about their perception of 'fundamental value'. I provide a valuation of the equity stake in the eyes of the above mentioned investor who appraises the value based on the professional forecast survey. By not proposing my own model and by using survey data I can directly compare the value implied by macro assumptions and observed stock price.

One of the motivations for the analysis is the already mentioned classical work by professor Shiller (1981), who suggested that asset prices were excessively volatile in relation to the present value of future corporate dividends. The issue is, however, that prof. Shiller assumed perfect foresight on the investors' side, twenty years ahead. Although a useful benchmark, the assumption is not realistic. Barsky and De Long (1993) picked up on this and pointed out that the uncertainty in long-run growth itself could make asset prices fluctuate significantly. The authors used a simplified and essentially static (or steady-state) 'Gordon model' for the

[1] Such an investor may be the proverbial unicorn, especially if the trust in the professional forecasters' outlook is assumed here. Sovereign wealth funds or large actively-managed institutional investors are possible examples. Warren Buffet and Charlie Munger would be great examples but they would not trust the forecasts most likely.

[2] The authors open the paper by saying: "Asset pricing theorists have long been concerned with explaining stock market expected returns, typically measured over monthly, quarterly or annual horizons…Far less attention has been given to understanding the real level of the stock market, i.e., stock price variation, or the cumulation of ex-post returns."

valuation, assuming a constant required real return, r, and a simple statistical model for long-run growth, g, implicitly assuming that all of the dividend changes were permanent. These are also strong assumptions, given the sizeable cyclical volatility of corporate earnings. Therefore, in this paper I explicitly take on board the survey data about forecasters' short-term and long-term expectations of growth and interest rates to help distinguishing between the level shifts of earnings and the changes in the long-term growth expectations.

For the valuation I use the simple but powerful concept of the present value of an expected income stream. I do not test the validity of the framework, as in Campbell and Shiller (1988), for instance. This is the dominant approach used by practitioners on financial markets and taught in MBA programs, see e.g. Damodaran (2012). But I do address the issues associated with its application – the income expectations, the discounting-factor path, and the large sensitivity to assumptions about long-term growth and discount factor, which are all detailed in the rest of the paper.

III. Valuation Analysis

A. Valuation Approach

In principle, the asset value should be aligned with the expected discounted income stream of that underlying assets. However, there is a catch with this generally accepted theoretical framework to valuation: it does not work in practice. Put differently, it can be very, very hard to use in the real world, where many components of the valuation are in the eye of beholder. One of the reasons for its problematic use is the sensitivity of the valuation to small changes in the long-term growth of the economy and the discount factors used, which are all uncertain.

The approach to valuation in this paper may differ from the modern macro-finance or econometric literature, but is natural for practitioners as spelled out in Graham and Dodd (2009), Damodaran (2012) or Mauboussin (2006) and many academics, Shiller (1981) for instance. Although the literature recognizes the role of the cycle and the need to 'normalize' earnings, often only elementary guidance is provided. The MBA courses and practitioners with workhorse models and complex spreadsheets for valuing companies, rarely rely on state-space modeling of trends and cycles or recursive methods of dynamic programming so frequent in modern finance.

I use the discounted-dividend model as a starting point for all valuations. Investors view the value of an asset, V_t, as an infinite discounted sum of the expected dividend income of that asset:

$$V_{t|t} = D_t + \frac{D_{t+1|t}}{R_{t+1|t}} + \frac{D_{t+2|t}}{R_{t+2|t} \times R_{t+1|t}} + \ldots = \sum_{s=0}^{\infty} D_{t+s|t} \frac{1}{\prod_p^s R_{t+p|t}}, \tag{1}$$

specifically I use the two-stage version of the model,

$$V_{t|t} = \underbrace{\sum_{s=0}^{T} D_{t+s|t} \frac{1}{\prod_p^s R_{t+p|t}}}_{\text{survey horizon}} + \underbrace{\frac{1}{\prod_p^{T+1} R_{t+p|t}} \frac{(1+g)D_{T|t}}{r-g}}_{\text{long-run capitalized}}, \tag{2}$$

where, $D_{t+s|t}$, is a dividend payment to occur at time $t+s$ expected as of period t and $R_{t+s|t} \equiv (1+r_{t+s|t})$ stands for the appropriate (gross) discount rate to be determined, including the 'equity risk premium.' Consistently with common practice, a multi-step approach to evaluating (1) is adopted (two or three steps to reflect cyclical development), where the dividend income is projected up to a horizon T in a detailed way and from $T+1$ onwards constant growth and discount factors are assumed. In the present case, $T = 5$ as dictated by the structure of the survey. Hence, the terminal value in the period $T+1$ is capitalized by the dreaded '$r-g$' term, i.e. the difference between the steady-state net discount factor and profits growth. Obviously, the volatility in the forecast of $(r-g)$ spills over into the valuations volatility.[3]

Although the first few periods of the outlook are often believed to matter a little for the final valuation, this is not true. The first few years will determine whether the current level of earnings is perceived as a cyclical high, or a new permanent level of earnings, which will be further projected and capitalized. Assessing the so called 'normalized' earnings is a key issue for the value analysis.

The survey-based data do not feature the forecasts of dividends, but only forecasts of pre-tax corporate earnings. Therefore, I choose to approximate dividends by a constant share of pre-tax corporate earnings (stable pay-out ratio), using the historical average of 50 percent (see also Campbell (2007)). Further, to derive the discount factor, R, I use the expected long-term interest rates from the survey augmented with a constant equity risk premium of four percent.[4]

[3]The present analysis ignores taxes both on the side of investors and also corporate income tax. The profits forecasts are for pre-tax profits. The statutory corporate profits were stable between 1988–2017 but subject to large declines in 1987 and 2018. The effective corporate income tax, however, is gradually declining over the horizon of the analysis.

[4]Below, this premium is also estimated by matching the valuation to the observed prices.

I do not remove either deterministic or stochastic trends from the data, nor otherwise transform the data, not even deflate to 'real' values. It is important not to de-trend the data, given the importance of the real-time difficulty of distinguishing between transitory level shocks and growth-rate shocks. For instance, Abel and Blanchard (1986) exponentially de-trend all variables before building a VAR model of corporate earnings and Tobin's q. With de-trending, valuable information may get lost, namely about the long-term growth and interest rate assumptions.

B. Data

The data come from the Bluechip Economic Indicators survey by ASPEN Publishers (henceforth Bluechip Survey), as available in Haver Analytics.[5] The Bluechip Survey contains consensus forecast database for the nowcast and next-year's forecast of corporate earnings' growth and the ten-year Treasury note yield. Twice each year, in March and in October, the survey features 'the long-range forecast' of the key variables for each of the next five years, plus an average for the following five-year period. The long-range forecasts are available from 1984, which is the first year of the present analysis. I work only with the March survey results, since the nature of the long-term outlook in October vintage is similar. I use the survey forecast for pre-tax corporate earnings and nominal ten-year interest rates for the valuation.

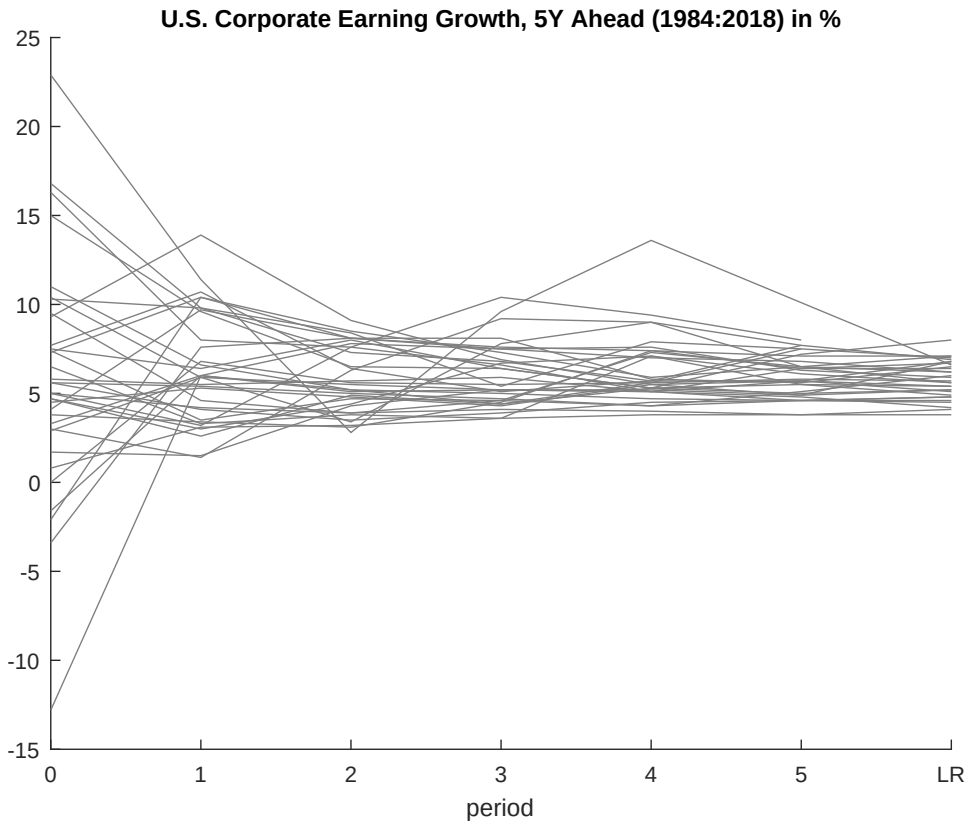
The data for the NIPA corporate earnings before tax and the March values for S&P-500 composite price index are sourced from Haver Analytics as well. To inspect the behavior of corporate earnings expectations at the quarterly frequency, namely around the cyclical highs or lows, I also use the Philadelphia FED Survey of Professional Forecasters (SPF) data for corporate earnings. The data is quarterly and four quarters ahead, which is sufficient to inspect the turning points.

C. Inspecting the Expectations

The nature of the economic shocks—transitory or permanent—is a key factor for valuation of the asset's income streams. For a positive cyclical and thus transitory shock, the value assessment should increase but less so than for a permanent shock. Specifically, for a transitory shock, all else equal, the price-dividend ratio can actually decline. On the other hand, for a

[5]For Haver Analytics subscribers, the Excel files with links/tickers to the database are available upon request, albeit unpopulated. The data was accessed thanks to the licence of the International Monetary Fund.

Figure 1. Corporate Earnings



permanent level shock (or a growth-rate shock), the price-dividend ratio should increase as the future increase in earning is priced in immediately. For building valuation models, it is crucial not to de-trend the data ex-post and tackle the data in their raw form.

The surprising thing about the corporate earnings is that most of the level changes in nominal corporate earnings are perceived as permanent, both in nominal and real terms. Figure 1 depicts the forecasted paths of corporate profits. After a large negative or positive change in the corporate earnings, the growth rate quickly reverts towards the assumed long-term growth. Although the deviation of earnings growth from the long-term expectations is considered transitory, the implied change in the levels of earnings is permanently higher or lower.

The long-term growth expectations also change over time. Although the changes in long-term growth may seem small, it is vital to realize that the present-value computations are extremely sensitive the changes in "$(r-g)$" term, to the capitalization rate of normalized earnings after the period $T+1$.

The convergence to long-term growth is necessary and an indication of economically meaningful forecasts. But the profiles in level terms imply a lack of truly expected cycles, where an excessive positive growth would be later offset by negative growth, with a 'zig-zag' pattern of growth rates. Fig. 2 illustrates profiles of a stylized transitory AR(1) shock and a permanent level shocks (a transitory growth-rate AR(1) shock) to a series growing 5% in a steady-state.[6] For asset valuation, this difference matters a lot!

Fig. 3 depicts the level of the pre-tax nominal corporate earnings, normalized and in 100*log units. Most of the increases in earnings are perceived as permanent. And permanent in real terms, since the changes in headline inflation are of much lower order. This observation suggests that the strong assumptions by Barsky and De Long (1993) about capitalizing current-period earnings with no adjustment for the cycle are not so far from the reality of market forecasts.

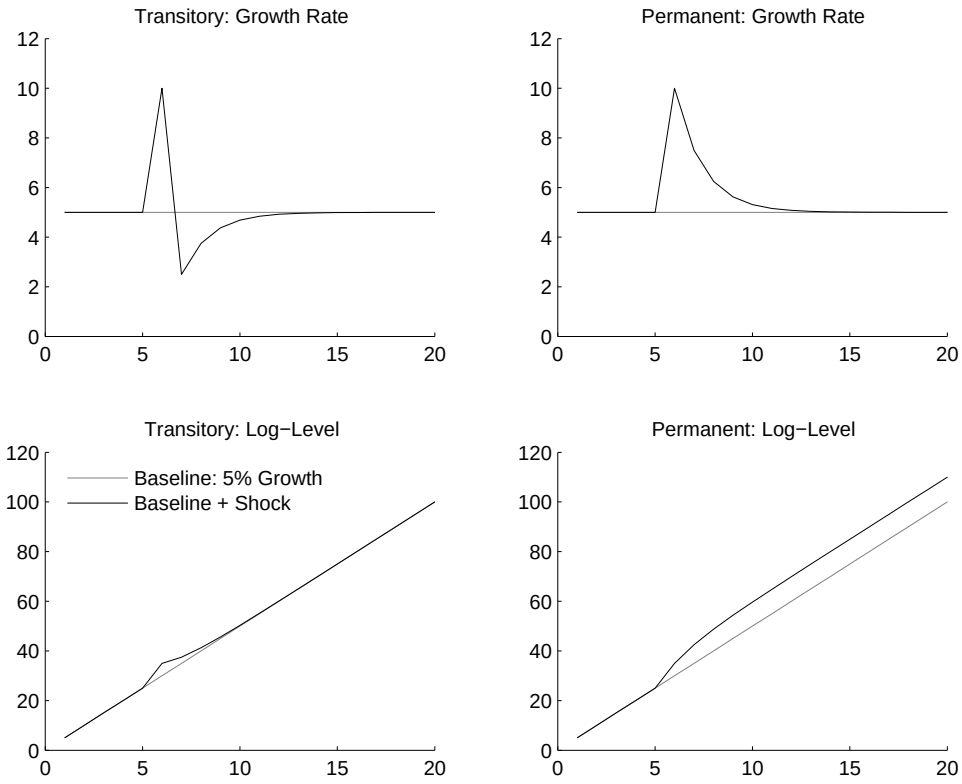
The profiles of expected corporate earning growth rates may be an artefact of too simple an approach to forecasting output and corporate earnings. Analysts obviously understand the idea of mean-reversion of the growth rates to some presumed long-term tendency. However, operating solely in growth rate terms, an estimated AR(1) model with non-negative persistence will *always* lead to the observed behavior of the forecasts – every shock will be a permanent level shift. Intuitively for the analyst, the growth profile looks 'right' and smooth, unlike forecasting with 'zig-zags'. Estimating an auto-regressive model across survey vintages v with variable long-run growth, $\dot{e}_{v,t} = \rho * \dot{e}_{v,t-1} + (1-\rho) * \dot{e}_{v,ss}$ results into a point estimate of $\rho = 0.17$.[7]

Low-order univariate AR or ARMA forecasting models will a have hard time capturing cyclical components on top of integrated processes, see Cai, den Haan, and Pinder (2016). Specifying a trend-cycle state-space model is more involved and can simply be just more complicated for many practitioners. This issue is common in vector-autoregressive (VAR) models for monetary policy and inflation forecasting. However, with forward-looking net-present value computations the issue of transitory versus permanent level change gains a whole new level of importance.

[6] The charts are stylized. For a nominal variable, in case of a well-functioning Phillips curve, even a transitory demand shock will lead to some permanent level change due to a permanent increase in the price level under an inflation-targeting regime. However, there will be a clearly pronounced cycle in corporate earnings, due to their higher volatility than consumer inflation.

[7] Estimating an AR(p), for low p model on the actual annual corporate earnings data delivers similar results.

Figure 2. Stylized Transitory vs. Permanent Shocks – A Reminder



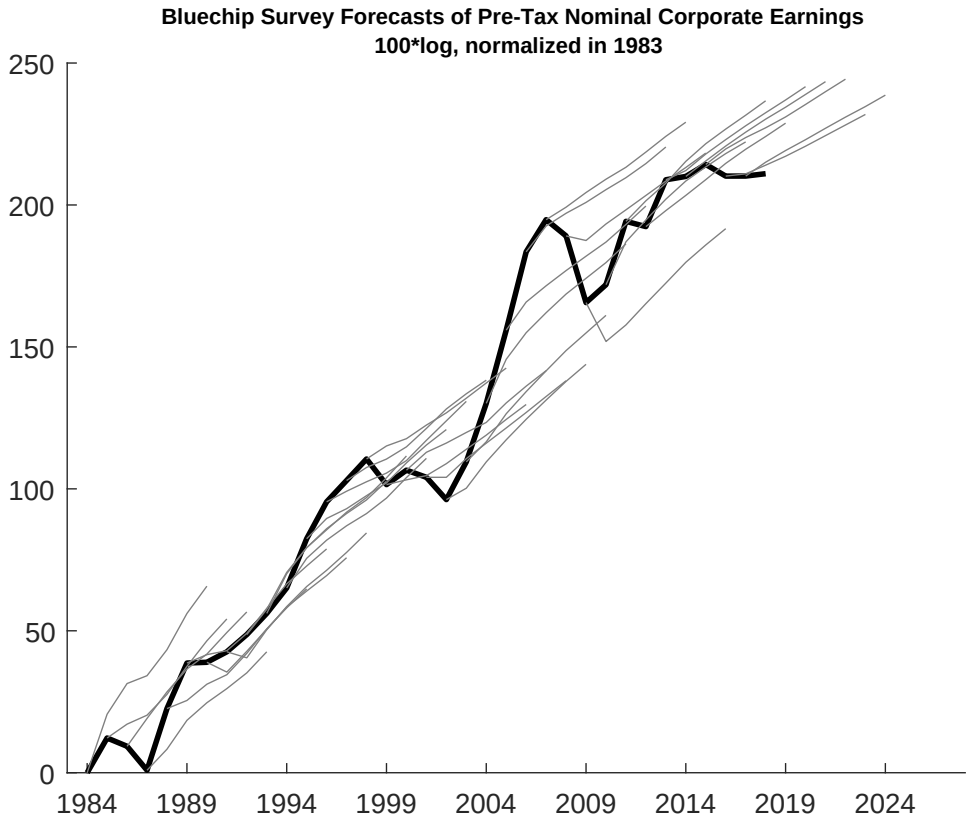
Note: Left panels depict transitory shock, the right panels depict a permanent level shock.

The over-reaction to cyclical changes observed in the Bluechip survey forecast at annual-frequency is also present in the data for five-quarter-ahead survey forecasts of the Survey of Professional Forecasters (SPF), see Fig. 9 in the Appendix. With quarterly data, the analysis of trend-cycle dynamics is more granular and much more real-time focused. In 1960s and 1970s the cycles seem to be accounted for but starting from 1990s, most of the quarterly innovations are considered as permanent right from the start.

If the true data-generating process features cyclical variations, where earnings have a stationary cyclical component and a stochastic trend component, a value investor who realizes this fact and is more cautious about the underlying trend increase in earnings and cyclical fluctuations would gain an advantage. Indeed, the so called 'value investing' literature focuses on the issue of distinguishing between permanent and transitory changes in earnings, see e.g. Graham and Dodd (2009) or Robert Shiller's famous cyclically adjusted price-earnings ratio[8].

[8]It is another question altogether what is the plausible way of adjusting for trends and cycles. Shiller, in reference to Graham and Dodd chooses ten-year moving average of earnings.

Figure 3. Nominal Corporate Earning Forecasts



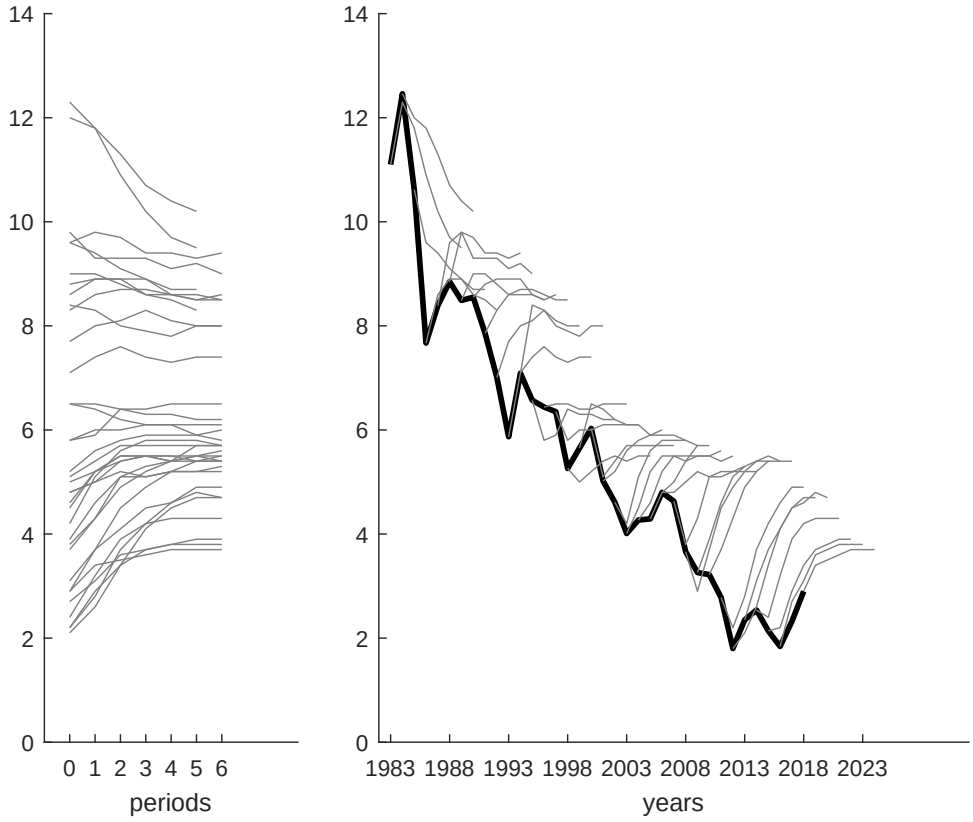
Concerning the expectations of long-term nominal interest rates, these are dominated by changing perception about long-term inflation and long-term real rates of interest. Both the level of inflation and real rates in the United States have been declining throughout the sample. Fig. 4 illustrates the recursive profiles of the 10Y T-Note forecasts. These are the forecasts used to value the corporate income stream in this paper.

In terms of valuation, the capitalization rate of normalized earnings after the medium term, $T+1$ onwards, is very important. This capitalization rate depends on the long-term interest rate augmented with the equity premium and expected profit growth. The long-run expectations of interest rates and profit growths are depicted in Fig. 5. Later on, their relationship will prove important for the estimate of the equity risk premium, namely in the 1980s and the first decade in the twenty-first century.

As one might expect, using the basic neoclassical growth model as guidance, the decline in real growth and real interest rates go hand in hand. Even after factoring in an assumption of a constant equity risk premium, the capitalization rate will fluctuate and affect the valuation.

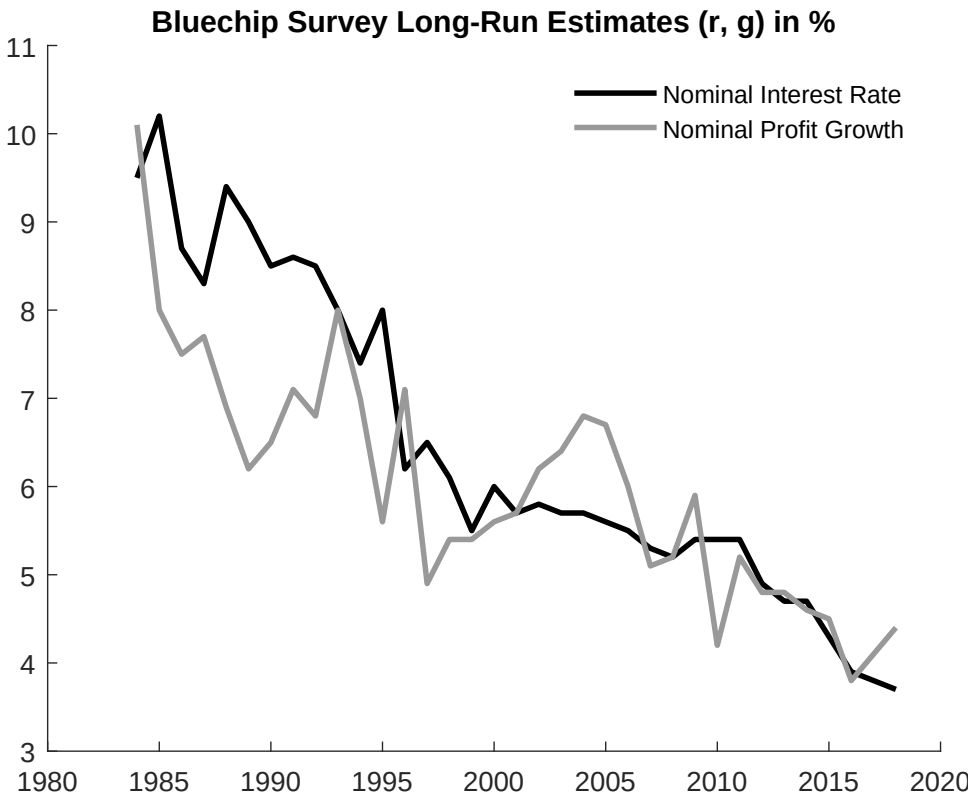
Barsky and De Long (1993) look at the effects of changes in the asset price with the price given by $P_t = D_t/(r - g_t)$, assuming no cyclicality and a constant real required rate of return, using just one leg of the '$r - g$' relationship.

Figure 4. Nominal 10Y T-Notes, % p.a.



Note: Left Panel – individual forecast profile, Right Panel – forecast profiles and the actual path

Figure 5. Bluechip Survey Long-Run Estimates



D. Present Value of Corporate Earnings

The valuation of "Corporate America" is based on the discounted-dividend model and the survey-based expectations of earnings and long-term interest rates introduced above. How would an investor with an infinite horizon appraise the value of Corporate America, based on the forecasts of professional forecasters?

Deviations from the estimated valuation should be expected and need not constitute evidence of market irrationality. Unlike the estimated valuation, the market price reflect the interaction of many market participants with different investment horizons, risk attitudes, and of course different outlooks for corporate earnings and interest rates. It is these deviations that 'value investors' relish and search for to invest in 'under-valued' markets and sell in 'over-valued markets.' The present value of market-expected earnings, however, provides information about what the expectations imply about value. If market prices deviate from the estimate, the deviations can hardly be explained in terms of earnings outlooks or interest rate expectations– these are factored in the value. The present value of earnings based on forecast surveys need not be the best estimate of value, as the expectations process behind the survey forecast seems rather imperfect.

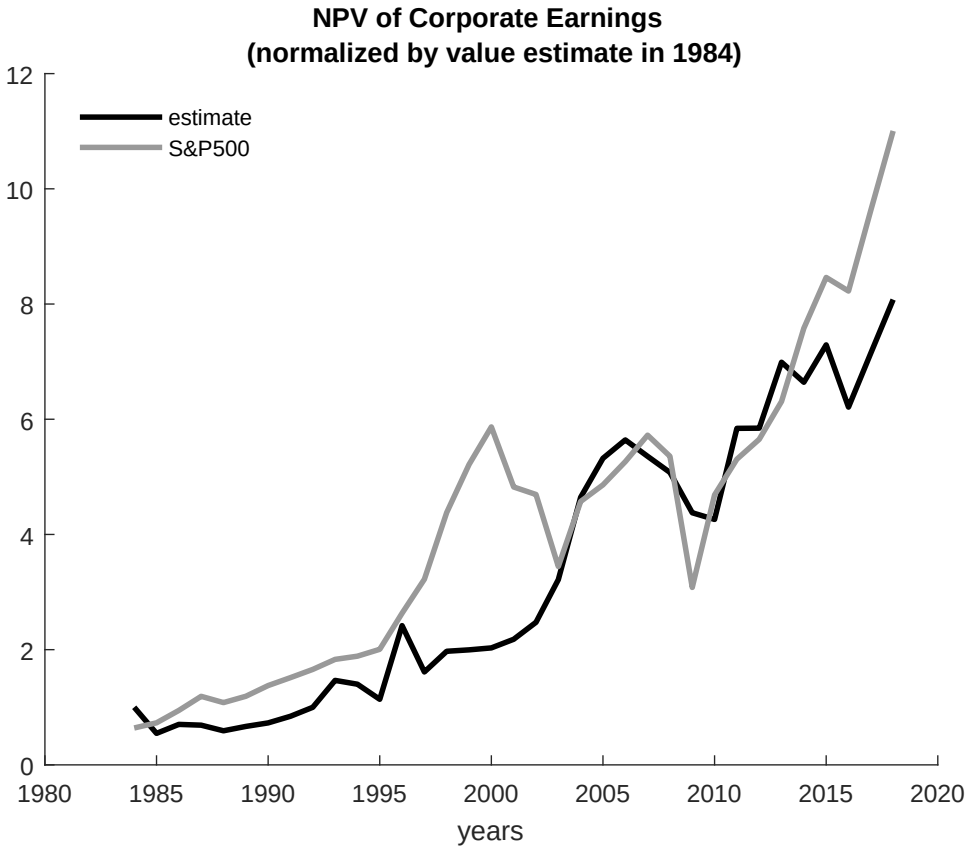
To make the valuation more realistic and assure that the valuation is always finite and positive, I introduce an equity premium to the valuation. I assume a constant equity premium of 4% through the whole sample size, based on the historical average.[9]

To put the valuation of corporate dividends (based on earnings) into context, I compare the estimated *value* with the observed *price* of the S&P500 index (average of March every year). It is an imperfect comparison as the measures of corporate earnings are based on national account concepts, whereas the S&P500 index is just a subset of the economy, with different composition of industries, weighted by corporate (free-float) capitalization. However, the evolution of earnings –both operating and reported earnings– of both concepts is rather comparable, see Hodge (2011).

The nominal valuation results are depicted in Fig. 6. The S&P500 price-earning ratio in 1984 was used to put the price index into commensurate units with the valuation of corporate earn-

[9] An assumption of constant equity premium is related to Model 2 in Campbell and Shiller (1988). The authors work in the opposite direction, going from price-dividend ratio to estimates of earnings expectations. In this paper, prices do not enter the valuation.

Figure 6. NPV of Corporate Earnings



ings and both indices are normalized by the net-present value estimate in 1984 (and thus levels remain comparable).

Recall that the valuation exercise is not an attempt to forecast or exactly explain the observed stock market *prices*. Rather, the analysis is aimed at obtaining an indication of the *value* of the dividend income stream. Despite all the simplifications, the results clearly suggest that fundamental analysis spot markets that are in excess of the value implied by market expectations of earnings and long-term interest rates. With hindsight it is comforting that the markets in the late 1990s are assessed as being above the value based on expected fundamentals. Also the stock market prices in 2015-2018 seem above the fundamental present value of corporate dividends (earnings).[10]

Clearly, for the years 1986 to 1997, the current valuation is inaccurate, see Fig.11 and Fig. 12. This is due to the largest differential between nominal corporate earnings growth and nomi-

[10]One important aspect of the analysis is the focus on pre-tax profits. With the significant changes in the U.S. tax code enacted by president Trump, part of the increase in market prices is likely to be attributed to tax changes.

nal interest rates, coupled with an assumption of the constant equity premium. The implied price-earning ratios are lower than in the rest of the sample and adjustment in the equity premium would be needed to change that. However, with a different but constant or smooth risk premium, the present-value computation would provide similar dynamics but different levels. Comparing the forecast-implied valuation to a constant price-earning ratio, it is clear that the dynamics of the forecast-based measures are richer – namely in the run-up to the 2008 financial crises.

Further, the present calculations support and expand on the analysis of Barsky and De Long (1993) – asset valuations can be volatile due to high uncertainty about the medium- and long-term value of income growth and discount factors.[11] Market participants do not have to be irrational or exuberant in order for the market valuations to be volatile.

The calculations suggest that in late 1990's the stock prices were clearly at odds with markets' projection of corporate earnings and interest rates, and the markets were overwhelmed by optimism about a few technology companies. In the run-up to the late 1990s, profits were following their usual trend path and long-run profit growth expectations were not increasing for the aggregate economy. The aggregate market-cap weighted S&P500 index was affected by the 'dot-com' companies, despite its smaller exposure than the technology-oriented NASDAQ index.

On the other hand, from 2003 to 2007, the growth of actual earnings was increasing strongly and long-term growth expectations picked up strongly as well against the backdrop of moderately declining long-term interest rates. Both the implied valuation of earnings and the observed stock prices enjoyed a forceful rebound, until the events of late 2007 and early 2008 set in. After 2010, both the expectations of long-run profit growth and the expected long-run Treasury yield decline hand-in-hand until they decouple in 2017.

Given an assumption of a constant equity premium, no dynamics in profit valuation are driven by changes in the premium. The dynamics are about earnings development and about expectations of growth and interest rates. Figure 5 displays the path of these long-run expectations of nominal profits growth and interest rates in the Bluechip survey. The premium, however, affects the denominator significantly. The larger the premium, the more the effects of the changes in $r - g$ are dampened.

[11] Their analysis considered only variations in the growth rate, keeping the real interest rate constant, assuming $V_t = D_t/(r - g_t)$.

E. Estimating Equity Risk Premium

Having the model set up and the real-time survey data available – what is the implied equity risk premium needed to perfectly match the observed prices?

To estimate the equity premium, the model valuation is run jointly with a search for an constant equity risk premium added to the discount factor, $r_{t+i|t} = r^{notes}_{t+i|t} + erp_t$. The estimated equity premium is in Fig. 7, together with the difference between the long-run estimate of $(r-g)$ from the Bluechip data. The equity risk premium estimate after year 2000 is around 4% and declining in the last couple of years. Notice that the decline in the risk premium is against the backdrop of a rather stable difference in '$r-g$' or even a decline. The profile of the equity premium is broadly consistent with other estimates, see Campbell (2007). The premium hovers around 6% in the early 1980's, it is declining until the late 1990's, followed by an increase in the 2000s to value around 4%. The estimate of the equity risk premium around 4% is the reason why the valuation above is quite reliable for the sample after the year 2000.

The results imply that when nominal interest rate decline, most of the time jointly with the estimate of the expected long-term growth, the estimated equity risk premium increases. In nominal terms, the effective rate of discount for equity stakes is rather stable between 8–10% nominally. This is consistent with the stability of the pre-tax rates of return for non-financial corporations since 1960, see Osborne and Retus (2017) also oscillating between 8–10%. The only period when pre-tax aggregate rates of return by non-financial corporations significantly exceeded 10 % was from 1960 to 1969.[12] This is remarkable nominal stability given the evolution of the rate of inflation in the same period.

Stock prices in 2016 onwards can only be reconciled with the survey data on earnings and interest rate expectations by assuming a decline in the equity risk premium from the average premium during the years 2003–2014. For investors who do not subscribe to this decline in the equity premium, the market is overvalued, conditioning on the path of interest rates and earnings forecast by the analysts.

[12] See details in Osborne and Retus (2017); the rates of return are calculated as the ratio of the net operating surplus to the stock of produced assets.

Figure 7. Estimated Equity Premium (%)

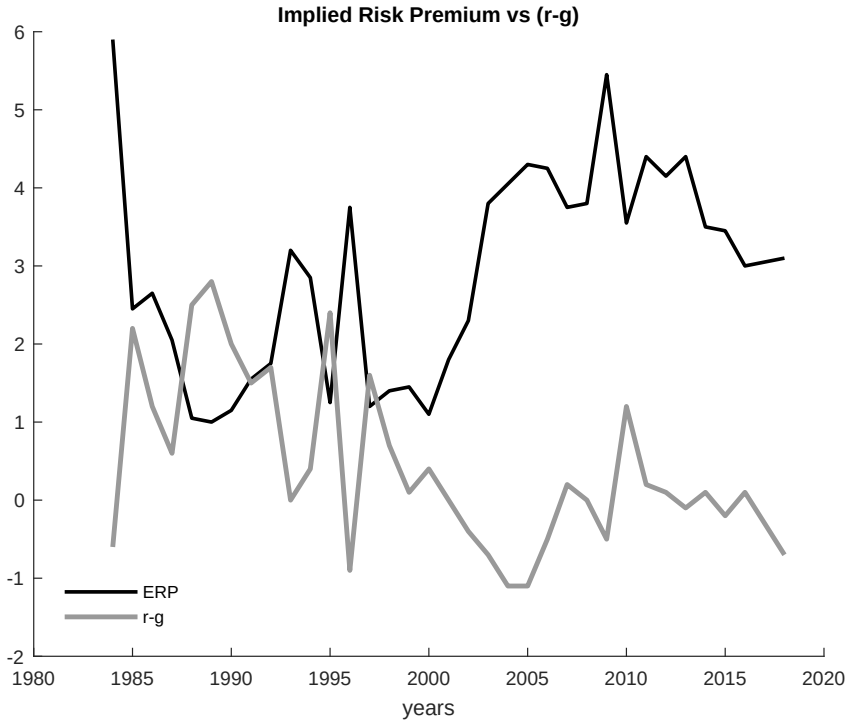
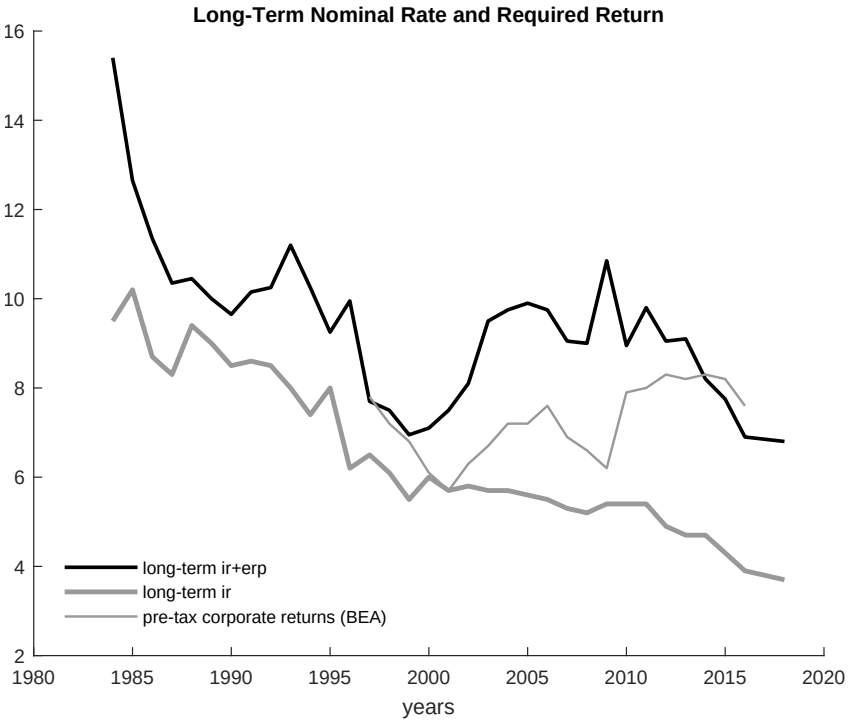


Figure 8. Nominal Required Rate of Return (%)



IV. Conclusion

This paper estimates the *present value* of corporate dividends in the United States, based on a long-term survey of professional forecasters.

The results indicate that value appraisals by rational value investors with a long investment horizon may display considerable volatility, if their estimate of earnings and interest rates coincide with professional forecasters. Market participants are not endowed by perfect foresight, far from it, they often revise their assumptions on trends and cycles and also revise their estimates of the long-run growth rate of the economy. Their struggles are reflected in valuation volatility.

The valuation model has also been used to estimate the equity risk premium conditioned on the survey forecast of earnings and interest rates. In particular, a decline of the equity premium must be assumed to reconcile current stock prices with expected fundatmentals. Otherwise, as of March 2018, the stock market is overvalued.

Another interesting result of the analysis concerns corporate earnings growth expectations themselves. Dynamics of corporate earning growth are surprising, as forecasters essentially do not reflect the very cyclical nature of corporate earnings and most of the shocks are viewed as having permanent level effects. This, of course, increases the volatility of the appraised value. Investors better recognizing the cyclical nature of earnings may gain a leg up in their investment strategies.

This simple, survey-based, and non-parametric valuation framework can be used for monitoring markets for over-valuation. Given the multiple-years-ahead forecasts of central banks and other policy institutions, this simple method can be adopted to provide guidance about the dynamics of stock market valuations implied by those macroeconomic forecasts.

REFERENCES

Abel, Andrew. B., and Olivier J. Blanchard, 1986, "The Present Value of Profits and Cyclical Movements in Investment," *Econometrica*, Vol. 54, pp. 249–273.

Barsky, Robert B., and J. Bradford De Long, 1993, "Why Does Stock Market Fluctuate?" *The Quarterly Journal of Economics*, Vol. 108, No. 2 (May), pp. 291–311.

Cai, Xiaoming, Wouter den Haan, and Jonathan Pinder, 2016, "Predictable Recoveries," *Economica*, Vol. 83, pp. 307–337.

Campbell, John Y., 2007, "Estimating the Equity Premium," Working Paper W13423, NBER, Cambridge, MA.

Campbell, John Y., and Robert J. Shiller, 1988, "The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors," *The Review of Financial Studies*, Vol. 1, No. 3, pp. 195–228.

Cochrane, John H., 2011, "Presidential Address: Discount Rates," *Journal of Finance*, Vol. 66, No. 4, pp. 1047–1108.

Damodaran, Aswath, 2012, *Investment Valuation: Tools and Techniques for Determinig the Value of Any Asset (Third Ed.)* (Wiley Finance).

Graham, Benjamin, and David L. Dodd, 2009, *Security Analysis, Sixth Edition* (New York: McGraw-Hill).

Greenwald, D.L., M. Lettau, and Sydney C. Ludvigson, 2016, "Origins of Stock Market Fluctuations," mimeo, NYU.

Hodge, Andrew W., 2011, "Comparing NIPA Profits with S&P 500 Profits," BEA Breifing pp. 22–27, https://www.bea.gov/scb/pdf/2011/03%20March/0311_profits.pdf, BEA Briefing, Washington DC.

Mauboussin, Michael J., 2006, "Common Errors in DCF Models: Do You Use Economically Sound and Transparent Models?" mimeo, Legg Mason Capital Management.

Osborne, Sarah, and Bonnie A. Retus, 2017, "Returns for Domestic Nonfinancial Business," BEA Breifing https://www.bea.gov/scb/pdf/2017/12-December/1217-returns-for-domestic-nonfinancial-business.pdf, BEA, Washington DC.

Shiller, Robert J., 1981, "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" *American Economic Review*, Vol. LXXI, pp. 421–435.

V. APPENDIX

Figure 9. Quarterly Nominal Corporate Earnings

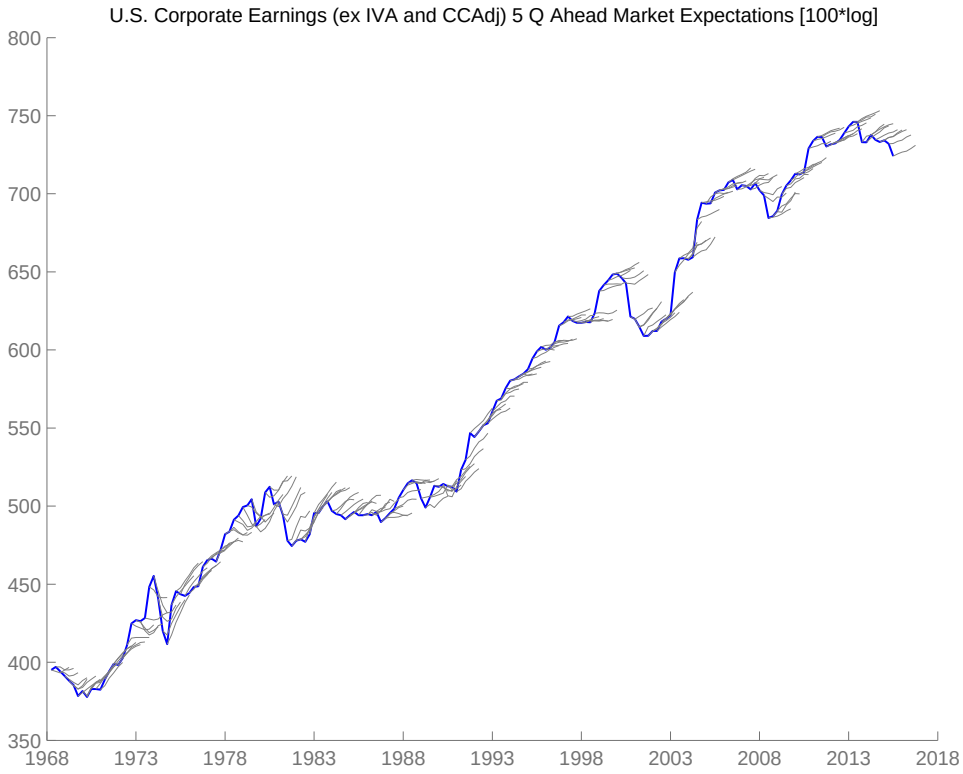


Figure 10. Asset Prices Returns

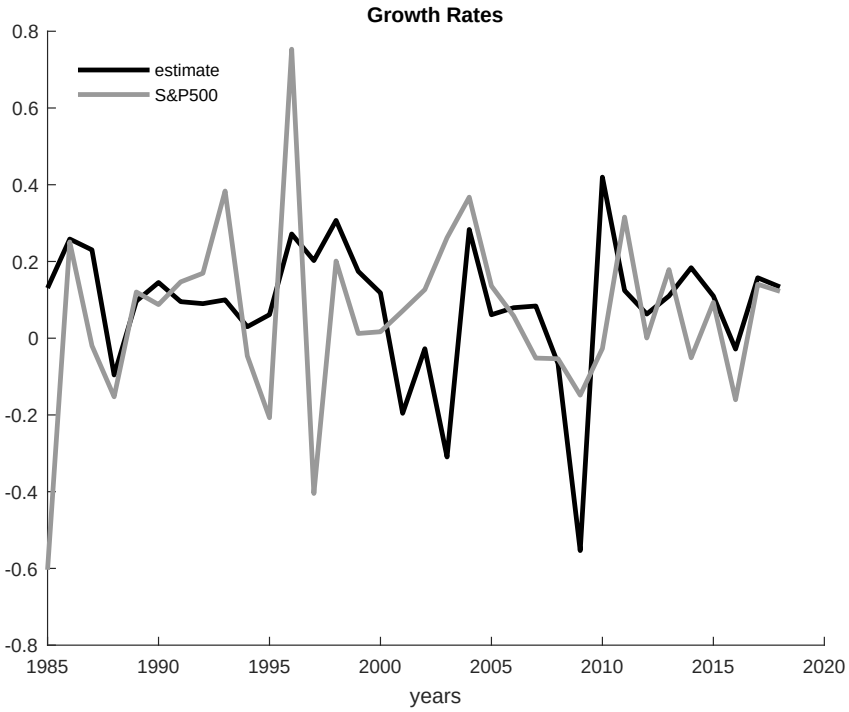


Figure 11. Implied Valuation

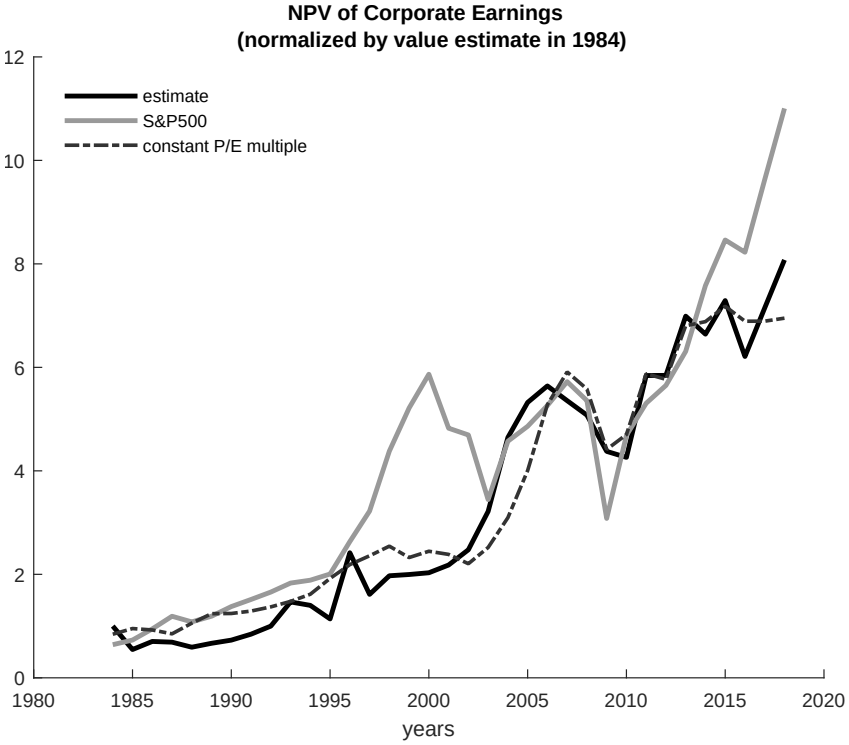


Figure 12. Price-to-Valuation Indicator