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Downside risk aversion, fixed-income exposure, and the value premium puzzle

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ABSTRACT

The value premium is relatively small for investors with a material fixed-income exposure, such as insurance companies and pension funds, especially when they are downside-risk-averse. Value stocks are less attractive to these investors because they offer a relatively poor hedge against poor bond returns. This result arises for plausible, medium-term evaluation horizons of around one year. Our findings cast doubt on the practical relevance of the value premium for these investors and reiterate the importance of the choice of the relevant test portfolio, risk measure and investment horizon in empirical tests of market portfolio efficiency.

1. Introduction

Value stocks are stocks that rank high on valuation multiples such as earnings-to-price ratio, debt-equity ratio, dividend-to-price ratio, cash flow-to-price ratio, and ratio of book value of common equity to market value of common equity. These stocks historically generate a higher average return than growth stocks, or stocks that rank low on these measures. The classic CAPM seems unable to explain this so-called value premium, because value stocks do not have higher equity market betas than growth stocks. Financial economists have struggled for decades to explain this puzzle and the debate is still ongoing. Some researchers argue that stocks are exposed to sources of risk beyond pure market risk, and the value premium is compensation for these additional risk factors (see, for example, Fama and French, 1993). Others argue that biases in investor expectations and limits to arbitrage cause security mispricing. Investors might overreact by naively extrapolating past corporate performance, resulting in stock prices that are 'too high' for growth stocks and 'too low' for value stocks (see, for example, DeBondt and Thaler (1987) and Lakonishok et al. (1994), for supportive evidence).

Empirical analysis involves the need to specify the relevant benchmark portfolio, risk measure and evaluation horizon. The most common choices are an *all-equity benchmark portfolio*, such as the CRSP all-market equity index, *variance* as the relevant risk measure, and a *monthly evaluation horizon*. Using various behavioral and institutional arguments (elaborated below), this study challenges this specification and advocates a greater focus on *fixed-income exposure*, *downside risk aversion*, and *intermediate evaluation horizons*. We show that the unexplained part of the value premium is economically and statistically less significant after accounting for these factors.

Table 1 gives a first illustration of our findings. Panel A shows the returns in the three worst years for equities: 1973, 1974, and 2002, years during which the stock market plummeted by more than 22%. A risk-averse all-equity investor would want to hedge against such losses by holding stocks that perform relatively well during these critical years. Growth stocks have performed worse than value stocks during these years, and the Value-Minus-Growth (VMG) return in 1973, 1974, and 2002 was 3.7% on average. This demonstrates the difficulty of rationalizing the value premium for a risk-averse all-equity investor. Panel B shows the returns in the three worst years for bonds: 1969, 1979, and 1980, years during which bonds lost more than 10% of their real value. Stocks have generally performed better during these years, limiting the losses for investors who mix stocks and bonds, and illustrating the advantages of diversification over asset classes. Interestingly, value

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Table 1
Returns during 'bad years'. This table shows annual real returns of value sorted, equity and bond portfolios. The value (Value) and growth (Growth) portfolios buy the top two (Value) or bottom two (Growth) deciles of the ten stock portfolios formed on book-to-market equity ratio (B/M). The Value-Minus-Growth (VMG) portfolio is the difference between these two portfolios. The equity market portfolio (Equity) is defined as the CRSP all-equity index and the bond index (Bonds) is an average of Intermediate Term Government Bond index, Long Term Government Bond index and Long Term Corporate Bond index. Panel A shows the returns during the three years when the equity market experienced the largest negative returns; Panel B shows the returns during the three worst years for bonds. The sample period is from 1963 to 2007 (45 annual observations). Equity data are from Kenneth French's website, bond data is from Ibbotson Associates and inflation data is from the US Department of Labor website (http://www.bls.gov/cpi).

Year	Value	Growth	VMG	Equity	Bonds
Panel A: Worst years for equities					
1974	−32.9	−36.8	3.9	−35.6	−8.5
1973	−17.5	−28.4	10.9	−25.7	−7.2
2002	−29.7	−26.1	−3.6	−22.8	12.8
Avg.	−26.7	−30.4	3.7	−28.0	−0.9
Panel B: Worst years for bonds					
1979	13.5	3.7	9.8	9.2	−12.6
1980	3.9	24.5	−20.6	19.2	−11.4
1969	−26.0	−5.3	−20.7	−16.0	−10.2
Avg.	−2.8	7.6	−10.5	4.1	−11.4

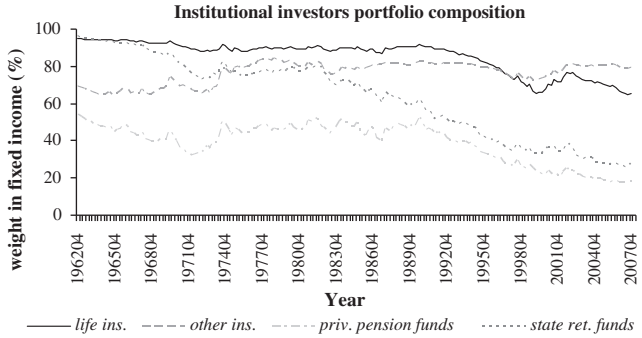

Fig. 1. Institutional investor's portfolio compositions. The figure shows the investment in fixed-income instruments as a percentage of the total financial assets for various categories of institutional investors: life insurance companies ("life ins."), property-casualty insurance companies ("other ins."), private pension funds ("priv. pension funds"), and state and local government employee retirement funds ("state ret. funds"). The results are based on quarterly assets holdings, measured at the end of the fourth quarter of 1962 till 2007. The data are taken from the "Flow of Funds Accounts of the United States" from the Federal Reserve Board; http://www.federalreserve.gov.

stocks have performed substantially worse than growth stocks did during these years; the average VMG return over 1969, 1979, and 1980 was −10.5%. This suggests that value stocks offer a worse hedge against poor bond performance than growth stocks.

A substantial part of many investors' portfolios is invested in fixed-income assets, such as bonds and loans, or, human capital, which often resembles a non-tradable fixed-income position. In fact, the market capitalization of US equities was roughly $4500 bn ($13,500 bn) at the end of 1996 (2007), whereas that of US fixed-income assets was around $12,300 bn ($32,100 bn).[1] Indeed, Fig. 1 shows that large institutional investors such as insurance companies and pension funds invest heavily in fixed-income assets.

A natural way to account for this situation is to include fixed-income assets in the benchmark portfolio or market index. Stambaugh (1982) and Shanken (1987) show that, for beta, industry and size-sorted portfolios, inferences about the CAPM are not affected by the inclusion of bonds, but their analyses do not include value-sorted portfolios (and also do not consider holding periods other than one month). By contrast, Jagannathan and Wang (1996) and Heaton and Lucas (2000) find that the performance of (a conditional version of) the CAPM improves when incorporating labor income or entrepreneurial income, but they do not study value portfolios and bonds.

Several empirical observations suggest that value stocks are a worse hedge against bond returns than growth stocks, which would make the addition of fixed-income assets to the benchmark non-trivial. For example, value firms have higher financial and operational leverage (Gulen et al., 2008), are more sensitive to aggregate permanent cash flow shocks that also tend to affect interest rates (Campbell et al., 2010), and are more exposed to business-cycle risk (Koijen et al., 2008). Moreover, bond returns and its predictors correlate more with value stocks than with growth stocks (Baker and Wurgler, 2012; Koijen et al., 2008) and worse value returns are expected when interest rates are low (Ferson and Harvey, 1999; Petkova, 2006). Furthermore, betas computed against an all-equity index tend to be lower than beta's computed against a mixed debt-equity index, and this difference is increasing with a firm's relative degree of leverage and distress, which strongly correlate with size and B/M (Ferguson and Shockley, 2003).

A well-known limitation of variance as a risk measure is that it places the same weight on upward and downward deviations. For this reason, semi-variance is often seen as a more suitable measure of risk.[2] This notion is supported by numerous psychological works on the way people perceive and deal with risk, ranging from students to business managers and professional investors (see for instance Cooley, 1977; Kahneman and Tversky, 1979). In addition, recent evidence suggests that downside risk aversion helps to explain why a substantial fraction of investable wealth is invested in fixed-income assets, despite the sizeable equity premium (see Benartzi and Thaler, 1995; Barberis and Huang, 2001).[3] Interestingly, the findings of Petkova and Zhang (2005) suggest that downside risk aversion may especially have a large influence on value-sorted portfolios if an investor's portfolio is also subject to a substantial fixed-income exposure. Their results show that value stocks have a higher downside beta than growth stocks with respect to variables known to predict bond returns (as, for example, documented by Keim and Stambaugh, 1986; Fama and French, 1989). However, their focus is on expected equity returns and they do not explicitly include fixed-income assets in the benchmark portfolio.

An annual evaluation period seems be more appropriate than a monthly period, because most performance evaluation and financial reporting takes place on an annual basis (for example, financial statements, tax files, update retirement accounts, see Benartzi and Thaler, 1995). Campbell and Viceira (2005) show that the variance and correlation structure can change dramatically across investment horizons, and stocks become relatively less risky than bonds at longer investment horizons. Since the factors that drive stock and bond returns affect value and growth stocks in a different way (Ferson and Harvey, 1999; Campbell and Vuolteenaho, 2004), we may expect a comparable change in the risks of value versus growth stocks as we move to longer evaluation horizons.

[1] Based on the US MSCI market capitalization, which represents roughly 99% of the US market capitalization, and the Securities Industry and Financial Markets Association (SIFMA) bond market Statistics.

[2] For example, in his Nobel Lecture Markowitz (1991, p. 476) points out that: "Semi-variance seems more plausible than variance as a measure of risk, since it is concerned only with adverse deviations".

[3] Barberis and Huang (2001) show that the value premium naturally emerges in an economy in which investors are (i) loss averse, (ii) less risk averse after gains and more risk averse after losses, and (iii) care about fluctuations in the outcomes of each asset held (instead fluctuations in their portfolio). By contrast, we will study the importance of the value premium for rational investors that care about downside fluctuations in their aggregated portfolio of stocks and bonds.