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EXPLANATIONS FOR THE MOMENTUM PREMIUM

Momentum is a well established empirical fact whose premium is evident in over 83 years of U.S. data, in 20 years of out of sample evidence from its original discovery, in 40 other countries, and in more than a dozen other asset classes. Its presence and robustness are remarkably stable and, along with the size and value premia, these investment styles have become the preeminent empirical regularities studied by academics and practitioners. And, like size and value, there is much debate and little consensus regarding the explanation driving this premium, though there are some compelling theories.

In this short note, we summarize briefly the risk-based and non-risk based explanations for momentum. While the jury is still out on which of these explanations better fit the data, we emphasize that similar uncertainty regarding the explanation behind the size and value premium also exists. Much like momentum, stories for the size and value premium range from risk-based to behavioral and there is a healthy debate over which of these theories is most consistent with the facts. These debates are likely to continue for the foreseeable future, but as we discuss below there are many viable candidate theories for their existence—and the *truth* behind the source of these premia probably contains elements from several explanations.

Non Risk-Based Explanations

Some argue that the momentum premium is driven by non-risk factors, many of which have a behavioral flavor.

Most of the behavioral models can be classified into two groups: underreaction and delayed overreaction. These two stories would seem to be at odds with each other, but in reality they can both be present and reinforce each other. Here's the basic idea.

Underreaction stories posit that information travels slowly into prices for a variety of reasons (investors may be conservative, not pay full attention, or face liquidity issues), thus causing momentum. There is ample evidence that investors underreact to corporate earnings and

dividend announcements for instance. There are also models and empirical evidence suggesting that investors have limited processing capacity and have limited attention constraints—going as far back as Merton's (1987) classic paper on investor inattention. Delayed overreaction stories argue that investors who chase returns provide a feedback mechanism that drives prices further away from fundamentals, causing momentum in the short term that is eventually reversed when prices correct themselves in the long-term. The literature on herding behavior among mutual fund managers arising from incentives to chase the same returns, to "window dress" before reported holdings, or to follow the same pressures from investors are good examples of this feedback, "bandwagon", or herding effect.

The overreaction and underreaction can also work in concert to exaggerate the effects of momentum, rather than cancel each other out. For example, momentum may be initiated early on by a slow reaction to information, which may then be reinforced by the feedback effect as time goes on allowing momentum to continue longer than expected. This might explain why the effect occurs for up to 12 months. At some point, however, when prices become so detached from fundamentals they tend to pull back and we see the longer-term reversals that a value investor is accustomed to. The data matches these observations as returns begin to reverse beyond a year.

Most behavioral models try to provide explanations for what might cause under or overreaction on the part of investors. For example, DeLong, Shleifer, Summers, and Waldmann (1990) show that rational speculators who engage in positive feedback trading against "noise" or uninformed traders will generate the kind of overreaction that can drive momentum. Daniel, Hirshleifer, and Subrahmanyam (1998) use investor overconfidence to generate delayed overreaction. Other models support underreaction stories such as Barberis, Shleifer, and Vishny (1998) and Hong and Stein (1999), who base their models on the Nobel Prize winning work of Kahneman and Tversky in behavioral economics.

Some of the more recent and intriguing theories have focused on what behavioral economists and experimental psychologists call the *disposition effect*. Investors tend to sell winning investments prematurely to lock in gains, and hold on to losing investments too long in the hope of breaking even. The original study on the subject was by Shefrin and Statman (1985) which proposed the theory and provided some empirical support for its validity. In a series of papers Odean (1998) and Barber and Odean (2000, 2001) found strong empirical support for its effects among retail investors. More recently, researchers such as Grinblatt and Han (2005) and Frazzini (2006) have shown a link between the disposition effect and momentum. The disposition effect creates an artificial headwind: when good news is announced, the price of an asset does not immediately rise to its value because of premature selling or lack of buying. Similarly, when bad news is announced, the price falls less because investors are reluctant to sell. This is another explanation for why prices might underreact, and both papers provide convincing evidence that this has a large impact on the momentum premium.

Risk-Based Explanations

Others argue that the momentum premium is compensation for risk under a rational or efficient market theory. For this to be true, the risk of an asset would have to increase after positive returns, which seems counterintuitive. But, there are several models that offer a plausible risk-based story for momentum. The general theme of these models is that economic risks affect firm investment and growth rates that impact the long-term cash flows and dividends of the firm.

For example, Johnson (2002) shows that expected returns are a function of firm growth rates. So, a firm that has a big positive shock to returns provides a signal to investors that the long-term growth prospects of the firm's cash flows have improved. Thus, the long-term expected return to the firm will also increase accordingly. This provides a positive relationship between the past return of the firm and its future long-term expected return or discount rate. In other words, momentum.

Berk, Green, and Naik (1999) show that economic risk factors can have a persistent effect when firms face growth opportunities and this can give rise to momentum. In a similar model, Sagi and Seasholes (2007) argue that if the market value of the firm increases faster than the revenue of the firm, this will cause a link between growth rates and firm risk, giving rise to a momentum effect where past returns predict future expected returns due to risk.

Zhang (2004) proposes a model where time-varying risk factors can drive momentum. Specifically, if a firm faces both market and firm-specific risks and adjusts its investment levels accordingly to those risks, this will create a change in beta risk that lines up neatly with past returns. A firm that has experienced recent good performance will going forward face greater beta risk, and hence a larger expected return, and a firm suffering recent poor performance will have lower beta risk and lower expected returns as a result. Interestingly, this model also captures some of the features of the Fama and French (1993) three-factor model, offering a similar explanation for size and value premia.

To summarize the essence of the risk-based models, past winners face greater risk going forward either because their growth prospects have now been identified as more risky or they face greater beta risk than before because their investment opportunities have been adjusted. In either case, a firm that has recently experienced a huge rise (fall) in returns over the past year will now face a higher (lower) cost of capital because their cash flow risks and/or risk exposures have increased (decreased).

In addition to these theories, there is some compelling empirical evidence that helps substantiate the risk-based explanations for momentum:

- There is strong correlation structure among momentum stocks. High momentum stocks covary strongly among each other and low momentum stocks covary among themselves, too. This "factor structure" for momentum is at least as strong as that of value or size,

which many advocates for value and size (e.g., Fama and French) claim is evidence of a risk-based story.

- The strong correlation structure for momentum extends across international markets and even across asset classes. A momentum strategy in equities is not only strongly correlated across international markets, but also strongly correlated with one in government bonds, commodities, and currencies. This provides more evidence of the strong covariation or factor structure among assets experiencing momentum which is consistent with a risk-based explanation (Asness, Moskowitz, and Pedersen (2010)).
- Further corroborating some of the theories described above, momentum is stronger among stocks with large growth opportunities and risky cash flows (Asness (1997)).
- Ahn, Conrad, and Dittmer (2003) and Chordia and Shivakumar (2002) also show some evidence that macroeconomic risks and time-varying risk premia can explain a sizeable portion of the momentum premium.
- Finally, Pastor and Stambaugh (2003) and Sadka (2006) claim that liquidity risk can explain part of the momentum phenomenon, whereby recent winners have greater exposure to liquidity risk than recent losers and therefore command a return premium going forward.

In fact, starting with Carhart (1995) and currently used by Fama and French (2008), a momentum factor has been added to the Fama and French (1993) three factor model to capture this important aspect of returns, in part based on the above evidence. Many people in fact refer to this model as the Fama and French *four* factor model or the Fama and French model augmented with a momentum factor. Carhart (1995) used this model to evaluate mutual fund performance and every academic (and many practitioners) since use this model as a starting point for their analysis.

Conclusion

There are a wealth of risk-based and non risk-based explanations for the momentum premium in financial markets. Just as there are for the size and value premium. At this point, the jury is still out on which of these explanations has the most merit, and, as with most things in life, the truth probably lies somewhere in between. It is likely both risk and non risk-based explanations contribute to all of these phenomena.

While this debate is ongoing in academia, the distinction between risk and non-risk explanations for the practical investor is far less relevant. From an investment perspective, whether there is a rational risk-based or behavioral story is of second order importance. Why? Because both the

risk and non-risk based explanations provide a reason for the premium to persist in markets. From a risk-based perspective, as long as risks and tastes for risks don't change, the premium will remain stable and long-lived. Likewise, under the behavioral explanations as long as the biases and behaviors remain stable, the premia for these effects will too. While there's no guarantee risks or behavior stay the same, the evidence from over 80 years of data in dozens of financial markets across many different asset classes suggests that these phenomena are here to stay.¹ The main thing is whether an investor can get exposure to these premia at low fees.

Whether risk or non-risk forces are driving these premia, for an investor who isn't already exposed to them, adding size, value, and momentum to a portfolio produces positive expected returns without additional risk. From an asset allocation perspective, investors should seek factors they're not currently exposed to that provide additional returns. Momentum provides exactly that, and the key is to seek exposure to momentum with low fees. Just as investors have sought exposure to size and value at low fees. Regardless of the underlying root cause of these phenomena, they can add substantially to virtually any investment portfolio.

Disclosure:

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¹ There is even evidence of momentum dating all the way back to the Victorian age (see Chabot, Ghysels, and Jagannathan (2009)), which of course predates all of the risk-based and behavioral explanations, suggesting that the momentum premium has been a part of markets since their very existence.

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