



Momentum – A Contrarian Case for Following the Herd

Tom Hancock



Price momentum has a long history as a successful stock selection strategy. At GMO we are somewhat neutral parties on momentum. On the one hand, our core investing philosophy is one of valuation and reversion to the mean, but on the other, we have been using various forms of momentum since the late 1980s to complement our valuation-based stock selection strategies. The basic thesis behind momentum investment strategies is that leadership within the market persists for enough time that, on average, one can beat the market simply by rotating into stocks that have been outperforming. For value managers, attending to momentum also moderates the pain that seems to come all too frequently with being both too early to buy and too early to sell. The historical success of momentum has continued well beyond when the effect was first documented, and thus the strategy has won widespread, if somewhat grudging, respect and adoption from investors over the years. It is a mainstay of quantitatively managed portfolios, but it is also a strategy that is indirectly employed by many more “fundamental” investors.

Price momentum has succeeded in the face of a couple of intuitive objections. One is that buying winners inherently conflicts with a contrarian philosophy that is deeply ingrained within many successful investors. The second is that the simplicity of analysis needed to build a portfolio is troubling to adherents of the belief that markets are at least reasonably efficient. While the skeptics may lurk in the shadows when the strategy is successful, they are eager to speak up when momentum fails. And it is hard for the practitioners of a momentum strategy to launch a vigorous defense while looking foolish for having recently lost money with a portfolio of stocks bought simply on the basis of having recently gone up.

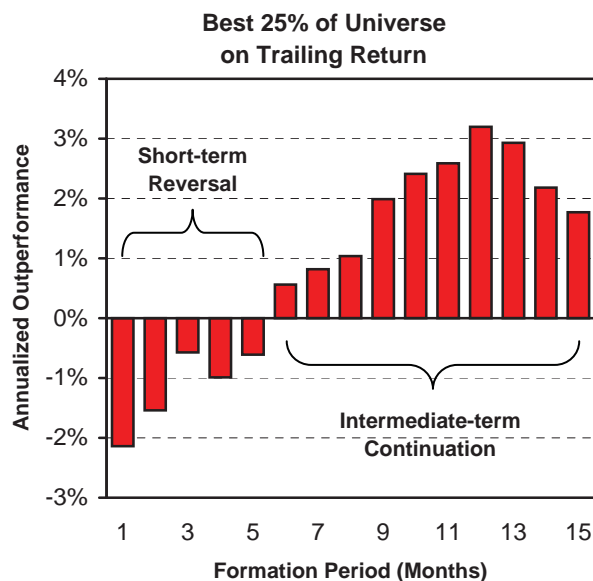
This paper surveys the state of the world from the perspective of a price momentum investor (focusing on the long-only side of investing). It reviews some of the

criticisms that have been raised and considers whether they carry enough weight to justify abandoning or modifying the strategy. To start with, a more precise definition of price momentum is in order, as is a survey of the historical evidence that supports the strategy.

Figure 1 shows the return relative to the market of portfolios built by taking the top performing quartile of a large cap U.S. investment universe over varying backward-looking horizons (both the quartiles and the portfolio weightings displayed are defined by market capitalization). The strategy here is to rebalance monthly, so the turnover is somewhat high to implement exactly this strategy, but the point is clear. For short horizons like a single month,

Figure 1

Price Momentum Has an Impressive History: 1927-2009



Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, CRSP, Compustat As of 12/31/09

there has been reversal, where last month's winners underperform the current month's winners. But as the time period is extended out to close to a year, the story flips over. Since 1927, the basket of stocks formed by taking the winning quartile over the prior 12 months continues to outperform by an annualized rate of over 3%.

With the desire to sidestep the shorter-term reversal of fortunes, it is common for students of this momentum effect to use a measure that omits the return from the most recent month. Figure 2 shows the return to portfolios formed over the 1 to 15 most recent months not including the prior month. The returns peak at 11 months, meaning the most successful portfolios are formed by taking the winners over the last 12 months, but excluding the return from the most recent month. This strategy has outperformed by nearly 4% per year over the period from 1927-2009. While practitioners all use their own variants of price momentum strategies, this simple "last 12 months ex-the most recent month strategy" is a good proxy for the range of momentum strategies used today.

There has been extensive debate among both practitioners and academics about why such a simple price momentum strategy might work. One argument centers about the idea

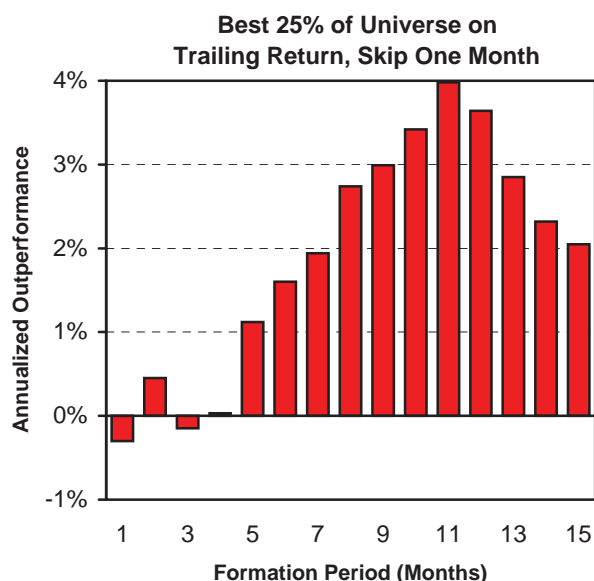
of slow diffusion of information into the marketplace (so the early money buying the stocks and creating the price momentum has effectively better information). Others point to more behavioral explanations including "disposition effects" whereby investors are too quick to realize gains (and loath to realize losses), or pure herding, either by naïve individuals or somewhat cynical professionals who are driven by career risk.

Since the explanations for momentum have a whiff of ex-post justification to them, it is important to note that the success of momentum is widespread and has persisted outside the period in which it was originally observed. As noted earlier, GMO started using momentum strategies in the U.S. in the late 1980s based on patterns observed from returns in the 1970s and 1980s. Jegadeesh and Titman published a much cited study on momentum in 1993.¹ In Figure 3, the left hand bar shows the return to the simple momentum strategy over the 1970s and 1980s. The 1990s in the U.S. was an even stronger period that lies outside of the sample of data used to discover the phenomenon, and so argues more persuasively that the effect is real. So also does the outperformance in Europe over that period. And given that GMO, like many other researchers, did not have access to older historical data at that time, the outperformance of momentum in the U.S. over the prior 40 years also serves as an important confirmation. In fact, by cleverly (or cynically) picking a time period to avoid the bursting of the internet bubble and the credit crisis, simple momentum performed quite well in the U.S. for much of the 2000s.

Figure 4 shows the cumulative outperformance of the simple momentum portfolio over time. The magic of compounding has lifted it to a level of wealth nearly 32 (2⁵) times that of the broad market. This chart, however, compresses over 80 years of history onto a single page in a way that obscures some details of volatility that seem rather more interesting when one lives through them. There are a number of rather significant divots in that graph, with the one freshest in our minds being the collapse off the peak in the summer of 2008 (the main event being the prices of commodity-oriented companies peaking to the detriment of momentum strategies that had dialed into those stocks).

Figure 2

**Because of Short-Term Reversal,
It's Standard to Omit a Month: 1927-2009**

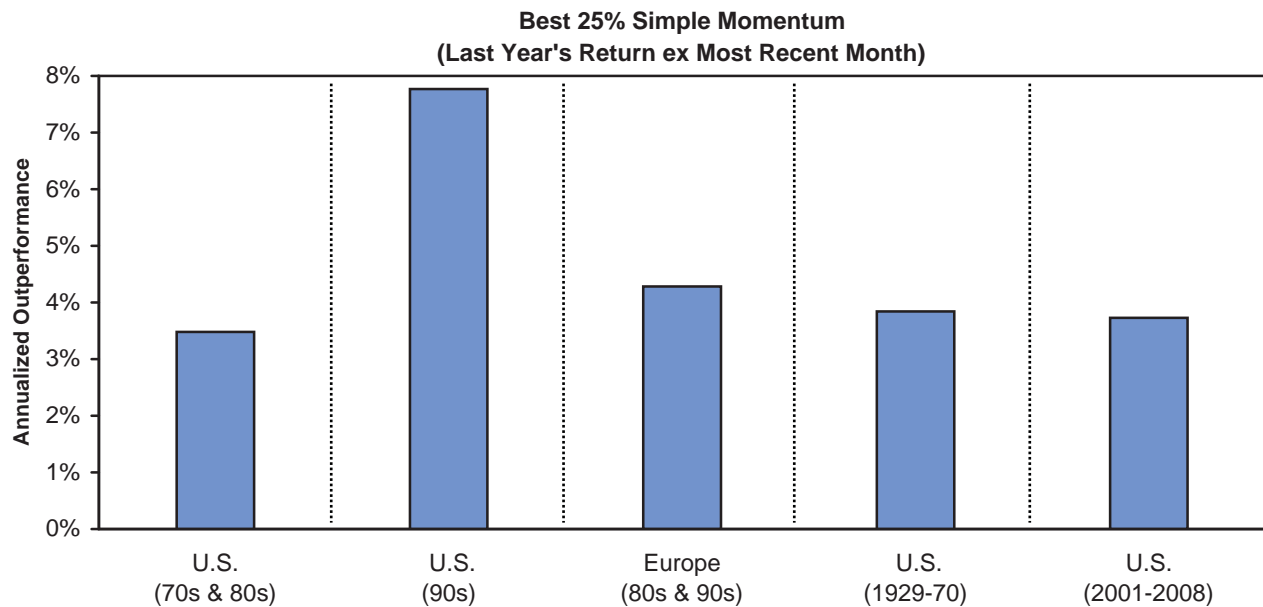


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Source: GMO, CRSP, Compustat As of 12/31/09

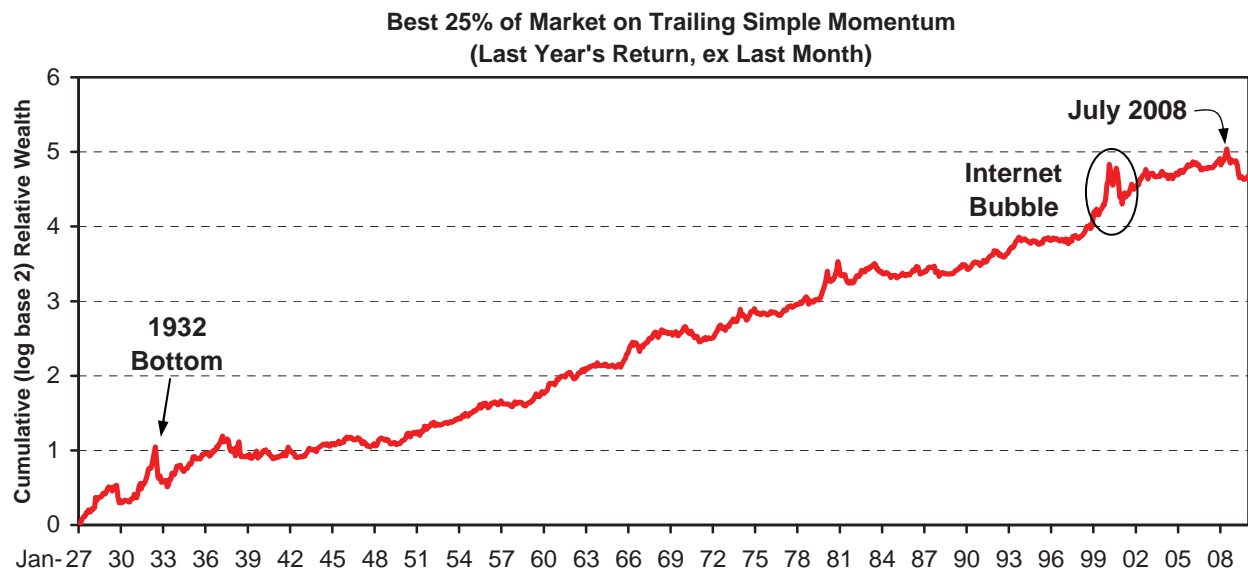
¹ Jegadeesh, Narasimhan and Titman, Sheridan, Momentum (October 23, 2001). University of Illinois Working Paper. Available at SSRN: <http://ssrn.com/abstract=299107> or doi:10.2139/ssrn.299107

Figure 3
Simple Momentum Has a Good “Out of Sample” Record



Source: GMO, Compustat, CRSP, MSCI

Figure 4
From a Distance This Looks Pretty Smooth



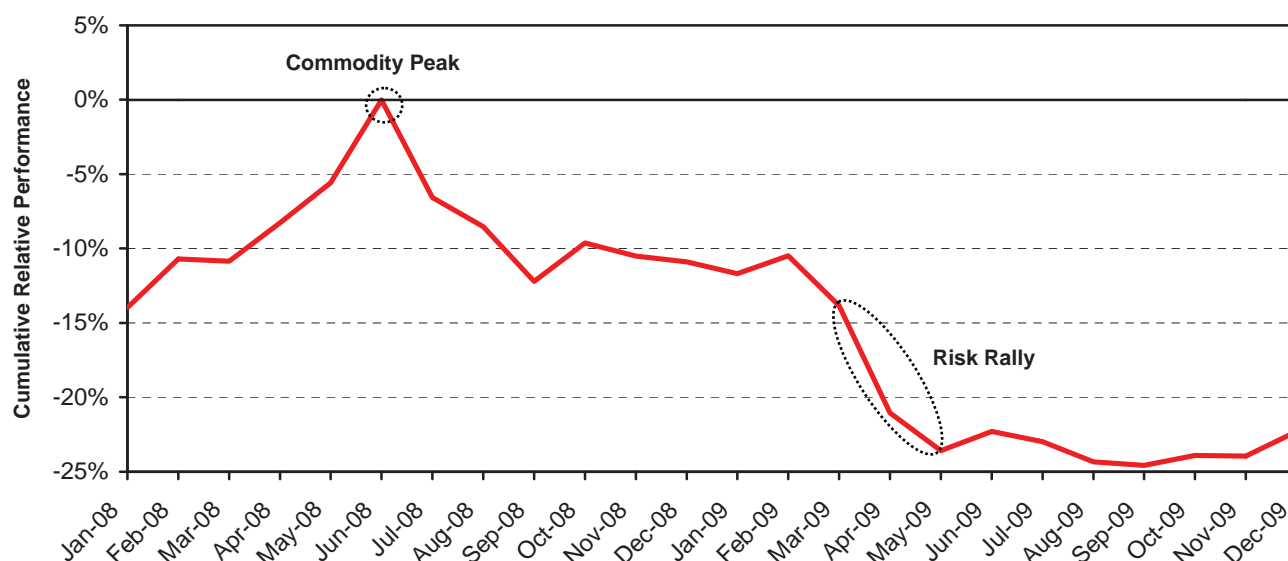
Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, CRSP, Compustat As of 12/31/09

Figure 5 zooms in on that window of recent momentum performance, indexed to 0% at the peak of relative wealth. In the course of roughly a year from the summer of 2008, simple momentum was battered and lost nearly a quarter of its value relative to the market. After the commodity peak, momentum limped through the collapse of Lehman Brothers in September 2008, and then was most severely damaged when there was a near complete reversal of market leadership at the market bottom with the rebound in riskier assets starting in March 2009.

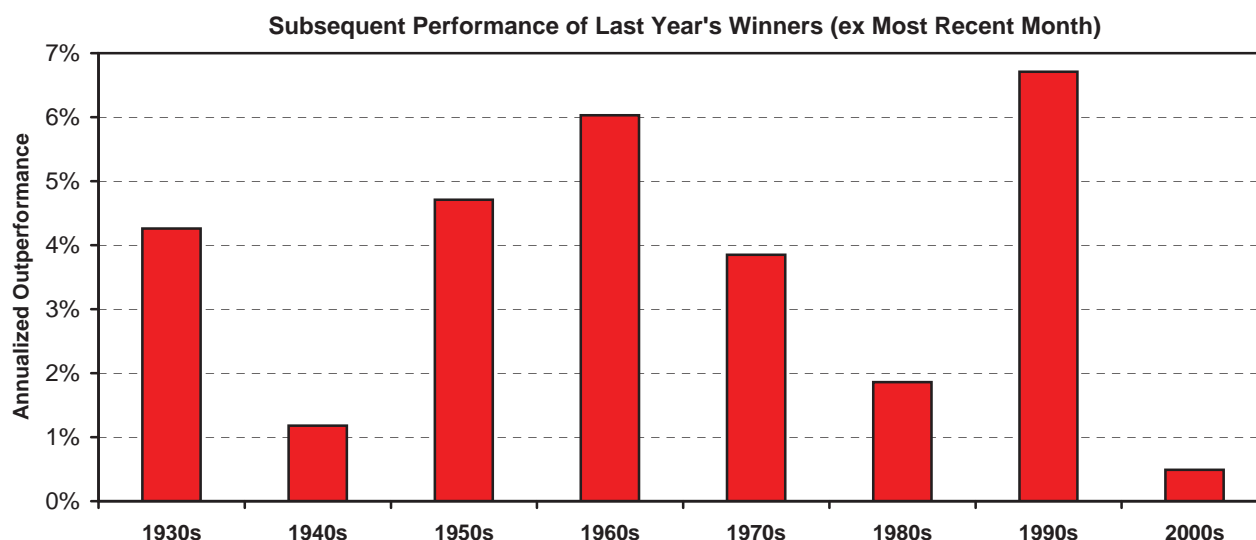
The effect of this turn in momentum's fortunes was to wipe out the gains the strategy had achieved over the decade of the 2000s. Breaking down the returns to simple momentum by calendar decade, Figure 6 shows that the 2000s closed as the worst period for momentum investing in our data history. One explanation is to write this off as an accident of timing given that the decade began and ended with extreme reversal events and the bursting of bubbles. But momentum is an approach with which many investors are uncomfortable, and has thus come under assault. The objections around momentum are reminiscent of the late 90s when value investing was dismissed as a relic from the past.

Figure 5
Since Mid-2008 Momentum Has Been Crushed



Source: GMO, CRSP, Compustat As of 12/31/09

Figure 6
The 00s Were the Weakest Decade for Momentum



Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, CRSP, Compustat As of 12/31/09

The main criticisms of momentum that we have heard are as follows:

- Because of the adoption of Regulation Fair Disclosure (Reg FD) in the U.S. in October 2000, companies no longer release information early to analysts, which is a key component to why there was historically a slow dissemination of information about changes in a company's fundamentals into the market.
- Because investors turn over their portfolios at a much higher rate than the historical norm, the speed at which information spreads across the market is much higher (or perhaps vice-versa). Thus the activity that occurred historically within 12 months is now compacted into a much-compressed window, and so if any momentum works it will have a much shorter time horizon.
- Perhaps momentum works in "normal" times, but given the market collapse, or the volatility of the market, or other indicators, investors should have known tactically either to de-emphasize momentum or to shorten its investment horizon at various points over the last year.
- There are too many "Quant" managers using too much leverage, and so the amount of investment dollars thrown at momentum strategies is too great for continued success.

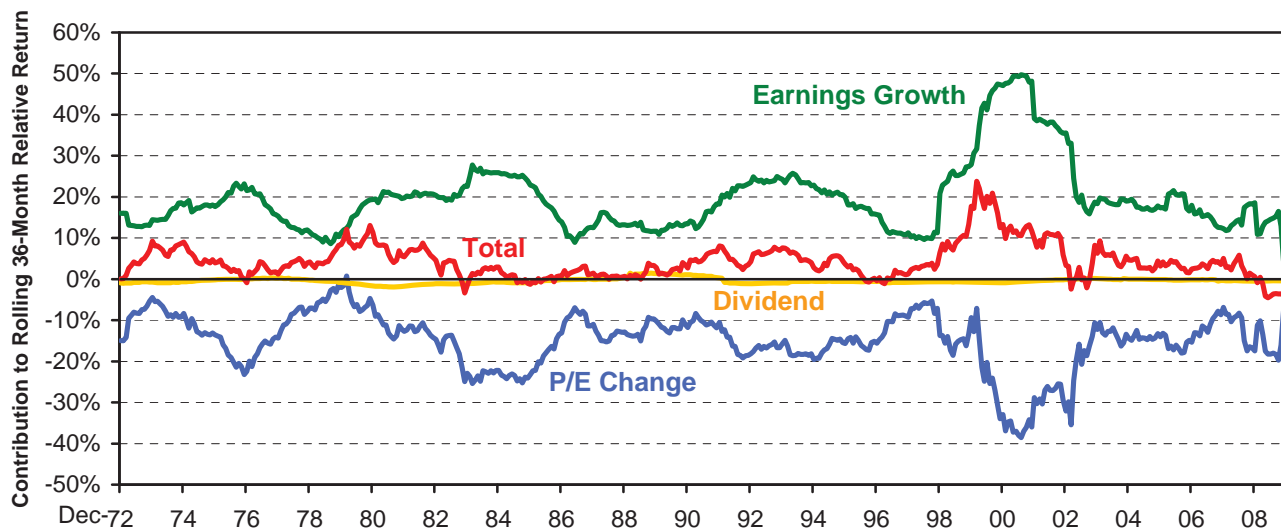
The remainder of this paper addresses these various points, starting with the concern about Reg FD. To understand

this criticism, it is important to realize how it is that momentum portfolios outperform. Figure 7 shows the rolling 36-month outperformance of simple momentum across time. When one buys a stock one can think of getting returns in three ways: to be paid a dividend, or to receive a capital gain either because earnings grow or because the price multiple (P/E ratio) assigned to those earnings expands. For momentum stocks in particular the cumulative return relative to the market is broken down in this figure. The salient point is that momentum stocks consistently outgrow the market by a significant amount.

Markets are actually somewhat efficient in this way, and so the price gain that momentum stocks have enjoyed to generate the momentum has driven them to almost the appropriate valuation premium. Specifically, most of that earnings growth is offset by subsequent contraction of the P/E ratio, so the stock price stays just slightly ahead of the market. Given that momentum stocks are almost by definition more expensive than the average, it is critical that they outgrow the market. The concern about Reg FD is effectively that momentum stocks will no longer deliver that growth. However the data does not bear that out. Momentum stocks have continued to outgrow the market by an amount close to their traditional 15% to 20% level.

Perhaps a more direct response to the Reg FD critique is the performance of momentum in non-U.S. equity markets. Reg FD is a U.S. regulation applying to U.S. companies.

Figure 7
Momentum Has Predicted Earnings Growth



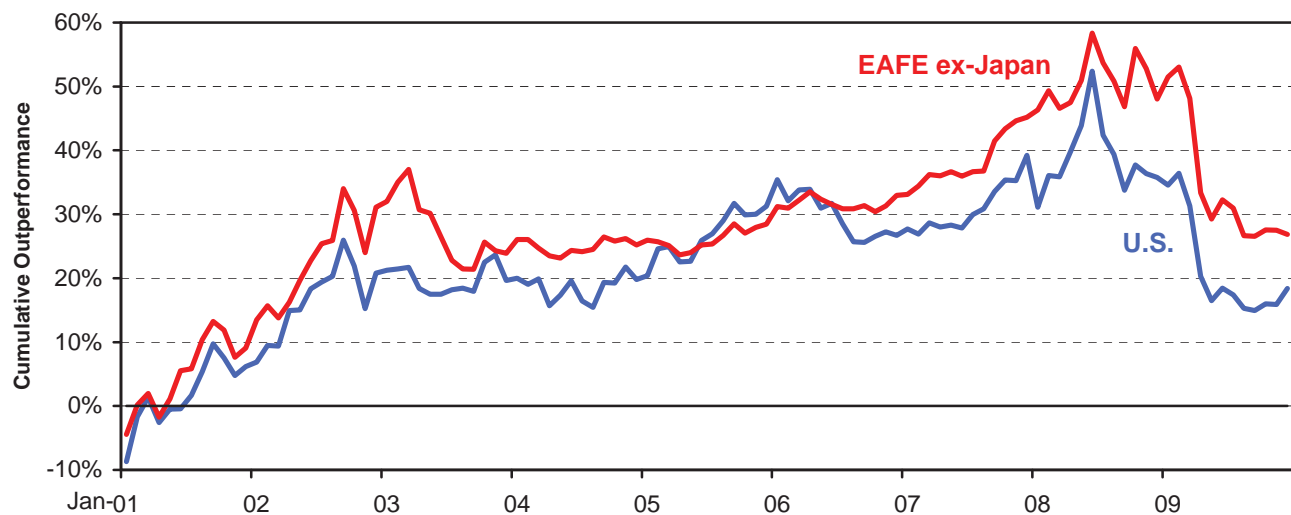
Source: GMO, Compustat As of 1/31/10

A quick glance at the performance lines in Figure 8 shows that the performance of momentum since 2001 is very similar in the U.S. and other developed international markets (omitting Japan). Given this similar effect, it does not appear to us that the forces in effect that have battered momentum are the creation of a U.S. regulator.

The second criticism of momentum is that a speed-up of equity market trading had likely changed how markets function. Indeed, as shown in Figure 9, the value of shares

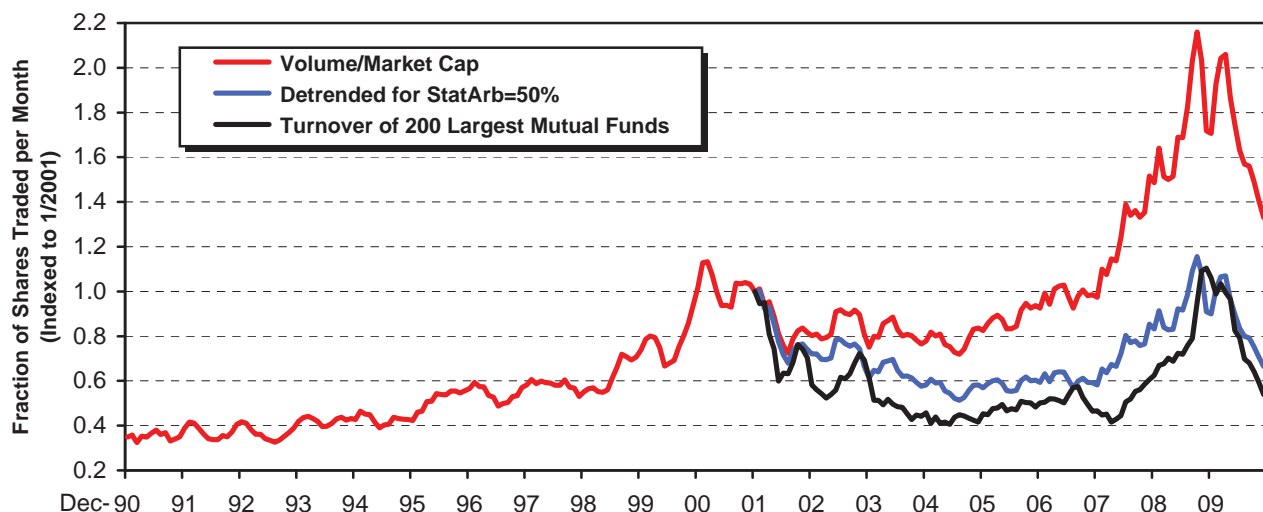
traded as a fraction of total market capitalization has increased significantly over the period in which momentum has failed. There is a difference between average and typical holding periods, however. And this volume data includes an increasing amount of short-term trading for, e.g., derivative hedging activities and high frequency statistical arbitrage strategies where positions are typically closed out within the day if not within seconds. Such short-horizon strategies have no obvious interaction with

Figure 8
Performance of Momentum post Reg FD



Source: GMO, Compustat, MSCI As of 12/31/09

Figure 9
Has Trading Gotten Faster?



Source: GMO, Compustat, Factset As of 12/31/09

longer-term price momentum. Estimates of statistical arbitrage volume are as high as 70% of trading. If we detrend the growth in volume for an estimated growth of up to 50% of market volume, the speeding up of “normal” trading is much less frightening. To get at that measure in another way, we studied 13-F filings from the 200 largest U.S. mutual funds and from these estimated the average turnover of those portfolios. Again, for these large institutional portfolios there is no clear trend toward persistent higher levels of trading.

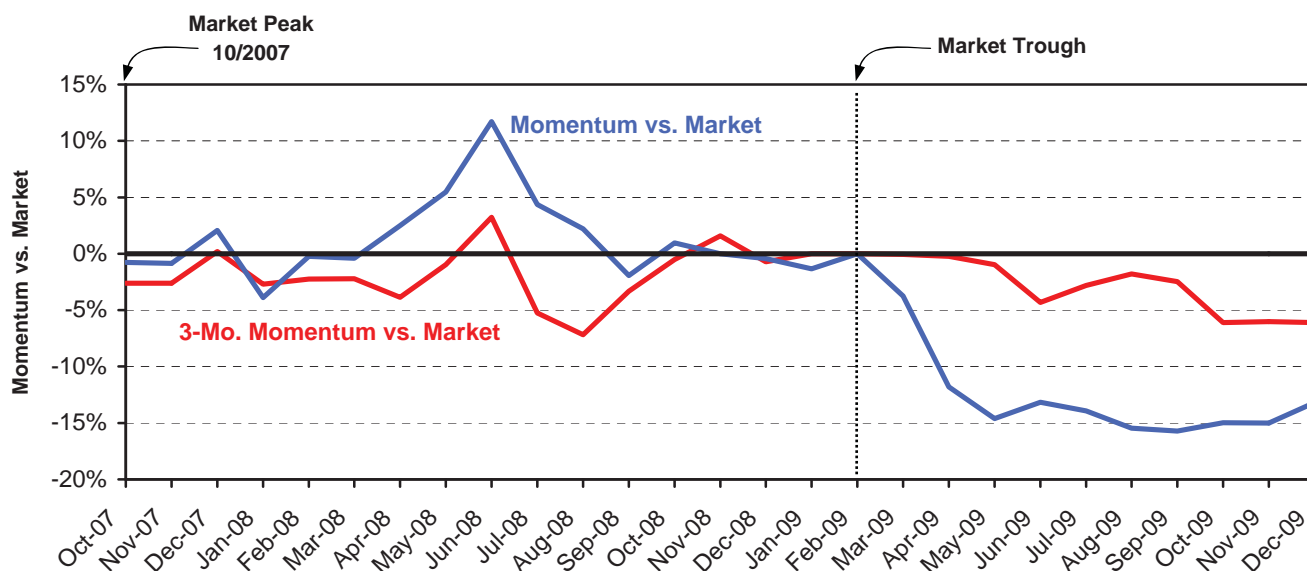
The notion that momentum should be implemented on a shorter time horizon has no doubt been boosted by the relatively smooth passage that shorter-term momentum strategies enjoyed through the recent turbulence. Figure 10 contrasts the performance of simple momentum (12-month return excluding the most recent month) with a momentum measure based on just 3 months of return. The relative returns are indexed to 0 at the market trough. The shorter-term version of momentum has not performed well historically (see Figure 1). But it held up impressively well by comparison as the market thrashed around over the past year.

Unfortunately, that relatively robust performance is unique to the 2009 bottom. Figure 11 shows the same return off of other historical bottoms following severe market declines. The shorter-term measure did not perform better off of the 2002, 1974, or 1932 bottoms. Figure 12 summarizes these results. It would require quite a leap of faith to conclude that a shorter-term momentum strategy is better than a longer-term measure.

It is apparent that both momentum portfolios suffered off of all these market bottoms. That is a somewhat unsurprising observation given that momentum is a trend following strategy, and market bottoms are by definition turning points. If it is clear that the market is at a bottom it seems unwise to pursue a momentum strategy. But an investor who can clearly see that the market is at a bottom today has little need to be bothered with esoteric second-order stock selection strategies in order to be successful!

Of course it is only clear that the market has bottomed after the fact. So the more relevant question for an investor hoping to identify an indicator applicable to timing momentum is whether the fact that there was recently a

Figure 10
Momentum Off the 2009 Bottom

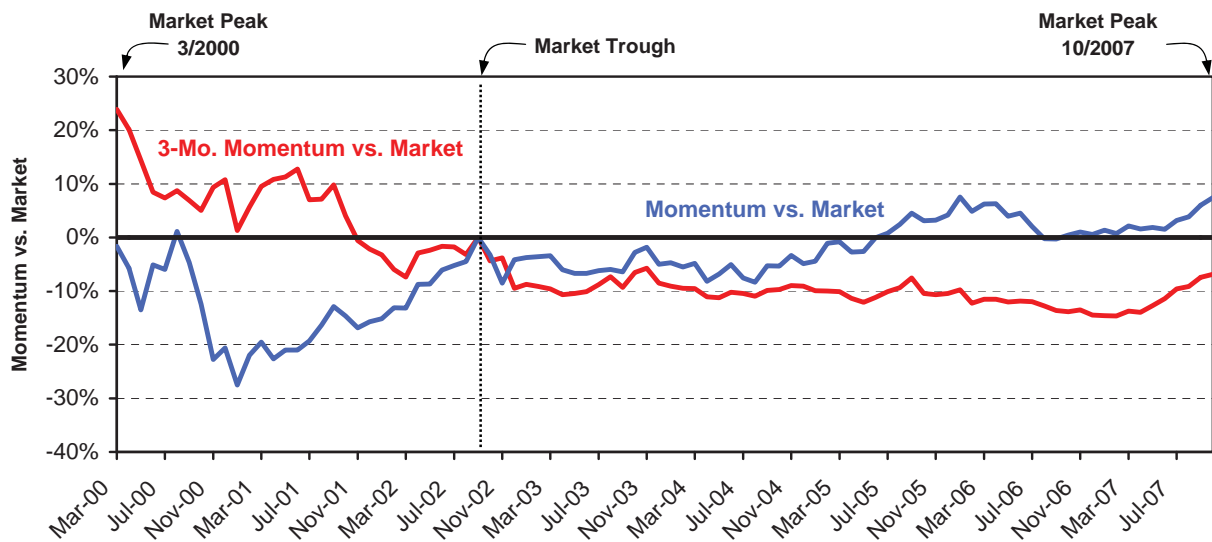


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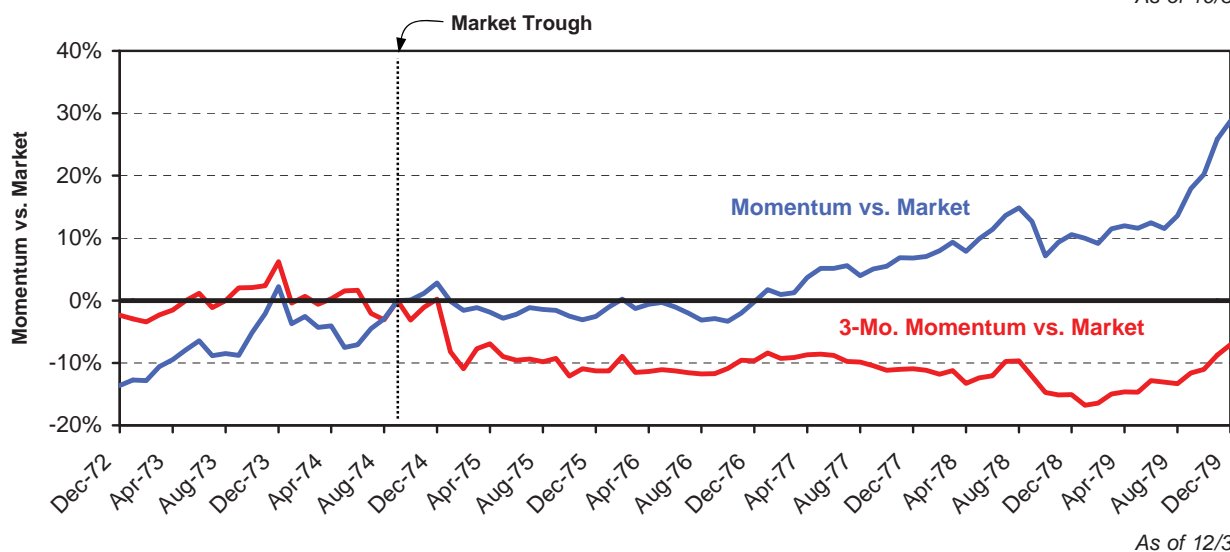
Source: GMO, CRSP, Compustat As of 12/31/09

Figure 11
Momentum Off Other Historical Bottoms

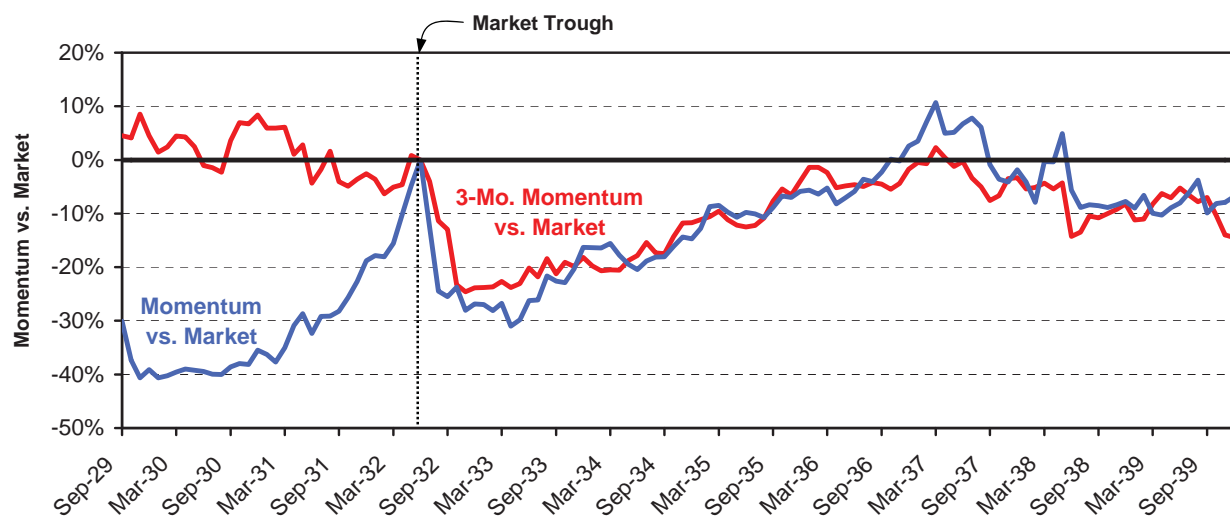
2002



1974



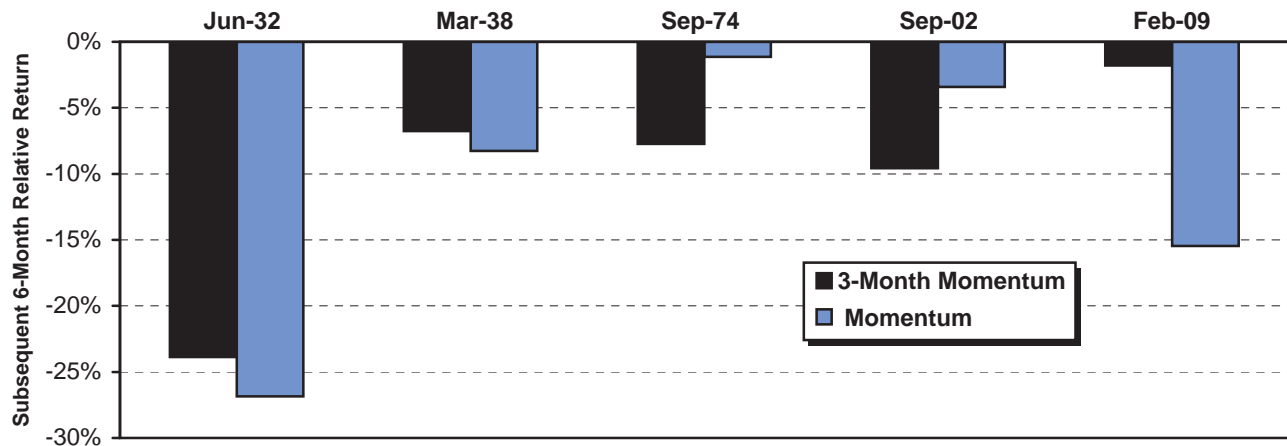
1932



Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, Compustat, MSCI

Figure 12
Performance of Momentum Off Market Bottoms

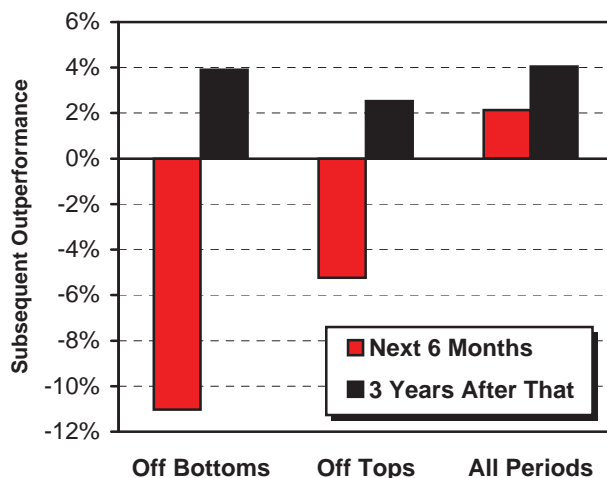


Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, CRSP, Compustat As of 8/31/09

market bottom is informative. Figure 13 shows two sets of returns. The first set is the relative performance of simple momentum for the 6 months following one of the major market bottoms (e.g., most recently March 2009-August 2009 and October 2002-March 2003), the 6 months following the intermediate market tops, and finally in other periods. This confirms the observation that momentum does badly at turns. But more relevant is the second set of bars showing how momentum fares in the subsequent three years (e.g., April 2003-March 2006). We choose a longer period with the idea that the question on the table is whether a strategic shift away from momentum is in order.

Figure 13
Momentum Does Poorly Off Turning Points



Source: GMO, Compustat, CRSP

There is no meaningful difference in the strategy's success following the identification of a bottom from the normal environment. This analysis can be viewed as revealing a glass either half full or half empty. The good news is that data suggests these turns don't "break" momentum. The bad news is that the strategy has just suffered a major drawdown (on average losing nearly 11% off the market bottom), and yet a patient investor does not get this return back. This is in marked contrast to value-based strategies where underperformance typically leads to an abnormally wide spread of valuations and a recovery of that loss as spreads revert to a normal level. The difference is that a momentum portfolio rotates its holdings more frequently, so the portfolio that subsequently wins doesn't include the abandoned losers. And their loss is a sunk cost. It doesn't mean an investor should abandon the strategy, but it requires a certain fortitude not to lose patience in a strategy that has disappointed without the promise of future outsized returns as consolation. And in an investing world where portfolios are typically managed by professionals with a keen sense of career risk, it is a real and significant drawback to lose with momentum and be left with relatively weak ammunition with which to exhort clients to stay the course in order to enjoy the potential opportunities.

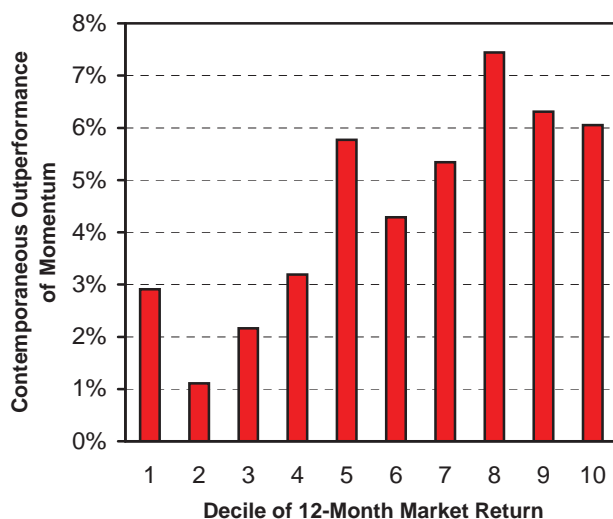
Returning to the issue of timing momentum, consider some of the folk wisdom on the utility of certain signals to time momentum. We have seen that major tops and bottoms in the market are not of much use as a forecasting tool. And other techniques also suffer the flaw of being coincident indicators for when momentum isn't working

without revealing much about whether momentum is going to work.

Figure 14 shows the return to the simple momentum strategy over 12-month periods broken out by the level of overall market return. So, for example, in the 10% worst rolling 12-month periods, momentum on average outperformed by a bit under 3%. There is perhaps some suggestion that momentum does better in stronger markets than weak markets, which would be intuitive given its success comes through above average growth. (Even that is a bit suspect as survivorship bias is a factor in our investment analyses taking place in a world in which bear markets tend not to last for many years in a row.) But this is a coincident indicator. Figure 15 shows the same breakdown of market returns, and then shows how momentum performs in the next 6 months. The level of market returns is not a useful forecasting indicator.

Japan is the one major market where price momentum has not been effective. During the long bear market, there have been many head fakes and rapid reversals that have led to the general failure of longer-term trend following strategies (and the success of mean reversion strategies). If one fears as some do that the U.S. equity market is heading the way of Japan, the implications are negative for momentum. But firstly that requires getting that macro forecast correct, and secondly there are other examples of decade-long dry spells for equity markets in

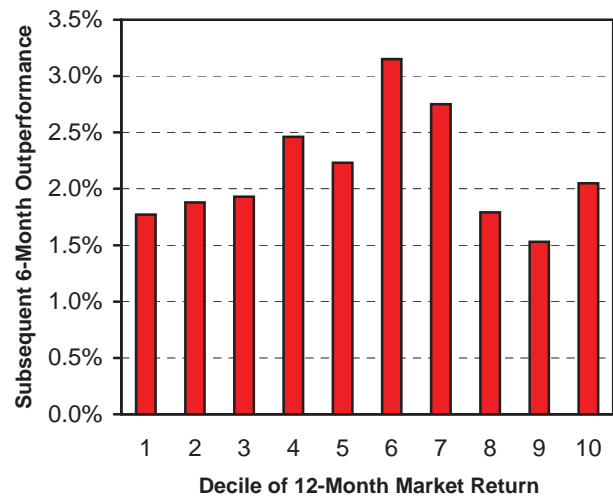
Figure 14
Bear Markets Are (Perhaps) Bad for Momentum



Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, Compustat, CRSP

Figure 15
Bear Markets Don't Have Much to Say About the Future of Momentum



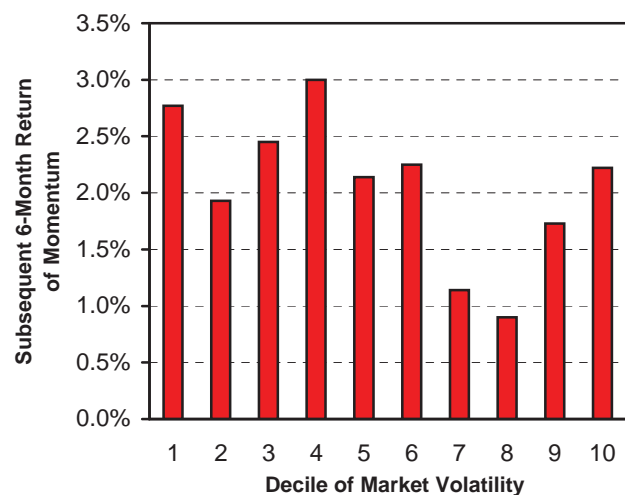
Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, Compustat, CRSP

which momentum did well (the 1930s and 1970s), so the resemblance to Japan would have to be quite precise.

Another class of indicator that has been put forward as relevant is the level or change in the level of volatility. Figure 16 shows the relationship between cross-sectional

Figure 16
Level of Trailing Volatility Is Not Compelling for Timing Momentum



Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, Compustat, CRSP

volatility in the market and future momentum returns (admittedly there are many ways of measuring volatility; the one used here is a 6-month average of the cross-sectional standard deviation of monthly returns). The connection is hardly convincing. Contemporaneously, volatility is bad for momentum, largely because volatility is associated with mean reversion and not trending. And if one can predict volatility or predict a bear market, that no doubt has power predicting whether momentum will succeed. But the ability to make those calls with some precision about the timing is a skill that allows one to profit in simpler ways.

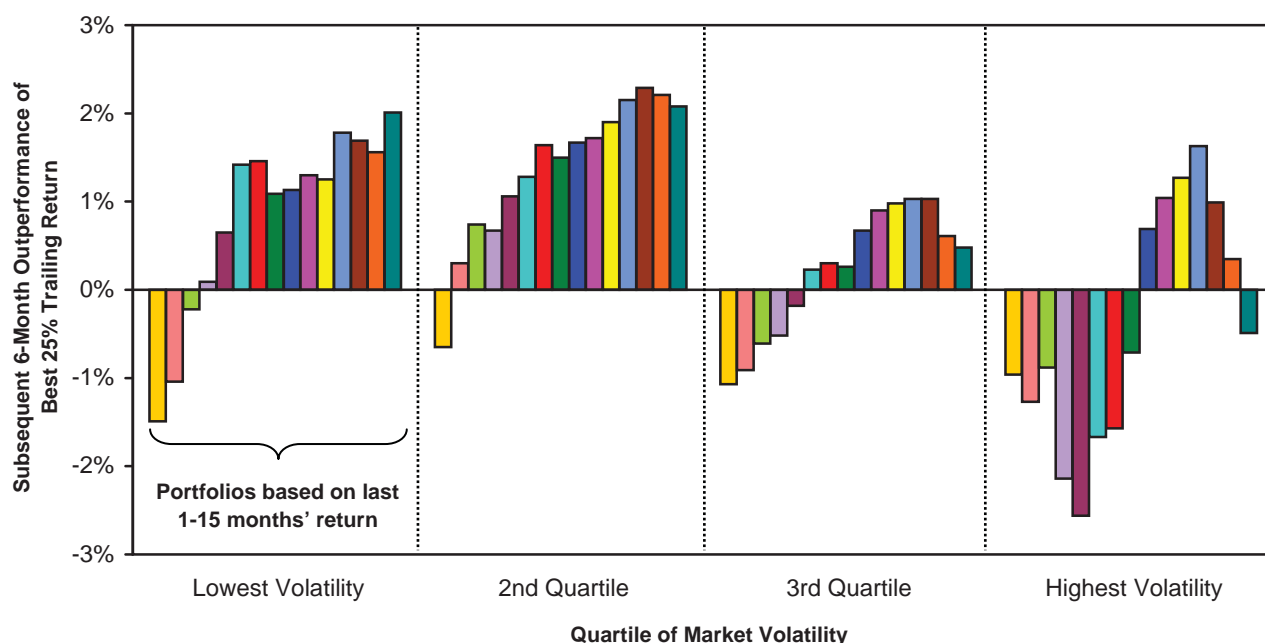
One final point on timing a momentum strategy is that some have claimed that investors should respond to higher volatility by shortening the horizon of momentum, presumably with the intuition that in a volatile environment things are happening more quickly and one needs to be nimble. In fact, the evidence does not suggest this. Figure 17 shows the return to trailing n-month return (here without skipping the most recent month) broken down by different levels of trailing market volatility. When volatility is high, there is more short-term reversal (and more mean reversion in the markets in general). The power of momentum still shines through the fog, but one needs to use a longer

version where the short-term thrashing around is less significant. Essentially, the problem with volatility is that the noise to signal ratio in returns is higher, so more data is needed to smooth that. If anything, one should lengthen a momentum signal.

So where does that leave us? The more technical explanations for momentum breaking from Reg FD and faster trading do not seem to withstand scrutiny. And in any case, momentum has worked fairly well over the last decade if one excludes the big events in 2000 and 2009.

The final criticism that momentum has become a crowded trade is one that we take more seriously. There is clearly some limit to how much money can be thrown at this strategy before momentum stocks become too expensive to justify their superior prospects (or where all the return chasers have exhausted their capital). The good news is that the returns to momentum over the last decade are wholly as might be expected given what happened with markets in general, and do not show a slow erosion. Even if that erosion were occurring, it has been at least temporarily arrested as quantitative managers have significantly reduced leverage and clients have reduced exposure to quantitative managers.

Figure 17
If Anything, You Should LENGTHEN the Signal



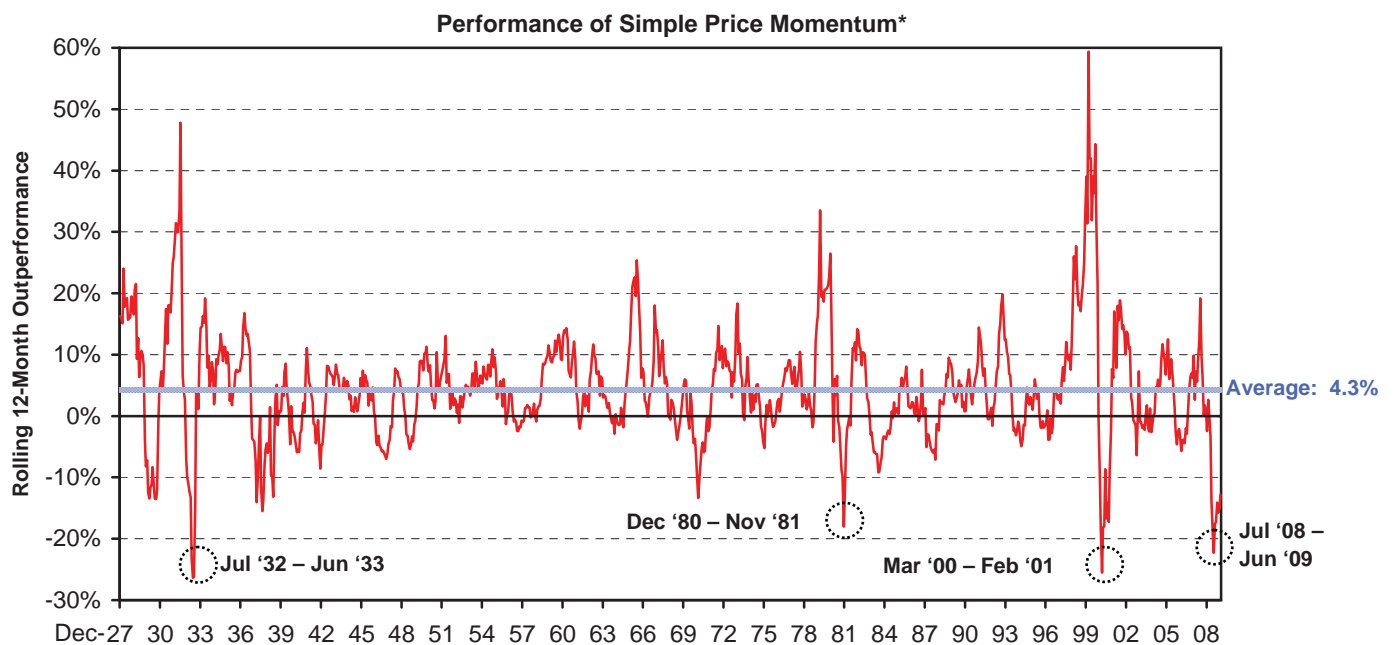
Note: Universe refers to the GMO U.S. large cap investment universe, currently comprised of the top 1,000 U.S. companies by market capitalization.

Source: GMO, Compustat, CRSP

While the capacity of momentum may be freeing up, the conclusion is that momentum is and always will be a very uncomfortable strategy to run. When it breaks, one is left without special hope of getting additional return, and one is forced to justify a strategy that on the surface of it sounds rather naïve. Figure 18 shows the rolling 12-month returns to the momentum portfolio over the longer term. While the average outperformance is significant, it comes at the cost of occasional large drawdowns that can be very injurious to a professional money manager. It is a painful way to lose. And fundamentally, it is the ability to bear that pain for which momentum investors are rewarded. GMO's approach to maximizing the benefits of momentum per unit pain (where we use it at all) is to keep momentum as a relatively small diversifying element for more fundamentally oriented strategies.

As somewhat scant evidence given the lack of data points, Figure 19 shows the longer-term returns to a momentum strategy following its wipe-outs. When momentum has failed the most and presumably fallen out of favor (or investors have shied away from managers with trend-following approaches) is when momentum has subsequently done the best. The number of events at the extremes is small, but the message is intuitive. While momentum involves buying stocks that are individually the most popular, the willingness to follow this strategy is becoming increasingly contrarian. And that we see as a necessary advantage for it to work.

Figure 18
A History of Consistent Outperformance, With Occasional Moments of Terror

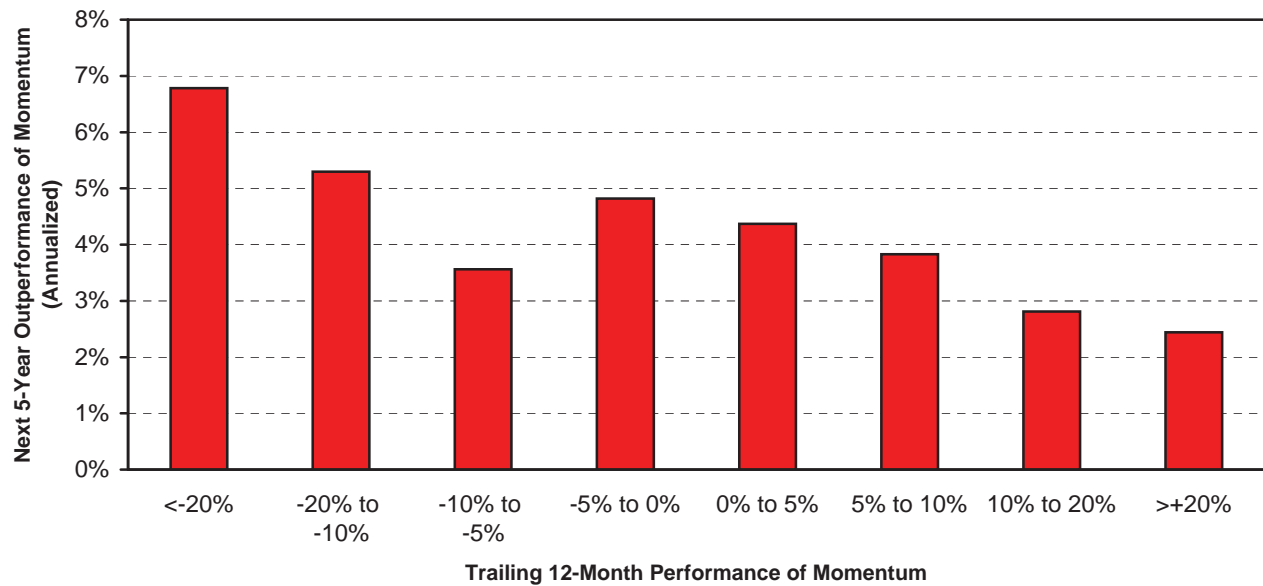


* Last year's 25% best performing stocks ex most recent month.

Source: GMO, Compustat, CRSP As of 12/31/09

Figure 19

Once Bitten, Twice Shy: Momentum Has Done the Best After Its Wipe-Outs



Source: GMO, Compustat, CRSP

Dr. Hancock is co-head of the GMO global quantitative equity team and lead manager for international quantitative portfolios.

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