# Survey Expectations of Returns and Asset Pricing Puzzles*

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Preliminary and incomplete: Comments welcome

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**Abstract**

Survey expectations of returns predict future returns negatively across countries and in three major asset classes: equities, currencies, and fixed income. The large negative returns from a cross-sectional portfolio strategy using survey expectations cannot be explained by standard factors such as carry, momentum, and value. Survey respondents expect negative returns on carry strategies, while they expect positive returns on momentum strategies which is consistent with models of extrapolative expectations. We find that the variation in discount rates related to survey expectations is highly correlated with the amount of excess volatility across equity markets.

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A large part of the empirical asset pricing literature is concerned with estimating cross-sectional and time-series variation in expected returns. The typical approach to estimate expected returns is to average historical returns or use predictive regressions, but this procedure tends to produce fairly noisy estimates. A natural alternative approach would be to use survey estimates of expected returns instead.

However, in recent work, Greenwood and Shleifer (2013) show that survey expectations negatively forecast future realized returns in the aggregate U.S. stock market.[2] We show that this phenomenon is much more pervasive by studying 13 equity markets, 19 currencies, and 10 fixed income markets. Our first main result is that survey expectations are, on average, negatively related to future returns in all three asset classes. A simple portfolio strategy that combines the three asset classes yields an annual Sharpe ratio of -0.78 for the sample from 1989 to 2012.

For the same cross section of countries, we also construct asset pricing factors based on carry, momentum, and value signals that have been shown to capture important variation in expected returns within and across global asset classes (Asness, Moskowitz, and Pedersen, 2013; Koijen, Pedersen, Moskowitz, and Vrugt, 2013). We find that these standard factors do not explain much of the variation of our survey-based investment strategies. Over our sample-period and across assets, the survey-based strategy performs somewhat worse than carry strategies but better than momentum and value strategies. Hence, we uncover a new dimension of expected returns in international asset markets beyond the traditional factors.[3]

Second, we combine the weights of carry and momentum strategies, which are both well-defined strategies across different asset classes, with the survey expectations of returns. This allows us to construct survey-based expectations of carry and momentum strategies. We find, in all three asset classes, that survey respondents would bet *against* carry strategies,

[2]For earlier work on survey-based expected returns and future realized returns, we refer to Vissing-Jørgensen (2004) and Brown and Cliff (2005). Adam, Beutel, and Marcet (2014) also show that U.S. equity valuation levels comove postively with survey-implied return expectations. Campbell and Diebold (2009) and Lemmon and Portniaguina (2006) find that survey-based expectations of business conditions and consumer confidence forecast U.S. equity returns.

[3]Survey-based expectations have been studied in various asset classes. Pennacchi (1991); Ang, Bekaert, and Wei (2007); Wright (2011); Chernov and Mueller (2012); Piazzesi and Schneider (2013); Cieslak and Povala (2014) study the link between survey expectations of inflation and the term structure of interest rates. Beber, Breedon, and Buraschi (2010) study survey-based exchange rate expectations and currency risk premia, and Case, Shiller, and Thompson (2012) use survey expectations and link it to house price expectations. Nagel (2012) links micro-survey data on inflation, equity return, and house price expectations to macro experiences of survey participants whereas Malmendier and Nagel (2011, 2014) link stock returns, risk-taking, and inflation expectations to macroeconomic experiences of survey participants.

despite high positive returns on average. For equities, survey-implied expected returns turn particularly negative during economic downturns. However, survey respondents do expect to earn positive returns on momentum strategies, consistent with the idea that expectations are driven in part by extrapolating past realized returns (Barberis, Greenwood, Jin, and Shleifer, 2014).

Third, since the seminal work by Shiller (1981) and Campbell and Shiller (1987), it is well understood that excess volatility in stock markets corresponds to variation in discount rates. Although most of the work on excess volatility focuses on the aggregate U.S. equity market, the amount of excess volatility varies greatly across equity markets. For instance, a simple measure of excess volatility, namely the standard deviation of returns relative to the standard deviation of dividend growth, is around two in the United States, but closer to one in Switzerland. The most excessively volatile country in our sample is Hong Kong, where this ratio equals three.

If survey expectations are correlated with an important part of discount rate variation, then the cross-country variation in excess volatility should be correlated with the variation in discount rates related to survey expectations. We indeed find a strong link between excess volatility and the discount rate variation related to surveys.

Our fourth set of results relates to the determinants of survey expectations. We find that survey expectations are significantly related to lagged returns, which is consistent with recently-proposed models of extrapolative expectations (Barberis, Greenwood, Jin, and Shleifer, 2014). Survey expectations of returns are also significantly related to surveys expectations of fundamentals, measures of the global business cycle, and the VIX. However, a non-trivial part of the variation in survey expectations is left unexplained by these variables, and this residual component does help to predict future returns.[4]

The results that we document in this paper are consistent with at least two interpretations. One view is that a non-trivial group of investors holds the beliefs as reported in surveys, which will then be reflected in asset prices if other, more rational, agents have limited risk bearing capacity (Barberis, Greenwood, Jin, and Shleifer, 2014). Alternatively, survey participants

[4] Amronin and Sharpe (2013) also find that survey-based expected returns are consistent with extrapolative expectations for the U.S. equity market, Frankel and Froot (1987) for currency forecasts, and Piazzesi and Schneider (2009) document price extrapolation in the housing market. Bacchetta, Mertens, and van Wincoop (2009) study expectations in equities, foreign exchange, and fixed income markets and find a link between standard return predictors (such as dividend yields, currency carry, and bond yield spreads) and survey-based expectational errors in each asset class.

misinterpret or misunderstand the survey questions and instead report demand functions for risky assets, which entangles return expectations, risk, and risk preferences, instead of expected returns directly.

For policy and welfare questions that one would like to ultimately answer with macro-finance models, it matters which interpretation is the right one. However, it is generally hard, if not impossible, to separate risk preferences from beliefs. Even direct information on expected returns and portfolio holdings (Vissing-Jørgensen, 2004) or fund flows (Greenwood and Shleifer, 2013) can be consistent with both interpretations, but these additional facts are useful to show that actions and survey expectations are related to each other.

Despite the ambiguity about the precise interpretation of survey expectations, we show at the very least that survey expectations are useful state variables that capture an important component of expected returns in a large cross section of assets.

# 1. Data and Portfolio Construction

## 1.1. Asset Returns and Fundamentals

Our international return data for equities, currencies, and fixed income are the same as in Koijen, Pedersen, Moskowitz, and Vrugt (2013) who provide further details on the data construction. We use futures returns for equities and fixed income, and forward returns for currencies. All returns are excess returns and expressed in US dollars.

We use equity index returns from 13 countries, which are the United States (S&P 500), Canada (S&P TSE 60), the United Kingdom (FTSE 100), France (CAC), Germany (DAX), Spain (IBEX), Italy (FTSE MIB), The Netherlands (AEX), Sweden (OMX), Switzerland (SMI), Japan (Nikkei), Hong Kong (Hang Seng), and Australia (S&P ASX 200).

We consider the returns on 19 currencies, which are all measured against the US dollar and include Australia, Austria, Belgium, Canada, Denmark, Euro, France, Germany, Ireland, Italy, Japan, The Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. Countries that joined the EMU are eliminated after the introduction of the Euro.

Fixed income returns are based on 10-year bonds and computed using synthetic futures for 10 countries, which are Australia, Canada, Germany, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

To compute our measures of excess volatility, we require dividends, which we obtain from Bloomberg based on MSCI country indices. Business cycle indicators are from the Economic Cycle Research Institute (ECRI), who try to mimic the NBER methodology to construct business cycle indicators for a large cross section of countries. Appendix A describes the data sources that we use in detail.

Table 1 reports the annualized means and standard deviations (in parentheses) of returns. The first column describes the start of the sample for each contract, which is when both survey and returns data are available. Sample periods for a given country and asset are largely dictated by data availability of the surveys whereas the cross-sectional coverage of countries within each asset class is largely dictated by the availability of returns. All equity and fixed-income surveys start in the second quarter of 1998, whereas all currency surveys start in the first quarter of 1989. If a later start date is indicated in Table 1 then this means that returns become available later.

### 1.2. Survey Expectations of Returns

Our data on return expectations come from the "World Economic Survey" (WES), run by the IFO Institute, Paris Chamber of Commerce, and the EU Commission. The survey is conducted in the same way in all countries, providing comparable survey expectations across countries. Survey expectations are available for a number of different series, among them return expectations and macro-economic fundamentals. We collect survey data from Datastream for all countries with available return data that we list above.[5]

The survey is run once per quarter (in the first month of the quarter) and asks experts in various countries for their near-term expectations (the next six months). The respondents in the survey are domiciled in the country for which they complete the survey. This is different from some other surveys where respondents from one country are asked for their expectation about different countries.

The WES panel contains economic experts with a range of specializations in management,

[5]Datastream mnemonics for these survey time series are detailed in the appendix.

finance, and other business functions.[6] About 65 percent of the WES panelists work for international corporations - non-financial companies (ca. 45%), banks (ca. 15%) and insurance (ca. 5%). Some work in economic research institutes (ca. 10%) and chambers of commerce (ca. 10%), consulates and embassies (ca. 5%). The remaining 10% are affiliated with international organizations (OECD, IMF, Asian Development Bank et cetera), foundations, media and press or small-scale enterprises.

Although the panel members are heterogeneous with respect to their professional affiliation, all respondents are in a leading position or work in an economic research department within their institution.

For each quarterly survey, the WES receives in total about 1,100 questionnaires from 121 countries, which makes for an average of 9 questionnaires for each country. However, the number of respondents is related to the size of a country. For example for Germany, France, United Kingdom, Italy and Spain, there are between 20 and 50 experts per country. In contrast, for Luxembourg and Cyprus (which are not in our sample, though), the WES receives only about 3 answers. Since 2002, the number of respondents remains stable at over 1,000 questionnaires. For more information about the survey, we refer to Stangl (2007).

The survey is qualitative in nature and respondents can answer either "higher," "about the same" or "lower." These answers are then coded as 1 (lower), 5 (about the same) or 9 (higher), respectively. The published score for each quarter is the average of all respondents' individual answers and hence ranges between 1 and 9.

In our empirical analysis below, we make use of survey scores for equities, currencies, interest rates, and the economic situation to which we will refer in the empirical sections as "growth." The survey asks respondents:

1. "The level of domestic share prices (in domestic currency) by the end of the next 6 months will be" — "higher", "about the same", "lower"
2. "The value of the US$ in relation to this country's currency by the end of the next 6 months will be" — "higher", "about the same", "lower"
3. "Expected interest rates by the end of the next 6 months – long-term rates (government bonds with 10 and more years of maturity)" — "higher", "about the same", "lower"

[6] We thank Johanna Plenk for providing detailed information about the survey respondents.

4. "The country's general situation regarding overall economy – from now on: expected situation by the end of the next 6 months" — "better", "about the same", "worse"

We use the first question to measure expectations about equity returns, the second question to measures exchange rate returns, the third item for fixed-income returns, and the last item to measure growth expectations.

For currencies, respondents issue expectations for the price of USD in foreign currency (FC), so we invert the survey scores to make them correspond to a USD/FC forecast, i.e. higher survey scores imply a positive return on holding foreign currency. For interest rate forecasts, we also invert the survey score so that a higher value indicates declining interest rates and, thus, higher bond returns.

Table 1 provides descriptive statistics for survey scores across countries. The third column reports the average survey scores and standard deviations (in parentheses) for all three asset classes and countries. As can be seen, all equity scores exceed five on average, whereas fixed-income scores are below five on average. This means that survey participants expected positive equity returns and rising interest rates, on average, during our sample periods. For currencies, there is no similarly uniform pattern, pointing to the fact that respondents expect some currencies to appreciate and some to depreciate relative to the US dollar.[7]

### 1.3. Carry, Momentum, and Value Signals

In our analysis below, we compare the returns to survey-based strategies to other strategies that produce positive returns for the same cross-section of countries such as carry, momentum, and value strategies. We briefly explain the computation of carry, momentum, and value signals below.

We follow Koijen, Pedersen, Moskowitz, and Vrugt (2013) and compute the carry of each asset's carry from futures ($F$) and spot ($P$) prices. They define the carry as the return an investor would earn if market conditions stay constant. In case of future, this definition

[7] We provide summary statistics of survey scores in Tables IA.1 and IA.2. Table IA.1 reports unconditional frequencies with which survey scores $s$ fall in the interval $1 \leq s < 2$, $2 \leq s < 3$, ..., $8 \leq s \leq 9$. Table IA.2 shows transition probabilities for these intervals.

implies as a measure of carry ($C_t$)

$$C_t \equiv \frac{P_t - F_t}{F_t}. \tag{1}$$

Koijen, Pedersen, Moskowitz, and Vrugt (2013) provide further details how to interpolate the futures curve to obtain a consistent carry measure over time and across countries.

The momentum signal is defined as the sum of lagged 12-month returns. The momentum signal, like the carry signal, is easy to apply in a consistent way across asset classes.

Value is typically defined as a measure of the fundamental value relative to the price, which requires assumptions about how to measure the fundamental value across asset classes. We follow Asness, Moskowitz, and Pedersen (2013) for the implementation of value strategies. The value signal for equities is the book-to-market ratio of each index. For currencies, the value signal is computed as the negative of the 5-year change in the real exchange rate (5-year change in the spot return minus 5-year U.S. inflation plus 5-year inflation of the foreign country). The value signal for fixed income is given by the 5-year change in bond yields. Details on the data used for computing these signals can be found in Appendix A.

### 1.4. Portfolio Construction

We build cross-sectional and time-series investment strategies to study the link between survey expectations of returns and future realized returns. For the cross-sectional strategies, we use weights $w_{i,t}^{XS}(k)$ for country $i$ in month $t$ that are linear in the cross-sectional rank of the survey expectations:

$$w_{i,t}^{XS}(k) = c_t \left( \text{rank}(x_{i,t-k+1}) - N_t^{-1} \sum_{i=1}^{N_t} \text{rank}(x_{i,t-k+1}) \right), \tag{2}$$

where $N_t$ is the total number of countries with available data in month $t$, $x_{t-k+1}$ is the investment signal in month $t-k+1$, $k$ is an implementation lag ($k = 1, 2, \ldots, 12$). $c_t$ is a scalar that we use to scale positions so that the portfolio invests both one dollar short and one dollar long. In some of our analyses below, we use a quarterly frequency and denote the time index in these analyses as $q$ and the implementation lag as $l$ to avoid confusion. Rank

weights in quarter $q$ are then given by

$$w_{i,q}^{XS}(l) = c_q \left( \text{rank}(x_{i,q-l+1}) - N_q^{-1} \sum_{i=1}^{N_q} \text{rank}(x_{i,q-l+1}) \right).$$

A cross-sectional investment strategy exploits relative differences in signals *across* countries at a given point in time and is, importantly, always long and short the same dollar amount, even if, for example, surveys are optimistic about all countries at a particular point in time. For currency portfolios, this also means that the rank portfolio is neutral relative to the U.S. dollar.

We consider a second investment strategy that exploits the time-series of signals as in Moskowitz, Ooi, and Pedersen (2012) and Koijen, Pedersen, Moskowitz, and Vrugt (2013). In this case, we go a dollar long or short in country $i$ in month $t$ when the signal is above or below a certain threshold, respectively. For survey strategies, this threshold is equal to five, which leads to the following portfolio weights for the time-series strategies

$$w_{i,t}^{TS}(k) = N_t^{-1} \left( I\left\{S_{i,t-k+1} > 5\right\} - I\left\{S_{i,t-k+1} \leq 5\right\} \right), \tag{3}$$

where $S_{i,t}$ denotes the survey score at time $t$ for country $i$.

In contrast to the cross-sectional investment strategy, a time-series strategy exploits variation in survey scores *within* countries. Moreover, the time-series portfolio does not mechanically take long and short positions that net out, but can take long (or short) positions in all assets at the same time. We refer to this strategy as a time-series or timing portfolio below.

To understand whether the survey-based investment strategies differ from well-known investment strategies such as carry, momentum, and value, we construct cross-sectional and time-series strategies based on carry, momentum, and value signals analogously to the survey-based strategies. For carry and momentum timing strategies, we use zero as the threshold and for value we use the recursive mean of the signal as the threshold.

# 2. Surveys and Asset Returns

We study in this section the link between survey-based measures of expected returns and future realized returns.

## 2.1. Panel Regressions

As a starting point to analyze the link between survey-based expected returns and realized returns, we consider panel regressions of the form:

$$R_{i,q+1} - R_{M,q+1} = \alpha + \beta_1 S_{i,q} + \beta_2 w_{i,q}^{XS}(1) + \varepsilon_{i,q+1} \tag{4}$$

where $R_{i,q+1}$ denotes the quarterly return of country $i$ in quarter $q+1$ and $R_{M,q+1}$ denotes the average return of all countries within each asset class during the same quarter, to which we will refer as the market return. We estimate the regression at a quarterly frequency to match the frequency at which the surveys are available. Following the same logic, we use the cross-sectional signal with a 1-quarter lag so that the moment of the surveys do not coincide with the period over which the returns are recorded. We subtract the market return, $R_{M,q+1}$, to remove aggregate fluctuations that are not predicted by the country-specific survey expectations, which improves the power of our tests. We estimate this panel on a quarterly frequency and for the full sample period of each asset class. Standard errors are clustered by time.

Table 2 reports estimation results. The first three columns report the estimates of the panel model in (4), while the last three columns only use the cross-sectional weight to predict future returns (that is, $\beta_1 = 0$).

We find that all the point estimates are negative and all the coefficients on the cross-sectional weights are significant at the 5%- or 10%-significance level. The coefficients are economically large. For instance, using the estimates in the last three columns, the standard deviation of $w_{i,q}^{XS}(1)$ is 0.2 for equities and currencies and 0.24 for fixed income, while the range of the cross-sectional weights is equal to 0.88 (from -0.44 to +0.44). Hence, a one standard deviation increase in $w_{i,q}^{XS}(1)$ leads to a 0.68% change in quarterly expected returns for equities. For currencies and fixed income, the same experiment leads to a 0.34% and 0.25% change in quarterly expected returns.

### 2.2. Survey Portfolios

Next, we form cross-sectional and timing strategies based on survey expectations of returns. We start with cross-sectional strategies based on rank weights defined in Equation (2) above. We work on a monthly frequency and lag the survey score for $k = 1, 2, ..., 12$ months, implying that the portfolio weights in period $t$ are based on survey scores in month $t + 1 - k$.

Implementation lags are worth exploring for various reasons. First, survey scores are not published immediately in the first month of the quarter in which respondents express their views, but typically with a one month lag and occasionally even with a lag of two months, so that an investable strategy would correspond to $k = 3$. The results for $k = 1$ are of independent interest, even if investors cannot build trading strategies based on this information, as these are the most recent survey expectations.

Second, as the survey is run at a quarterly frequency, $k = 3$ corresponds to a quarterly strategy where portfolios in one quarter are based on survey scores from the previous quarter and thus represents a natural benchmark. Third, we also report results for lags of $k > 3$ because findings from the earlier literature suggest that it might take time for surveys to forecast returns (Brown and Cliff, 2005; Greenwood and Shleifer, 2013).

Table 3 reports average annualized excess returns ("mean"), volatilities ("std"), and Sharpe Ratios ("SR") of portfolios formed on surveys in international equity markets, currencies, and fixed income. Numbers in squared brackets are $t$-statistics of the mean returns using Newey and West (1987) standard errors. Panel A reports the results for cross-sectional strategies and Panel B for time-series strategies.

In each panel, we also report results for a strategy that combines the equities, currencies, and fixed income portfolios, to which we refer as the Cross-Sectional Survey Factor and the Time-Series Survey Factor, respectively. To form this factor, we weigh the returns of the three asset classes with the inverse of their volatility. We then scale the portfolio have an annual volatility of 10%.

If we first focus on Panel A, then we find that the Sharpe ratios are all negative for up to $k = 8$ lags. At a 3-month lag, i.e. the quarterly benchmark strategy, the Sharpe ratios are lowest. For equities, the Sharpe ratio equals -0.67, for currencies it -0.52, and -0.48 for fixed income. All the mean returns are significantly different from zero.

If we combine the three strategies into a cross-sectional survey factor, then this strategy has a Sharpe ratio of -0.72 p.a. The mean return equals -7.2% p.a. with a $t$-statistic of -3.48. Over the same sample period, the Sharpe ratio of the US stock market equals on 0.12 (Table 1), which illustrates the sizable Sharpe ratio of the Global Survey Factor.

Turning to Panel B, we find that most Sharpe ratios are again negative at a 3-month lag. However, the Sharpe ratio for equities equals only -0.04, while it equals -0.53 for currencies, and -1.10 for fixed income. We show below that the Sharpe ratio of equities can be explained by a large market exposure, which implies that the information ratio (in particular for equities) is much lower than the Sharpe ratio. Combining all three strategies into a time-series survey factor, we find a Sharpe Ratio of -0.67 which is only slightly below the cross-sectional survey factor in Panel A.

Finally, if we combine all six strategies into one Global Survey Factor (Panel C) using the same weighting procedure as above, the Sharpe ratio at a 3-month lag equals -0.78, which exceeds the Sharpe Ratio of both the cross-sectional and the time-series survey factor.

In sum, we find strong evidence that survey expectations negatively forecast future returns in all asset classes, both in the time series and in the cross section, and across various implementation lags.

### 2.3. Return contributions

To illustrate that the returns on the portfolio strategy are not driven by a single country, Table 4 reports the contribution of individual countries to the average portfolio excess return for our benchmark strategy with an implementation lag of $k = 3$ months (see Panel A of Table 3) and which corresponds to a quarterly forecast horizon in calendar time (which is equivalent to $k = 3$ months).

We compute the return contribution for country $i$, $RC_i$, as

$$RC_i = \frac{1}{T} \sum_{t=2}^{T_i} w_{i,t-1}^{XS}(3) R_{i,t},$$

where $T_i$ denotes the number of months with available data for country $i$, $T = \max_i T_i$. If we aggregate the return contributions across countries, we obtain the average excess return

on the strategy that we report in Table 3.

We find that the average returns are negative for 10 out of 13 countries for equities, for 13 out of 19 currencies, and for 7 out of 10 countries for fixed income. Hence, most countries contribute negatively to the average strategy return in all three asset classes, which implies that our results are not driven by a single country.

### 2.4. Correlations and Exposure to Carry, Momentum, and Value

First, we study the correlation properties of the strategy returns. Table 5 reports correlations between returns to survey portfolios for cross-sectional and time-series strategies in all three asset classes.

We find that the correlations across asset classes are typically low and often slightly negative. For a given asset class, however, the correlations between cross-sectional and time-series strategies are all positive and range from 35% for fixed income to 53% for currencies. Taken together, these results suggest substantial diversification benefits by combining various strategies, in particular across asset classes.

Next, a natural explanation of our results in Table 3 is that survey-based return strategies correlate with other well-known asset pricing factors and thus do not offer independent information about future asset returns. For example, Greenwood and Shleifer (2013) show that U.S. equity surveys are driven by lagged returns, so our survey-based strategies may well be similar to a momentum strategy and do not offer any positive returns beyond standard factors.

To examine how survey strategies are linked to other factors, we form portfolios based on carry, momentum, and value, as well as passive long benchmarks (that is, an equally-weighted portfolio of all countries within an asset class) using the same portfolio construction techniques as for our survey-based strategies.[8]

Figure 1 plots cumulative returns to a Global Survey Factor (GSF), Global Carry Factor (GCF), Global Momentum Factor (GMF), and Global Value Factor (GVF), which are based on combining cross-sectional and time-series portfolios for each of the three asset classes into

[8]We report average returns, standard deviations, and Sharpe ratios for carry, momentum, and value portfolios in Tables IA.4 – IA.5 in the appendix.

a single factor. As before, we form these combined portfolios by weighting returns of cross-sectional and time-series strategies by the inverse of their standard deviation, and then scale positions to ensure that the strategy has a volatility of 10% to ensure comparability across assets.

We use the benchmark lag of $k = 3$ months for survey strategies to ensure that the strategy uses information that is surely available to investors and a lag of $k = 1$ month for carry, momentum, and value. The choice of lags is driven by the quarterly data frequency of survey signals and the monthly data frequency of carry, momentum, and value, respectively. The red dashed line in all four panels corresponds to the cumulative return of the passive long benchmark.

Figure 1 shows that the cumulative returns of the survey strategy are strongly negative and (in absolute value) higher than momentum and value over our sample period. The performance is somewhat weaker than the global carry strategy.

For a visual comparison of the Sharpe Ratios and the impact of lagging signals, Figure 2 plots annualized Sharpe ratios of the GSF, GCF, GMF, and GVF for different lags as in Table 3. For carry and momentum, the Sharpe ratios decay from 1.1 and 0.5 at $k = 1$ to 0.7 and 0.1 at $k = 12$. The survey-based strategy starts at -0.5, then declines to -0.8 at $k = 3$, before gradually increasing to -0.5 at $k = 12$. The value strategy is rather stable at a Sharpe ratio between 0.15 and 0.4. Hence, survey-based strategies perform somewhat weaker than carry strategies but perform better than value or momentum strategies over our sample period in terms of their Sharpe ratios.

To compare the strategies more formally, we consider factor regressions of the form

$$xr^S_{t+1} = \alpha + \beta^P xr^P_{t+1} + \beta^C xr^C_{t+1} + \beta^M xr^M_{t+1} + \beta^V xr^V_{t+1} + e_{t+1},$$

where $xr$ denote excess returns and $S, P, C, M$, and $V$ denote surveys, passive long benchmarks, carry, momentum, and value, respectively. We use returns to cross-sectional carry, momentum, and value strategies for the cross-sectional survey portfolios and we follow the same approach for the time-series strategies.

Table 6 reports the exposures of survey strategies to these four factors as well as the alphas and the information ratios ("IR"), which is the ratio of the alpha to the residual standard deviation. We also report results for regressions of the global survey factor on the global

passive long benchmark, the global carry factor, the global momentum factor, and the global value factor in the final column.

We find that all survey portfolios have negative alphas. Consequently, the information ratios are all negative, ranging from -0.22 (cross-sectional fixed income) to -0.78 (time-series currencies). The alpha is statistically significant for the cross-sectional equity portfolio, all three time-series portfolios, and for the $GSF$.

We find that the time-series equity strategy also has a significantly negative alpha even though the raw return to the strategy is basically zero. This is driven by the fact that the equity time-series strategy is long most of the time (as can also be seen by the large and highly significant market beta of 0.67 in Table 6), but delivers low returns when it deviates from the market portfolio.

We find that the value betas are mostly negative and statistically significant in four out of the seven cases. The momentum betas tend to be positive, although only statistically significant in two cases. The exposure for carry is negative for the cross-sectional strategies and positive for the time-series strategies, but (like for momentum) the betas are often economically small and statistically insignificant.

This evidence implies that although there are exposures to the other factors, this is mostly for the time-series strategies that result in an exposure to the passive long strategy. After correcting for standard factors, all information ratios are consistently negative.

### 2.5. The Long and Short of Survey-based Strategies

In the top panel of Table 7, we report the mean, Sharpe ratio, and information ratio of all six survey strategies and decompose these statistics into the part coming from long (indexed by a "+" superscript in the second panel) and short (indexed by a "−" superscript in the third panel) positions. We do so by computing the portfolio return for positive and negative portfolio weights. In the bottom panel, we report the fraction of the average return coming from long and short positions, implying that both shares aggregate to 100%.

There is a consistent pattern across all six portfolios: The short leg of all survey portfolios yields negative returns and contributes between 85% to 262% to the overall portfolio mean

return.[9] This implies that the stock markets that survey respondents are most negative about perform relatively well in the future.

If we focus on the information ratios on the long and the short side, which removes the market exposure as well as the exposures to the carry, momentum, and value factors, we find that the information ratios of the long and the short side are very similar. This implies that the superior performance of the long positions relative to the short positions is due to factor exposures to well-known factors. After correcting for those exposures, both sides of the strategy underperform by about the same amount.

## 3. Survey Expectations of Carry and Momentum Strategies

Survey respondents are not directly asked about their expectations about quantitative investment strategies such as carry and momentum. However, we can combine the weights from carry and momentum strategies with the survey expectations of each of the countries in our sample to compute the implied expectation for carry and momentum strategies.

More formally, we compute

$$z_t = \sum_i w_{i,t}^{XS}(1) S_{i,t},$$

for each month in our sample, where $w_{i,t}^{XS}(1)$ and $S_{i,t}$ denote the rank weights based on carry or momentum signals and survey score for country $i$ in month $t$. Carry and momentum signals are contemporaneous to the survey scores. Hence, $z_t$ tells us about the survey-implied expected return to following a cross-sectional carry or momentum strategy.

We focus on carry and momentum strategies as these definitions can easily be applied to different asset classes, while value strategies, which require a model of fundamental value, are less trivial to apply universally.

Figure 3 displays the time series of $z_t$ for equity, currency, and fixed income carry and momentum strategies. We plot 1-year moving averages of $z$ as solid, blue lines. Dashed blue lines show unconditional averages of weighted survey scores. Thin black lines correspond to 1-year moving averages of strategy excess returns (cross-sectional carry or momentum strategies) shifted one year back to align expectations and realizations.

[9] A share of more than 100% means that the positive leg of a survey portfolio actually yields a positive return.

Over the full sample period, the average survey-implied expected carry returns are negative for all three asset classes and the average is statistically significant for equities ($t$-statistic -1.81) and for fixed income ($t$-statistic -4.55). For equities, we find that the expected carry returns turns very negative during economic downturns in 2001 and during the recent financial crisis.

The average survey-implied expected momentum returns are positive for all three asset classes, but the average is only statistically significant for currencies ($t$-statistic 3.26) over the full sample period.[10] The positive expected returns on momentum strategies are consistent with the idea that surveys are to some extent driven by extrapolating past returns, which we discuss in more detail below.

## 4. Excess Volatility and Survey-Implied Expected Returns

Although we have shown that survey-implied expected returns are negatively related to future realized returns in many countries and across three major asset classes, it is unclear how much of overall discount rate variation can be related to variation in discount rates related to survey expectations.

Since the seminal work by Shiller (1981) and Campbell and Shiller (1987), it is well understood that fluctuations in discount rates are directly related to excessively volatile asset prices in equity markets. If surveys capture an important part of discount rate variation across countries, we would expect to see a link between excess volatility and the variation in discount rates related to survey expectations across different equity markets.

As a simple measure of excess volatility, we compute the ratio of equity return volatility to dividend growth volatility. We use annual dividend growth rates and annual returns to avoid problems with seasonalities in dividends.[11]

[10] If we repeat the same analysis for value strategies, which are based on book-to-market for equities, 5-year changes in real exchange rates for currencies, and 5-year changes in 10-year bond yields for fixed income as in Asness, Moskowitz, and Pedersen (2013), we find negative survey scores on average for equities ($t$-stat -1.11) and currencies ($t$-stat -5.69) and a positive weighted score on average for fixed income ($t$-stat 1.60).

[11] We obtain annual dividends by computing monthly dividend levels from MSCI country price and total return indices and then sum monthly dividends within each year to obtain dividend levels at the annual frequency. Dividend levels in month $t$ are computed as $(R_t^{TR} - R_t^{PI})PI_{t-1}$ where $R_t^{TR}$ and $R_t^{PI}$ denote the return on the total return index and price index, respectively, and $PI$ denotes the price index level. Since we need a full year of data to compute excess volatility, the sample period is from 1998 - 2011.

To compute the variation in discount rates related to survey expectations, we run panel regressions of the form

$$R_{i,q+1} = \alpha + \beta_1 S_{i,q} + \beta_2 w_{i,q}^{XS}(1) + \varepsilon_{i,q+1} \tag{5}$$

which is similar to (4) but we do not subtract the passive long benchmark here.[12] We run this panel regression on a quarterly frequency (in calendar time) so that it corresponds to our benchmark survey portfolios above (with $k = 3$ months or $q = 1$ in quarters) and the panel regressions in Table 2 above and we use the full sample period for all countries.

The discount rate variation related to survey-implied expected returns is given by

$$E[R_{i,q+1} \mid S_{i,q}, w_{i,q}^{XS}(1)] = \alpha + \beta_1 S_{i,q} + \beta_2 w_{i,q}^{XS}(1).$$

We compute the variation in discount rates related to survey expectations as $stdev(E[R_{i,q+1} \mid S_{i,q}, w_{i,q}^{XS}(1)])$ for each country $i$.

We employ returns and dividends based on MSCI country indices in local currency for the excess volatility computation and the panel regressions as the dividend data for the indices underlying the futures returns are imprecise in both Bloomberg and Datastream.[13] However, more generally, using MSCI country indices is equally relevant as surveys ask for "share prices" in a particular country and not for a particular index.

Figure 4 shows a scatter plot with our measure of excess volatility on the vertical axis and the variation in discount rates related to survey expectations on the horizontal axis.

We find a strong positive link between these measures with a cross-country correlation of 73%. This implies that countries with higher excess volatility also have a higher variation in discount rates related to surveys. These results suggest that survey-implied expected returns are correlated with an important part of overall discount rate variation.

[12] We present robustness results below where we subtract the passive long return as in (4). The results are shown in Figure IA.1. We find a cross-country correlation between excess volatility and the variation in discount rates related to survey expectations of 88%, which implies that the results are even stronger in this case.

[13] We are currently obtaining dividend data directly from index providers to ensure the robustness of these results for the same indices as the ones for which we have futures data.

## 5. Determinants of Survey Expectations

The last question that we address relates to the determinants are of survey expectations. We estimate pooled panel regressions at a quarterly frequency per asset class of survey scores ($S_{iq}$) on lagged returns over the last 4 quarters ($R_{i,q-4;q-1}$), the lagged VIX index ($VIX_{q-1}$), a global business cycle indicator ($GBC_q$), and survey growth expectations ($Growth_{i,q}$).

The full model is given by

$$S_{i,q} = \alpha_0 + \alpha_1 R_{i,q-4;q-1} + \alpha_2 VIX_{q-1} + \alpha_3 GBC_q + \alpha_4 Growth_{i,q} + u_{i,q}. \tag{6}$$

We also consider a specification in which $VIX_{q-1}$ is replaced by the change in the VIX, $\Delta VIX_{q-4;q-1}$.[14]

The timing in these panels is such that we regress survey scores in quarter $q$ on lagged returns over the previous 4 quarters (that is, from quarter $q-4$ to quarter $q-1$), the VIX at the end of the previous quarter $q-1$ (or the change in VIX over the previous four quarters), the business cycle indicator in the first month of the same quarter $q$, and the contemporaneous growth survey score in quarter $q$. The reason for lagging the VIX by a quarter (we use the last trading day of the previous quarter) is that we do not know the exact day of the month at which the respondents complete the survey. The same logic applies to VIX changes.

Including lagged returns in the panel aims for capturing the notion of extrapolative expectations based on past returns as emphasized recently by Greenwood and Shleifer (2013) and Barberis, Greenwood, Jin, and Shleifer (2014). Including growth expectations, global business cycle indicators, and the VIX allows for the possibility that survey participants might misunderstand the survey questions and report demand functions for assets instead of return forecasts or, alternatively, that these factors directly influence the return expectations of survey participants.

For currencies, we make one further adjustment and we use differences in growth survey scores and the GBC (foreign country relative to the U.S.) as exchange rates depend on relative growth rates.

[14] We also ran regressions with country-specific regression dummies instead of, or on top of, the global business cycle dummies. The results suggest that using the global business cycle measure captures all the relevant information and that adding country-specific business cycle information does not yield additional insights.

We report the estimation results in Table 8. The results in Panel A for equities indicate that if we study one determinant at the time, lagged returns are positively related to survey expectations, consistent with models of extrapolative return expectations. If we study the full model, the two variables that stand out in terms of significance are the VIX and growth expectations. However, we find that growth expectations are positively related to return expectations, while the VIX is negatively related to expected returns (which is the same as in the univariate model). The latter observation appears to be at odds with most basic risk-based asset pricing models.

In Panel B for currencies and Panel C for fixed income, we find an important role for past returns, even in the full model. High past returns are associated with high survey expectations. The VIX also enters significantly for both asset classes, but with the opposite sign. For currencies, foreign currencies are expected to depreciate relative to the dollar in periods of high volatility, while interest rates are expected to decline, which seems economically reasonable.

Growth expectations do not significantly explain return expectations for currencies, but they do for fixed income. The sign is the opposite as for equities: when growth is expected to pick up, the survey respondents expect interest rates to rise and bond prices to decline.

Despite this relatively rich model, we explain only 41% of the variation of equity return expectations, 20% of currency return expectations, and 42% of the fixed income return expectations. This implies that a non-trivial amount of variation is left unexplained by standard measures of risk, business cycle movements, growth expectations, as well as a measure of extrapolative expectations.

In Table 9, we ask the question whether the negative returns of survey-based investment strategies are due to the predicted part of survey expectations or the residual component. We use Model (vi) of Table 8. Instead of using weights that are linear in the ranks of surveys, we use weights that are linear in the survey scores themselves to ensure that the decomposition of average returns is exact.

We find that the residual components matters more for return predictability. For cross-sectional and time-series equity and currency strategies, as well as the cross-sectional fixed-income strategy, the residual component has a stronger (negative) link to future returns, while the predicted and residual component are roughly at par for the fixed-income timing strategy. This evidence suggests that it is worth exploring further what may drive the residual variation in survey expectations.

# 6. Conclusions

We study the link between survey-expectations of returns and future realized returns. We find that survey expectations of returns predict future returns negatively across countries and in three major asset classes: equities, currencies, and fixed income.

The large negative returns from a cross-sectional portfolio strategy using survey expectations cannot be explained by standard factors such as carry, momentum, and value. Survey respondents expect negative returns on carry strategies. For equities, the results are particularly pronounced during economic downturns. The expect positive returns on momentum strategies, which is consistent with extrapolative expectations models.

We find that the variation in discount rates related to survey expectations is highly correlated with the amount of excess volatility across equity markets. This implies that survey expectations pick up a significant part of discount rate variation.

Lastly, we study the determinants of survey expectations. We find that survey expectations are significantly related to lagged returns, which is consistent with recently-proposed models of extrapolative expectations (Barberis, Greenwood, Jin, and Shleifer, 2014). Survey expectations of returns are also significantly related to surveys expectations of fundamentals, measures of the global business cycle, and the VIX. However, a non-trivial part of the variation in survey expectations is left unexplained by these variables. This residual variation does help to forecast future returns in all classes, which makes it important to understand this residual variation in more detail.

# Data Appendix

**Dividends and returns for excess volatility.** We emply MSCI country index returns to compute dividends for the 13 countries in our sample which are used for the excess volatility computations. Table A.1 lists the corresponding Bloomberg data codes. More specifically, we first compute monthly dividends from the total return index (TR) and price index (PI) for each country, sum the monthly dividends within each year, and then compute annual dividend growth rates. Both dividends and returns are in USD.

**Surveys.** As mentioned in the data section, we employ survey scores from the World Economic Survey (WES) which can be downloaded from Datastream at a quarterly frequency. Table A.1 lists the corresponding mnemonics for equities, foreign exchange, interest rates, and growth surveys.

**Global business cycle indicator.** We employ a global business cycle indicator in Table 8 which is based on data from the Economic Cycle Research Institute (ECRI), available at `www.businesscycle.com`. For each country with available data, we construct a time series of recession dummies (which equals one during a recession and zero otherwise). We then average the recession indicators across all countries to obtain the global business cycle indicator (denoted GBC in the table). Note that the GBC is asset-specific, e.g. for equities we average the individual recession indicators across the 13 countries for which we have equity futures returns. ERCI recession dummies are available for the full sample period since 1983 for all countries except Belgium, Denmark, Hong Kong, Ireland, the Netherlands, Norway, and Portugal.

**Value measures.** We build value measures for equities, currencies, and fixed income as in Asness, Moskowitz, and Pedersen (2013). Equity value is based on book-to-market ratios, currency value is based on (the negative of) 5-year changes in real exchange rates, and fixed income value is based on 5-year changes in 10-year bond yields. For equities, we download MSCI country index book-to-market ratios from Datastream. For currencies, we download CPI data from Datastream to compute real exchange rates. 10-year government bond yields are based on combining the yield data by Jonathan Wright (`http://econ.jhu.edu/directory/jonathan-wright/`) and yields from Bloomberg as in Koijen, Pedersen, Moskowitz, and Vrugt (2013).

Table A.1 lists the corresponding Bloomberg and Datastream mnemonics.

**Table A.1.** Data codes

This table lists Bloomberg tickers and Datastream menmonics for data used in the paper. MSCI PI and MSCI TR list Bloomberg codes for MSCI price index and total return index series (in local currency and converted to USD) for the 13 equity markets in our sample. We use these data to construct dividends. The next four columns list Datastream menmonics for WES surveys series. The interest rate surveys are used to construct fixed income return expectations and "Growth" refers to surveys that ask for the expected economic situation in six months. The final three columns list Datastream mnemonics for book-to-market (BM) and CPI inflation data (CPI) as well as Bloomberg tickers for 10-year fixed income yields.

| | MSCI (local ccy) | | MSCI (in USD) | | WES survey data | | | | Value | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | PI | TR | PI | TR | Equities | FX | Int. rates | Econ | BM | CPI | Yields |
| Australia | MSDLAS | GDDLAS | MSDUAS | GDDUAS | AUIFDSPLR | AUIFCUUSR | AUIFIRLTR | AUIFGSOFR | MSAUSTL | AUCONPRCF | F12710y |
| Austria | | | | | | OEIFCUUSR | | OEIFGSOFR | | OECONPRCF | |
| Belgium | | | | | | BGIFCUUSR | | BGIFGSOFR | | BGCONPRCF | |
| Canada | MSDLCA | GDDLCA | MSDUCA | GDDUCA | CNIFDSPLR | CNIFCUUSR | CNIFIRLTR | CNIFGSOFR | MSCNDAL | CNCONPRCF | F10110y |
| Denmark | | | | | | DKIFCUUSR | | DKIFGSOFR | | DKCONPRCF | |
| EMU | | | | | | EMIFCUUSR | | EMIFGSOFR | | EMCONPRCF | |
| France | MSDLFR | GDDLFR | MSDUFR | GDDUFR | FRIFDSPLR | FRIFCUUSR | | FRIFGSOFR | MSFRNCL | FRCONPRCE | |
| Germany | MSDLGR | GDDLGR | MSDUGR | GDDUGR | BDIFDSPLR | BDIFCUUSR | BDIFIRLTR | BDIFGSOFR | MSGERML | BDCONPRCF | F91010y |
| Hong Kong | MSDLHK | GDDLHK | MSDUHK | GDDUHK | HKIFDSPLR | | | HKIFGSOFR | MSHGKGL | | |
| Ireland | | | | | | IRIFCUUSR | | IRIFGSOFR | | IRCONPRCF | |
| Italy | MSDLIT | GDDLIT | MSDUIT | GDDUIT | ITIFDSPLR | ITIFCUUSR | | ITIFGSOFR | MSITALL | ITCONPRCF | |
| Japan | MSDLJN | GDDLJN | MSDUJN | GDDUJN | JPIFDSPLR | JPIFCUUSR | JPIFIRLTR | JPIFGSOFR | MSJPANL | JPCONPRCE | F10510y |
| Netherlands | MSDLNE | GDDLNE | MSDUNE | GDDUNE | NLIFDSPLR | NLIFCUUSR | | NLIFGSOFR | MSNETHL | NLCONPRCF | |
| New Zealand | | | | | | NZIFCUUSR | NZIFIRLTR | NZIFGSOFR | | NZCONPRCF | F25010y |
| Norway | | | | | | NWIFCUUSR | NWIFIRLTR | NWIFGSOFR | | NWCONPRCF | F26610y |
| Portugal | | | | | | PTIFCUUSR | | PTIFGSOFR | | PTCONPRCF | |
| Spain | MSDLSP | GDDLSP | MSDUSP | GDDUSP | ESIFDSPLR | ESIFCUUSR | | ESIFGSOFR | MSSPANL | ESCONPRCF | |
| Sweden | MSDLSW | GDDLSW | MSDUSW | GDDUSW | SDIFDSPLR | SDIFCUUSR | SDIFIRLTR | SDIFGSOFR | MSSWDNL | SDCONPRCF | F25910y |
| Switzerland | MSDLSZ | GDDLSZ | MSDUSZ | GDDUSZ | SWIFDSPLR | SWIFCUUSR | SWIFIRLTR | SWIFGSOFR | MSSWITL | SWCONPRCF | F25610y |
| U.K. | MSDLUK | GDDLUK | MSDUUK | GDDUUK | UKIFDSPLR | UKIFCUUSR | UKIFIRLTR | UKIFGSOFR | MSUTDKL | UKCONPRCF | F11010y |
| U.S. | MSDLUS | GDDLUS | MSDLUS | GDDLUS | USIFDSPLR | | USIFIRLTR | USIFGSOFR | MSUSAML | USCONPRCE | F08210y |

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**Table 1.** Summary statistics

This table reports averages and standard deviations (in parentheses) for asset returns and survey scores. Survey scores are on a scale from 1 to 9, where 5 means "no change" and values below 5 mean "declining" and values above 5 mean "increasing". Column "Sample" shows the first month in the sample for which both returns and survey expectations are available. Average returns and return volatilities are annualized. The sample ends in September 2012.

| | Sample | Returns | Surveys |
|---|---|---|---|
| **Equities** | | | |
| U.S. | 1998/04 | 1.90 | 6.43 |
| | | (16.45) | (1.02) |
| Canada | 1999/10 | 5.72 | 6.62 |
| | | (15.79) | (1.03) |
| U.K. | 1998/04 | 0.15 | 5.88 |
| | | (14.97) | (1.07) |
| France | 1998/04 | 1.02 | 6.47 |
| | | (19.73) | (0.88) |
| Germany | 1998/04 | 2.86 | 6.72 |
| | | (23.53) | (0.88) |
| Spain | 1998/04 | 1.93 | 6.03 |
| | | (22.28) | (0.80) |
| Italy | 2004/04 | -1.41 | 6.27 |
| | | (21.12) | (0.66) |
| Netherlands | 1998/04 | -0.24 | 6.72 |
| | | (21.46) | (1.02) |
| Sweden | 2005/03 | 8.53 | 6.43 |
| | | (19.04) | (0.83) |
| Switzerland | 1998/04 | 0.68 | 6.50 |
| | | (16.43) | (0.79) |
| Japan | 1998/04 | -1.88 | 6.32 |
| | | (20.70) | (0.97) |
| Hong Kong | 1998/04 | 8.62 | 6.29 |
| | | (25.83) | (1.53) |
| Australia | 2000/06 | 3.65 | 6.00 |
| | | (13.20) | (1.19) |
| **Currencies** | | | |
| Australia | 1989/01 | 4.10 | 4.72 |
| | | (11.70) | (1.45) |
| Austria | 1997/02 | -2.64 | 4.97 |
| | | (8.70) | (0.94) |
| Belgium | 1997/02 | -2.69 | 5.07 |
| | | (8.67) | (1.11) |
| Canada | 1989/01 | 1.73 | 4.39 |
| | | (7.52) | (2.18) |
| Denmark | 1989/01 | 2.13 | 5.04 |
| | | (10.72) | (1.61) |
| Euro | 1999/02 | 1.20 | 4.75 |
| | | (10.83) | (1.75) |
| France | 1989/01 | 2.89 | 6.79 |
| | | (10.62) | (1.36) |
| Germany | 1989/01 | 1.64 | 6.35 |
| | | (10.83) | (1.60) |

| | Sample | Returns | Surveys |
|---|---|---|---|
| **Currencies (continued)** | | | |
| Ireland | 1997/02 | -2.50 | 4.48 |
| | | (8.89) | (1.37) |
| Italy | 1989/01 | 2.50 | 4.88 |
| | | (10.83) | (1.28) |
| Japan | 1989/01 | -0.08 | 4.94 |
| | | (11.13) | (1.15) |
| Netherlands | 1989/01 | 1.55 | 5.94 |
| | | (10.74) | (1.65) |
| New Zealand | 1989/01 | 4.56 | 5.00 |
| | | (11.61) | (1.43) |
| Norway | 1989/01 | 2.84 | 4.38 |
| | | (11.04) | (1.43) |
| Portugal | 1997/02 | -2.26 | 3.14 |
| | | (8.42) | (1.78) |
| Spain | 1997/02 | -1.48 | 3.02 |
| | | (8.52) | (1.10) |
| Sweden | 1989/01 | 1.76 | 4.42 |
| | | (11.77) | (1.72) |
| Switzerland | 1989/01 | 1.28 | 5.49 |
| | | (11.64) | (1.93) |
| U.K. | 1989/01 | 1.83 | 5.20 |
| | | (9.66) | (1.13) |
| **Fixed Income** | | | |
| Australia | 1998/04 | 2.72 | 3.96 |
| | | (8.90) | (1.60) |
| Canada | 1998/04 | 4.74 | 3.86 |
| | | (6.79) | (1.44) |
| Germany | 1998/04 | 4.81 | 3.60 |
| | | (6.95) | (1.02) |
| U.K. | 1998/04 | 3.92 | 4.23 |
| | | (7.68) | (1.31) |
| Japan | 1998/04 | 3.22 | 3.77 |
| | | (5.26) | (1.12) |
| New Zealand | 2003/07 | 3.30 | 3.75 |
| | | (8.59) | (1.36) |
| Norway | 1998/04 | 3.84 | 3.66 |
| | | (9.08) | (2.05) |
| Sweden | 1998/04 | 4.30 | 3.79 |
| | | (7.48) | (1.53) |
| Switzerland | 1998/04 | 4.13 | 3.81 |
| | | (5.44) | (1.08) |
| U.S. | 1998/04 | 5.84 | 3.95 |
| | | (10.10) | (1.31) |

**Table 2.** Returns and lagged surveys

This table reports results for panel regressions of returns on lagged surveys:

$$R_{i,q+1} - R_{M,q+1} = \alpha + \beta_1 S_{i,q} + \beta_2 w_{i,q}^{XS}(1) + \varepsilon_{i,q+1}$$

where $R_{i,q+1}$ denotes returns of country (or currency) $i$ in quarter $t+1$, $R_{M,q+1}$ denotes the return of the (asset-specific) passive long benchmark, $S_{i,q}$ denotes survey scores, and $w_{i,q}^{XS}(1)$ denotes(cross-sectional) rank weights of survey scores. EQ denotes the equity sample of 13 countries, FX denotes the sample of 19 currencies, and FI denotes the fixed income sample of 10 contracts. The frequency is quarterly and we report $t$-statistics in brackets based on standard errors clustered by time. The sample is quarterly from 1998Q2 – 2012Q3 for equities and fixed income and from 198Q1 – 2012Q3 for currencies.

| | EQ | FX | FI | EQ | FX | FI |
|---|---|---|---|---|---|---|
| Lagged survey score | -0.11 | -0.07 | -0.00 | | | |
| | [-0.86] | [-1.18] | [-0.14] | | | |
| Lagged rank weight | -2.97 | -1.31 | -1.05 | -3.39 | -1.68 | -1.06 |
| | [-2.31] | [-2.09] | [-1.86] | [-2.84] | [-2.44] | [-1.82] |
| Adjusted $R^2$ | 0.02 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 |

**Table 3.** Survey strategies

This table reports annualized returns, standard deviations (std), and Sharpe Ratios (SR) of survey portfolios. We report results for both cross-sectional strategies (portfolios are formed on cross-sectional ranks of survey expectations – Panel A) and time-series strategies (we go long or short in a country depending on whether survey indicate a rising or falling asset price – Panel B). We allow for a lag of $k = 1, 2, ..., 12$ months between the survey expectation and portfolio formation. Panels A and B also report results for a cross-sectional and a times-series survey factor, respectively, where we combine the individual strategies of all three asset classes by dividing individual strategy returns by their volatilities, then average across strategies, and scale the resulting return to have an annual volatlity of 10%. Panel C reports results for a Global Survey Factor which combines all six generic strategies into one single portfolio based on the same weighting procedure. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies and the three Survey Factors (Cross-sectional survey factor, Time-series survey factor, Global survey factor).

| | Lag between survey and portfolio formation $k$ (months) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Panel A. Cross-sectional strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | -4.32 | -4.70 | -6.32 | -4.35 | -4.47 | -3.93 | -5.00 | -4.06 | -3.84 | -1.32 | -0.14 | -0.36 |
| std | 10.03 | 10.06 | 9.45 | 9.71 | 9.50 | 9.82 | 10.06 | 10.22 | 9.78 | 9.53 | 9.14 | 8.98 |
| $t$ | [-1.64] | [-1.77] | [-2.53] | [-1.69] | [-1.77] | [-1.50] | [-1.86] | [-1.48] | [-1.46] | [-0.51] | [-0.06] | [-0.15] |
| SR | -0.43 | -0.47 | -0.67 | -0.45 | -0.47 | -0.40 | -0.50 | -0.40 | -0.39 | -0.14 | -0.02 | -0.04 |
| **Currencies** | | | | | | | | | | | | |
| mean | -2.57 | -3.27 | -3.21 | -2.90 | -3.12 | -2.78 | -2.54 | -2.83 | -2.47 | -2.83 | -2.98 | -3.44 |
| std | 6.01 | 6.08 | 6.19 | 6.20 | 6.15 | 5.94 | 5.88 | 5.84 | 5.92 | 5.97 | 5.86 | 6.06 |
| $t$ | [-2.08] | [-2.62] | [-2.52] | [-2.27] | [-2.46] | [-2.26] | [-2.09] | [-2.33] | [-2.00] | [-2.27] | [-2.43] | [-2.72] |
| SR | -0.43 | -0.54 | -0.52 | -0.47 | -0.51 | -0.47 | -0.43 | -0.48 | -0.42 | -0.47 | -0.51 | -0.57 |
| **Fixed income** | | | | | | | | | | | | |
| mean | -0.76 | -0.85 | -2.35 | -1.46 | -1.35 | -0.60 | -1.47 | -0.71 | 0.23 | 0.35 | 0.82 | 0.76 |
| std | 4.26 | 4.54 | 4.90 | 4.94 | 5.00 | 4.67 | 5.03 | 4.89 | 4.91 | 4.70 | 4.77 | 4.70 |
| $t$ | [-0.68] | [-0.71] | [-1.81] | [-1.11] | [-1.02] | [-0.48] | [-1.09] | [-0.54] | [0.17] | [0.28] | [0.64] | [0.59] |
| SR | -0.18 | -0.19 | -0.48 | -0.30 | -0.27 | -0.13 | -0.29 | -0.15 | 0.05 | 0.07 | 0.17 | 0.16 |
| **Cross-sectional Survey Factor** | | | | | | | | | | | | |
| mean | -5.55 | -6.78 | -7.17 | -5.41 | -5.43 | -4.68 | -5.38 | -5.26 | -3.97 | -4.01 | -3.69 | -4.74 |
| std | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| $t$ | [-2.71] | [-3.30] | [-3.48] | [-2.62] | [-2.63] | [-2.26] | [-2.60] | [-2.53] | [-1.91] | [-1.92] | [-1.77] | [-2.27] |
| SR | -0.56 | -0.68 | -0.72 | -0.54 | -0.54 | -0.47 | -0.54 | -0.53 | -0.40 | -0.40 | -0.37 | -0.47 |

(continued on next page)

**Table 3.** continued

| | Lag between survey and portfolio formation $k$ (months) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Panel B. Time-series strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | 1.21 | -0.36 | -0.53 | 0.65 | 2.34 | 1.97 | 1.81 | 0.59 | -0.13 | -0.29 | 0.67 | 0.14 |
| std | 12.40 | 12.68 | 12.81 | 13.25 | 13.00 | 12.99 | 12.81 | 12.73 | 12.79 | 13.31 | 13.29 | 13.52 |
| $t$ | [0.37] | [-0.11] | [-0.16] | [0.19] | [0.68] | [0.57] | [0.53] | [0.17] | [-0.04] | [-0.08] | [0.19] | [0.04] |
| SR | 0.10 | -0.03 | -0.04 | 0.05 | 0.18 | 0.15 | 0.14 | 0.05 | -0.01 | -0.02 | 0.05 | 0.01 |
| **Currencies** | | | | | | | | | | | | |
| mean | -2.16 | -2.33 | -2.86 | -2.56 | -2.32 | -1.54 | -1.57 | -1.81 | -1.98 | -2.49 | -2.77 | -2.38 |
| std | 5.46 | 5.24 | 5.40 | 5.24 | 5.22 | 5.16 | 5.29 | 5.51 | 5.57 | 5.67 | 5.57 | 5.53 |
| $t$ | [-1.92] | [-2.16] | [-2.57] | [-2.37] | [-2.15] | [-1.44] | [-1.43] | [-1.58] | [-1.70] | [-2.10] | [-2.38] | [-2.06] |
| SR | -0.39 | -0.44 | -0.53 | -0.49 | -0.44 | -0.30 | -0.30 | -0.33 | -0.35 | -0.44 | -0.50 | -0.43 |
| **Fixed income** | | | | | | | | | | | | |
| mean | -3.57 | -4.19 | -5.12 | -4.15 | -3.20 | -2.93 | -3.25 | -2.56 | -2.76 | -3.06 | -3.23 | -2.54 |
| std | 4.95 | 4.77 | 4.68 | 4.81 | 4.73 | 4.55 | 4.49 | 4.63 | 4.54 | 4.57 | 4.72 | 5.04 |
| $t$ | [-2.75] | [-3.34] | [-4.15] | [-3.25] | [-2.55] | [-2.41] | [-2.71] | [-2.06] | [-2.26] | [-2.49] | [-2.53] | [-1.86] |
| SR | -0.72 | -0.88 | -1.10 | -0.86 | -0.68 | -0.64 | -0.72 | -0.55 | -0.61 | -0.67 | -0.68 | -0.51 |
| **Time-series Survey Factor** | | | | | | | | | | | | |
| mean | -4.38 | -5.65 | -6.69 | -5.30 | -3.73 | -2.80 | -3.77 | -3.97 | -4.17 | -5.38 | -5.36 | -4.55 |
| std | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| $t$ | [-2.14] | [-2.75] | [-3.25] | [-2.57] | [-1.80] | [-1.35] | [-1.82] | [-1.91] | [-2.00] | [-2.58] | [-2.57] | [-2.18] |
| SR | -0.44 | -0.56 | -0.67 | -0.53 | -0.37 | -0.28 | -0.38 | -0.40 | -0.42 | -0.54 | -0.54 | -0.46 |
| **Panel C. Global Survey Factor** | | | | | | | | | | | | |
| mean | -5.53 | -6.90 | -7.79 | -5.95 | -5.14 | -4.25 | -5.25 | -5.31 | -4.61 | -5.29 | -5.10 | -5.33 |
| std | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| $t$ | [-2.69] | [-3.36] | [-3.78] | [-2.89] | [-2.49] | [-2.05] | [-2.53] | [-2.56] | [-2.21] | [-2.54] | [-2.44] | [-2.55] |
| SR | -0.55 | -0.69 | -0.78 | -0.60 | -0.51 | -0.42 | -0.53 | -0.53 | -0.46 | -0.53 | -0.51 | -0.53 |

**Table 4.** Return contributions

This table reports the contribution of individual countries to the overall average rank portfolio excess return for our benchmark strategy based on a quarterly forecast horizon in calendar time ($k = 3$ in Panel A of Table 3). Return contributions for country/currency $i$, $RC_i$, are computed as

$$RC_i = \frac{1}{T} \sum_{t=2}^{T_i} w_{i,t-1}^{XS}(3) R_{i,t},$$

where $T_i$ denotes the number of months with available data for country $i$, $T$ is the overall number of months with data, $w_{i,t-1}(3)$ denotes the portfolio weight of country/currency $i$ in month $t$ based on a three month implementation lag ($k = 3$), and $R_{i,t}$ is the excess return of country/currency $i$ in month $t$. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies.

| | EQ | FX | FI |
|---|---|---|---|
| Australia | -0.21 | -1.22 | -0.62 |
| Austria | | -0.02 | |
| Belgium | | -0.04 | |
| Canada | 0.24 | -0.07 | -0.32 |
| Denmark | | -0.18 | |
| Euro | | 0.24 | |
| France | -0.20 | 0.03 | |
| Germany | -0.71 | 0.03 | -0.20 |
| Hong Kong | -2.47 | | |
| Ireland | | -0.04 | |
| Italy | -0.07 | -0.38 | |
| Japan | -1.86 | -0.45 | -0.19 |
| Netherlands | -0.33 | 0.20 | |
| New Zealand | | -0.11 | 0.53 |
| Norway | | -0.02 | -1.20 |
| Portugal | | 0.01 | |
| Spain | -0.12 | -0.02 | |
| Sweden | 0.40 | -1.36 | 0.09 |
| Switzerland | -1.38 | -0.11 | 0.22 |
| UK | 0.72 | 0.31 | -0.20 |
| US | -0.34 | | -0.46 |
| Sum | -6.32 | -3.21 | -2.35 |

**Table 5.** Correlations of survey portfolios

This table reports correlation coefficients of returns to survey portfolios based on cross-sectional (CS) and time-series strategies in equities (EQ), currencies (FX), and fixed income (FI). The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies.

| | $EQ_{CS}$ | $EQ_{TS}$ | $FX_{CS}$ | $FX_{TS}$ | $FI_{CS}$ | $FI_{TS}$ |
|---|---|---|---|---|---|---|
| $EQ_{CS}$ | | 0.43 | -0.11 | 0.15 | -0.03 | 0.08 |
| $EQ_{TS}$ | 0.43 | | -0.04 | 0.05 | 0.12 | 0.40 |
| $FX_{CS}$ | -0.11 | -0.04 | | 0.53 | 0.05 | 0.04 |
| $FX_{TS}$ | 0.15 | 0.05 | 0.53 | | 0.06 | 0.10 |
| $FI_{CS}$ | -0.03 | 0.12 | 0.05 | 0.06 | | 0.35 |
| $FI_{TS}$ | 0.08 | 0.40 | 0.04 | 0.10 | 0.35 | |

**Table 6.** Exposure of survey portfolios

This table reports exposures of survey portfolios to benchmark factors. We regress survey portfolio returns on a passive long benchmark, carry, momentum, and value returns for all asset classes and both cross-sectional and time-series strategies. We report results for survey portfolios of each asset class individually and for a Global Survey Factor (GSF) which combine all survey portfolios by weighting with the inverse of return volatility and then scaling the returns up to have 10% annualized volatility. We annualize the alphas and Information Ratios (IR), where the IR is the alpha divided by the residual volatility from the regression. We regress returns to cross-sectional (time-series) survey portfolios on returns to cross-sectional (time-series) carry, momentum, and value portfolios and regress the GSF on global carry, momentum, and value factors (constructed in an analogous way). Numbers in squared brackets are $t$-statistics based on Newey and West (1987) standard errors. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies and the GSF.

| | Cross-sectional strategies | | | Time-series strategies | | | |
|---|---|---|---|---|---|---|---|
| | EQ | FX | FI | EQ | FX | FI | GSF |
| $\alpha$ | -4.45 | -1.72 | -0.99 | -3.27 | -3.90 | -2.49 | -7.00 |
| | [-1.97] | [-1.47] | [-0.57] | [-2.49] | [-3.62] | [-2.58] | [-2.98] |
| Passive | 0.21 | 0.05 | 0.00 | 0.67 | -0.06 | -0.59 | 0.03 |
| | [4.14] | [0.86] | [0.01] | [12.23] | [-0.70] | [-6.49] | [0.43] |
| Carry | -0.13 | -0.11 | -0.27 | 0.13 | 0.20 | 0.04 | -0.06 |
| | [-1.18] | [-1.93] | [-1.71] | [0.75] | [2.43] | [0.38] | [-0.70] |
| Mom | -0.04 | 0.01 | 0.30 | 0.13 | 0.15 | 0.08 | 0.06 |
| | [-0.38] | [0.24] | [2.29] | [2.25] | [1.27] | [1.14] | [0.62] |
| Value | -0.29 | -0.42 | 0.21 | -0.19 | -0.11 | -0.18 | -0.17 |
| | [-2.79] | [-8.37] | [1.26] | [-1.59] | [-0.91] | [-1.95] | [-2.28] |
| $R^2$ | 0.17 | 0.27 | 0.12 | 0.72 | 0.13 | 0.50 | 0.03 |
| IR | -0.52 | -0.33 | -0.22 | -0.48 | -0.78 | -0.76 | -0.72 |

**Table 7.** Survey portfolios: Long and short positions

This table reports annualized mean returns and Sharpe Ratios for survey portfolios in equities (EQ), currencies (FX), and fixed income (FI) based on the benchmark cross-sectional (CS) and time-series strategies with an implementation lag of $k = 3$ months. The upper part shows results for the overall portfolio (both long and short positions), the middle part (denoted by a + superscript) shows results for portfolios that are based only on the long signals, whereas the lower part (denoted by a − superscript) reports results for portfolios based only on the short signals at each point in time. The last two rows report the fraction of the overall portfolio returns that can be attributed to the long and short signals, respectively. Numbers in squared brackets are $t$-statistics based on Newwey/West standard errors. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies.

| | EQ | | FX | | FI | |
|---|---|---|---|---|---|---|
| | CS | TS | CS | TS | CS | TS |
| Mean | -6.32 | -0.53 | -3.21 | -2.86 | -2.35 | -5.12 |
| | [-2.53] | [-0.16] | [-2.52] | [-2.57] | [-1.81] | [-4.15] |
| SR | -0.67 | -0.04 | -0.52 | -0.53 | -0.48 | -1.10 |
| IR | -0.52 | -0.48 | -0.33 | -0.78 | -0.22 | -0.76 |
| $\text{Mean}^+$ | -0.97 | 0.86 | 1.04 | -0.14 | 3.02 | -0.52 |
| | [-0.19] | [0.23] | [0.54] | [-0.13] | [1.85] | [-0.94] |
| $\text{SR}^+$ | -0.05 | 0.06 | 0.11 | -0.03 | 0.49 | -0.25 |
| $\text{IR}^+$ | -0.57 | -0.48 | -0.24 | -0.78 | -0.09 | -0.76 |
| $\text{Mean}^-$ | -5.36 | -1.38 | -4.25 | -2.72 | -5.37 | -4.60 |
| | [-1.24] | [-1.07] | [-2.43] | [-2.64] | [-3.15] | [-3.61] |
| $\text{SR}^-$ | -0.33 | -0.28 | -0.50 | -0.54 | -0.83 | -0.95 |
| $\text{IR}^+$ | -0.38 | -0.48 | -0.35 | -0.78 | -0.29 | -0.76 |
| $\text{Share}^+$ | 0.15 | -1.62 | -0.33 | 0.05 | -1.28 | 0.10 |
| $\text{Share}^-$ | 0.85 | 2.62 | 1.33 | 0.95 | 2.28 | 0.90 |

**Table 8.** What drives surveys?

This table reports results for pooled regressions of survey expectations on lagged returns (returns over the prior 4 quarters), lagged volatility (VIX), the global business cycle (GBC), and growth expectations ("Growth"). $VIX$ denotes the S&P500 implied volatility index and $\Delta VIX$ denotes one-year changes. GBC is a global recession indicator which averages over individual countries' recession indicators in the cross-section for each month. "Growth" denotes survey expectations (from the same survey respondents) for the future economic situation of a country (where a higher score means "better"). Numbers in brackets are $t$-statistics based on standard errors clustered by country and time. The sample is quarterly from 1998Q2 – 2012Q3 for equities and fixed income and from 198Q1 – 2012Q3 for currencies.

| | (i) | (ii) | (iii) | (iv) | (v) | (vi) | (vii) |
|---|---|---|---|---|---|---|---|
| **Panel A. Equities** | | | | | | | |
| Lagged returns | 0.16 | | | | | -0.04 | -0.03 |
| | [3.13] | | | | | [-0.84] | [-0.66] |
| $VIX$ | | -4.20 | | | | -2.00 | |
| | | [-4.92] | | | | [-3.25] | |
| $\Delta VIX$ | | | -0.04 | | | | -0.01 |
| | | | [-5.43] | | | | [-1.45] |
| GBC | | | | -1.55 | | -0.30 | -0.57 |
| | | | | [-5.76] | | [-1.05] | [-2.18] |
| Growth | | | | | 0.40 | 0.36 | 0.35 |
| | | | | | [13.02] | [10.17] | [7.91] |
| $R^2$ | 0.09 | 0.11 | 0.17 | 0.11 | 0.38 | 0.41 | 0.40 |
| **Panel B. Currencies** | | | | | | | |
| Lagged returns | 0.69 | | | | | 0.63 | 0.68 |
| | [5.58] | | | | | [5.15] | [5.03] |
| $VIX$ | | -6.53 | | | | -4.13 | |
| | | [-3.90] | | | | [-2.79] | |
| $\Delta VIX$ | | | -0.02 | | | | 0.01 |
| | | | [-1.48] | | | | [1.10] |
| GBC | | | | 1.09 | | 0.56 | 1.39 |
| | | | | [1.88] | | [1.36] | [3.13] |
| Growth | | | | | -0.10 | -0.01 | 0.03 |
| | | | | | [-1.57] | [-0.11] | [0.66] |
| $R^2$ | 0.15 | 0.08 | 0.01 | 0.03 | 0.01 | 0.20 | 0.19 |

(continued on next page)

**Table 8.** continued

| | (i) | (ii) | (iii) | (iv) | (v) | (vi) | (vii) |
|---|---|---|---|---|---|---|---|
| **Panel C. Fixed income** | | | | | | | |
| Lagged returns | 0.63 | | | | | 0.41 | 0.46 |
| | [2.99] | | | | | [2.81] | [3.30] |
| $VIX$ | | 8.03 | | | | 3.52 | |
| | | [5.57] | | | | [2.33] | |
| $\Delta VIX$ | | | 0.07 | | | | 0.02 |
| | | | [7.39] | | | | [2.06] |
| GBC | | | | 2.98 | | 0.98 | 1.47 |
| | | | | [5.64] | | [1.57] | [2.55] |
| Growth | | | | | -0.43 | -0.33 | -0.30 |
| | | | | | [-7.09] | [-4.98] | [-4.33] |
| $R^2$ | 0.08 | 0.22 | 0.23 | 0.22 | 0.24 | 0.42 | 0.40 |

**Table 9.** Survey strategies: Expected versus unexpected

This table reports survey portfolio returns as in Table 3 in the main text but here we form portfolios based on survey scores ($S$), the expected part of survey scores ($S^E$) and the unexpected part of survey scores ($S^U$) where the expected and unexpected part are obtained from a (full sample) regression of survey scores on lagged 12-months returns, the lagged VIX, the global business cycle (ECRI recession dummies averaged across countries), as well as (contemporaneous) growth survey scores (model (vi) in Table 8). We employ actual survey scores instead of ranks in the cross-sectional portfolios. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies.

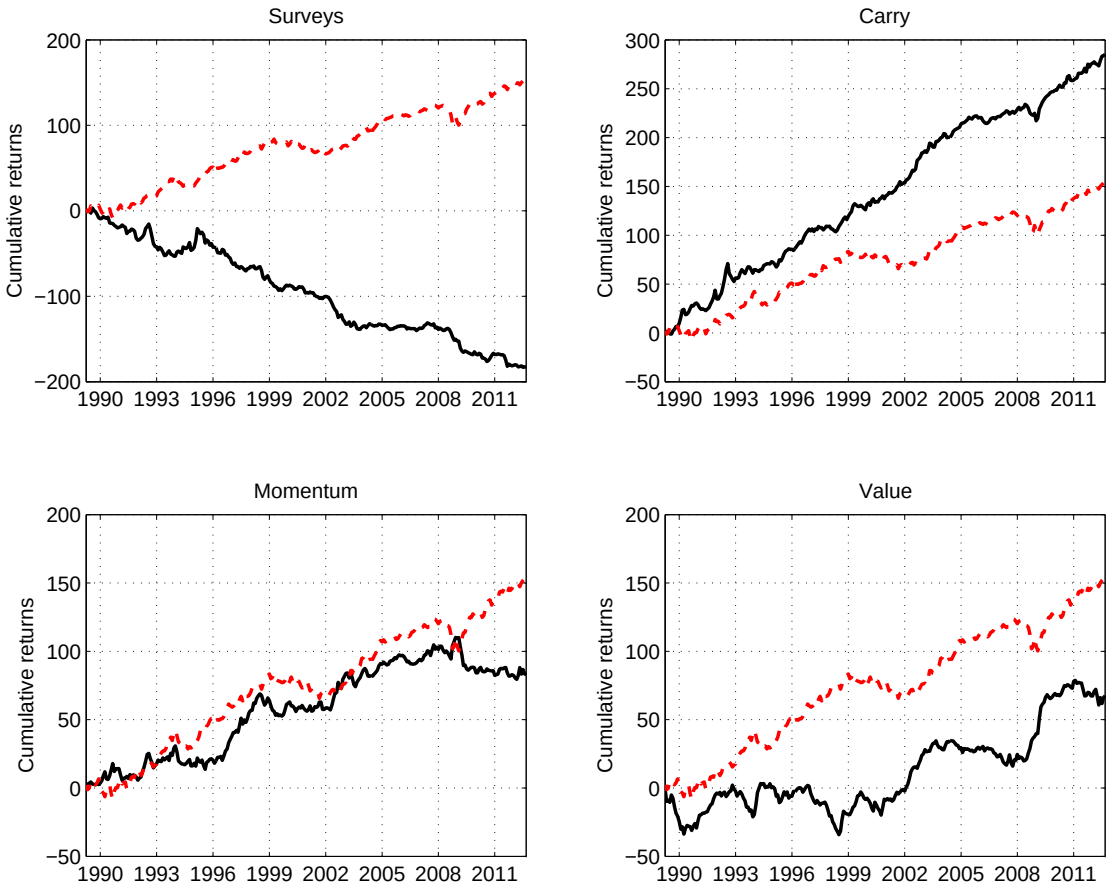
| | Lag between survey and portfolio formation $k$ (months) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Panel A. Cross-sectional strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| $S$ | -6.13 | -6.35 | -6.29 | -4.46 | -3.98 | -4.22 | -5.47 | -3.70 | -3.18 | -1.02 | -1.03 | -1.68 |
| $t$ | [-2.10] | [-2.16] | [-2.30] | [-1.66] | [-1.48] | [-1.53] | [-1.82] | [-1.23] | [-1.09] | [-0.37] | [-0.39] | [-0.63] |
| $S^E$ | -0.78 | -1.43 | -1.96 | -0.81 | -0.47 | -0.01 | -1.08 | -1.46 | -1.55 | -1.17 | -0.64 | -0.21 |
| $t$ | [-0.56] | [-1.08] | [-1.55] | [-0.65] | [-0.35] | [-0.01] | [-0.83] | [-1.17] | [-1.36] | [-0.97] | [-0.53] | [-0.17] |
| $S^U$ | -5.36 | -4.92 | -4.33 | -3.65 | -3.51 | -4.21 | -4.39 | -2.24 | -1.63 | 0.16 | -0.39 | -1.47 |
| $t$ | [-2.10] | [-1.92] | [-1.77] | [-1.55] | [-1.55] | [-1.82] | [-1.71] | [-0.86] | [-0.63] | [0.06] | [-0.16] | [-0.61] |
| **Currencies** | | | | | | | | | | | | |
| $S$ | -3.03 | -3.93 | -4.16 | -3.59 | -3.23 | -2.87 | -2.70 | -3.24 | -2.76 | -3.25 | -3.83 | -4.49 |
| $t$ | [-2.15] | [-2.77] | [-2.91] | [-2.51] | [-2.23] | [-2.06] | [-1.96] | [-2.36] | [-1.95] | [-2.26] | [-2.69] | [-3.16] |
| $S^E$ | 0.05 | -0.08 | -0.41 | -0.15 | 0.31 | 0.18 | -0.41 | -0.57 | -0.48 | -0.52 | -0.38 | -0.12 |
| $t$ | [0.07] | [-0.12] | [-0.63] | [-0.23] | [0.50] | [0.29] | [-0.68] | [-0.96] | [-0.75] | [-0.74] | [-0.55] | [-0.18] |
| $S^U$ | -3.08 | -3.85 | -3.75 | -3.45 | -3.54 | -3.05 | -2.29 | -2.66 | -2.27 | -2.72 | -3.45 | -4.37 |
| $t$ | [-2.15] | [-2.69] | [-2.67] | [-2.51] | [-2.61] | [-2.28] | [-1.71] | [-1.95] | [-1.61] | [-1.95] | [-2.53] | [-3.23] |
| **Fixed income** | | | | | | | | | | | | |
| $S$ | -0.79 | -1.03 | -2.50 | -1.42 | -1.15 | -0.86 | -1.37 | -0.77 | -0.22 | 0.04 | 1.06 | 1.02 |
| $t$ | [-0.58] | [-0.72] | [-1.73] | [-0.99] | [-0.80] | [-0.59] | [-0.90] | [-0.52] | [-0.16] | [0.03] | [0.76] | [0.78] |
| $S^E$ | -0.48 | -0.51 | -0.85 | -0.85 | -0.39 | -0.92 | -0.45 | -0.48 | -0.75 | -0.90 | -0.66 | -0.56 |
| $t$ | [-0.91] | [-0.96] | [-1.62] | [-1.48] | [-0.69] | [-1.69] | [-0.82] | [-0.85] | [-1.38] | [-1.64] | [-1.32] | [-1.07] |
| $S^U$ | -0.31 | -0.52 | -1.64 | -0.58 | -0.76 | 0.06 | -0.93 | -0.28 | 0.53 | 0.94 | 1.73 | 1.58 |
| $t$ | [-0.25] | [-0.39] | [-1.18] | [-0.41] | [-0.54] | [0.04] | [-0.62] | [-0.19] | [0.38] | [0.69] | [1.31] | [1.31] |

(continued on next page)

**Table 9.** continued

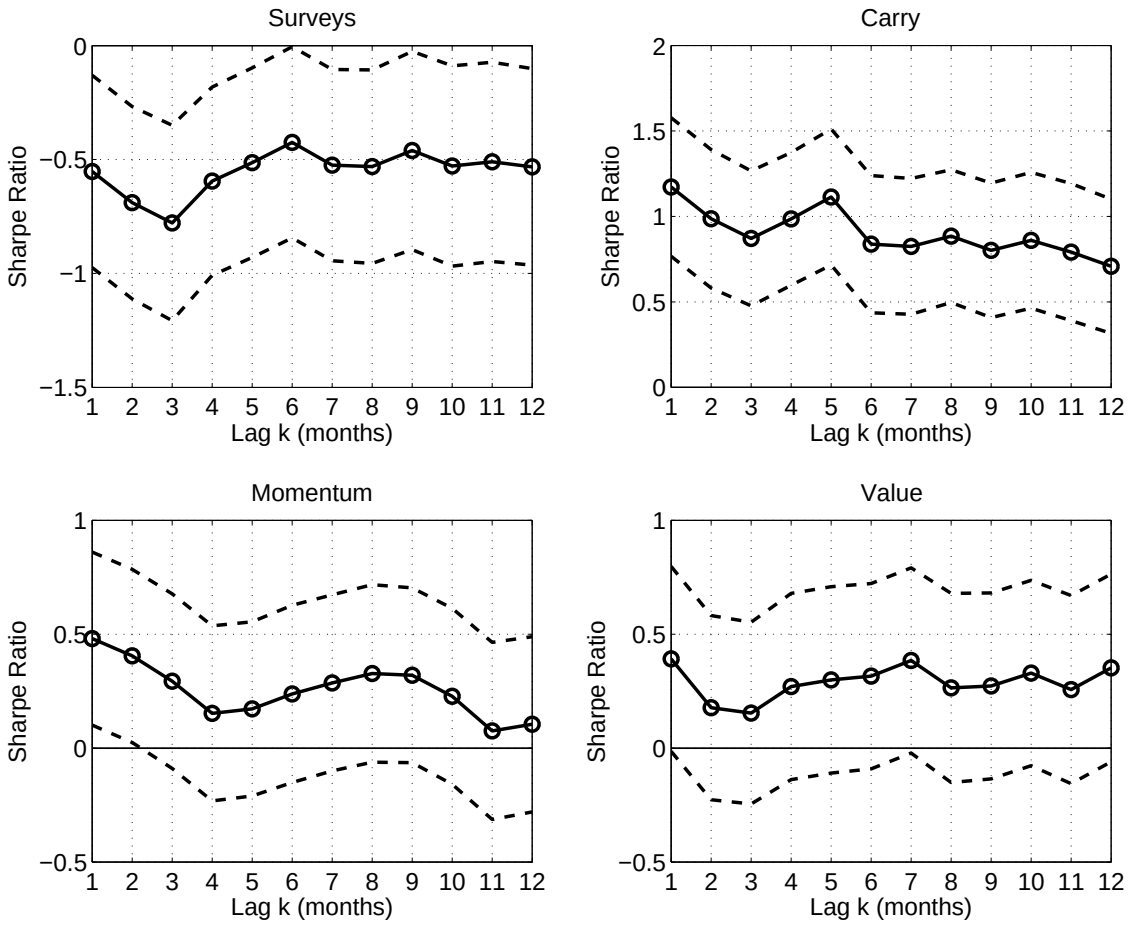
| | Lag between survey and portfolio formation $k$ (months) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Panel B. Time-series strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| $S$ | 0.86 | -0.73 | -0.92 | 0.08 | 1.80 | 1.41 | 1.38 | 0.33 | -0.72 | -0.99 | -0.13 | -0.36 |
| $t$ | [0.26] | [-0.22] | [-0.27] | [0.02] | [0.52] | [0.40] | [0.40] | [0.09] | [-0.21] | [-0.27] | [-0.04] | [-0.10] |
| $S^E$ | 1.94 | 1.05 | 0.54 | -0.72 | -0.11 | -0.09 | -0.28 | -0.77 | -0.84 | 0.12 | 0.36 | -0.12 |
| $t$ | [0.48] | [0.26] | [0.13] | [-0.18] | [-0.03] | [-0.02] | [-0.07] | [-0.19] | [-0.20] | [0.03] | [0.08] | [-0.03] |
| $S^U$ | 0.53 | -2.26 | -3.39 | -1.93 | -0.67 | -0.61 | 0.55 | 2.68 | 3.43 | 2.63 | 1.87 | 1.72 |
| $t$ | [0.29] | [-1.25] | [-1.84] | [-0.99] | [-0.35] | [-0.30] | [0.27] | [1.30] | [1.63] | [1.33] | [0.95] | [0.98] |
| **Currencies** | | | | | | | | | | | | |
| $S$ | -2.17 | -2.14 | -2.79 | -2.41 | -2.08 | -1.32 | -1.34 | -1.67 | -1.74 | -2.28 | -2.58 | -2.38 |
| $t$ | [-1.85] | [-1.89] | [-2.39] | [-2.13] | [-1.84] | [-1.18] | [-1.17] | [-1.39] | [-1.44] | [-1.85] | [-2.13] | [-1.99] |
| $S^E$ | 1.40 | 0.85 | 1.27 | 1.67 | 1.42 | 2.12 | 2.16 | 2.17 | 0.08 | -1.12 | -0.30 | 0.95 |
| $t$ | [0.93] | [0.56] | [0.81] | [1.08] | [0.92] | [1.39] | [1.39] | [1.41] | [0.05] | [-0.73] | [-0.19] | [0.60] |
| $S^U$ | -1.40 | -1.46 | -2.15 | -1.82 | -1.57 | -1.36 | -1.38 | -1.84 | -1.04 | -1.62 | -2.74 | -3.37 |
| $t$ | [-1.19] | [-1.22] | [-1.83] | [-1.57] | [-1.34] | [-1.14] | [-1.13] | [-1.53] | [-0.87] | [-1.39] | [-2.33] | [-2.96] |
| **Fixed income** | | | | | | | | | | | | |
| $S$ | -3.57 | -4.13 | -5.11 | -4.06 | -3.15 | -2.94 | -3.31 | -2.66 | -2.87 | -3.19 | -3.35 | -2.65 |
| $t$ | [-2.73] | [-3.26] | [-4.10] | [-3.13] | [-2.48] | [-2.37] | [-2.72] | [-2.11] | [-2.32] | [-2.55] | [-2.60] | [-1.95] |
| $S^E$ | -2.87 | -3.07 | -3.18 | -3.06 | -2.93 | -3.63 | -3.37 | -3.79 | -3.72 | -3.75 | -3.02 | -3.13 |
| $t$ | [-1.98] | [-2.15] | [-2.18] | [-2.12] | [-2.11] | [-2.69] | [-2.54] | [-2.67] | [-2.59] | [-2.55] | [-2.04] | [-2.13] |
| $S^U$ | -2.05 | -2.69 | -3.25 | -2.01 | -1.08 | -0.83 | -1.41 | -0.60 | -0.02 | -0.06 | -0.07 | 0.38 |
| $t$ | [-2.25] | [-2.81] | [-3.40] | [-2.04] | [-1.12] | [-0.84] | [-1.36] | [-0.60] | [-0.02] | [-0.06] | [-0.08] | [0.44] |

**Figure 1.** Cumulative returns of Survey, Carry, Momentum, and Value strategies



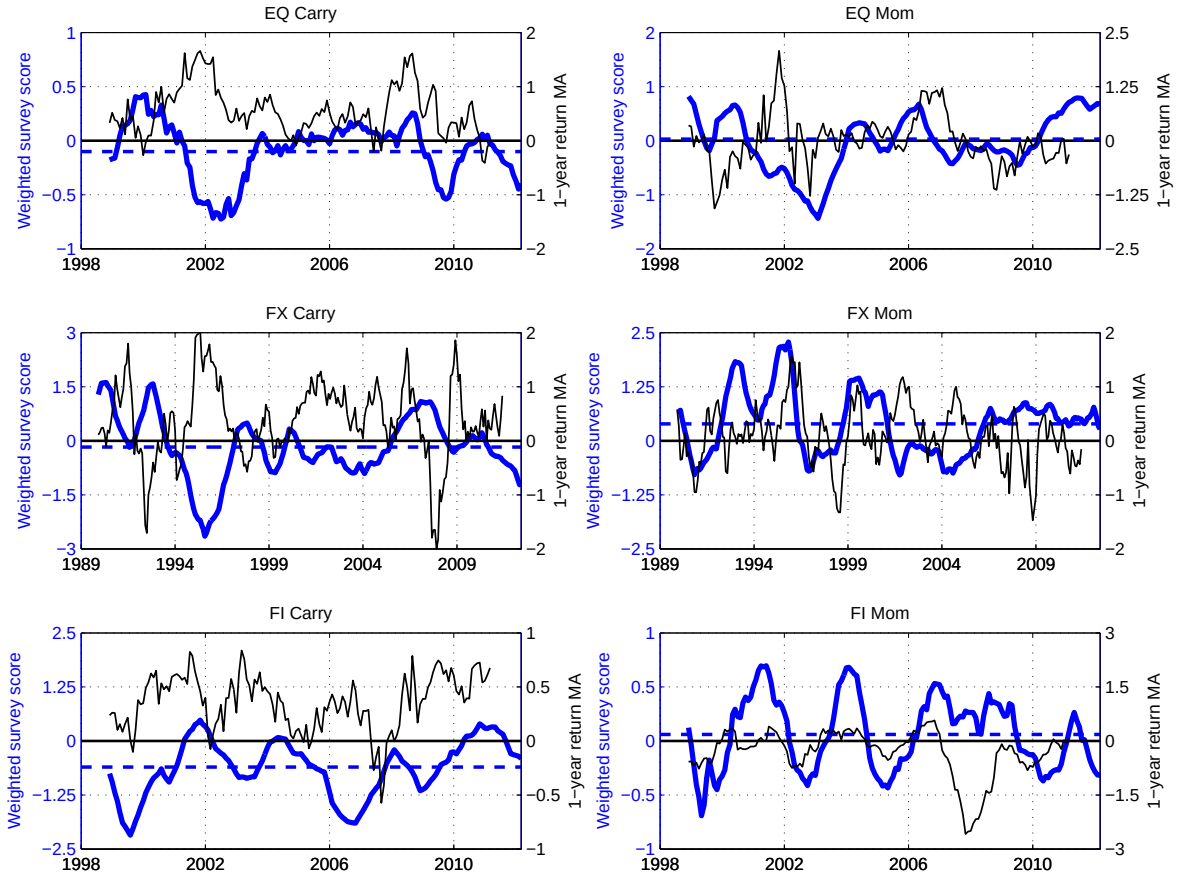

This figure shows cumulative excess returns of survey, carry, value, and momentum strategies (solid lines). We combine cross-sectional and time-series strategies and all asset classes for each strategy by dividing individual strategy returns by their volatility, then average across all strategies, and scale the resulting return to have an annual volatility of 10%. The dashed lines show cumulative returns of the passive long benchmarks which are weighted in the same way. The sample is monthly from 1989/01 – 2012/09 for all four strategies.

**Figure 2.** Sharpe Ratios of Survey, Carry, Momentum, and Value strategies



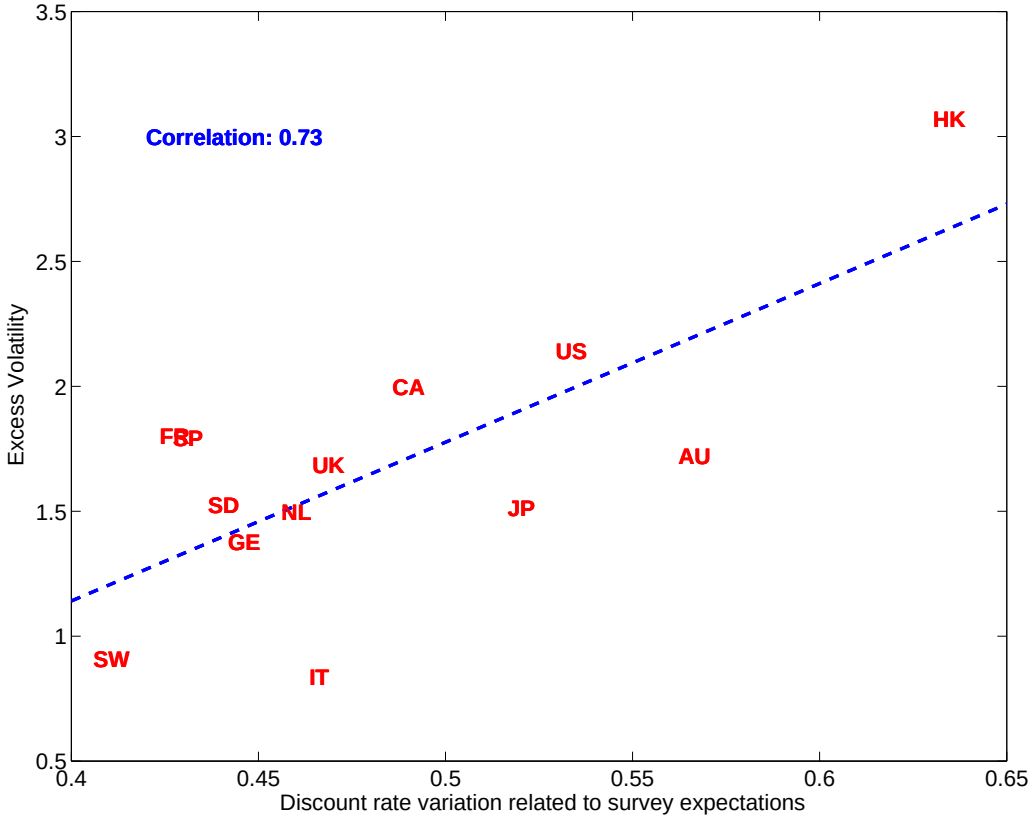

This figure shows annualized Sharpe Ratios for survey, carry, value, and momentum strategies (solid lines). We combine cross-sectional and time-series strategies and all asset classes for each strategy by dividing individual strategy returns by their volatility, then average across all strategies, and scale the resulting return to have an annual volatility of 10%. We plot these Sharpe Ratios for different implementation lags of $k = 1, 2, ..., 12$ months. Dashed lines correspond to 95% confidence intervals. The sample is monthly from 1989/01 – 2012/09 for all four strategies.

**Figure 3.** Survey scores weighted by carry and momentum




This figure shows 1-year moving averages of survey scores weighted by carry (left panels) and momentum (right panels) rank weights as solid, blue lines. Weighted surevy scores for each month are based on weighting the survey scores with rank weights based on carry or momentum signals and then summing over all countries/currencies. Dashed blue lines show unconditional averages of weighted survey scores. Thin black lines correspond to 1-year moving averages of strategy excess returns (cross-sectional carry or momentum strategies) shifted one year back. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies.

**Figure 4.** Surveys and excess volatility




This figure shows a scatter plot of excess volatility (vertical axis) and the variation in discount rates related to survey expectations (horizontal axis). Excess volatility is computed as the ratio of the standard deviation of annual equity returns and the standard deviation of annual dividend growth. Due to the annual frequency of returns and dividends, the sample period is from 1998 – 2011. The volatility of returns related to surveys is based on the panel regression

$$R_{i,q+1} = \alpha + \beta_1 S_{i,q} + \beta_2 w_{i,q}^{XS}(1) + \varepsilon_{i,q+1}$$

where $R_{i,q+1}$ denotes quarterly equity returns of country $i$ in quarter $q+1$, $S_{i,q}$ denotes the survey scores, and $w_{i,q}^{XS}(1)$ denotes the cross-sectional rank weights of (equity) survey scores for the benchmark strategy with a one quarter lag ($k = 3$ months, $q = 1$ quarter). We then compute the variation in discount rates related to survey expectations as $stdev(E[R_{i,q+1} \mid S_{i,q}, w_{i,q}^{XS}(1)])$ for each country $i$. We employ the full sample period from 1998Q2 – 2012Q3 and all return and dividend data used for this figure are based on MSCI country indices in local currency.

*Internet Appendix to accompany*

# Survey Expectations of Returns and Asset Pricing Puzzles

(not for publication)

**Table IA.1.** Unconditional frequencies for survey scores

This table reports unconditional frequencies for survey scores, i.e. the frequencies with which the survey score lies within the following boundaries: $1-2, 2-3, ..., 8-9$. We report these frequencies separately for equities, currencies, and fixed income, and average over all countries within each asset class. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies.

| | Equities | Currencies | Fixed income |
|---|---|---|---|
| 1-2 | 0.00 | 0.07 | 0.07 |
| 2-3 | 0.00 | 0.05 | 0.22 |
| 3-4 | 0.02 | 0.12 | 0.27 |
| 4-5 | 0.06 | 0.17 | 0.21 |
| 5-6 | 0.25 | 0.27 | 0.13 |
| 6-7 | 0.36 | 0.17 | 0.07 |
| 7-8 | 0.28 | 0.12 | 0.02 |
| 8-9 | 0.04 | 0.03 | 0.00 |

**Table IA.2.** Transition probabilities

This table reports transition probabilities for equity, currency, and fixed income survey scores where we make use of the discretization of survey scores as in Table IA.1 above. The rows correspond to the bucket at time $t$ whereas columns correspond to the buckets at time $t+1$. The sample is monthly from 1998/04 – 2012/09 for equities and fixed income and from 1989/01 – 2012/09 for currencies.

| | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 |
|---|---|---|---|---|---|---|---|---|
| **Panel A. Equities** | | | | | | | | |
| 1-2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2-3 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3-4 | 0.00 | 0.00 | 0.08 | 0.25 | 0.58 | 0.00 | 0.08 | 0.00 |
| 4-5 | 0.00 | 0.00 | 0.07 | 0.20 | 0.44 | 0.24 | 0.04 | 0.00 |
| 5-6 | 0.00 | 0.01 | 0.04 | 0.12 | 0.40 | 0.33 | 0.10 | 0.00 |
| 6-7 | 0.00 | 0.00 | 0.00 | 0.03 | 0.22 | 0.44 | 0.29 | 0.02 |
| 7-8 | 0.00 | 0.00 | 0.00 | 0.01 | 0.11 | 0.36 | 0.45 | 0.07 |
| 8-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.52 | 0.22 |
| **Panel B. Currencies** | | | | | | | | |
| 1-2 | 0.59 | 0.30 | 0.09 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 2-3 | 0.37 | 0.23 | 0.25 | 0.07 | 0.06 | 0.01 | 0.00 | 0.00 |
| 3-4 | 0.06 | 0.08 | 0.36 | 0.25 | 0.21 | 0.03 | 0.01 | 0.00 |
| 4-5 | 0.01 | 0.03 | 0.17 | 0.32 | 0.36 | 0.10 | 0.01 | 0.00 |
| 5-6 | 0.01 | 0.01 | 0.08 | 0.22 | 0.39 | 0.21 | 0.08 | 0.01 |
| 6-7 | 0.00 | 0.00 | 0.02 | 0.12 | 0.32 | 0.29 | 0.20 | 0.02 |
| 7-8 | 0.00 | 0.00 | 0.00 | 0.02 | 0.14 | 0.32 | 0.38 | 0.12 |
| 8-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.18 | 0.40 | 0.28 |
| **Panel C. Fixed income** | | | | | | | | |
| 1-2 | 0.37 | 0.29 | 0.22 | 0.02 | 0.05 | 0.02 | 0.02 | 0.00 |
| 2-3 | 0.13 | 0.49 | 0.29 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3-4 | 0.05 | 0.26 | 0.32 | 0.22 | 0.14 | 0.01 | 0.00 | 0.00 |
| 4-5 | 0.02 | 0.09 | 0.35 | 0.30 | 0.16 | 0.06 | 0.01 | 0.02 |
| 5-6 | 0.01 | 0.03 | 0.16 | 0.29 | 0.24 | 0.24 | 0.04 | 0.00 |
| 6-7 | 0.00 | 0.02 | 0.05 | 0.34 | 0.34 | 0.17 | 0.05 | 0.00 |
| 7-8 | 0.00 | 0.00 | 0.27 | 0.09 | 0.09 | 0.45 | 0.09 | 0.00 |
| 8-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 |

**Table IA.3.** Carry strategies

This table reports annualized returns, standard deviations (std), and Sharpe Ratios (SR) of carry portfolios. We report results for both cross-sectional strategies (portfolios are formed on cross-sectional ranks of carry – Panel A) and time-series strategies (we go long or short in a country depending on whether carry is above or below zero – Panel B). We allow for a lag of $k = 1, 2, ..., 12$ months between the carry signal and portfolio formation. The sample is monthly from 1988/03 – 2012/09 for equities, from 1983/11 – 2012/09 for currencies and fixed income.

| | Lag between survey and portfolio formation $k$ (months) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Panel A. Cross-sectional strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | 9.57 | 4.50 | 2.17 | 2.02 | 3.61 | -1.10 | 2.45 | 1.42 | -0.54 | 1.45 | 2.23 | 1.27 |
| std | 10.48 | 11.48 | 10.45 | 9.40 | 10.17 | 10.77 | 11.07 | 11.32 | 11.04 | 10.35 | 11.15 | 10.91 |
| SR | 0.91 | 0.39 | 0.21 | 0.21 | 0.36 | -0.10 | 0.22 | 0.13 | -0.05 | 0.14 | 0.20 | 0.12 |
| **Currencies** | | | | | | | | | | | | |
| mean | 4.73 | 4.08 | 3.68 | 3.95 | 3.78 | 3.97 | 3.60 | 3.90 | 3.19 | 3.59 | 2.99 | 3.01 |
| std | 8.01 | 7.97 | 7.90 | 7.83 | 7.79 | 7.76 | 7.89 | 7.87 | 7.78 | 7.81 | 7.82 | 7.71 |
| SR | 0.59 | 0.51 | 0.47 | 0.50 | 0.49 | 0.51 | 0.46 | 0.50 | 0.41 | 0.46 | 0.38 | 0.39 |
| **Fixed income** | | | | | | | | | | | | |
| mean | 3.85 | 4.69 | 3.78 | 3.23 | 3.30 | 3.19 | 2.20 | 2.90 | 2.01 | 2.65 | 1.96 | 2.42 |
| std | 7.45 | 7.00 | 7.45 | 7.16 | 7.52 | 7.52 | 7.29 | 7.20 | 6.91 | 6.70 | 6.79 | 6.68 |
| SR | 0.52 | 0.67 | 0.51 | 0.45 | 0.44 | 0.42 | 0.30 | 0.40 | 0.29 | 0.40 | 0.29 | 0.36 |
| **Panel B. Time-series strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | 3.85 | 1.35 | -1.48 | 1.52 | 3.71 | 0.17 | 0.96 | 1.46 | 2.42 | 0.72 | 2.29 | 1.33 |
| std | 9.33 | 9.62 | 9.06 | 9.19 | 8.73 | 9.39 | 9.63 | 9.85 | 9.72 | 9.50 | 9.73 | 9.60 |
| SR | 0.41 | 0.14 | -0.16 | 0.17 | 0.43 | 0.02 | 0.10 | 0.15 | 0.25 | 0.08 | 0.24 | 0.14 |
| **Currencies** | | | | | | | | | | | | |
| mean | 4.29 | 4.05 | 3.84 | 3.94 | 4.28 | 3.68 | 3.36 | 3.36 | 3.52 | 3.18 | 3.19 | 2.75 |
| std | 5.49 | 5.79 | 5.90 | 5.78 | 5.81 | 5.91 | 6.17 | 5.80 | 5.73 | 5.45 | 5.45 | 5.47 |
| SR | 0.78 | 0.70 | 0.65 | 0.68 | 0.74 | 0.62 | 0.55 | 0.58 | 0.62 | 0.58 | 0.59 | 0.50 |
| **Fixed income** | | | | | | | | | | | | |
| mean | 3.55 | 3.55 | 4.41 | 4.46 | 4.74 | 4.63 | 4.34 | 4.40 | 4.20 | 3.94 | 3.16 | 3.01 |
| std | 5.47 | 5.51 | 5.57 | 5.54 | 5.58 | 5.44 | 5.43 | 5.27 | 5.23 | 5.31 | 5.26 | 5.29 |
| SR | 0.65 | 0.64 | 0.79 | 0.81 | 0.85 | 0.85 | 0.80 | 0.83 | 0.80 | 0.74 | 0.60 | 0.57 |

**Table IA.4.** Momentum strategies

This table reports annualized returns, standard deviations (std), and Sharpe Ratios (SR) of momentum portfolios. We report results for both cross-sectional strategies (portfolios are formed on cross-sectional ranks of momentum – Panel A) and time-series strategies (we go long or short in a country depending on whether momentum is above or below zero – Panel B). Momentum is defined as the sum of lagged returns over the previous 12 months. We allow for a lag of $k = 1, 2, ..., 12$ months between the momentum signal and portfolio formation. The sample is monthly from 1989/03 – 2012/09 for equities, from 1984/11 – 2012/09 for currencies and fixed income.

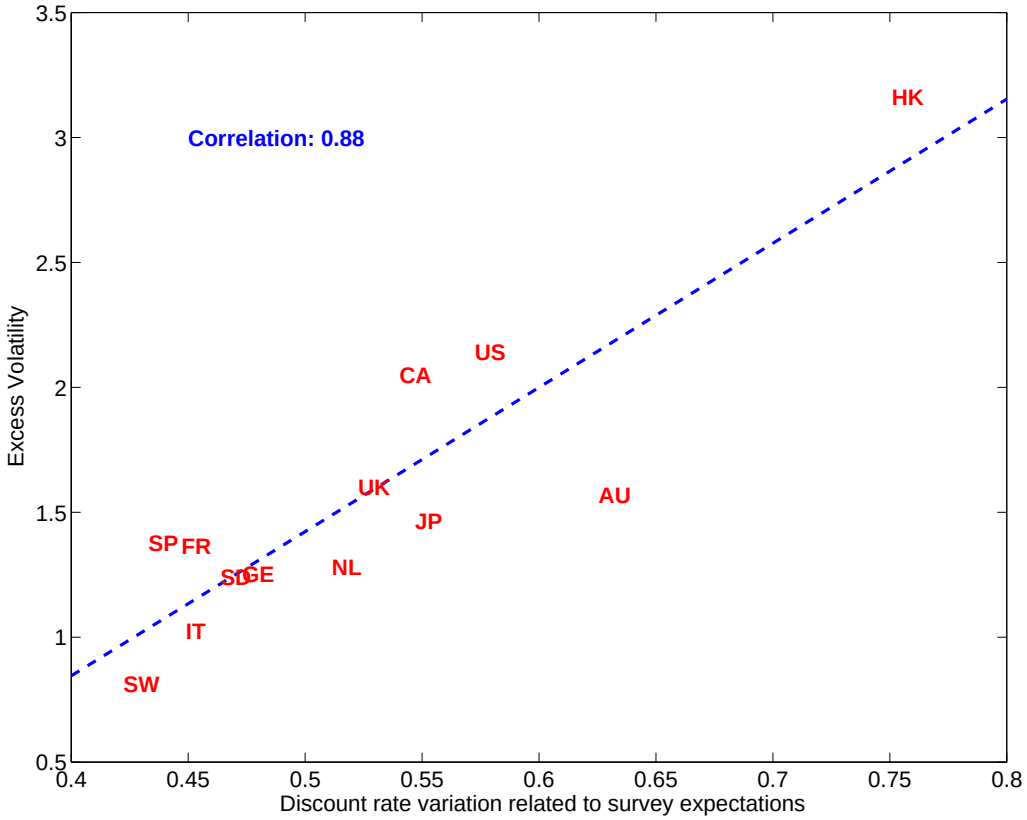
| | Lag between survey and portfolio formation $k$ (months) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Panel A. Cross-sectional strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | 1.71 | 1.43 | 3.28 | 1.45 | 0.83 | 2.73 | 3.26 | 3.28 | 5.32 | 2.68 | 0.13 | 4.42 |
| std | 13.49 | 13.40 | 12.52 | 12.81 | 12.53 | 11.76 | 12.17 | 12.04 | 12.12 | 12.31 | 12.64 | 12.15 |
| SR | 0.13 | 0.11 | 0.26 | 0.11 | 0.07 | 0.23 | 0.27 | 0.27 | 0.44 | 0.22 | 0.01 | 0.36 |
| **Currencies** | | | | | | | | | | | | |
| mean | 1.36 | 1.02 | -0.45 | -0.89 | -0.92 | -0.46 | 0.07 | -1.08 | -1.12 | -1.62 | -1.51 | -1.70 |
| std | 7.95 | 7.40 | 7.23 | 7.37 | 7.38 | 7.21 | 7.03 | 7.27 | 7.40 | 7.29 | 7.37 | 7.32 |
| SR | 0.17 | 0.14 | -0.06 | -0.12 | -0.13 | -0.06 | 0.01 | -0.15 | -0.15 | -0.22 | -0.20 | -0.23 |
| **Fixed income** | | | | | | | | | | | | |
| mean | -0.75 | -0.29 | -0.58 | -0.95 | 0.46 | 1.72 | 1.63 | 2.17 | 1.62 | 1.77 | 0.67 | 0.46 |
| std | 7.61 | 7.06 | 7.20 | 6.93 | 6.99 | 7.30 | 7.42 | 7.08 | 7.27 | 7.47 | 7.19 | 7.40 |
| SR | -0.10 | -0.04 | -0.08 | -0.14 | 0.07 | 0.23 | 0.22 | 0.31 | 0.22 | 0.24 | 0.09 | 0.06 |
| **Panel B. Time-series strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | 5.57 | 4.75 | 4.87 | 3.37 | 2.76 | 1.70 | 0.28 | 2.20 | 0.94 | -0.07 | -1.17 | 0.67 |
| std | 13.75 | 13.59 | 13.47 | 13.52 | 13.99 | 13.93 | 13.88 | 13.73 | 13.60 | 13.39 | 13.81 | 14.29 |
| SR | 0.41 | 0.35 | 0.36 | 0.25 | 0.20 | 0.12 | 0.02 | 0.16 | 0.07 | -0.01 | -0.08 | 0.05 |
| **Currencies** | | | | | | | | | | | | |
| mean | 2.91 | 1.86 | 1.36 | 0.35 | 0.19 | 0.54 | 0.59 | 0.12 | 0.56 | -0.10 | -0.09 | -0.10 |
| std | 7.82 | 7.75 | 7.72 | 7.90 | 8.02 | 7.93 | 7.91 | 7.72 | 7.70 | 7.59 | 7.75 | 7.91 |
| SR | 0.37 | 0.24 | 0.18 | 0.04 | 0.02 | 0.07 | 0.07 | 0.02 | 0.07 | -0.01 | -0.01 | -0.01 |
| **Fixed income** | | | | | | | | | | | | |
| mean | 4.04 | 3.37 | 2.91 | 2.51 | 2.58 | 1.62 | 2.26 | 2.89 | 2.67 | 3.26 | 2.57 | 1.46 |
| std | 6.20 | 6.22 | 6.35 | 6.31 | 6.19 | 6.15 | 6.05 | 6.02 | 6.08 | 6.16 | 5.97 | 5.87 |
| SR | 0.65 | 0.54 | 0.46 | 0.40 | 0.42 | 0.26 | 0.37 | 0.48 | 0.44 | 0.53 | 0.43 | 0.25 |

**Table IA.5.** Value strategies

This table reports annualized returns, standard deviations (std), and Sharpe Ratios (SR) of value portfolios. We report results for both cross-sectional strategies (portfolios are formed on cross-sectional ranks of value – Panel A) and time-series strategies (we go long or short in a country depending on whether value is above or below the historical mean – Panel B). We allow for a lag of $k = 1, 2, ..., 12$ months between the value signal and portfolio formation. The sample is monthly from 1988/04 – 2012/09 for equities, from 1988/11 – 2012/09 for currencies, and from 1994/05 – 2012/09 for fixed income.

| | Lag between survey and portfolio formation $k$ (months) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Panel A. Cross-sectional strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | 3.22 | 2.03 | 1.88 | 2.54 | 1.64 | 1.66 | 1.91 | 1.78 | 2.21 | 3.67 | 3.38 | 3.51 |
| std | 11.07 | 11.01 | 11.04 | 11.26 | 11.35 | 11.41 | 11.05 | 11.19 | 11.14 | 11.14 | 11.07 | 11.15 |
| SR | 0.29 | 0.18 | 0.17 | 0.23 | 0.14 | 0.15 | 0.17 | 0.16 | 0.20 | 0.33 | 0.31 | 0.32 |
| **Currencies** | | | | | | | | | | | | |
| mean | 2.68 | 2.96 | 3.98 | 4.54 | 4.14 | 3.23 | 3.11 | 3.54 | 3.55 | 3.21 | 3.06 | 2.82 |
| std | 7.43 | 7.41 | 7.23 | 7.44 | 7.45 | 7.45 | 7.43 | 7.60 | 7.72 | 7.62 | 7.64 | 7.61 |
| SR | 0.36 | 0.40 | 0.55 | 0.61 | 0.56 | 0.43 | 0.42 | 0.47 | 0.46 | 0.42 | 0.40 | 0.37 |
| **Fixed income** | | | | | | | | | | | | |
| mean | 1.73 | 0.43 | -0.34 | -0.93 | -1.14 | -0.23 | -0.41 | -0.68 | 0.00 | -0.34 | -1.65 | -0.74 |
| std | 6.14 | 6.49 | 6.09 | 6.30 | 6.26 | 6.39 | 6.35 | 6.28 | 6.16 | 5.95 | 5.83 | 5.95 |
| SR | 0.28 | 0.07 | -0.06 | -0.15 | -0.18 | -0.04 | -0.06 | -0.11 | 0.00 | -0.06 | -0.28 | -0.12 |
| **Panel B. Time-series strategies** | | | | | | | | | | | | |
| **Equities** | | | | | | | | | | | | |
| mean | -1.55 | -1.60 | -2.01 | -2.07 | -1.83 | -1.75 | -1.29 | -1.00 | -1.44 | -1.85 | -0.12 | -0.13 |
| std | 11.51 | 11.19 | 11.16 | 10.99 | 11.25 | 11.05 | 10.93 | 10.96 | 10.85 | 10.62 | 10.61 | 10.49 |
| SR | -0.13 | -0.14 | -0.18 | -0.19 | -0.16 | -0.16 | -0.12 | -0.09 | -0.13 | -0.17 | -0.01 | -0.01 |
| **Currencies** | | | | | | | | | | | | |
| mean | -0.94 | -1.09 | -0.92 | -0.04 | 0.91 | 0.75 | 0.80 | 0.21 | -0.37 | 0.51 | 0.15 | 0.37 |
| std | 6.86 | 7.21 | 7.20 | 6.97 | 6.92 | 7.02 | 6.79 | 6.98 | 7.11 | 6.92 | 6.91 | 6.89 |
| SR | -0.14 | -0.15 | -0.13 | -0.01 | 0.13 | 0.11 | 0.12 | 0.03 | -0.05 | 0.07 | 0.02 | 0.05 |
| **Fixed income** | | | | | | | | | | | | |
| mean | 1.31 | 0.89 | 0.95 | 1.84 | 1.65 | 2.23 | 2.81 | 1.40 | 1.80 | 1.50 | 1.21 | 1.44 |
| std | 4.97 | 5.01 | 4.74 | 4.95 | 4.91 | 4.99 | 4.88 | 4.67 | 4.75 | 4.68 | 4.68 | 4.55 |
| SR | 0.26 | 0.18 | 0.20 | 0.37 | 0.34 | 0.45 | 0.58 | 0.30 | 0.38 | 0.32 | 0.26 | 0.32 |

**Figure IA.1.** Surveys and excess volatility: Subtracting the benchmark return




This Figure is similar to Figure 4 but here we estimate the standard deviation of the predicted part based on a panel regression where we subtract the passive long benchmark from asset returns

$$R_{i,q+1} - R_{M,q+1} = \alpha + \beta_1 S_{i,q} + \beta_2 w_{i,q}^{XS}(1) + \varepsilon_{i,q+1}$$

and where all returns and dividends are based on MSCI country indices measured in USD (so that the benchmark return and equity returns are expressed in the same currency).