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# ECONOMIC CYCLES AND EXPECTED STOCK RETURNS

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# ABSTRACT

## Economic Cycles and Expected Stock Returns*

We construct daily real-time indices capturing the public information on realized and anticipated economic activity. The one-month change in realized fundamentals predicts US stock returns across horizons with strongest results between a month and a quarter. The information in anticipated fundamentals that is orthogonal to the realized data predicts returns even more strongly particularly at longer horizons up to two quarters. Splitting the sample into times of high versus low uncertainty, as measured by the cross-sectional dispersion of economist forecasts, we show that the predictability is largely concentrated in high-uncertainty times. Finally, extending the analysis internationally, we find similar results that are curiously much stronger when US data are used as predictors than global composites or local data.

JEL Classification: G12
Keywords: macroeconomic uncertainty, state of the economy and stock market predictability

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# 1 Introduction

Risk-averse investors hedge against future shifts in economic fundamentals that are correlated with changes in consumption and investment opportunities. As a result, asset risk premia depend on the expectations about the state of the economy and, necessarily, on the uncertainty surrounding these expectations.

Based on this simple intuition, a number of empirical papers have shown the predictability of stock market returns by variables that should be informative about the business cycle. The seminal papers on stock market predictability have gauged economic expectations using traditional valuation measures, such as dividend yields or consumption-wealth ratios (e.g., Campbell and Shiller, 1988; Lettau and Ludvigson, 2001). More recently, Bollerslev et al. (2009) show that the variance risk premium, the difference between implied and realized variation of the S&P500 index, predicts future stock market returns. In their model, the variance risk premium is associated with consumption growth volatility.

The motivation for the use of proxies for the state of the economy instead of direct readings of the economy itself is that macroeconomic information is only available at low frequency and is reported with a lag. For example, GDP announcements are only available at quarterly frequency and release information that typically refers to the state of the economy two months earlier. We take a different standpoint in this paper, that is, we try and extract an high-frequency component from low-frequency macroeconomic variables using the methodology of Beber, Brandt and Luisi (2013). They develop a framework to estimate macroeconomic factors in real time, using a variety of macroeconomic announcements data observed at different frequencies. Exploiting the information in the forecasts of different economists, this methodology also allows to obtain a directly linked daily measurement of macroeconomic disagreement. A real-time direct measure of the state of the economy is clearly better suited than a proxy, because it does not need to rely on the validity of a model or a set of assumptions.

The empirical strategy for this paper is straightforward. First, we briefly document properties and time patterns of the state of the economy and its uncertainty, as measured in our real-time framework and refer to Beber et al. (2013) for further details. We then forecast the equity premium using our real-time measures of the state of the business cycle. More specifically, we use the gradient in growth and economic activity as proxies for the evolution of the business cycle. We also employ a more forward-looking measure of economic expectations constructed with the portion of macroeconomic sentiment indicators (e.g., consumption and business confidence releases) that is orthogonal to contemporaneous growth fundamentals. Finally, we explore the degree of stock market predictability afforded by our measure of macroeconomic uncertainty. This analysis is carried out internationally and controlling for the standard predictors used before in the literature.

The features of our measure of the state of the economy and its uncertainty allow us to uncover a strong stock market predictability relation. Our simple measures of current macroeconomic dynamics, such as first differences in the growth or in the economic activity factor, are strong predictors of future stock market excess returns, for horizons ranging between 5 and 120 trading days. These results are even stronger when the explanatory variable is a measure of macroeconomic sentiment that is orthogonal to economic activity. Importantly, this empirical evidence is not subsumed by traditional predictors used in previous stock market predictability literature. We also extend the analysis to other countries, such as the Eurozone, the U.K., and Japan and obtain very similar results.

Our proxy for macroeconomic uncertainty also offers interesting empirical insights. Specifically, we find that real-time disagreement about growth releases is a significant predictor of future stock market returns in U.S., the Eurozone, and the U.K., beyond the factors describing the state of the economy. Interestingly, this proxy for macroeconomic uncertainty can act as an important conditioning variable to enhance substantially the predictive power of our *orthogonal* measure of macroeconomic sentiment. More specifically, it is precisely when economists disagree a lot, that the divergences between sentiment and economic activity demand a substantial equity risk premium.

Finally, we show that our real-time macroeconomic factors, both our measure of the state of the economy and its uncertainty, have predictive ability for the future growth of the economy. This evidence can provide an economic rational for our stock market predictability results.

Our paper is clearly related to the primal research question of stock market return predictability. A long list of papers have shown long-horizon predictability afforded by a number of predictor variables, such as the dividend yield, the P/E ratio, the default spread, or the consumption-wealth ratio (CAY). More recently, Bollerslev et al. (2009) have shown strong stock market return predictability at the quarterly horizon using the variance risk premium. We add to this literature by using a predictor variable – the state of the economy and its uncertainty – which is explicitly tracking macroeconomic conditions at daily frequency and as such can provide a clear and direct link between consumption growth, its volatility, and the equity premium.

The methodology in our paper is related to the literature that has tried to quantify the state of the economy in a time-series, starting from the seminal coincident indicator of Stock and Watson (1989), now Chicago Federal National Activity Index (CFNAI). As Beber et al. (2013) show, the simple cross-sectional technique used in this paper delivers real-time macro factors that are correlated with the CFNAI and with the ADS business condition index of Arouba et al. (2010), but appear to be more timely and accurate. Furthermore, our truly $real-time$ approach allows us to sidestep all the potential forecasting issues induced by restated macroeconomic data and publication lags (e.g., Ghysels et al., 2012).[1]

This paper is also tangentially related to papers that have looked at sentiment and equity markets. For example, Baker, Wurgler, and Yuan (2012) measure sentiment as a combination of the cross-sectional volatility premium, IPO information, and market turnover. This combination

[1]Bai (2010) constructs monthly *adaptive* macroeconomic indices that optimize stock return predictability and use final (potentially restated) macroeconomic data. In contrast, our macroeconomic factors are non-optimized, daily, and truly obtained in real-time.

of indicators is relatively unrelated to macro fundamental series.[2] We clearly depart from this approach, because the origin of our measure of macroeconomic sentiment is specifically in macroeconomic announcements and does not depend on financial markets dynamics such as IPOs or volatility and turnover. At the same though, we label it sentiment in that it is obtained from business and consumer confidence readings and because we focus our empirical analysis on the divergences between these readings and economic activity macroeconomic releases.

The paper proceeds as follows. In Section 2, we describe the macroeconomic news, the asset prices data, and we carry out some preliminary analysis on macroeconomic announcements. Section 3 explains our methodology for estimating in real-time the state of the economy and an empirical proxy for its uncertainty. We present our empirical results in Section 4. Section 5 concludes with a summary of our findings.

# 2 Data and Preliminaries

## 2.1 Macroeconomic news and forecasts

We obtain data on the dates, release times, and actual released figures for 43 U.S. macroeconomic announcements covering the period from January 1997 through December 2011, for a total of more than 8,000 announcements over about 3,800 working days. This data is obtained from Bloomberg through the Economic Calendar screen, which provides precisely time-stamped and unrestated announcement data.[3] We also collect data on economist forecasts for each announcement. Bloomberg surveys economists during the weeks prior to the release of each indicator to obtain a consensus estimate. We work with the individual economist level forecasts, rather than the aggregated consensus forecasts, in order to construct cross-sectional measures of disagreement for each news release.

Bloomberg contains data for many of our series prior to 1997, but those data are stored in historical fields which (a) are not associated with clear announcement dates and times (rather they are dated according to the period they reference) and (b) are restated over time.[4] We collect this more problematic data for January 1990 through 1996 simply to construct an initial correlation matrix estimate, which is required by our methodology (see Section 3).

We complement the U.S. data with equivalent information for the Eurozone, the U.K., and Japan. More specifically, we obtain information from 183 European macro releases, from 43 U.K. releases, and from 45 Japanese releases, for the same sample period. The surveyed economist forecasts are only available for a slightly shorter sample period, starting in June 1997 for Europe and the U.K, and in May 2000 for Japan.

[2] Baker, Wurgler, and Yuan (2012) show that their sentiment indicator series orthogonalized to macroeconomic proxies has a 0.88 correlation with the raw series.

[3] The importance of using real-time versus final data in macroeconomic forecasting has been discussed extensively in the literature (e.g., Koenig et al., 2003).

[4] For example, there are monthly releases of quarterly GDP labeled "advance," "preliminary" and "final" all referring to the same quarter. Bloomberg's historical field for GDP is dated according to the referenced quarter, so that the advance release gets overwritten by the preliminary release, which in turn gets overwritten by the final release. Historically only the final releases are stored.

Most macroeconomic indicators are released on different days and at different frequencies, making it difficult to process the flow of information in a systematic and consistent way. Figure 1 shows that actual news releases occur with a variety of different lags with respect to the month they are referring to. Furthermore, news on different indicators are frequently released simultaneously.[5] For example, the employment report traditionally announced on the first Friday of the month contains four different indicators: nonfarm payrolls, nonfarm payrolls in the manufacturing sector, unemployment rate, and average weekly hours. Finally, the release frequency varies across different economic aggregates. Data releases of different economic indicators are usually observed at different frequency; e.g., GDP data are sampled quarterly, the Non-Farm Payrolls are released monthly, Initial Jobless Claims are sampled weekly, etc. These features of our large cross-section of macroeconomic releases generate a sparse matrix of data that our methodology will have to take up.

The Appendix describes in detail the set of U.S., Europe, U.K., and Japan macroeconomic news in our sample, including their frequency, source, and units of measurement.

### 2.2 Financial Market and Control Variables

Our empirical analysis is based on forecasting the equity premium using leading stock market index daily returns, namely the S&P500 for the U.S., the EURO STOXX 50 Index for the Eurozone, the FTSE100 for the U.K., and the Nikkei 225 Stock Average Index for Japan, for the sample period from January 1997 to December 2011. We also rely on a number of control variables that have been used before in the literature as equity premium predictors.

To quantify our measure for implied variance $IV_t$, we rely on daily data for the VIX volatility index for the U.S., the VDAX volatility index for the Eurozone, the VFTSE volatility index for the U.K., and the VXJ Japanese volatility index. All these volatility indexes are based on highly liquid stock market index options along with the same model-free calculation approach (Britten-Jones and Neuberger, 2000) that allows to replicate the risk-neutral variance of a fixed 30-day maturity.

We obtain high-frequency returns for the four stock indexes listed above from Tickdata. We construct our measure for daily realized variance $RV_t$ as the summation of the 78 five-minute squared returns covering the normal trading hours, as in Bollerslev et al. (2009).[6]

We compute the daily variance risk premium $VRP_t$ as the difference between daily implied variance $IV_t$ and the current expectation of $RV_t$ for the next 22 trading days. We forecast future realized variance using information from both realized and implied volatility, as in Drechsler and Yaron (2011). More specifically, we obtain the expectation of realized variance as the optimal forecast of future variance based on current realized and implied volatility as observed both

[5] On approximately 80% of days, there was at least one data release. Multiple data releases occurred much less frequently, on approximately 60% of the days in the sample.

[6] As a robustness check, we also obtain high-frequency five-minute returns for the shortest maturity futures contracts written on the same indices. The measures of realized variance obtained from futures returns are virtually indistinguishable from the ones obtained from the underlying stock index returns.

at time $t$ and on average during the last month. Using lagged volatility terms measured on different horizons is consistent with some promising volatility forecasting Heterogeneous Auto-Regressive models posited in Corsi (2009) and used in Corsi, Fusari, La Vecchia (2012) and Mueller, Vedolin, and Yen (2012). Formally,

$$\begin{aligned} VRP_t &= IV_t - E_t\left[RV_{t,t+22}\right] && (1) \\ E_t\left[RV_{t,t+22}\right] &= \left(\widehat{\beta}_1 \overline{IV}^{0.5}_{t-22,t} + \widehat{\beta}_2 \overline{RV}^{0.5}_{t-22,t} + \widehat{\beta}_3 IV^{0.5}_t + \widehat{\beta}_4 RV^{0.5}_t\right)^2, && (2) \end{aligned}$$

where the vector of $\beta$ parameters are estimated with a rolling one-year window so as to avoid any look-ahead bias in the following regression:

$$RV^{0.5}_{t,t+22} = \alpha + \beta_1 \overline{IV}^{0.5}_{t-22,t} + \beta_2 \overline{RV}^{0.5}_{t-22,t} + \beta_3 IV^{0.5}_t + \beta_4 RV^{0.5}_t + \epsilon_t. \quad (3)$$

This forecasting model is sufficiently parsimonious and delivers large explanatory power in the forecast of future volatility, mainly thanks to the high-frequency measurement of realized volatility and the degree of persistence imposed by the use of implied volatility. More involved specifications with further lags and volatility measured on different horizons improve the explanatory power only marginally.

In addition to stock market and volatility variables, we also consider a set of other more traditional predictors. Specifically, we obtain daily P/E ratios and dividend yields for the different equity indices from Datastream. We calculate a daily default spread variable as the difference between Moody's BAA and AAA corporate bond spreads for U.S. issuers and use this variable as a proxy for the default spread of the other countries as well. We also compute a term spread variable as the difference between the ten-year T-bond and the three-month T-bill yields, using U.S., German, U.K., and Japanese government bond data obtained from Datastream.

## 2.3 Categorizing the macroeconomic news flow

Our aim is to extract a set of factors describing the state of the economy. We impose a specific economically motivated structure on the macroeconomic news flow, rather than relying on a statistical procedure to obtain a set of orthogonalized factors that are increasingly difficult to interpret with the order of the factor. Based on both empirical evidence and economic rationale, we first separate the aggregate economy into two broad dimensions: the nominal, and the real side.[7] In practice, we split the set of announcements into nominal inflation-related announcements and news that relates to real growth. Growth data, in turn, come in two flavors - objective realizations of past economic activity and subjective often forward-looking views derived from surveys which we label "anticipated growth." Finally, economic activity can be split one last time into information relating to output versus employment.

[7] The economy is often separated into the nominal and real sides because shocks to the two should be separated and treated differently. For example, many argue, from the perspective of monetary policy, nominal shocks should be minimized, whereas real shocks should not be intervened upon. Other studies also suggest that a nominal and a real factor can account for much of the observed variation in major economic aggregates.

Through this structure, we can potentially obtain two (inflation and growth), three (inflation, realized growth, and anticipated growth), or four (inflation, output, employment, and anticipated growth) factors:

- Inflation
- Growth
  - Realized Growth
    - Output
    - Employment
  - Anticipated Growth

where, for example, the Realized Growth factor is obtained from the combined information relating to Output and Employment. In that sense, the information is nested from right to left.

We utilize information from different subsets of news to construct the different macroeconomic factors. For example, we extract the U.S. anticipated growth factor from the news flow generated by 10 macroeconomic surveys: ABC consumer confidence, Chicago purchasing manager, consumer confidence, Dallas Fed manufacturing activity, Empire manufacturing survey, leading indicators index, NAPM-Milwaukee, Philadelphia Fed. business outlook survey, Richmond Fed manufacturing index, and the University of Michigan confidence index. For completeness, the Appendix includes a summary on how the different macroeconomic announcements in the U.S., Europe, U.K., and Japan are assigned to the four categories: inflation, output, employment, and anticipated growth.

It is worth reiterating at this point that we do not include any market based data (such as stock prices, interest rates, credit spreads, or VIX) in our analysis, unlike, for example, Arouba et al. (2009) and Giannone et al. (2008). While such data are very timely and undoubtedly informative about the state of the economy, they represent already the market's *interpretation* of the macroeconomic news flow. Our aim is to objectively summarize and describe the macroeconomic news flow itself, so that we can relate the actual state of the economy to expected stock market returns.

## 2.4 Transformation and temporal alignment

We examine the stationarity of each data series in two ways. First, we conduct a Dickey-Fuller test on each series. Second, we read the definition and description of each statistic to determine from an economic perspective whether it is a non-stationary index or a stationary quarterly growth rate, for example. In a few cases where the conclusions from the two approaches differ, usually because the available data is too short to examining statistically, we rely more on the description to determine whether the series is stationary. All series that are deemed non-stationary are then first-differenced in news release time. The Appendix provides more details.

The final data management task is to align the data temporally by moving from announcement time to calendar time. We do this by populating the news releases in a $T \times N$ matrix where $T$ denotes the total number of days in our sample and $N$ refers, for example, to the 43 announcement types for the U.S.. The data at this stage looks like the top panel of Figure 2.

There are two important aspects of the data to discuss. First, there are a vast number of missing values as we can think of each news series as a continuous evolving statistic that is observed only once per month or quarter. Second, not all announcements have a complete history. Some announcements are initiated in the middle of the sample and/or are terminated before the end of the sample. To solve the missing data problem, we simply forward fill the last observed release until the next announcement. Forward filling can be rationalized as replacing missing values with expected values under a simple independent random walk assumption for each news series. Of course, both independence in the cross-section and random walk dynamics through time are simplifying assumptions that are rejected by the data (in fact, the motivation for our methodology described below is the cross-sectional correlation structure within news category). A more sophisticated approach for filling in missing data would be to compute the expectation of the missing values given the full cross-section of previous releases as well as the cross-sectional and intertemporal correlation structure of the data. An optimal solution would also allow for sampling error, which is the case in Kalman filter or Bayesian data augmentation algorithms. However, there is a clear trade-off between statistical complexity and ability to process a large cross-section of news series. Since the goal of our approach is to utilize the entire cross-section of news, we choose a very simple statistical model for filling in missing observations. After forward filling, the data looks like the bottom plot of Figure 2.

Note that the second data issue, the fact that some series do not span the entire sample period, cannot be solved with missing values imputation. It is instead explicitly addressed in our methodology below.

# 3 Methodology

## 3.1 Subset principal component analysis

Our goal is to extract from the cross-section of macroeconomic news releases a set of factors that capture in real time the state of inflation, output, employment, and anticipated growth, as well as the two more overarching factors measuring realized growth and growth for each country. The most obvious ways of accomplishing this, full data principal components and forecasting regressions, do not appeal to us. First, with full data principal components (or factor analysis) we would obtain factors that are mechanically orthogonal, whereas the dimensions of the economic news flow we want to capture are likely correlated (e.g., output and employment are both high at the peak and low at the trough of an economic cycle). This orthogonalization makes is practically impossible to assign an economic meaning to higher order factors. Second, trying to identify the factors through predictive regressions on a candidate variables in each category, such as final GDP for output, would require us being able to identify a single series that represents each category. While this is a common approach in the nowcasting literature (e.g., Stock and Watson, 1989), it relies on ex-ante knowledge of the key statistic to track and assumes that there is only one such statistic that does not change over time.

Instead, we rely on our ex-ante categorization of the news for each country and, within each category subset, let the data speak for itself by extracting the first principal component of that subset of data. Specifically, on each day of our sample $t$, we obtain for each news category $i$ the first principal component from the correlation matrix $\Omega_{t,i}$ of the stationary news series in category $i$. We work with the correlation matrix to abstract from arbitrary scaling of data. Moreover, in order to obtain a real-time measure, we use a telescoping (with a common historical start date and rolling end dates) correlation matrix starting in 1990.[8] We denote the $N_i \times 1$ principal component weights by $c_{t,j}$, where $N_i$ is the number of news series in category $i$ for each country.

### 3.2 Economic new series correlation matrix

The key inputs to our methodology are the within news category correlation matrices $\Omega_{t,i}$. Specifically, we need to calculate from historical data up through date $t$ the correlation of all news series of category $i$ that are "active" on that date, where active means that the news series was previously initiated and has not yet been terminated. There are two issues that need to be addressed in computing these correlation matrices. First, the data is in the form of an unbalanced panel due to some of the series being initiated after the start date of the estimation window (e.g., series $j = 5$ in Figure 2). Second, the data is naturally persistent, partly due to autocorrelation of the data in announcement time, partly due to the cross-sectional misalignment of the news in calendar time, and partly due to the forward filling of missing data.

We address the first unbalanced panel issue by using a correlation matrix estimator along the lines of Stambaugh (1997), who shows how to adjust first and second moments estimates for unequal sample lengths. The intuition of his approach is to use the observed data on the longer series, along with a projection of the shorter series on the longer ones estimated when both are observed, to adjust the moments of the shorter time series.

To correct for the persistence in the economic data, we depart from the standard approach of Newey-West (1987). The data is locally constant, due to the forward filling, and over longer intervals only moderately (cross-) autocorrelated due to the statistical nature of the news series. This peculiar correlation structure is actually identical to that found in high-frequency asset prices, where asynchronous and infrequent trading creates a misaligned and locally constant panel of observations. Inspired by this literature (e.g,, Ait-Sahalia, Mykland, and Zhang, 2005) they devise an estimator to handle this specific structure of short versus long-horizon dependence. Specifically, the estimator subsamples the data at a sufficiently low frequency that overcomes the local constancy and then averages over the set of all possible estimators that start the subsampling schemes at different times.

At date $t$ we sub-sample the forward filled news series backward at a monthly frequency and then compute a Newey-West estimate of the correlation matrix using four lags. We repeat the same for monthly sampling starting at dates $\{t-1, t-2, ..., t-d+1\}$ (assuming $d$ days per month) and then average the resulting $d$ correlation matrix estimates.

[8] We also experimented with fixed window size rolling correlation matrices for 5, 10, 15, and 20 years. The results are qualitatively similar, particularly for the longer data windows.

### 3.3 Level versus disagreement factors

Given the vector of principal component weight $c_{t,j}$, we then construct for each news category two times-series for each country. First, we sum at each date the product of the weights multiplied by the most recent releases to obtain our real-time *level* factors. Second, we sum the product of the same weights multiplied this time by the cross-sectional standard deviations of the economist forecasts for the most recent releases to obtain our real-time *disagreement* factors. Throughout our sample not every news series has economist level forecasts data available. We therefore construct the disagreement factor using the available data, renormalizing first the principal component weights to account for the proportion of missing data.

## 4 Results

In this Section, we first present some graphical intuition and preliminary evidence. We then study more formally the relation between the state of the economy and expected stock returns unconditionally and conditionally on periods of high macroeconomic uncertainty proxied by large dispersion of growth. We extend this analysis to an international sample of countries and study the role of local and global factors. The predictability results can be used in a portfolio exercise to establish their economic significance. Finally, we explore the predictive properties of realized and anticipated growth for the future state of the economy.

### 4.1 Preliminaries

We set the stage in Figure 3, where we illustrate the estimate of the latent factor for U.S. growth in the upper panel and the U.S. macroeconomic uncertainty factor obtained from economist disagreement in the lower panel. As can be readily seen, the real-time growth factor dips in the recession periods (identified ex-post by NBER) in 2001 and 2008-2009. The macroeconomic uncertainty measure proxied by the real-time dispersion factor on growth releases exhibits the taller peaks of disagreement in the terminal stages of the recession periods, suggesting that economists tend to disagree much more on recoveries after business cycle contractions as opposed to the end of expansion periods.

In Figure 4, we compare the two sub-factors that constitute the overarching U.S. growth factor, namely the realized growth and the anticipated growth factor. Both sub-factors are constructed purely from macroeconomic releases without the use of financial market variables. However, the realized growth index relies on hard macroeconomic data such as employment and output numbers, anticipated growth is based on consumer and manufacturer surveys on the perceived state of the economy. While the two factors are highly correlated, as one would expect, we also notice intriguing divergences. More specifically, anticipated growth seems to predict somewhat realized growth around turning points. This will become an important feature of our empirical analysis in the next Sections of the paper.

To better understand the properties of the real-time macro factors, Table 1 reports some interesting summary statistics and correlations with popular stock market predictors for the U.S.. We first notice that both the real-time growth and the anticipated growth factor tend to exhibit negative skewness, whereas dispersion, our proxy for macroeconomic uncertainty, is quite naturally positively skewed. The growth and anticipated growth factors are very highly correlated, but are both almost uncorrelated with the dispersion of economist forecasts, suggesting that they are capturing different economic phenomena.

When we look at the correlation of our macroeconomic factors with traditional stock market predictors, we observe a significantly negative correlation with the Variance Risk Premium (Bollerslev et al., 2009). This is interesting because it confirms directly suggestive claims that were relating the size of the variance risk premium to economic conditions. Another interesting finding is the significant correlation between macroeconomic factors and volatility. This is remarkable, given the lack of empirical evidence of the link between financial markets volatility and uncertainty about fundamentals (e.g., Schwert, 1989). Finally, the extremely high negative correlation between the growth factor and the default premium corroborates the traditional assumption that the default premium can serve as a high-frequency proxy for business cycle variation.

Given our interest in stock market returns, in Figure 5 we plot on the same graph the real-time U.S. growth factor and the S&P500 index. The two series appear to be strongly correlated, suggesting that stock market valuations are likely to reflect macroeconomic fundamentals. Interestingly, the peak and droughts of the growth index factor seem to anticipate the stock market extremes and hint to a potential role of macroeconomic fundamentals in stock market predictability.

A similar story emerges in Figure 6 for the real-time growth dispersion factor. Here economists seem to disagree more right before the stock market starts producing strong positive returns. In contrast, there seem to be a general agreement – low dispersion – when the stock market has reached the top.

We complement the U.S. graphical evidence and illustrate the evolution of growth (total, realized, and anticipated) for the Eurozone, U.K., and Japan, in Figures 7 to 9. In all cases, we can readily observe the large degree of comovement of the real-time macroeconomic indices of different countries. This is most clear for realized growth dynamics (Figure 8) and a little less apparent for the evolution of anticipated growth (Figure 9). However, even with this large cross-sectional correlation, we can still observe idiosyncratic growth patterns that correspond to well-known idiosyncratic events. For example, we notice the drop in Japanese realized growth in 2011 that corresponds to the Tsunami that hit the country in March of that year.

### 4.2 Stock Market Excess Returns

We investigate more formally the potential role of the current state of the economy for future stock market returns using regression analysis. More specifically, logarithmic S&P500 excess returns for different future horizons are regressed on three different measure of current macroeconomic dynamics: first, the one-month gradient in the U.S. realized growth factor; second, the part of the anticipated growth factor that is orthogonal to realized growth in a rolling linear regression fashion. Using monthly first differences of the macroeconomic factors or the residual of the anticipated growth series on the realized growth series, allows us to obtain stationary series, which alleviate potential statistical concerns in the estimation. More formally, we estimate

$$R_{m;t,t+lead} - R_{f;t,t+lead} = \alpha + \beta X_t + \epsilon_t, \tag{4}$$

where $R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 in excess of the three-month T-bill rate. $X_t$ is either the monthly first difference $RealizedGrowth_t - RealizedGrowth_{t-22}$, where $RealizedGrowth_t$ is the real-time U.S. realized growth factor; or $Anticipated_t$, which is the real-time anticipated growth factor orthogonalized on the economic activity factor in rolling fashion; or both regressors.

Table 2 shows that there is indeed predictability for U.S. stock market returns from both the predictor variables we employ. In all cases, the statistical significance is obtained with Newey-West robust standard errors that appropriately correct for the correlations induced by overlapping observations (see Bollerslev et al., 2012). In Panel A, we observe that a positive monthly first difference in realized growth forecast positive and significant S&P500 stock returns in the following 20 to at least 80 days, with the strongest statistical significance at the 20-trading days horizon. [9]

In Table 2, Panel B, we show that the part of anticipated growth that is orthogonal to realized growth has the strongest predictive power for future stock market returns. It is statistically significant at all horizons, peaking at 100 days, and with larger explanatory power. For example, for the quarterly horizon that is traditionally used as benchmark in predictability exercises (e.g., Bollerslev et al., 2009), *orthogonal* anticipated growth has about three times the explanatory power of the monthly gradient in realized growth. In practice, what seems to matter a lot for stock market predictability, is the divergence between consumer/manufacturing expectation of the business cycle and actual macroeconomic realizations.

Finally, Table 2, Panel C, shows the joint predictability power of realized and anticipated growth. Interestingly, none of the two regressors' statistical significance is driven out, suggesting that they reflect information that is sufficiently independent. For example, at the quarterly horizon, statistical significance is virtually unchanged compared with the univariate specifications and the explanatory power increases by about one third with respect to the $adjustedR^2$ of Panel B.

These new results of predictability could be simply related to other predictive variables that the literature has related to future stock market returns. We thus regress the quarterly log

[9] As a further robustness check on the potential influence of overlapping observations, we experiment with the estimation of a model featuring disjoint non-overlapping quarterly stock market returns regressed on macroeconomic factors at the beginning of the quarter. Even with such a severely reduced sample size and the related loss in information, we obtain a statistically significant relation between stock returns and macroeconomic factors.

S&P500 excess returns on both our macroeconomic predictors, together with a set of control variables:

$$R_{m;t,t+60} - R_{f;t,t+60} = \alpha + \beta X_t + \gamma Z_t + \epsilon_t, \tag{5}$$

where again the $R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 in excess of the three-month T-bill rate. $X_t$ contains both the one-month first difference in the realized growth factor and the orthogonalized anticipated growth factor. $Z_t$ is a set of control variables. Control variables include the variance risk premium $VRP_t$ defined as the difference between the implied variance and the expected realized variance, as in equation (1). Other predictors variable include the logarithm of the price-earning ratio, the logarithm of the dividend yield, the default spread defined as the difference between Moody's BAA and AAA corporate bond yields, and the term spread defined as the difference between the ten-year and three-month Treasury yields.

Table 3 shows the results for the quarterly forecast horizon.[10] In the set of univariate regressions reported in the first six columns, among the standard predictor variables used in the literature, only the price-earnings ratio and the dividend yield pass the statistical significance hurdle with Newey-West standard errors and daily observation frequency. Furthermore, the variance risk premium $VRP_t$ is also not statistically significant, in contrast to the results of Bollerslev et al. (2009), who used a monthly observation frequency, a slightly shorter sample, and a different approach to obtain the expectation of realized variance.

In the last four columns of Table 3, we check whether any of these control variable drives out the explanatory power of the first difference in realized growth or the *orthogonal* anticipated economic growth. We find that this is never the case. If anything, including some of these control variables, allows to increase the explanatory power and improves the statistical significance of our real-time macroeconomic indices. For example, including the price-earnings ratio alone as a regressor, is enough to increase the model explanatory power by about 50%. In summary, the evidence in Table 3 shows that the U.S. macroeconomic predictors constructed from the flow of scheduled macroeconomic announcements have genuine forecasting power that is not subsumed by any of the variables traditionally used in the literature.[11]

### 4.3 Conditional Stock Market Predictability

Macroeconomic conditions measured in real-time forecast the equity premium unconditionally. We now focus on a conditional predictability exercise, using macroeconomic uncertainty proxied by the dispersion of growth forecasts as the conditioning variable. The general motivation for this analysis is to identify potentially sharper predictability links that are determined by states

[10] We do not report the predictability results for different horizons, as they are very similar to the quarterly horizon evidence.

[11] In additional robustness checks, we also control for stock market momentum and reversals by including lagged returns for the same horizon. For example, if the forecasting horizon is a quarter, we include as a regressor the stock market return over the previous quarter. Our findings are virtually unchanged and therefore not reported. If anything, controlling for momentum for the shortest 5-day horizon helps to better identify the role of macroeconomic fundamentals that appear to be statistically even more significant. We also include additional control variables, such as implied volatility and realized variance, and the results are unchanged.

with different marginal utility growth. More specifically in our setting, in periods of high macroeconomic uncertainty, investors could assign a stronger influence to changes in realized economic growth. Similarly, we might expect a larger equity premium attached to divergences between anticipated and realized growth when economists disagree more.

In Table 4, Panel A and B, we repeat the predictability exercise of equation (4) conditioning on growth dispersion above and below its sample median, respectively.[12] We notice a striking pattern. Predictability is substantially stronger statistically and economically when economists disagree a lot about growth prospects. For example, at the quarterly horizon, the explanatory power is about 15 times larger with large macroeconomic uncertainty and the coefficients on the real-time indices are at least four times larger. When growth dispersion is below median, only the part of anticipated growth that is orthogonal to realized growth seems to matter and only in the short part of the maturity spectrum.

Another obvious candidate as a conditioning variable is the state of the economy. It is precisely in *bad times* that marginal utility growth is likely to rise. As a candidate measure for bad times we use the levels of real-time growth that are below zero. Table 4, Panel C, shows that during these times macroeconomic conditions tend to matter much more. For example, at the traditional quarterly forecast horizon, the explanatory power is about 17% when growth is below zero and just less than 1% when the real-time level of growth is positive (in Panel D). These findings resemble the evidence obtained in panel A and B with growth dispersion as a conditioning variable and they are consistent with dispersion peaking in *bad times*, as Figure 3 was already indicating graphically.

### 4.4 International Evidence

It is important to understand whether the relation we uncover between the $real-time$ macroeconomic information flow and the equity risk premium carries over to other countries. In this case, we would be after a more general feature of the relation between macroeconomic growth dynamics, in their realized and anticipated attributes, and the stock market response to those dynamics.

We thus use representative stock market indices for the Euro zone, the United Kingdom, and Japan (as described in the data Section) and relate their future excess returns to the respective national real-time macroeconomic news flow. More specifically, we repeat the predictability exercise of equation (4) at different horizons and then control for a set of traditional predictors obtained for each country to make sure the relation we find is not spurious.

Given the graphical evidence of large comovement between the real-time macroeconomic indices of different countries (Figures 7 to 9), we also consider as a regressor for international stock market predictability the global version of the indices. The global version is constructed

[12] The time-series of growth dispersion is very noisy at the beginning of our sample because detailed economist forecasts are available for a small subset of releases. We thus use January 2000 instead of January 1997 as a sample starting date in these regressions. However, the results are essentially the same even with the usual earlier sample starting date.

either as the first principal component of the four local indices or, given the prominent role of the U.S. economy, simply using the news flow for the U.S..

Table 5 shows our findings for different horizons for U.S., Eurozone, U.K., and Japan in four panels.[13] For each panel, the macro factors can be local, global, or just the U.S. factors. Panel A shows the results for the U.S. case, where clearly the local macroeconomic indices coincide with the global constructed from U.S. data. In this case, local factors tend to perform overall better than global factors, especially for the monthly gradient in realized growth, suggesting that international macroeconomic environment is less relevant than the domestic one for the U.S. case. In Panel B, we repeat the same analysis for the Eurozone. In this case, the global factors defined as the U.S. macroeconomic indices deliver the most consistent results across the two predictors. The local monthly gradient in realized growth turns out to be not statistically significant.

In Panel C, we present similar evidence for the U.K.. Global factors tend to have larger explanatory power than local factors, with the U.S. version providing again the more consistent evidence. Finally, Panel D shows our findings for the Japanese stock market. While the part of anticipated growth that is orthogonal to realized growth is a significant predictors in all specifications, the monthly gradient in realized growth is highly statistically significant only when the U.S. index is used. In summary, in our international analysis we find very similar results that are curiously much stronger when U.S. data are used as predictors.[14]

We now want to make sure that our international findings are not subsumed by the traditional predictors used before in the literature. We thus carry out a set of robustness tests similar to the one we run for the U.S. using equation (5). Specifically, we repeat all of the empirical analysis of Table 5 adding either domestic or U.S. control variables.[15] While in most cases the explanatory power of the regression model is enhanced, the statistical significance of our real-time macroeconomic indices is never driven out by the additional predictors. In summary, we confirm the evidence for the U.S. that the predictability of the macroeconomic news flow that we identify is not captured by traditional proxies.

To have a better sense of the relation between local and global factors, we estimate a richer specification where we include among the regressors both the global factors and the deviation of the local from the global:

$$R_{m;t,t+60} - R_{f;t,t+60} = \alpha + \beta_{1,2} Global + \gamma_{1,2} \left[ Local - Global \right] + \epsilon_t, \quad (6)$$

[13] To save space, we only show forecasting horizons between 20 and 80 days in this table. However, we obtain comparable results for the other three forecasting horizons used elsewhere in the paper.

[14] In unreported additional analysis, we carry out a similar empirical exercise in a fixed-effect panel regression framework. Our aim is to understand whether the predictive ability of our macroeconomic factors obtained in the time-series for each country in isolation carries over to a joint cross-sectional estimation imposing the same stock market sensitivity across countries. The results strongly support this idea. In particular, we find that our real-time growth indices forecast future stock market excess returns across all considered horizons, with economic magnitudes that are indistinguishable from the country-specific regressions.

[15] As we obtain very similar results as the univariate specifications, we do not report these additional findings in the paper to save space.

where the $R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 for the U.S., the EuroSTOXX50 for the E.U., the FTSE100 for the U.K., and the Nikkei225 for Japan, all in excess of the three-month risk-free rate. *Global* contains the monthly gradient in the U.S. real-time realized growth factor and the U.S. real-time anticipated growth factor that is orthogonal to realized growth. $Local - Global$ contains differences between local and U.S. macro factors.

Table 6 shows the results for the four countries separately and for the pooled sample with country fixed-effects. Even if the identification of these more subtle effects is challenged by the collinearity in the regressors, we still observe that the deviations of the local from global gradient in realized growth tends to have a negative sign, that is, mean-reverting effects. For instance, when the gradient in Japanese realized growth is larger than the U.S., Japanese stock returns tend to be relatively lower. In contrast, deviations of the local from global *orthogonal* anticipated growth tend to carry a positive sign, i.e. to have persistent effects. In this case for example, when Eurozone anticipated *orthogonal* growth is larger than the U.S., European stock returns tend to be relatively larger. All these results are intriguing, because they suggest a composite relation between the equity premium, real-time realized and anticipated U.S. growth, and the deviations of other economies from U.S. macroeconomic dynamics.

### 4.5 Conditional International Predictability

The empirical analysis for the U.S. has uncovered a very strong conditional pattern in stock market predictability induced by either large macroeconomic uncertainty or negative real-time U.S. growth (Table 4). In this Section, we carry out a similar analysis internationally. Given the evidence of a very strong role for U.S. macroeconomic dynamics, we use U.S. data both to construct the macroeconomic indices and their conditioning variables.

In Table 7, Panel A and B, we condition on high and low macroeconomic uncertainty proxied by dispersion of U.S. growth forecast that is above or below the sample median, respectively. We can readily see the very strong predictability when we condition on states of high dispersion. For example, if we focus on the quarterly forecasting horizon, the model explanatory power in Panel A is about six times larger than in Panel B for the Eurozone and the U.K., and almost 20 times larger for Japan. Both regressors are statistical significant at all horizons for all countries in Panel A, but only *orthogonal* U.S. anticipated growth is somewhat significant in Panel B.

In Table 7, Panel C and D, we condition international stock market predictability on negative or positive U.S. economic growth, respectively. As for the U.S. case, we can observe a much stronger patter of predictability in states of negative U.S. growth. For example, focusing again on the quarterly forecasting horizon, the model explanatory power in Panel C is about 16 times larger than in Panel D for the Eurozone, about ten times larger for the U.K., and almost three times larger for Japan. Both regressors are statistical significant at all horizons for all countries in Panel C, with few exceptions. Interestingly, in states of positive U.S. growth (Panel D), U.S. *orthogonal* anticipated growth predicts significantly negative excess returns for the U.K. and the Japanese stock market. This result points to a potentially different role for the deviation of anticipated from realized U.S. growth in states of positive U.S. growth, but this asymmetric effect seems hard to identify.

### 4.6 A Simple Portfolio Exercise

In this section, we carry out a simple portfolio exercise with the aim of quantifying the economic significance of our predictability results. The previous empirical analysis suggests that our fundamental factors, realized and anticipated growth, are likely to contain at least three sources of useful information to predict future stock market returns. First, they contain time-series information, as our macro factors predict future stock market returns at different horizons, with the most significant results around the quarterly horizon. Second, our predictability evidence seems to be even stronger when we consider global or U.S. factors, as some countries seem more sensitive to international dynamics than to local factors. Finally, we find some evidence that deviations of realized growth from the global pattern seem to mean-revert, while there is some persistence in net anticipated growth divergences from the global trend.

We construct a portfolio each day that combines four strategies that resemble the elements of predictability described above. More specifically, to reflect time-series predictability, we construct a portfolio based on a simple 60-trading days momentum strategy, where we go long (short) the four stock market indexes in equal risk proportions whenever the current global realized growth factor is above (below) its level 60-day before.[16] In this portfolio exercise, the global factor is defined as the average of the local factors, as we aim to retain the real-time nature of the empirical exercise and do not want to rely on a full-sample principal component analysis. We also experiment with the global factor constructed from U.S. data only and obtain a very similar trading strategy.

Similarly, we exploit the net anticipated growth predictability evidence by going long (short) stock market indexes whenever there is a positive (negative) difference between anticipated and realized growth. This difference is very close to the measure of *orthogonal* anticipated growth used before in the paper, but can be easily computed in real-time and does not require to run a regression on previous parts of the time-series. Finally, we exploit the evidence of mean reversion and persistence of local to global factors. Specifically, we go long the two stock market indices with smaller divergence between local and global realized growth and short the two indices with the larger difference. We do the opposite with net anticipated growth.

We invest in the four stock market indexes in single units of risk, standardizing the trade size by the previous monthly standard deviation, so as to maintain a relatively constant level of risk over time. This methodology allows us to understand the economic significance of predictability without taking a stand on what are the most important sources of returns and without an unwarranted effect of the most volatile periods in our sample.

[16] The choice of the 60-day span corresponds to the horizon where we obtain the largest statistical predictability and is consistent with other short-term predictability research (e.g., Bollerslev et al., 2009).

Figure 10 plots the returns of this macro timing investment strategy benchmarked to a risk-adjusted buy and hold strategy of an equally-weighted average of the four stock market indices. As can be easily observed, the macro timing strategy delivers a stable and strong performance that clearly outperforms the underlying indexes in the same sample period, for the same level of risk. More specifically, the investment strategy delivers a Sharpe Ratio of 0.6955, which speaks to the economic significance of the macro fundamentals patterns that we uncover.

### 4.7 Forecasting the State of the Economy

In this Section, we study whether the information in real-time realized and anticipated growth has any predictive power for the future state of the economic growth. If it did, this would constitute a sufficient condition to justify the role of macroeconomic fundamentals in determining the equity risk premium.

We thus estimate a simple regression:

$$Growth_{t+lead} = \alpha + \rho Growth_t + \beta_1 \left(Realized_t - Realized_{t-22}\right) + \beta_2 Anticipated_t + \epsilon_t \qquad (7)$$

where $Growth_t$ is the real-time U.S. growth factor, $Realized_t$ is the U.S. real-time realized growth factor, $Anticipated_t$ is the U.S. real-time anticipated growth factor that is orthogonal to realized growth. We include the lagged level of growth among the regressors to control for the persistence in the growth index.

Table 8, Panel A, shows that both the gradient in realized growth and the *orthogonal* anticipated growth can explain between 4 and 27 percent of the variance of future growth that has been left unexplained by the current level of growth. Real-time realized growth differentials have predictive power slightly beyond the quarterly horizon. Instead, *orthogonal* anticipated growth has significant predictive power at all horizons, with the strongest statistical significance at shorter forecasting horizons. In sum, this is important evidence that the current dynamics of the state of the economy, obtained from both realized and anticipated growth, contain important information for future growth, suggesting an economic motivation for the stock market predictability results of the previous sections.

We now mirror the empirical strategy used for stock return predictability and we try to understand whether the predictability of future growth has different conditional dynamics. More specifically, we test predictability in states of high/low macroeconomic uncertainty as proxied by U.S. dispersion of growth forecast above/below the sample median. Table 8, Panel B and C, show that growth predictability is much stronger in periods of high macroeconomic uncertainty. For example, at the quarterly horizon, the explanatory power is twice as large in Panel B than in Panel C. Both regressors are always significant when growth dispersion is large, but only *orthogonal* anticipated growth is significant in periods of low dispersion.

These conditional growth predictability results are very useful to fully understand the conditional stock return predictability results of the previous sections. In periods of high macroeconomic uncertainty, it seems that the equity premium is more responsive to growth dynamics not only because of the higher marginal utility, but also because our real-time macroeconomic indices are more informative about future economic growth.

## 5 Conclusions

In this paper, we use a novel technique to distill the frequent macroeconomic releases into daily real-time factors capturing realized and anticipated growth and the uncertainty surrounding these releases. We use these macroeconomic indices to predict future stock market returns, in an attempt to link economic conditions and the equity risk premium.

We obtain a number of intriguing results with our high-frequency estimates of the current state of the economy. The one-month change in realized economic growth predicts U.S. stock returns across horizons with strongest results between a month and a quarter. The information in anticipated growth that is orthogonal to the realized data predicts returns even more strongly, particularly at longer horizons up to two quarters. A conditional analysis where we split the sample into times of high versus low uncertainty, as measured by the cross-sectional dispersion of economist forecasts, shows that the predictability is largely concentrated in high-uncertainty times. Finally, extending the analysis internationally, we find similar results that are curiously much stronger when US data are used as predictors than global composites or local data.

The strong statistical relation between real-time macroeconomic indices and the equity premium that we uncover is also very relevant economically. We carry out a simple portfolio timing exercise based on trading strategies of four stock markets that are mirroring the statistical results in the paper. We obtain a consistent and substantial Sharpe ratio in our sample period, suggesting that we are documenting important economic effects.

We conclude the paper with an analysis on the predictive ability of our real-time macroeconomic factors for the future growth of the economy. We find evidence that there is indeed such predictability, especially in periods of higher macroeconomic uncertainty. These results provide an economic rational for our stock market predictability results.

# 6 Appendix: Macroeconomic News

This Appendix summarizes the main features of the macroeconomic releases considered in our sample. Category is either inflation (INF), employment (EMP), output (OUT), or anticipated growth (ANT). If the sample series is stationary in our sample, we make no adjustment (Adj.=0), otherwise we use first differences with respect to previous period (Adj.=1) or previous year (Adj.=12). We also indicate Units, Frequency ($M$ for monthly, $W$ for weekly, $Q$ for quarterly), and the source of the release.

## 6.1 U.S. Macroeconomic News

| Category | Name Macro Release | Adj. | Units | Freq | Source |
|---|---|---|---|---|---|
| INF | US Import Price Index by End Use All MoM | 0 | Rate | M | Bureau Labor Statistics |
| INF | US PPI Finished Goods Total MoM | 0 | Rate | M | Bureau Labor Statistics |
| INF | US PPI Finished Goods Except Foods Energy | 0 | Rate | M | Bureau Labor Statistics |
| INF | US CPI Urban Consumers MoM | 0 | Rate | M | Bureau Labor Statistics |
| INF | US CPI Urban Consumers Less Food Energy | 0 | Rate | M | Bureau Labor Statistics |
| INF | BLS Employment Cost Civilian Workers QoQ | 0 | Rate | Q | Bureau Labor Statistics |
| INF | US GDP Price Index QoQ SAAR | 0 | Rate | Q | Bureau Economic Analysis |
| INF | US Personal Cons. Expenditure Core Price Index MoM | 0 | Rate | M | Bureau Economic Analysis |
| INF | US Output Per Hour Nonfarm Business Sector QoQ | 0 | Rate | Q | Bureau Labor Statistics |
| EMP | ADP National Employment Report Private Nonfarm Change | 0 | Volume | M | Automatic Data Processing |
| EMP | US Initial Jobless Claims | 1 | Volume | W | Department of Labor |
| EMP | US Continuing Jobless Claims | 1 | Volume | W | Department of Labor |
| EMP | US Employees on Nonfarm Payrolls Total Net Change | 0 | Value | M | Bureau Labor Statistics |
| EMP | US Employees on Nonfarm Payrolls Manufact Net Change | 0 | Value | M | Bureau Labor Statistics |
| EMP | US Unemployment Rate Total in Labor Force | 1 | Rate | M | Bureau Labor Statistics |
| EMP | US Average Weekly Hours All Total Private | 1 | Volume | M | Bureau Labor Statistics |
| OUT | ISM Manufacturing PMI | 0 | Value | M | Institute Supply Management |
| OUT | US Manufacturers New Orders Total MoM | 0 | Rate | M | U.S. Census Bureau |
| OUT | US Auto Sales Domestic Vehicles | 1 | Volume | M | BLOOMBERG |
| OUT | ISM Non-Manufacturing NMI NSA | 0 | Value | M | Institute Supply Management |
| OUT | Federal Reserve Consumer Credit Net Change | 1 | Value | M | Federal Reserve |
| OUT | Merchant Wholesalers Inventories Change | 0 | Rate | M | U.S. Census Bureau |
| OUT | Adjusted Retail Food Services Sales Change | 0 | Rate | M | U.S. Census Bureau |
| OUT | Adjusted Retail Sales Less Autos Change | 0 | Rate | M | U.S. Census Bureau |
| OUT | US Industrial Production MoM 2007=100 SA | 0 | Rate | M | Federal Reserve |
| OUT | US Capacity Utilization of Total Capacity | 0 | Rate | M | Federal Reserve |
| OUT | US Manufacturing Trade Inventories Total | 0 | Rate | M | U.S. Census Bureau |
| OUT | US Durable Goods New Orders Industries | 0 | Rate | M | U.S. Census Bureau |
| OUT | US Durable Goods New Orders Ex Transp. | 0 | Rate | M | U.S. Census Bureau |
| OUT | GDP US Chained 2005 Dollars QoQ SAAR | 0 | Rate | Q | Bureau Economic Analysis |
| OUT | GDP US Personal Consumption Chained Change | 0 | Rate | Q | Bureau Economic Analysis |
| OUT | US Personal Income MoM | 0 | Rate | M | Bureau Economic Analysis |
| OUT | US Personal Consumption Expend. Nominal Dollars | 0 | Rate | M | Bureau Economic Analysis |
| ANT | Bloomberg US Weekly Consumer Comfort Index | 1 | Price | W | BLOOMBERG |
| ANT | University Michigan Survey Consumer Confidence | 1 | Price | M | U. of Michigan Survey Research |
| ANT | Empire State Manufact. Survey Business Conditions | 1 | Value | M | Federal Reserve |
| ANT | Conference Board US Leading Index MoM | 0 | Rate | M | Conference Board |
| ANT | Philadelphia Fed Business Outlook General Conditions | 1 | Price | M | Philadelphia Fed |
| ANT | Conference Board Consumer Confidence SA 1985=100 | 1 | Rate | M | Conference Board |
| ANT | Richmond Fed Reserve Manufacturing Survey | 0 | Rate | M | Richmond Fed |
| ANT | US Chicago Purchasing Managers Index SA | 1 | Price | M | Kingsbury Intern. |
| ANT | ISM Milwaukee Purchasers Manufacturing Index | 1 | Rate | M | NAPM - Milwaukee |
| ANT | Dallas Fed Manufact. Outlook Business Activity | 1 | Rate | M | Dallas Fed |

## 6.2 Eurozone Macroeconomic News

| Category | Name Macro Release | Adj. | Units | Freq | Source |
|---|---|---|---|---|---|
| INF | Austria PPI 2010 MoM | 0 | Rate | M | Austrian Institute of Economic |
| INF | Belgium CPI MoM NSA 100=2004 | 0 | Rate | M | Belg. Inst Nat'l Stat. |
| INF | Estonia CPI MoM | 0 | Rate | M | Statistical Office of Estonia |
| INF | Estonia PPI MoM | 0 | Rate | M | Statistical Office of Estonia |
| INF | Finland CPI 2010=100 MoM | 0 | Rate | M | Finnish Statistics Office |
| INF | Finland PPI 2005=100 MoM | 0 | Rate | M | Finnish Statistics Office |
| INF | France CPI MoM 1998=100 | 0 | Rate | M | INSEE National Statistics Offi |
| INF | France European Harmonised CPI MoM 2005=100 | 0 | Rate | M | INSEE National Statistics Offi |
| INF | France PPI MoM 2005=100 | 0 | Rate | M | INSEE National Statistics Offi |
| INF | Germany CPI MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany HICP MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany CPI Saxony MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany CPI Baden Wuerttemberg MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany CPI Bavaria MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany CPI Hesse MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany CPI North Rhine Westphalia MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany CPI Brandenburg MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany Producer Prices MoM | 0 | Rate | M | German Fed Statistical Off |
| INF | Germany Wholesale Prices MoM 2005=100 | 0 | Rate | M | German Fed Statistical Off |
| INF | Greece Harmonized CPI YoY 2005=100 | 0 | Rate | M | National Statistical Service o |
| INF | Greece CPI YoY 2009=100 | 0 | Rate | M | National Statistical Service o |
| INF | Ireland CPI All Items MoM | 0 | Rate | M | Central Statistics Office Irel |
| INF | Ireland HICP MoM 2005=100 | 0 | Rate | M | Central Statistics Office Irel |
| INF | Ireland WPI MoM 2005=100 | 0 | Rate | M | Central Statistics Office Irel |
| INF | Italy HICP MoM NSA | 0 | Percent | M | ISTAT |
| INF | Italy CPI NIC Incl Tobacco MoM NSA | 0 | Percent | M | ISTAT |
| INF | Italy PPI Manufacturing MoM 2005=100 | 0 | Rate | M | ISTAT |
| INF | Netherlands CPI MoM 2006=100 | 0 | Rate | M | Dutch Statistics Office |
| INF | Netherlands HICP MoM | 0 | Rate | M | Dutch Statistics Office |
| INF | Portugal HICP MoM Base year 2005 | 0 | Rate | M | Instituto Nacional de Estatist |
| INF | Portugal CPI 2008=100 MoM | 0 | Percent | M | Instituto Nacional de Estatist |
| INF | Portugal Producer Prices Total 2005=100 MoM | 0 | Rate | M | Instituto Nacional de Estatist |
| INF | Slovakia CPI MoM | 0 | Rate | M | Statistical Office of the Slov |
| INF | Slovakia CPI Harmonized MoM | 0 | Rate | M | Statistical Office of the Slov |
| INF | Slovakia PPI MoM | 0 | Rate | M | Statistical Office of the Slov |
| INF | Spain CPI MoM 2006=100 | 0 | Rate | M | Instituto Nacional de Estadist |
| INF | Spain CPI Core MoM 2006=100 | 0 | Rate | M | Instituto Nacional de Estadist |
| INF | Spain Harmonized CPI 2005=100 MoM | 0 | Rate | M | INE |
| INF | Spain PPI MoM 2005=100 | 0 | Rate | M | INE |
| INF | Slovenia CPI MoM | 0 | Rate | M | Statistical Office of the Repu |
| INF | Slovenia PPI MoM | 0 | Rate | M | Statistical Office of the Repu |
| INF | Eurostat Eurozone MUICP All Items MoM NSA | 0 | Rate | M | Copyright European Communities |
| INF | Eurostat Eurozone MUICP All Items YoY Flash Estimate NSA | 0 | Rate | M | Copyright European Communities |
| INF | Eurostat Eurozone Core MUICP YoY NSA | 0 | Rate | M | Copyright European Communities |
| INF | Eurostat PPI Eurozone Industry Ex Construction MoM | 0 | Rate | M | Copyright European Communities |
| EMP | Belgium Unemployment Rate SA | 1 | Rate | M | National Bank of Belgium |
| EMP | Estonia Unemployment Rate | 1 | Rate | M | Estonian Labour Market Board |
| EMP | Estonia Average Gross Monthly Wages (Quarterly figures) YoY | 0 | Percent | Q | Statistical Office of Estonia |
| EMP | Finland Unemployment Rate | 1 | Rate | M | Finnish Statistics Office |
| EMP | France Non-Farm Non-Government Payrolls Total Quarterly Per-Chge | 0 | Rate | Q | INSEE National Statistics Offi |
| EMP | France Monthly Wage Index QoQ | 0 | Rate | Q | French Labor Office |
| EMP | France Unemployment Rate ILO Method - Mainland France | 1 | Rate | Q | INSEE National Statistics Offi |
| EMP | France Unemployment Rate ILO Method Net Change (000s) | 0 | Volume | Q | INSEE National Statistics Offi |
| EMP | France Unemployment Rate ILO Method - Mainland & Overseas Const. | 1 | Rate | Q | INSEE National Statistics Offi |
| EMP | France Jobseekers Total SA net change | 1 | Volume | M | French Labor Office |

## Eurozone Macroeconomic News (continued)

| Category | Name Macro Release | Adj. | Units | Freq | Source |
|---|---|---|---|---|---|
| EMP | Germany Unemployment Change SA | 1 | Rate | M | Deutsche Bundesbank |
| EMP | Greece Unemployment Rate Monthly | 1 | Rate | M | National Statistical Service |
| EMP | Ireland Unemployment Rate SA | 1 | Rate | M | Central Statistics Office Irel |
| EMP | Ireland Total Persons on Live Register SA | 1 | Volume | M | Central Statistics Office Irel |
| EMP | Ireland Total Persons on Live Register SA MoM | 0 | Rate | M | Central Statistics Office Irel |
| EMP | Italy New Hourly Wages MoM SA 2005=100 | 0 | Rate | M | ISTAT |
| EMP | Italy Unemployment Rate SA | 1 | Rate | Q | ISTAT |
| EMP | Netherlands Unemployment Registered SA Per | 1 | Rate | M | Dutch Statistics Office |
| EMP | Portugal Unemployment Rate NSA | 1 | Rate | Q | Instituto Nacional de Estatist |
| EMP | Portuguese Labor Cost Index: Year over Year Percentage Change | 0 | Percent | Q | Instituto Nacional de Estatist |
| EMP | Slovakia Unemployment Available to Work Rate | 1 | Rate | M | The Center for Labor, Family a |
| EMP | Slovakia Avg Monthly Real Wages Industry YoY | 0 | Rate | M | Statistical Office of the Slov |
| EMP | Spain Unemployment Level MoM Net Change Latest Rev | 0 | Volume | M | Spanish Labour Ministry |
| EMP | Spain Labor Costs Avg Monthly Labor Cost Worker YoY | 0 | Rate | Q | INE |
| EMP | Spain Unemployment Rate | 1 | Rate | Q | INE |
| EMP | Slovenia Unemployment Rate Unemployed of Active Population | 1 | Rate | M | Rep Statistical Office |
| EMP | Slovenia Avg Gross Real Wages YoY | 0 | Rate | M | Rep Statistical Office |
| EMP | Eurostat Unemployment Eurozone SA | 1 | Rate | M | Copyright Euro Communities |
| EMP | Eurostat Eurozone Employment SA WDA QoQ | 0 | Rate | Q | Copyright Euro Communities |
| EMP | Eurostat Labor Costs Nominal Values Eurozone YoY WDA | 0 | Rate | Q | Copyright Euro Communities |
| EMP | Eurostat Eurozone Employment NSA YoY | 0 | Rate | Q | Copyright Euro Communities |
| OUT | Austria GDP Constant Prices QoQ | 0 | Rate | Q | Austrian Institute of Economic |
| OUT | Austria Industrial Production MoM SA | 0 | Rate | M | Statistik Austria |
| OUT | Belgium GDP Constant 2008 Prices SA QoQ | 0 | Rate | Q | National Bank of Belgium |
| OUT | Estonia Chain Linked GDP Seas Working Day Adj QoQ | 0 | Rate | Q | Statistical Office Estonia |
| OUT | Estonia Retail Sale Enterprises Constant YoY | 0 | Rate | M | Statistical Office Estonia |
| OUT | Finland GDP Constant Prices SA QoQ | 0 | Rate | Q | Finnish Statistics Office |
| OUT | Finland GDP Working Day Adjusted | 0 | Rate | Q | Finnish Statistics Office |
| OUT | Finland Industrial Production Volume MoM SA 2005=100 | 0 | Rate | M | Finnish Statistics Office |
| OUT | Finland Retail Sales Volume Index YoY Per | 0 | Rate | M | Finnish Statistics Office |
| OUT | France GDP QoQ | 0 | Rate | Q | INSEE National Statistics Offi |
| OUT | France Industrial Production MoM SA 2005=100 | 0 | Rate | M | INSEE National Statistics Offi |
| OUT | France Manufacturing Production MoM SA 2005=100 | 0 | Rate | M | INSEE National Statistics Offi |
| OUT | Germany GDP Chain Linked Pan German QoQ | 0 | Rate | Q | German Fed Statistical Off |
| OUT | Germany GDP Chain Linked Investment in Construction QoQ | 0 | Rate | Q | German Fed Statistical Off |
| OUT | Germany GDP Chain Linked Exports QoQ | 0 | Percent | Q | German Fed Statistical Off |
| OUT | Germany GDP Chain Linked Imports QoQ | 0 | Percent | Q | German Fed Statistical Off |
| OUT | Germany GDP Chain Linked Private Consumption QoQ | 0 | Percent | Q | German Fed Statistical Off |
| OUT | Germany GDP Chain Linked Government Consumption QoQ | 0 | Percent | Q | German Fed Statistical Off |
| OUT | Germany GDP Chain Linked Domestic Demand QoQ | 0 | Rate | Q | German Fed Statistical Off |
| OUT | Germany GDP Chain Linked Gross fixed capital investment QoQ | 0 | Rate | Q | German Fed Statistical Off |
| OUT | Germany Industrial Production MoM SA | 0 | Rate | M | Deutsche Bundesbank |
| OUT | Germany Manufacturing Orders MoM SA | 0 | Rate | M | Deutsche Bundesbank |
| OUT | Germany Retail Sales Constant 2005 Prices MoM SA | 0 | Rate | M | German Fed Statistical Off |
| OUT | Greece Real GDP QoQ SA | 0 | Rate | Q | National Statistical Service o |
| OUT | Greece Industrial Production YoY | 0 | Rate | M | National Statistical Service o |
| OUT | Greece Retail Sales YoY 2005=100 WDA | 0 | Rate | M | National Statistical Service o |
| OUT | Ireland GDP Constant 2005 Prices QoQ SA | 0 | Rate | Q | Central Statistics Office Irel |
| OUT | Ireland Industrial Production SA MoM 2000=100 | 0 | Rate | M | Central Statistics Office Irel |
| OUT | Ireland All New Vehicle Registrations | 1 | Volume | M | Central Statistics Office Irel |
| OUT | Ireland Retail Sales Volume All Businesses MoM SA | 0 | Rate | M | Central Statistics Office Irel |
| OUT | Italy Real GDP QoQ SA WDA | 0 | Rate | Q | ISTAT |
| OUT | Italy Industrial Production MoM SA | 0 | Rate | M | ISTAT |
| OUT | Italy Industrial Orders MoM SA 2005=100 | 0 | Rate | M | ISTAT |
| OUT | Italy Industrial Sales MoM SA 2005=100 | 0 | Rate | M | ISTAT |
| OUT | Italy New Car Registrations YoY NSA | 0 | Rate | M | ANFIA |
| OUT | Italy Retail Sales MoM SA 2005=100 | 0 | Rate | M | ISTAT |

## Eurozone Macroeconomic News (continued)

| Category | Name Macro Release | Adj. | Units | Freq | Source |
|---|---|---|---|---|---|
| OUT | GDP at Real 2000 Prices Seasonally Adjusted in Euros QoQ | 0 | Rate | Q | Dutch Statistics Office |
| OUT | Netherlands Industrial Production MoM 2005=100 SA | 0 | Rate | M | Dutch Statistics Office |
| OUT | Netherlands Industrial Sales YoY 2005=100 | 0 | Rate | M | Dutch Statistics Office |
| OUT | Netherlands Retail Sales Turnover Index 2000=100 YoY | 0 | Rate | M | Dutch Statistics Office |
| OUT | Portugal GDP Constant 2006 Prices QoQ | 0 | Rate | Q | Instituto Nacional de Estatist |
| OUT | Portugal Industrial Production Index MoM | 0 | Rate | M | Instituto Nacional de Estatist |
| OUT | Portugal Industrial Sales Index 2005=100 MoM | 0 | Rate | M | Instituto Nacional de Estatist |
| OUT | Portugal Retail Sales Index MoM | 0 | Rate | M | Instituto Nacional de Estatist |
| OUT | Slovakia GDP Constant Prices YoY | 0 | Percent | Q | Statistical Office of the Slov |
| OUT | Slovakia Industrial Production Index Adjusted | 0 | Percent | M | Statistical Office of the Slov |
| OUT | Slovakia Industrial Sales Constant Prices YoY | 0 | Rate | M | Statistical Office of the Slov |
| OUT | Slovakia Industrial Orders MoM | 0 | Rate | M | Statistical Office of the Slov |
| OUT | Slovakia Retail Sales Ex Motor Vehicles Constant YoY | 0 | Percent | M | Statistical Office of the Slov |
| OUT | Spain GDP SA Chained Linked at Constant 2008 Prices QoQ | 0 | Rate | Q | INE |
| OUT | Spain Industrial Production YoY 2005=100 | 0 | Rate | M | Instituto Nacional de Estadist |
| OUT | Spain Industrial Production Workday Adjusted YoY | 0 | Rate | M | Instituto Nacional de Estadist |
| OUT | Spain Retail Sales Constant Prices 2005=100 YoY | 0 | Rate | M | INE |
| OUT | Spain Retail Sales Constant Prices WDA YoY | 0 | Rate | M | INE |
| OUT | Slovenia GDP Constant Prices YoY | 0 | Rate | Q | Statistical Office of the Repu |
| OUT | Slovenia Industrial Production MoM | 0 | Rate | M | Statistical Office of the Repu |
| OUT | Slovenia Retail Trade MoM | 0 | Rate | M | Statistical Office of the Repu |
| OUT | Eurostat GDP cons prices Euro QoQ | 0 | Rate | Q | Copyright Euro Communities |
| OUT | Eurostat GDP cons prices Euro Household CExp | 0 | Rate | Q | Copyright Euro Communities |
| OUT | Eurozone Government Expenditure cons prices | 0 | Rate | Q | Copyright Euro Communities |
| OUT | Eurostat GDP cons prices Euro Gross Fixed Cap Form | 0 | Rate | Q | Copyright Euro Communities |
| OUT | Eurostat Ind Production Euro Ex Constr MoM SA | 0 | Rate | M | Copyright Euro Communities |
| OUT | Eurostat New Orders Euro Manufact Ind Orders MoM SA | 0 | Rate | M | Copyright Euro Communities |
| OUT | Eurostat Euro Monthly Prod Construction SA MoM | 0 | Rate | M | Copyright Euro Communities |
| OUT | Eurostat Retail Sales Volume Eurozone MoM SA | 0 | Rate | M | Copyright Euro Communities |
| ANT | Belgium General Index Business Confidence | 0 | Value | M | National Bank of Belgium |
| ANT | Belgium ANT Indicator | 0 | Value | M | National Bank of Belgium |
| ANT | Finland Industrial Confidence Indicator | 0 | Value | M | Confederation of Finnish Indus |
| ANT | Finland ANT Indicator | 0 | Value | M | Finnish Statistics Office |
| ANT | France Manufacturing PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | France Services PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | France Business Confidence Manuf ANTt Index | 0 | Value | M | INSEE National Statistics Offi |
| ANT | Bank of France Business ANTtiment Indicator | 0 | Value | M | Banque De France |
| ANT | France Business Confidence General Prod Expect | 0 | Value | M | INSEE National Statistics Offi |
| ANT | France Business Confidence Personal Prod Expect | 0 | Value | M | INSEE National Statistics Offi |
| ANT | France Bus Conf Mfg Industry Demand Past 3 Month | 0 | Value | M | INSEE National Statistics Offi |
| ANT | Ifo Pan Germany Business Climate | 0 | Value | M | IFO Institute - Institut fuer |
| ANT | IFO Pan Germany Business Expectations | 0 | Value | M | IFO Institute - Institut fuer |
| ANT | ZEW Germany Assessment of Current Situation | 0 | Value | M | ZEW Zentrum fuer Europaeische |
| ANT | ZEW Germany Expectation of Economic Growth | 0 | Value | M | ZEW Zentrum fuer Europaeische |
| ANT | IFO Pan Germany Current Assessment | 0 | Value | M | IFO Institute - Institut fuer |
| ANT | Germany Manufacturing PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | Germany Services PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | GfK ANT | 0 | Value | M | GfK AG |

## Eurozone Macroeconomic News (continued)

| Category | Name Macro Release | Adj. | Units | Freq | Source |
|---|---|---|---|---|---|
| ANT | Ireland Consumer ANTtiment Index | 0 | Value | M | IIB Bank |
| ANT | Italy Business Confidence | 0 | Value | M | ISTAT |
| ANT | Italy Services PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | Italy Manufacturing PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | Italy ANT Indicator SA | 0 | Value | M | ISTAT |
| ANT | Netherlands Producer Confidence | 0 | Price | M | Dutch Statistics Office |
| ANT | Netherlands ANT Seasonally Adjusted | 0 | Value | M | Dutch Statistics Office |
| ANT | Portugal ANT Indicator 3Mth Moving Average | 0 | Value | M | Instituto Nacional de Estatist |
| ANT | Portugal Economic Climate Indicator | 0 | Value | M | Instituto Nacional de Estatist |
| ANT | Slovakia Industrial Confidence Indicator | 0 | Yield | M | Statistical Office of the Slov |
| ANT | Slovakia ANT Indicator SA | 0 | Yield | M | Statistical Office of the Slov |
| ANT | Spain Business Confidence Indicator | 1 | Value | Q | Spanish Chamber of Commerce |
| ANT | Slovenia ANTtiment Indicator SA | 0 | Value | M | Statistical Office of the Repu |
| ANT | EC Manufacturing Confidence Euro Ind Confidence | 0 | Value | M | European Commission |
| ANT | EC Composite PMI Output | 0 | Value | M | Markit |
| ANT | Eurozone Manufacturing PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | Eurozone Services PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | EC Economic ANTtiment Indicator Eurozone | 0 | Value | M | European Commission |
| ANT | EC Euro Area Business Climate Indicator | 0 | Value | M | European Commission |
| ANT | EC Services Confidence Indicator Eurozone | 0 | Value | M | European Commission |
| ANT | ZEW Eurozone Expectation of Economic Growth | 0 | Value | M | ZEW Zentrum fuer Europaeische |
| ANT | ANTtix Economic Indices Euro Aggregate Index | 0 | Value | M | ANTtix Behavioral Indices |
| ANT | EC ANT Indicator Eurozone | 0 | Value | M | European Commission |

## 6.3 UK Macroeconomic News

| Category | Name Macro Release | Adj. | Units | Freq | Source |
|---|---|---|---|---|---|
| INF | BRC NielANT Shop Price Index All Items YoY | 0 | Percent | M | The British Retail Consortium |
| INF | UK CPI EU Harmonized MoM NSA | 0 | Rate | M | UK Office National Statist |
| INF | UK CPI Ex Energy Food Alcohol and Tobacco YoY | 0 | Rate | M | UK Office National Statist |
| INF | UK RPI MoM NSA | 0 | Rate | M | UK Office National Statist |
| INF | UK RPI Less Mortgage Interest Payments YoY NSA | 0 | Rate | M | UK Office National Statist |
| INF | UK PPI Input Prices Mat Fuels Purchased Manufact MoM NSA | 0 | Rate | M | UK Office National Statist |
| INF | UK PPI Manufact Products MoM NSA | 0 | Rate | M | UK Office National Statist |
| INF | UK PPI Output Prices Ex Food Beverages Tobacco Petro MoM NSA | 0 | Rate | M | UK Office National Statist |
| INF | Bank of England GfK Inflation Expect Survey Inflation | 0 | Rate | M | Bank of England |
| EMP | Lloyds TSB Consumer Barometer Job Prospects | 1 | Value | M | Lloyds TSB Corp Markets |
| EMP | UK Claimant Count Rate SA | 1 | Rate | M | UK Office National Statist |
| EMP | UK Unemployment Claimant Count Monthly Change SA | 0 | Rate | M | UK Office National Statist |
| EMP | Average Weekly Earnings 3 Month Avg Growth Whole Economy YoY | 0 | Rate | M | UK Office National Statist |
| EMP | UK AWE Regular Pay Whole Economy 3M Avg YoY SA | 0 | Rate | M | UK Office National Statist |
| EMP | UK Unemployment ILO Unemployment Rate SA | 1 | Rate | M | UK Office National Statist |
| OUT | UK IOS Index Total Service Industries MoM | 0 | Percent | M | UK Office National Statist |
| OUT | UK IOS Index Total Service Industries 3 Mth/3 Mth | 0 | Rate | M | UK Office National Statist |
| OUT | UK Lending to Individuals Net Lending Consumer Credit GBP/Billion SA | 12 | Value | M | Bank of England |
| OUT | UK Lending to Individuals Net Lending Secured On Dwellings in Billions | 12 | Value | M | Bank of England |
| OUT | UK New Car Registrations YoY | 0 | Rate | M | Society of Motor Manufacturers |
| OUT | UK Industrial Production MoM SA | 0 | Rate | M | UK Office National Statist |
| OUT | UK Manufacturing Production MoM SA | 0 | Rate | M | UK Office National Statist |
| OUT | UK Business Investment Chained QoQ SA | 0 | Rate | Q | UK Office National Statist |
| OUT | UK GDP Chained GDP at Market Prices QoQ | 0 | Rate | Q | UK Office National Statist |
| OUT | UK National Institute Of Economic and Social Research GDP Estimate QoQ | 0 | Rate | M | National Institute of Economic |
| OUT | UK GDP Chained Mkt Prices Gross Fixed Capital Formation Expend QoQ | 0 | Rate | Q | UK Office National Statist |
| OUT | UK GDP Chained Mkt Prices General Govt Consumption Expend QoQ | 0 | Rate | Q | UK Office National Statist |
| OUT | UK GDP Chained Volume Measures Household Expend SA QoQ | 0 | Value | Q | UK Office National Statist |
| OUT | UK GDP Chained Mkt Prices All Exports Expend QoQ | 0 | Rate | Q | UK Office National Statist |
| OUT | UK GDP Chained Mkt Prices Gross Final Expend Less Imports QoQ | 0 | Rate | Q | UK Office National Statist |
| OUT | BRC KPMG Retail Sales Monitor Like For Like YoY | 0 | Percent | M | The British Retail Consortium |
| OUT | UK Retail Sales All Sales Ex Auto Fuel Volume MoM SA | 0 | Rate | M | UK Office National Statist |
| OUT | UK Retail Sales Volume Including Auto Fuel MoM | 0 | Rate | M | UK Office National Statist |
| ANT | CBI MTE Full Volume of Total Order Book Balance | 0 | Value | M | Confederation of British Indus |
| ANT | CBI MTE Full Average Sell Prices Next 3Mo Balance | 0 | Value | M | Confederation of British Indus |
| ANT | CBI ITS Q1 Quarterly Optimism Balance | 0 | Value | M | Confederation of British Indus |
| ANT | CBI Retail Q1Monthly Volume Sales to Y Earlier | 0 | Value | M | Confederation of British Indus |
| ANT | UK Manufacturing PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | UK Purchasing Managers Index Construction | 12 | Value | M | Markit |
| ANT | UK Services PMI Markit Survey Ticker | 0 | Value | M | Markit |
| ANT | GFK UK Consumer Confidence Indicator | 0 | Value | M | GfK NOP (UK) |
| ANT | Lloyds TSB Business Barometer Current Per Balance | 0 | Value | M | Lloyds TSB Corporate Markets |
| ANT | UK Nationwide Consumer Confidence Index SA | 12 | Rate | M | Nationwide Building Society |

## 6.4 Japan Macroeconomic News

| Category | Name Macro Release | Adj. | Units | Freq | Source |
|---|---|---|---|---|---|
| INF | Japan CPI Tokyo YoY | 0 | Rate | M | Ministry Internal Affairs |
| INF | Japan CPI Tokyo Ex Fresh Food YoY | 0 | Rate | M | Ministry Internal Affairs |
| INF | Japan CPI Tokyo Ex Food and Energy YoY Per | 0 | Rate | M | Ministry Internal Affairs |
| INF | Japan CPI Nationwide YoY | 0 | Rate | M | Ministry Internal Affairs |
| INF | Japan CPI Nationwide Ex Fresh Food YoY | 0 | Rate | M | Ministry Internal Affairs |
| INF | Japan CPI Nationwide Ex Food and Energy YoY Per | 0 | Rate | M | Ministry Internal Affairs |
| INF | Japan GDP Chained Deflators YoY | 0 | Rate | Q | Economic and Social Research |
| INF | Japan Domestic Corporate Goods Price MoM | 0 | Rate | M | Bank of Japan |
| INF | Japan Corporate Services Price YoY | 0 | Rate | M | Bank of Japan |
| EMP | Japan Unemployment Rate SA | 12 | Rate | M | Ministry Internal Affairs |
| EMP | Japan Jobs to Applicants Ratio SA | 12 | Rate | M | Ministry Health Labour |
| EMP | Japan Labour Statistics Avg Monthly Cash Earnings YoY | 0 | Rate | M | Ministry Health Labour |
| EMP | Japan Manpower Survey | 0 | Percent | Q | Manpower Inc. |
| OUT | Japan Vehicle Sales YOY | 0 | Rate | M | Japan Auto Manufacturers |
| OUT | Japan Machinery Orders: Private Sector (exc. volatile orders) MoM SA | 0 | Rate | M | Economic and Social Research |
| OUT | Japan Bankruptcies Cases with Total Debt of 10 Million Yen or More YoY | 0 | Rate | M | Tokyo Shoko Research |
| OUT | Japan Machine Tool Orders YoY | 0 | Rate | M | Japan Machine Tool Builders |
| OUT | Japan Indices of Industrial Production MoM SA 2005=100 | 0 | Rate | M | Ministry of Economy Trade |
| OUT | Japan Capacity Utilization Operating Ratio Manufacturing MoM SA | 0 | Rate | M | Ministry of Economy Trade |
| OUT | Japan Tertiary Industry Activity MoM SA | 0 | Rate /Mid | M | Ministry of Economy Trade |
| OUT | Japan All Industrial Activity MoM SA | 0 | Rate /Mid | M | Ministry of Economy Trade |
| OUT | Nomura/JMMA Seasonal PMI | 12 | Value | M | Markit/Nomura Securities |
| OUT | Japan Vehicle Production YOY | 0 | Rate | M | Japan Auto Manufacturers |
| OUT | Japan Big 50 Constructors Orders by Contract Value YoY | 0 | Rate | M | Ministry of Land, Infrastructu |
| OUT | Japan Capital Investment Excl Software YoY | 0 | Rate | Q | Ministry of Finance |
| OUT | Japan Capital Investment YoY | 0 | Rate | Q | Ministry of Finance |
| OUT | Japan All Households Living Expend Real YoY | 0 | Rate | M | Ministry of Internal Affairs |
| OUT | Japan GDP at Current Prices QoQ SA | 0 | Rate | Q | Economic and Social Research |
| OUT | Japan Real GDP Annualized QoQ SA GDP expenditure approach Per | 0 | Rate | Q | Economic and Social Research |
| OUT | Japan GDP Real Chained QoQ Per SA | 0 | Rate | Q | Economic and Social Research |
| OUT | Japan Nationwide Department Store Sales YoY | 0 | Rate | M | Japan Dept Store Ass. |
| OUT | Tokyo Department Store Sales YoY | 0 | Rate | M | Japan Department Store Ass. |
| OUT | Japan Convenience Same Store Sales YoY | 0 | Rate | M | Japan Franchise Ass. |
| OUT | Japan Chain Store Sales YoY | 0 | Rate | M | Japan Chain Stores Ass. |
| OUT | Japan Retail Trade MoM SA 2005=100 | 0 | Rate | M | Ministry of Economy Trade |
| OUT | Japan Large-Scale Retail Store Sales YoY | 0 | Rate | M | Ministry of Economy Trade |
| ANT | Japan New Composite Index of Business Cycle Indicators Coincident Index | 12 | Value | M | Economic and Social Research |
| ANT | Japan New Composite Index of Business Cycle Indicators Leading Index | 12 | Value | M | Economic and Social Research |
| ANT | Japan Economy Watchers Survey Current Conditions | 12 | Value | M | Economic and Social Research |
| ANT | Japan Economy Watchers Survey Expectations | 12 | Value | M | Economic and Social Research |
| ANT | Japan Small Business Confidence All Industries | 0 | Value | M | Shoko Chukin Bank |
| ANT | Japan BSI Business Condition Large Co All Industry QoQ | 0 | Rate | Q | Ministry of Finance |
| ANT | Japan BSI Business Condition Large Co Manufacturing QoQ | 0 | Rate | Q | Ministry of Finance |
| ANT | Japan Consumer Confidence Overall Nationwide NSA | 12 | Value | M | Economic and Social Research |
| ANT | Japan Consumer Confidence Households Confidence NSA | 12 | Value | M | Economic and Social Research |

### Table 1: Summary Statistics

The sample period extends from January 1997 to December 2011. $R_m - R_f$ denotes the logarithmic return on the S&P500 in excess of the three-month T-bill rate. *Growth*, *Realized Growth*, and *Anticipated Growth* denote the respective real-time macro factors. *Growth Dispersion* denotes the real-time factor constructed from the standard deviation of growth release forecasts. $VRP$ is the variance risk premium defined as the difference between the squared VIX index and the expectation of realized variance based on a time-series model with lagged VIX and realized volatility obtain from five-minute returns. The predictor variables also include the logarithm of the price-earning ratio ($\log\frac{P}{E}$), the dividend yield ($\log\frac{D}{P}$), the default spread $DEF$, defined as the difference between Moody's BAA and AAA corporate bond yields, and the term spread $TERM$, defined as the difference between the ten-year and three-month Treasury yields.

| | $R_m - R_f$ | Growth | Realized Growth | Anticipated Growth | Growth Dispersion | $VRP$ | $\log\frac{P}{E}$ | $\log\frac{D}{P}$ | $DEF$ | $TERM$ |
|---|---|---|---|---|---|---|---|---|---|---|
| **Summary statistics** | | | | | | | | | | |
| Mean | 0.63 | -0.04 | -0.15 | 0.10 | -0.00 | 0.04 | 2.98 | 0.55 | 1.03 | 1.68 |
| Stdev. | 21.42 | 1.15 | 1.18 | 1.20 | 0.99 | 0.05 | 0.23 | 0.25 | 0.48 | 1.30 |
| Skew | -0.20 | -1.30 | -1.63 | -0.83 | 1.40 | 4.96 | 0.05 | 0.48 | 2.82 | -0.06 |
| Kurtosis | 9.77 | 4.97 | 5.95 | 3.72 | 4.19 | 36.57 | 2.19 | 3.56 | 12.25 | 1.66 |
| **Correlation matrix** | | | | | | | | | | |
| $R_m - R_f$ | 1.00 | 0.01 | 0.00 | 0.01 | 0.01 | -0.13 | 0.04 | -0.03 | -0.01 | 0.01 |
| **Growth:** | | | | | | | | | | |
| All | | 1.00 | 0.97 | 0.93 | -0.14 | -0.46 | 0.55 | -0.71 | -0.84 | -0.51 |
| Realized | | | 1.00 | 0.82 | -0.23 | -0.44 | 0.46 | -0.66 | -0.81 | -0.57 |
| Anticipated | | | | 1.00 | 0.05 | -0.44 | 0.65 | -0.71 | -0.80 | -0.38 |
| Dispersion | | | | | 1.00 | 0.15 | 0.19 | 0.09 | 0.14 | 0.02 |
| **Predictors:** | | | | | | | | | | |
| $VRP$ | | | | | | 1.00 | -0.30 | 0.40 | 0.65 | 0.19 |
| $\log(P/E)$ | | | | | | | 1.00 | -0.85 | -0.52 | -0.28 |
| $\log(D/P)$ | | | | | | | | 1.00 | 0.69 | 0.42 |
| $DEF$ | | | | | | | | | 1.00 | 0.40 |
| $TERM$ | | | | | | | | | | 1.00 |

## Table 2: Stock Market Predictability and Macro Factors

The sample period extends from January 1997 to December 2011. We estimate:

$$R_{m;t,t+lead} - R_{f;t,t+lead} = \alpha + \beta X_t + \epsilon_t.$$

$R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 in excess of the three-month T-bill rate. $X_t$ is either $Realized_t - Realized_{t-22}$ (Panel A), where $Realized_t$ is the real-time realized growth factor, or $Anticipated_t$ (Panel B), which is the real-time anticipated growth factor that is orthogonal to realized growth, or both factors (Panel C). All of the regression are based on daily observations. The constant is included but not reported to save space. Robust Newey-West t-statistics are reported in parentheses.

Panel A: Realized Growth

| Daily Return Horizon | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Realized_t - Realized_{t-22}$ | 0.0036 | 0.0211 | 0.0316 | 0.0367 | 0.0447 | 0.0323 | 0.0296 |
| | (1.7015) | (3.7538) | (3.2537) | (2.9032) | (2.4543) | (1.4926) | (1.2436) |
| $Adj.R^2(\%)$ | 0.1985 | 2.1641 | 2.4796 | 2.2707 | 2.4672 | 0.9656 | 0.6308 |

Panel B: Orthogonal Anticipated Growth

| Daily Return Horizon | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| *Anticipated* | 0.0016 | 0.0055 | 0.0171 | 0.0323 | 0.0484 | 0.0647 | 0.0782 |
| | (1.7728) | (1.9610) | (3.2399) | (4.0668) | (4.4579) | (4.6729) | (4.5861) |
| $Adj.R^2(\%)$ | 0.1208 | 0.5047 | 2.5708 | 6.2397 | 10.1854 | 13.6772 | 15.7540 |

Panel C: Realized Growth and Orthogonal Anticipated Growth

| Daily Return Horizon | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Realized_t - Realized_{t-22}$ | 0.0035 | 0.0208 | 0.0306 | 0.0350 | 0.0423 | 0.0288 | 0.0252 |
| | (1.6675) | (3.6644) | (3.1458) | (2.7962) | (2.4109) | (1.3866) | (1.0892) |
| *Anticipated* | 0.0015 | 0.0052 | 0.0166 | 0.0318 | 0.0478 | 0.0642 | 0.0778 |
| | (1.7190) | (1.8952) | (3.1987) | (4.0322) | (4.4020) | (4.6352) | (4.5580) |
| $Adj.R^2(\%)$ | 0.3101 | 2.6119 | 4.8923 | 8.3002 | 12.3976 | 14.4474 | 16.2099 |

## Table 3: Macro Factors and Other Predictors

We estimate

$$R_{m;t,t+60} - R_{f;t,t+60} = \alpha + \beta X_t + \gamma Z_t + \epsilon_t,$$

where the $R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 in excess of the three-month T-bill rate. $X_t$ contains $Realized_t - Realized_{t-22}$, where $Realized_t$ is the real-time realized growth factor, and $Anticipated_t$, which is the real-time anticipated growth factor that is orthogonal to realized growth. The set of control variables $Z_t$ contains the variance risk premium $VRP$, the logarithm of the price-earning ratio, the dividend yield, the default spread $DEF_t$ and the term spread $TERM_t$. All of the regression are based on daily observations. The sample period extends from January 1997 to December 2011. The constant is included but not reported to save space. Robust Newey-West t-statistics are reported in parentheses.

| | Univariate | | | | | | Multiple | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| $\Delta_{t,t-22}Realized$ | 0.04 | | | | | | 0.04 | 0.04 | 0.04 | 0.04 |
| | (2.80) | | | | | | (3.02) | (3.14) | (3.25) | (2.86) |
| $Anticipated_t$ | 0.03 | | | | | | 0.03 | 0.03 | 0.04 | 0.04 |
| | (4.03) | | | | | | (3.94) | (3.67) | (4.91) | (4.19) |
| $VRP_t$ | | 0.07 | | | | | 0.13 | | | |
| | | (0.51) | | | | | (0.99) | | | |
| $\mathbf{log}\frac{P_t}{E_t}$ | | | -0.05 | | | | | | -0.08 | |
| | | | (-2.05) | | | | | | (-3.94) | |
| $\mathbf{log}\frac{D_t}{P_t}$ | | | | 0.05 | | | | | | |
| | | | | (1.86) | | | | | | |
| $DEF_t$ | | | | | -0.01 | | | | | -0.003 |
| | | | | | (-0.68) | | | | | (-0.19) |
| $TERM_t$ | | | | | | -0.001 | | | | -0.01 |
| | | | | | | (-0.34) | | | | (-2.03) |
| $Adj.R^2(\%)$ | 8.30 | 0.13 | 1.42 | 1.76 | 0.29 | 0.00 | 8.70 | 9.03 | 12.14 | 9.79 |

## Table 4: Conditional Stock Market Predictability

We estimate:

$$R_{m;t,t+lead} - R_{f;t,t+lead} = \alpha + \beta_1 \left( Realized_t - Realized_{t-22} \right) + \beta_2 Anticipated_t + \epsilon_t,$$

where the $R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 in excess of the three-month T-bill rate, $Realized_t$ is the real-time realized growth factor, $Anticipated_t$ is the real-time anticipated growth factor that is orthogonal to realized growth. Estimates are conditional on high growth dispersion (Panel A), low growth dispersion (Panel B), recession periods (Panel C), expansion periods (Panel D). The sample period extends from January 2000 (January 1997) to December 2011 for Panel A,B (Panel C,D). All of the regression are based on daily observations. The constant is included but not reported to save space. Robust Newey-West t-statistics are reported in parentheses.

Panel A: Growth Dispersion above median

| Daily Return Horizon | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Realized_t - Realized_{t-22}$ | 0.0106 | 0.0355 | 0.0421 | 0.0456 | 0.0386 | 0.0223 | -0.0071 |
| | (2.9329) | (3.9659) | (3.0505) | (2.8258) | (1.5745) | (0.7200) | (-0.2199) |
| *Anticipated* | -0.0000 | 0.0048 | 0.0247 | 0.0472 | 0.0701 | 0.0880 | 0.1057 |
| | (-0.0160) | (1.1361) | (3.1831) | (3.9811) | (4.4069) | (4.7542) | (4.7631) |
| $Adj.R^2(\%)$ | 1.8163 | 6.4621 | 10.3170 | 16.9731 | 20.9409 | 22.1108 | 23.8770 |

Panel B: Growth Dispersion below median

| Daily Return Horizon | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Realized_t - Realized_{t-22}$ | -0.0018 | 0.0011 | -0.0036 | -0.0022 | 0.0132 | -0.0001 | 0.0143 |
| | (-0.8654) | (0.1766) | (-0.3291) | (-0.1528) | (0.7895) | (-0.0061) | (0.5640) |
| *Anticipated* | 0.0038 | 0.0078 | 0.0105 | 0.0146 | 0.0274 | 0.0435 | 0.0507 |
| | (2.7236) | (1.8391) | (1.2537) | (1.1798) | (1.4533) | (1.5847) | (1.4029) |
| $Adj.R^2(\%)$ | 0.6362 | 0.8258 | 0.9000 | 1.1979 | 3.7404 | 6.3257 | 6.2244 |

Panel C: Recessions (Level of growth$<$ 0)

| Daily Return Horizon | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Realized_t - Realized_{t-22}$ | 0.0062 | 0.0264 | 0.0305 | 0.0312 | 0.0299 | 0.0084 | -0.0179 |
| | (1.8273) | (2.9157) | (2.0786) | (1.7999) | (1.2725) | (0.2756) | (-0.5699) |
| *Anticipated* | 0.0022 | 0.0087 | 0.0258 | 0.0455 | 0.0688 | 0.0925 | 0.1148 |
| | (1.9311) | (2.3622) | (3.9216) | (4.6956) | (5.2776) | (5.8291) | (6.1228) |
| $Adj.R^2(\%)$ | 0.9744 | 5.0551 | 9.6299 | 16.8170 | 25.6765 | 30.0008 | 33.3534 |

Panel D: Expansions (Level of growth$>$ 0)

| Daily Return Horizon | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Realized_t - Realized_{t-22}$ | -0.0019 | 0.0052 | 0.0132 | 0.0161 | 0.0241 | 0.0086 | 0.0219 |
| | (-0.8791) | (0.8523) | (1.1811) | (0.9585) | (0.9964) | (0.3398) | (0.7203) |
| *Anticipated* | -0.0019 | -0.0079 | -0.0100 | -0.0051 | -0.0039 | -0.0022 | -0.0002 |
| | (-1.4074) | (-2.3466) | (-1.6744) | (-0.5525) | (-0.3126) | (-0.1515) | (-0.0144) |
| $Adj.R^2(\%)$ | 0.0856 | 1.1712 | 1.5636 | 0.7210 | 0.9534 | 0.0360 | 0.4477 |

## Table 5: International Evidence. Local and Global Factors

We estimate:

$$R_{m;t,t+lead} - R_{f;t,t+lead} = \alpha + \beta_1 \left(Realized_t - Realized_{t-22}\right) + \beta_2 Anticipated_t + \epsilon_t,$$

where the $R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 (Panel A), the EuroSTOXX50 (Panel B), the FTSE100 (Panel C), and the Nikkei225 (Panel D), all in excess of the three-month risk-free rate. $Realized_t$ is the real-time realized growth factor and $Anticipated_t$ is the real-time anticipated growth factor that is orthogonal to realized growth. For each panel, macro factors can be local, global as first principal component of all locals, or global as U.S. factors. The sample period extends from January 1997 to December 2011. All of the regression are based on daily observations. The constant is included but not reported to save space. Robust Newey-West t-statistics are reported in parentheses.

Panel A: U.S.

| | Local | | | | Global | | | | Global is US | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| horizon | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | 0.0208 | 0.0306 | 0.0350 | 0.0423 | 0.0122 | 0.0132 | 0.0177 | 0.0106 | 0.0208 | 0.0306 | 0.0350 | 0.0423 |
| | (3.6644) | (3.1458) | (2.7962) | (2.4109) | (2.0441) | (1.3152) | (1.3375) | (0.6490) | (3.6644) | (3.1458) | (2.7962) | (2.4109) |
| $Anticipated_t$ | 0.0052 | 0.0166 | 0.0318 | 0.0478 | 0.0029 | 0.0085 | 0.0146 | 0.0218 | 0.0052 | 0.0166 | 0.0318 | 0.0478 |
| | (1.8952) | (3.1987) | (4.0322) | (4.4020) | (2.0294) | (3.5745) | (4.1458) | (4.4840) | (1.8952) | (3.1987) | (4.0322) | (4.4020) |
| $Adj.R^2(\%)$ | 2.6119 | 4.8923 | 8.3002 | 12.3976 | 2.3333 | 4.8704 | 8.7859 | 11.8209 | 2.6119 | 4.8923 | 8.3002 | 12.3976 |

Panel B: EU

| | Local | | | | Global | | | | Global is US | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | -0.0025 | -0.0232 | -0.0190 | -0.0294 | 0.0130 | 0.0102 | 0.0183 | 0.0092 | 0.0240 | 0.0386 | 0.0457 | 0.0513 |
| | (-0.3143) | (-1.7164) | (-1.0084) | (-1.5042) | (1.8799) | (0.8350) | (1.1305) | (0.4596) | (3.6725) | (3.3528) | (2.9101) | (2.4169) |
| $Anticipated_t$ | 0.0104 | 0.0234 | 0.0329 | 0.0421 | 0.0036 | 0.0099 | 0.0152 | 0.0221 | 0.0050 | 0.0154 | 0.0296 | 0.0432 |
| | (4.3848) | (5.7204) | (5.8840) | (5.5359) | (2.1068) | (3.4643) | (3.7556) | (4.0326) | (1.4986) | (2.5249) | (3.4660) | (3.7837) |
| $Adj.R^2(\%)$ | 3.0512 | 7.3861 | 9.4744 | 10.8505 | 2.0252 | 3.5614 | 5.7311 | 7.0744 | 2.1340 | 3.7100 | 5.3678 | 6.8425 |

Panel C: UK

| | Local | | | | Global | | | | Global is US | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | 0.0063 | 0.0162 | 0.0228 | 0.0182 | 0.0105 | 0.0109 | 0.0119 | 0.0020 | 0.0165 | 0.0276 | 0.0291 | 0.0328 |
| | (1.2632) | (1.5802) | (1.6192) | (1.0619) | (2.0971) | (1.2388) | (1.1091) | (0.1599) | (3.3329) | (3.3706) | (2.8050) | (2.3380) |
| $Anticipated_t$ | 0.0081 | 0.0149 | 0.0239 | 0.0294 | 0.0026 | 0.0078 | 0.0138 | 0.0199 | 0.0038 | 0.0127 | 0.0271 | 0.0392 |
| | (2.0301) | (1.9066) | (2.1751) | (2.0107) | (1.9617) | (3.4705) | (4.5268) | (4.9188) | (1.4050) | (2.4782) | (3.8369) | (4.2836) |
| $Adj.R^2(\%)$ | 0.6948 | 1.6307 | 2.7186 | 2.4310 | 1.9722 | 4.5030 | 8.6491 | 11.3474 | 1.7313 | 3.9531 | 7.1732 | 10.1169 |

Panel D: JP

| | Local | | | | Global | | | | Global is US | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | -0.0016 | -0.0142 | -0.0130 | -0.0133 | 0.0061 | -0.0011 | -0.0062 | -0.0199 | 0.0247 | 0.0331 | 0.0264 | 0.0190 |
| | (-0.3181) | (-1.7124) | (-1.0882) | (-0.7829) | (0.8898) | (-0.0957) | (-0.3624) | (-0.9191) | (3.5666) | (2.9355) | (1.7774) | (0.8873) |
| $Anticipated_t$ | 0.0124 | 0.0246 | 0.0304 | 0.0387 | 0.0058 | 0.0136 | 0.0200 | 0.0255 | 0.0065 | 0.0174 | 0.0318 | 0.0449 |
| | (3.0088) | (3.4246) | (2.8892) | (2.6324) | (3.3562) | (4.7624) | (4.5426) | (3.9291) | (1.9484) | (2.5334) | (2.8899) | (2.8916) |
| $Adj.R^2(\%)$ | 1.5831 | 3.6521 | 3.4268 | 3.8499 | 2.8229 | 5.8978 | 8.0398 | 8.5796 | 2.6596 | 3.9210 | 4.9500 | 5.9794 |

## Table 6: Global versus Local Factors

We estimate:

$$R_{m;t,t+60} - R_{f;t,t+60} = \alpha + \beta_{1,2} Global + \gamma_{1,2} \left[Local - Global\right] + \epsilon_t,$$

where the $R_{mt} - R_{ft}$ denotes the logarithmic return on the S&P500 for the U.S., the EuroSTOXX50 for the E.U., the FTSE100 for the U.K., and the Nikkei225 for Japan, all in excess of the three-month risk-free rate. *Global* contains the monthly gradient in the U.S. real-time realized growth factor and the U.S. real-time anticipated growth factor that is orthogonal to realized growth. $Local - Global$ contains differences between local and U.S. macro factors. The sample period extends from January 1997 to December 2011. All of the regression are based on daily observations. The constant is included but not reported to save space. Robust Newey-West t-statistics are reported in parentheses.

| | **U.S.** | **EU** | **U.K.** | **JP** | **Pooled** |
|---|---|---|---|---|---|
| $\Delta_{t,t-22} Realized^{gl}$ | 0.0350 | -0.0018 | 0.0338 | 0.0059 | 0.0227 |
| | (2.7962) | (-0.0761) | (2.2368) | (0.3432) | (2.8275) |
| $Anticipated_t^{gl}$ | 0.0318 | 0.0348 | 0.0302 | 0.0373 | 0.0365 |
| | (4.0322) | (4.1067) | (2.9076) | (3.0511) | (7.8662) |
| $\left[\Delta_{t,t-22} Realized^{loc}\right] - \left[\Delta_{t,t-22} Realized^{gl}\right]$ | | -0.0194 | 0.0068 | -0.0209 | -0.0074 |
| | | (-1.0494) | (0.5269) | (-1.7962) | (-0.9597) |
| $Anticipated_t^{loc} - Anticipated_t^{gl}$ | | 0.0288 | 0.0053 | 0.0075 | 0.0169 |
| | | (4.2711) | (0.4445) | (0.7098) | (3.6344) |
| $Adj.R^2(\%)$ | 8.3002 | 9.7250 | 7.2559 | 5.8718 | 7.3647 |

## Table 7: International Evidence Conditional Analysis

We estimate:

$$R_{m;t,t+lead} - R_{f;t,t+lead} = \alpha + \beta_1 \left(Realized_t - Realized_{t-22}\right) + \beta_2 Anticipated_t + \epsilon_t,$$

where the $R_{mt} - R_{ft}$ denotes the logarithmic return the S&P500 for the U.S., the EuroSTOXX50 for the E.U., the FTSE100 for the U.K., and the Nikkei225 for Japan, all in excess of the three-month risk-free rate. $Realized_t$ is the U.S. real-time realized growth factor, $Anticipated_t$ is the U.S. real-time anticipated growth factor that is orthogonal to realized growth. Estimates are conditional on high growth dispersion (Panel A), low growth dispersion (Panel B), recession periods (Panel C), expansion periods (Panel D). The sample period extends from January 2000 (January 1997) to December 2011 for Panel A,B (Panel C,D). All of the regression are based on daily observations. The constant is included but not reported to save space. Robust Newey-West t-statistics are reported in parentheses.

Panel A: Growth Dispersion above median

| | EU | | | | UK | | | | JP | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | 0.0324 | 0.0602 | 0.0760 | 0.0780 | 0.0236 | 0.0328 | 0.0339 | 0.0247 | 0.0435 | 0.0469 | 0.0432 | 0.0299 |
| | (3.1136) | (2.9830) | (3.3275) | (2.9614) | (3.0054) | (2.7905) | (2.3474) | (1.2425) | (4.2871) | (2.8949) | (2.4587) | (1.1474) |
| $Anticipated_t$ | 0.0111 | 0.0167 | 0.0318 | 0.0596 | 0.0057 | 0.0222 | 0.0439 | 0.0614 | 0.0048 | 0.0233 | 0.0469 | 0.0659 |
| | (2.7979) | (2.2008) | (3.2278) | (4.0516) | (1.4054) | (3.0227) | (4.3006) | (5.0991) | (1.0439) | (2.2949) | (2.7792) | (2.9735) |
| $Adj.R^2(\%)$ | 7.6172 | 11.1770 | 16.5966 | 22.6117 | 4.1122 | 9.2961 | 16.3904 | 19.5785 | 6.4589 | 7.7286 | 11.2687 | 12.6371 |

Panel B: Growth Dispersion below median

| | EU | | | | UK | | | | JP | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | 0.0026 | 0.0058 | 0.0010 | 0.0089 | -0.0027 | -0.0062 | -0.0075 | 0.0017 | 0.0011 | 0.0028 | -0.0185 | -0.0247 |
| | (0.4292) | (0.5749) | (0.0628) | (0.5095) | (-0.4613) | (-0.7197) | (-0.7489) | (0.1333) | (0.1425) | (0.2134) | (-0.8719) | (-0.8176) |
| $Anticipated_t$ | 0.0092 | 0.0167 | 0.0205 | 0.0253 | 0.0047 | 0.0088 | 0.0164 | 0.0283 | 0.0031 | -0.0039 | -0.0102 | -0.0036 |
| | (2.3398) | (2.2149) | (1.8499) | (1.7459) | (1.0068) | (1.0478) | (1.5628) | (1.7166) | (0.4993) | (-0.3113) | (-0.5589) | (-0.1265) |
| $Adj.R^2(\%)$ | 1.3404 | 2.9376 | 2.5786 | 3.2430 | 0.2765 | 0.8025 | 2.4594 | 5.1466 | -0.0452 | -0.0450 | 0.5801 | 0.4119 |

Panel C: U.S. recession (Level of growth < 0)

| | EU | | | | UK | | | | JP | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | 0.0246 | 0.0507 | 0.0613 | 0.0717 | 0.0147 | 0.0218 | 0.0224 | 0.0189 | 0.0303 | 0.0244 | 0.0222 | -0.0026 |
| | (2.4686) | (2.5926) | (2.2852) | (2.3629) | (1.8679) | (1.7692) | (1.5873) | (1.0747) | (3.1099) | (1.5771) | (1.2033) | (-0.1020) |
| $Anticipated_t$ | 0.0128 | 0.0219 | 0.0337 | 0.0517 | 0.0101 | 0.0256 | 0.0443 | 0.0641 | 0.0110 | 0.0299 | 0.0484 | 0.0717 |
| | (3.6183) | (3.3889) | (3.8800) | (4.7528) | (2.8266) | (4.0033) | (5.4656) | (6.6536) | (2.9001) | (3.7716) | (3.8352) | (4.1552) |
| $Adj.R^2(\%)$ | 6.5991 | 12.1350 | 15.8235 | 21.7168 | 3.8255 | 10.4485 | 20.3047 | 30.8759 | 5.3065 | 8.0334 | 12.2050 | 17.1420 |

Panel D: U.S. expansion (Level of growth > 0)

| | EU | | | | UK | | | | JP | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** | **20** | **40** | **60** | **80** |
| $\Delta_{t,t-22}Realized$ | 0.0066 | 0.0194 | 0.0167 | 0.0277 | 0.0063 | 0.0106 | 0.0054 | 0.0060 | 0.0033 | 0.0217 | -0.0018 | 0.0026 |
| | (1.1777) | (1.7953) | (1.0197) | (1.2563) | (1.1807) | (1.1144) | (0.3856) | (0.3062) | (0.4147) | (1.6457) | (-0.0830) | (0.0823) |
| $Anticipated_t$ | -0.0040 | -0.0104 | -0.0074 | -0.0040 | -0.0141 | -0.0222 | -0.0193 | -0.0240 | -0.0194 | -0.0367 | -0.0454 | -0.0655 |
| | (-1.1485) | (-1.6804) | (-0.8583) | (-0.3368) | (-4.0349) | (-3.5707) | (-1.9867) | (-1.9649) | (-2.8620) | (-2.8751) | (-2.3465) | (-2.5685) |
| $Adj.R^2(\%)$ | 0.5675 | 2.5174 | 0.9860 | 1.3366 | 3.3172 | 4.5592 | 1.9970 | 2.2075 | 2.5709 | 6.6346 | 4.4287 | 6.3812 |

## Table 8: Forecasting future growth

We estimate:

$$Growth_{t+lead} = \alpha + \rho Growth_t + \beta_1 \left(Realized_t - Realized_{t-22}\right) + \beta_2 Anticipated_t + \epsilon_t$$

where $Growth_t$ is the real-time U.S. growth factor. $Realized_t$ is the U.S. real-time realized growth factor, $Anticipated_t$ is the U.S. real-time anticipated growth factor that is orthogonal to realized growth. The sample period extends from January 1997 (January 2000) to December 2011 in Panel A (in Panel B,C). $ARResidualR^2(\%)$ represents the proportion of explained variance of future growth that has been left unexplained by the current level of growth. All of the regression are based on daily observations and include a (non-reported) constant. Robust Newey-West t-statistics are reported in parentheses.

Panel A: Unconditional analysis

| | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Growth_t$ | 0.9956 | 0.9739 | 0.9357 | 0.8929 | 0.8499 | 0.8084 | 0.7655 |
| | (331.1565) | (88.9596) | (40.7666) | (25.3094) | (17.8421) | (13.9705) | (11.6457) |
| $\Delta_{t,t-22}Realized$ | 0.0355 | 0.1075 | 0.1997 | 0.2922 | 0.2716 | 0.2229 | 0.1564 |
| | (2.4397) | (2.1637) | (2.0885) | (2.0433) | (1.6371) | (1.2131) | (0.8580) |
| $Anticipated_t$ | 0.0320 | 0.1087 | 0.1755 | 0.2569 | 0.3728 | 0.4963 | 0.6068 |
| | (6.7134) | (6.3126) | (5.2161) | (4.7626) | (4.7849) | (4.6231) | (4.5333) |
| $Adj.R^2(\%)$ | 98.9502 | 94.6168 | 88.0927 | 81.5675 | 74.8610 | 69.4073 | 64.9324 |
| $ARResidualR^2(\%)$ | 4.6915 | 9.5483 | 11.7794 | 15.5993 | 19.0918 | 23.3195 | 27.0958 |

Panel B: Conditional on growth dispersion above median

| | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Growth_t$ | 0.9984 | 0.9826 | 0.9502 | 0.9171 | 0.8817 | 0.8368 | 0.7866 |
| | (292.7564) | (87.3472) | (38.8146) | (23.2642) | (16.8007) | (13.0709) | (10.7387) |
| $\Delta_{t,t-22}Realized$ | 0.0694 | 0.2978 | 0.4883 | 0.6431 | 0.6696 | 0.6207 | 0.5129 |
| | (3.9524) | (4.8952) | (3.9344) | (3.5969) | (3.3935) | (2.8180) | (2.3172) |
| $Anticipated_t$ | 0.0380 | 0.0975 | 0.1773 | 0.2715 | 0.4109 | 0.5335 | 0.6265 |
| | (6.1670) | (4.2917) | (3.5008) | (3.0165) | (3.2741) | (3.2906) | (3.2120) |
| $Adj.R^2(\%)$ | 99.2918 | 96.4274 | 90.7865 | 85.0919 | 80.1577 | 75.4808 | 71.0886 |
| $ARResidualR^2(\%)$ | 9.6273 | 19.6016 | 21.6682 | 25.2112 | 29.2735 | 31.7484 | 32.7612 |

Panel C: Conditional on growth dispersion below median

| | **5** | **20** | **40** | **60** | **80** | **100** | **120** |
|---|---|---|---|---|---|---|---|
| $Growth_t$ | 0.9909 | 0.9511 | 0.8999 | 0.8202 | 0.7569 | 0.7335 | 0.7237 |
| | (108.1908) | (31.1649) | (17.8167) | (12.5289) | (8.3135) | (6.5200) | (5.4987) |
| $\Delta_{t,t-22}Realized$ | 0.0017 | -0.0743 | -0.0784 | -0.0189 | -0.0796 | -0.1473 | -0.2009 |
| | (0.0872) | (-1.2804) | (-0.8572) | (-0.1370) | (-0.4767) | (-0.7425) | (-0.8557) |
| $Anticipated_t$ | 0.0290 | 0.1313 | 0.2026 | 0.3023 | 0.4030 | 0.5084 | 0.6052 |
| | (2.4295) | (3.5597) | (3.4489) | (4.0523) | (4.2614) | (3.8144) | (3.4478) |
| $Adj.R^2(\%)$ | 97.8247 | 89.9384 | 82.0962 | 74.8282 | 65.6712 | 59.9653 | 56.2207 |
| $ARResidualR^2(\%)$ | 1.4990 | 7.0403 | 8.6199 | 12.5594 | 15.1860 | 18.0325 | 20.2985 |

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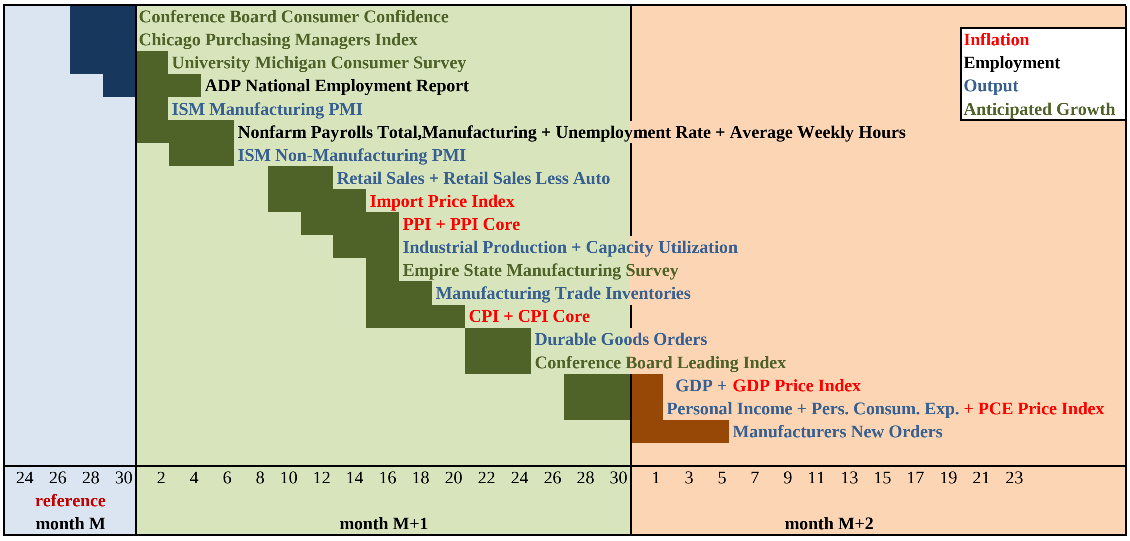


Figure 1: This figure shows the typical reporting structure for a large cross-section of U.S. macroeconomic announcements. On the horizontal axis, we repreANTt the days of the reference month $M$ and the subsequent two months. On the vertical axis, we list the macroeconomic releases in order of reporting, highlighting in bold the typical reporting period. The macroeconomic announcements are color-coded in the four aggregates of inflation news, employment news, output news, and anticipated growth news.

| | j=1 | j=2 | … | j=5 | j=6 | … | j=N |
|---|---|---|---|---|---|---|---|
| 1 | … | … | … | *missing* | … | … | … |
| … | … | … | … | *missing* | … | … | … |
| … | … | … | … | *missing* | … | … | … |
| t-22 | $A_{t-22,1}$ | not released | … | *missing* | not released | … | … |
| t-21 | not released | $A_{t-21,2}$ | … | *missing* | $A_{t-21,6}$ | … | … |
| … | not released | not released | … | *missing* | not released | … | … |
| *t* | $A_{t,1}$ | not released | … | $A_{t,5}$ | not released | … | … |
| t+1 | not released | $A_{t+1,2}$ | … | not released | $A_{t+1,6}$ | … | … |
| … | not released | not released | … | not released | *discontinued* | … | … |
| … | … | … | … | … | *discontinued* | … | … |
| *T* | … | … | … | … | *discontinued* | … | … |

| | j=1 | j=2 | … | j=5 | j=6 | … | j=N |
|---|---|---|---|---|---|---|---|
| 1 | … | … | … | *missing* | … | … | … |
| … | … | … | … | *missing* | … | … | … |
| … | … | … | … | *missing* | … | … | … |
| t-22 | $A_{t-22,1}$ | $E[A_{t-22,2}]=A_{t-43,2}$ | … | *missing* | $E[A_{t-22,6}]=A_{t-43,6}$ | … | … |
| t-21 | $E[A_{t-21,1}]=A_{t-22,1}$ | $A_{t-21,2}$ | … | *missing* | $A_{t-21,6}$ | … | … |
| … | $E[A_{...,1}]=A_{t-22,1}$ | $E[A_{...,2}]=A_{t-21,2}$ | … | *missing* | $E[A_{...,2}]=A_{t-21,6}$ | … | … |
| *t* | $A_{t,1}$ | $E[A_{t,2}]=A_{t-21,2}$ | … | $A_{t,5}$ | $E[A_{t,2}]=A_{t-21,6}$ | … | … |
| t+1 | $E[A_{t+1,1}]=A_{t,1}$ | $A_{t+1,2}$ | … | $E[A_{t+1,5}]=A_{t,5}$ | $A_{t+1,6}$ | … | … |
| … | $E[A_{...,1}]=A_{t,1}$ | $E[A_{...,2}]=A_{t+1,2}$ | … | $E[A_{...,5}]=A_{t,5}$ | *discontinued* | … | … |
| … | … | … | … | … | *discontinued* | … | … |
| *T* | … | … | … | … | *discontinued* | … | … |

Figure 2: This figure shows a stylized example of the actual macroeconomic announcement data, for $N$ announcement types over a daily sample period between 1 and $T$. The releases $j = 1$ and $j = 2$ are monthly indicators released on two different days of the month. The macroeconomic indicator $j = 5$ is a news release that did not exist at the beginning of the sample, but was included in the sample from day $t$ onwards. The macroeconomic indicator $j = 6$ did exist at the beginning of the sample, but was subsequently discontinued. The top panel repreANTts the matrix of the actual macroeconomic releases in real-time as it is constructed from the data. The bottom panel shows how our simple forward filling algorithm is used to fill in the expectation of the indicator when it is not released.

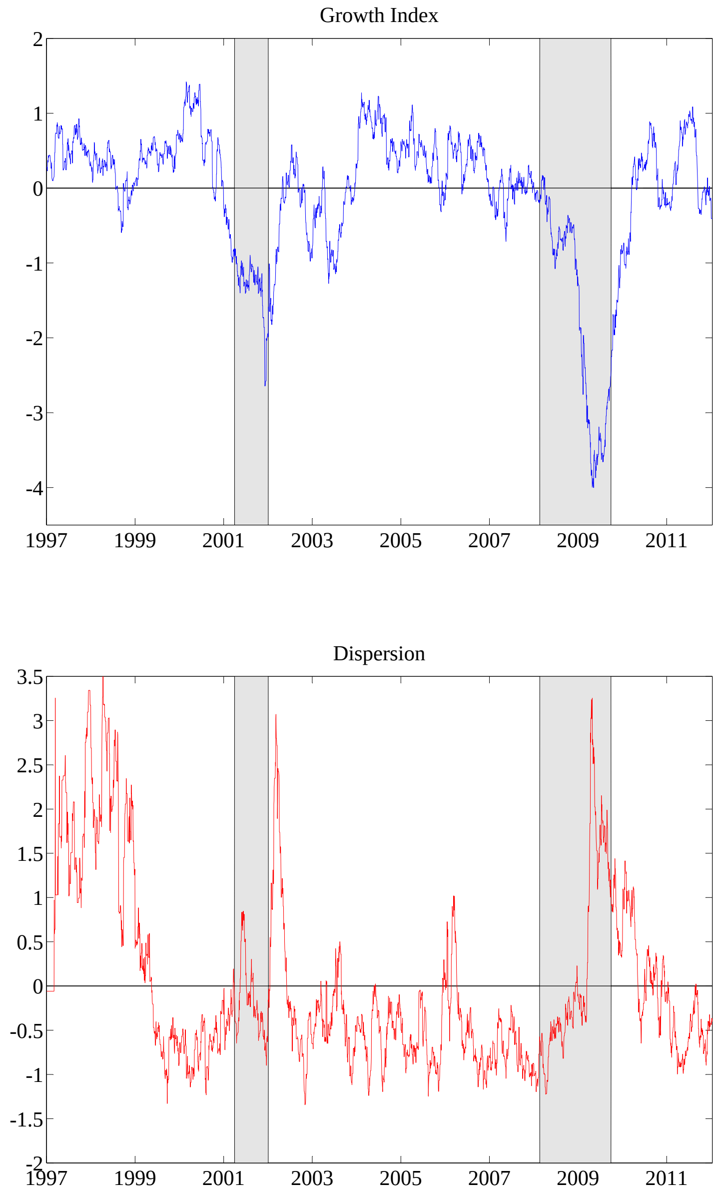


Figure 3: The upper panel shows the real-time growth factor. The lower panel depicts the real-time dispersion of growth obtained as from disagreement about growth releases. Grey areas denote NBER recessions.

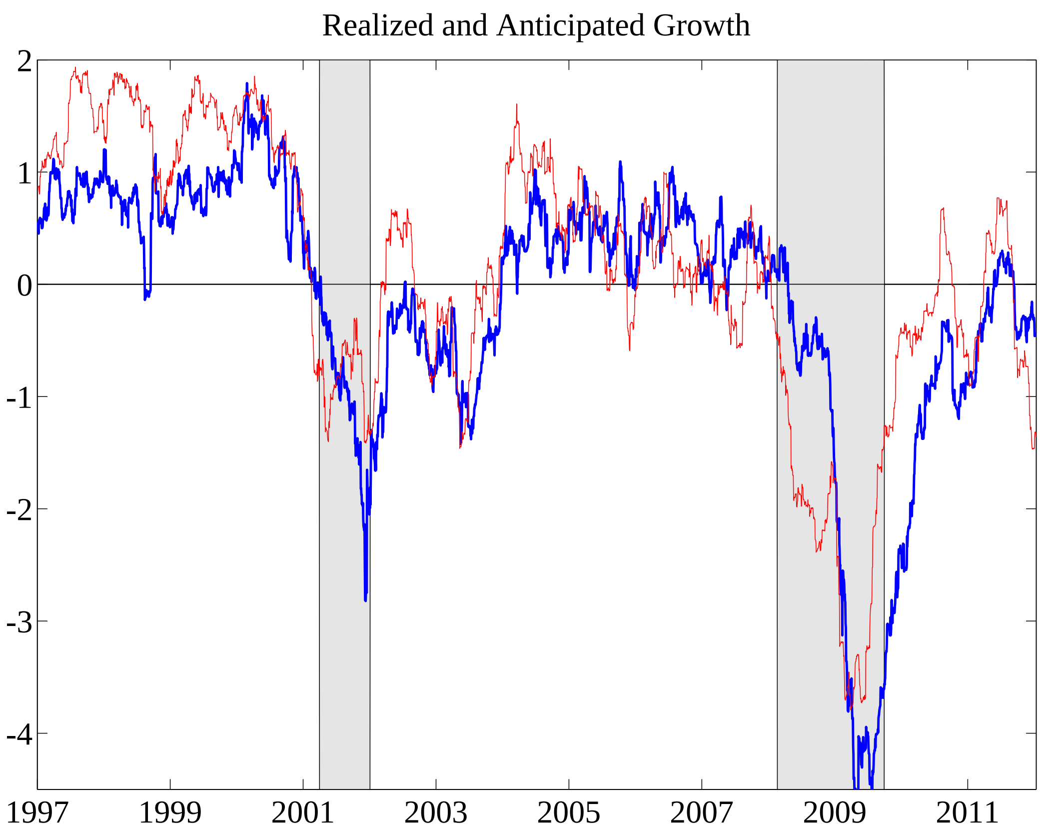


Figure 4: In this figure, we plot the real-time *Realized Growth* factor (in bold blue) and *Anticipated Growth* factor (in red). Grey areas denote NBER recessions.

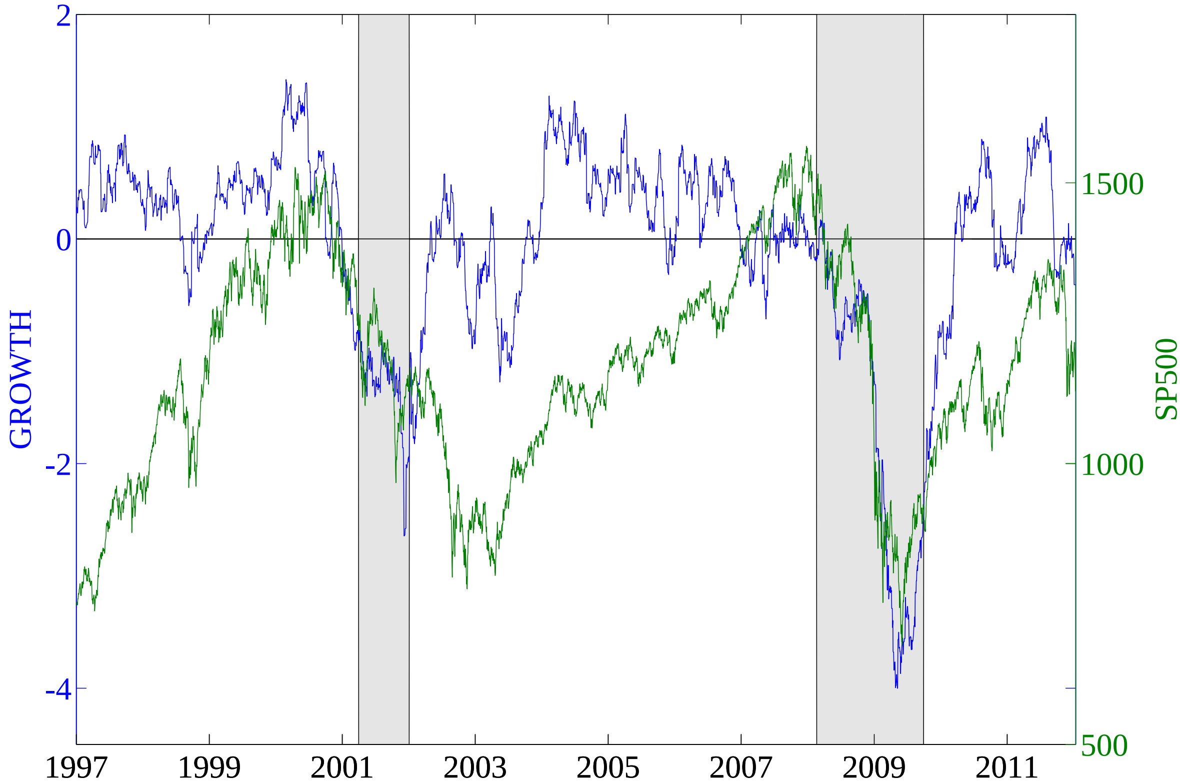


Figure 5: In this figure we plot the real-time growth factor $GROWTH$ (left-scale, in blue) and the S&P500 index (right-scale, in green) during our sample period.

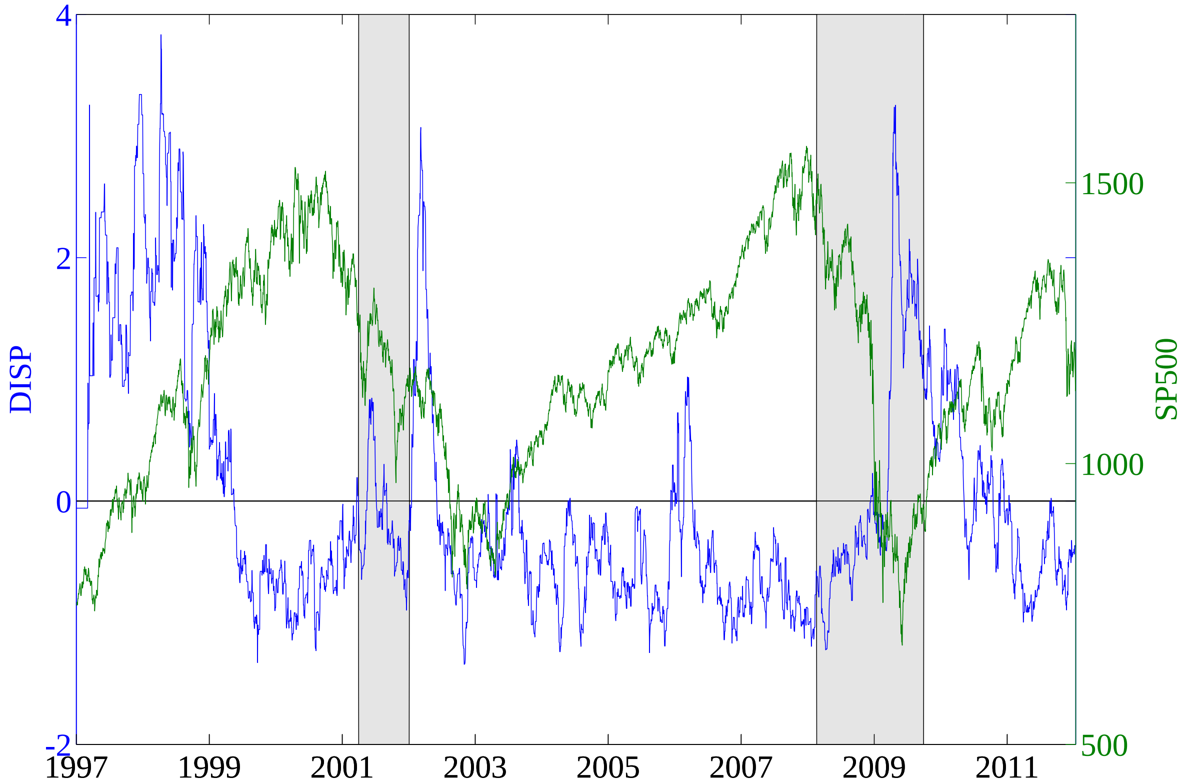


Figure 6: In this figure we plot the real-time dispersion of growth factor (left-scale, in blue) and the S&P500 index (right-scale, in green) during our sample period.

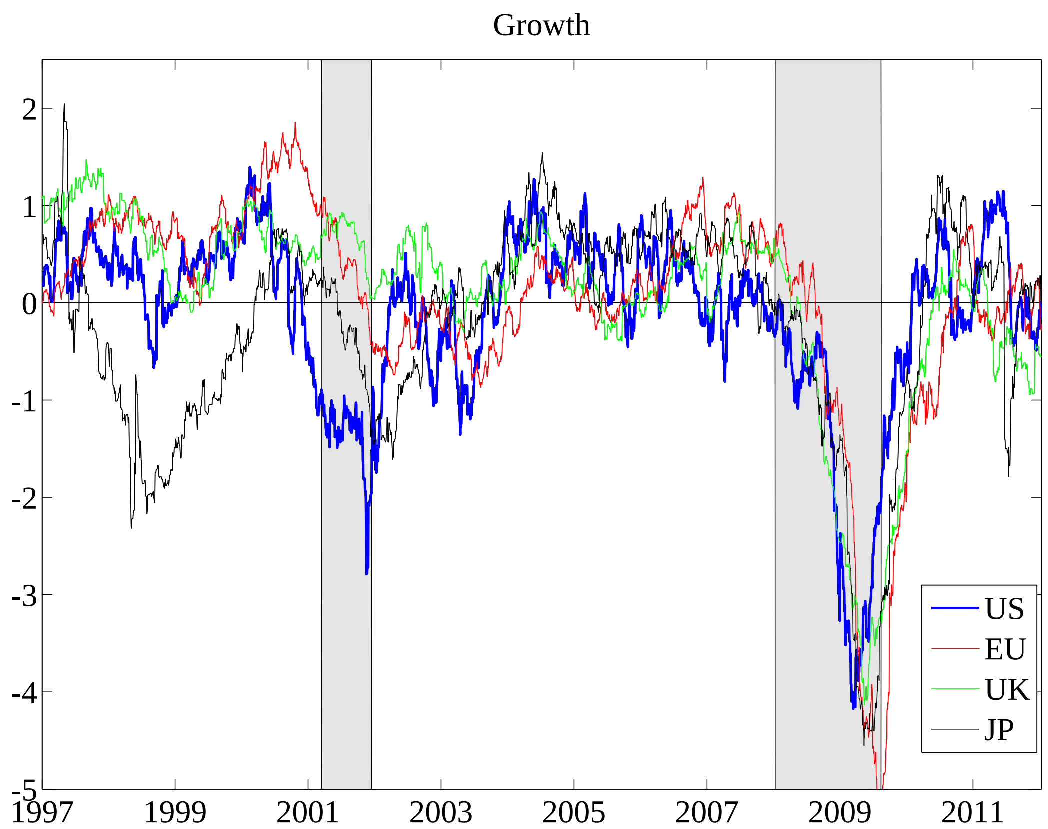


Figure 7: In this figure, we plot the real-time growth factor for the U.S. (in blue), the Eurozone (in red), the U.K. (in green), and Japan (in black). Grey areas denote NBER U.S. recessions.

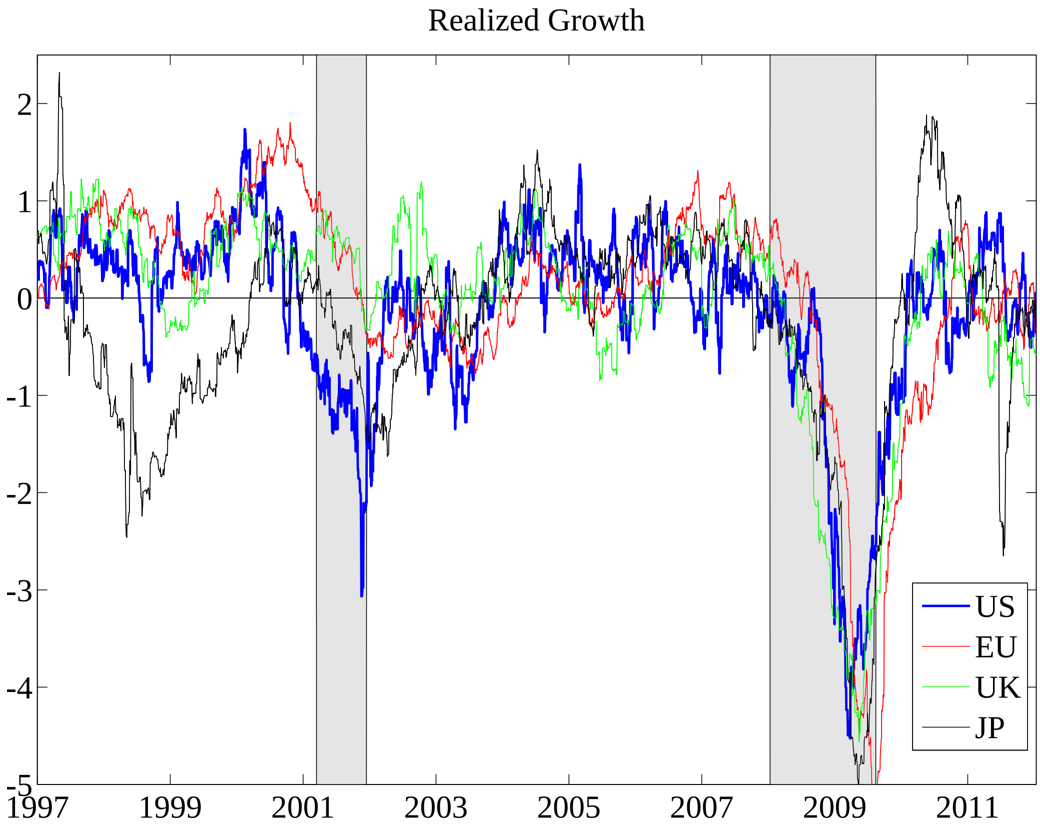


Figure 8: In this figure, we plot the real-time realized growth factor for the U.S. (in blue), the Eurozone (in red), the U.K. (in green), and Japan (in black). Grey areas denote NBER U.S. recessions.

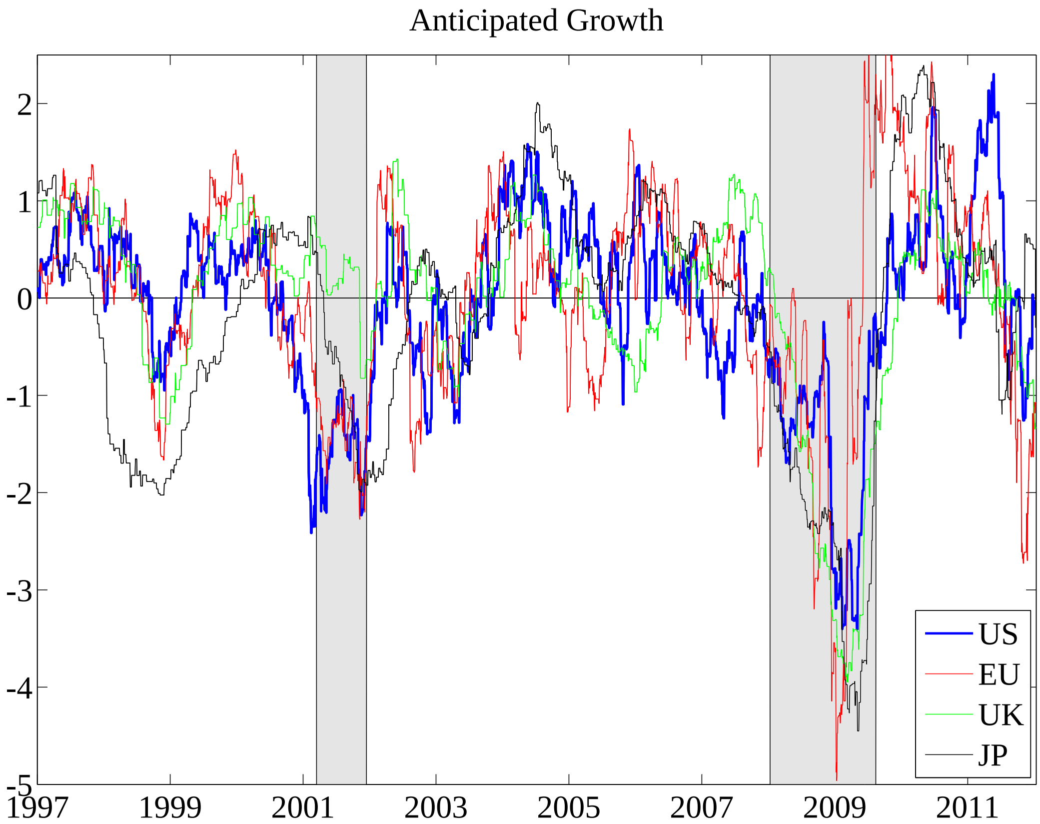


Figure 9: In this figure, we plot the real-time anticipated growth factor for the U.S. (in blue), the Eurozone (in red), the U.K. (in green), and Japan (in black). Grey areas denote NBER U.S. recessions.

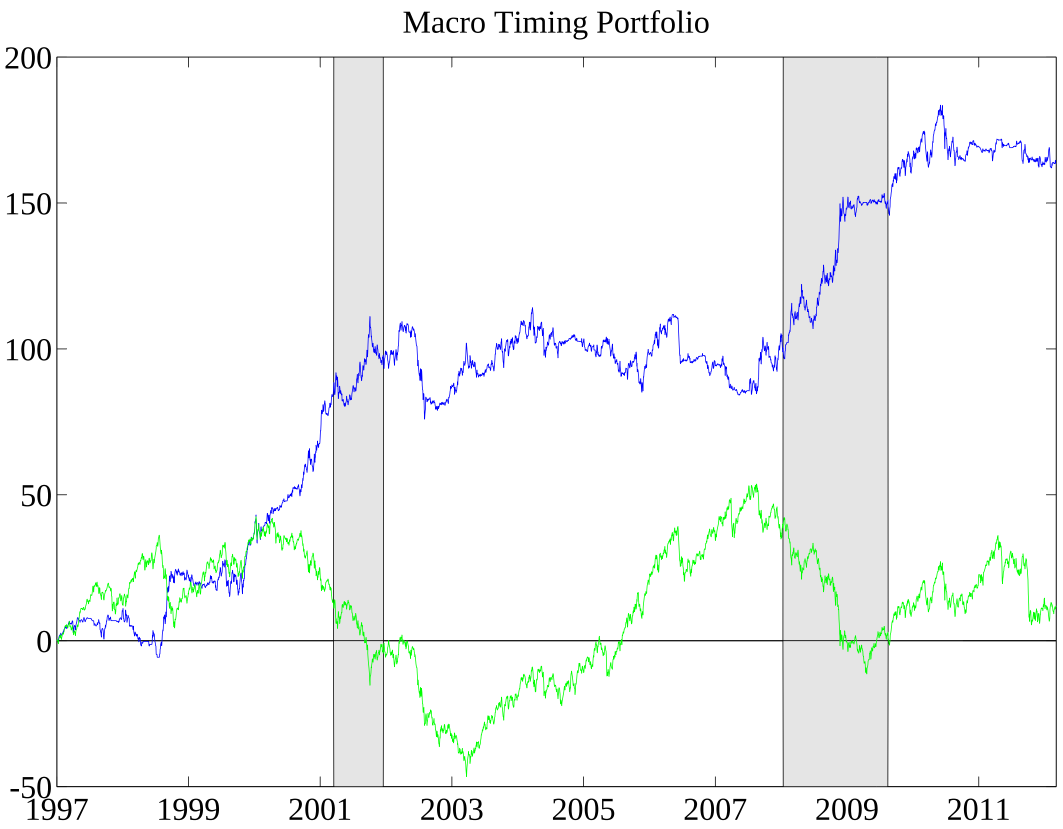


Figure 10: In this figure, we plot the macroeconomic timing portfolio return profile (in blue) and stock market returns (in green), as the equally weighted average of the U.S., U.K., Eurozone, and Japanese stock market indexes. Grey areas denote NBER recessions.