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Financial conditions indexes for the United States and euro area

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ABSTRACT

Financial conditions indexes are developed for the United States and euro area using a wide range of financial indicators and a dynamic factor model. The financial conditions indexes are shown to be useful for forecasting economic activity and have good revision properties. Variants of the indexes that allow for cross-economy effects reveal very strong financial linkages across the United States and euro area.

1. Introduction

Financial conditions indexes (FCIs) have long been used to assess the current state of financial conditions. FCIs are typically constructed using either simple weighted averages or the first principal component of a range of financial indicators. This paper develops FCIs for the United states and the euro area using a wide range of financial indicators and a dynamic factor model (DFM).[1] A key advantage of this framework relative to other methodologies is that the FCIs can be estimated when values for some indicators are missing due to publication lags, which allows all available information to be used in a timely fashion. Hatzius et al. (2010) and Brave and Butters (2011) use similar methodologies to construct FCIs for the United States: Hatzius et al. (2010) estimate an FCI at the quarterly frequency, while Brave and Butters (2011) estimate an FCI at the weekly frequency. This paper differs from previous work because it presents results for the euro area, takes account of publication lags at the end of the sample in the forecasting experiments, examines the revision properties of the estimated FCIs, and examines cross-economy financial linkages.

In a real-time forecasting experiment, it is found that simple closed economy VARs augmented with the estimated FCIs produce better forecasting performance than a range of other model specifications. It is also found that the revision properties of the FCIs are generally good over the sample period considered. A variant of the FCI that incorporates financial linkages reveals large strong financial linkages across the United States and euro area. The results suggest that the FCIs can not only provide useful summary measures of the state of financial conditions, but also useful information about the evolution of economic activity in real time.

2. Methodology

The DFM assumes that each standardized indicator of financial conditions, y_t, can be decomposed into a common component, χ_t, and an idiosyncratic component, ε_t. The common component captures the bulk of the covariation between y_t and the other indicators in the data set, whereas the idiosyncratic component is assumed mainly to affect only y_t:

$$y_t = \chi_t + \varepsilon_t, \quad \varepsilon_t \sim N(0, \psi) \tag{1}$$

where $\chi_t = \Lambda F_t$ and ψ is assumed to be diagonal. The common component is thus simply a scaled common factor, F_t, which is estimated using the entire set of financial indicators. For each economy, the FCI is defined to be this common factor.

The dynamics of the FCI are captured by an autoregressive process:

$$F_t = \sum_{i=1}^{p} \beta_i F_{t-i} + \nu_t, \quad \nu_t \sim N(0, \Sigma) \tag{2}$$

where the βs are coefficients and p is the lag length of the process. In this paper, the lag length, p, is selected using the

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[1] See, for example, Giannone et al. (2008) and Matheson (2010).

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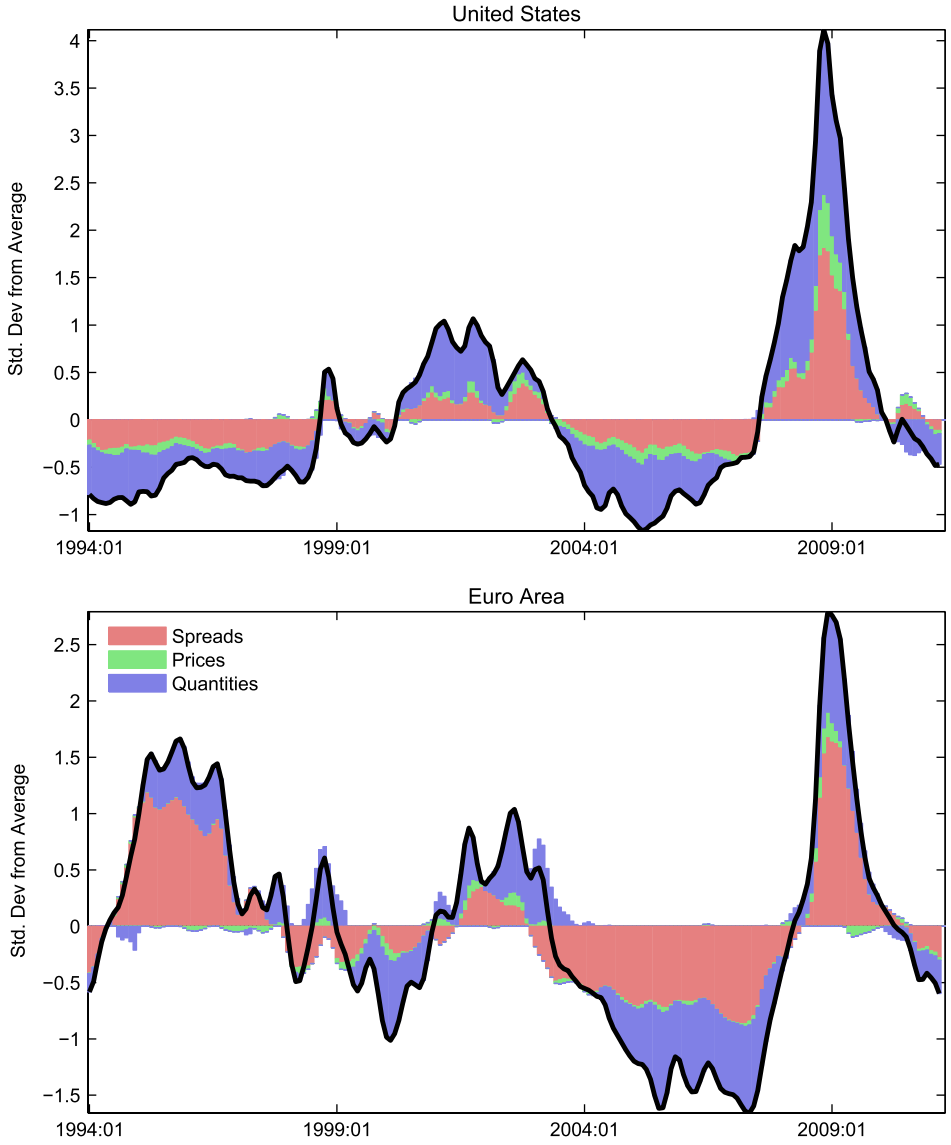

Fig. 1. FCIs and contributions by class of indicator (positive = tightening).

Swartz–Bayesian information criteria (SBC). See Giannone et al. (2008) for a more detailed description of how the procedure deals with missing observations, and Doz et al. (2011) for details on estimation.[2]

2.1. Allowing for financial linkages across economies

Given the high degree of financial integration across the United States and euro area, we also estimate FCIs that allow for financial linkages across the two economies. These FCIs, denoted FCI*, employ the same measurement equation as the baseline FCIs (1), but the dynamics of each economy's common factor is determined by a VAR in the common factors from *both* economies.

3. Data description and results

For each economy, selecting data from a broad set of financial indicators is a crucial step. Most series are measured at a monthly frequency, with the remainder measured at daily or quarterly frequencies. Before estimation, all series are converted to monthly frequency, transformed to be free from non-stationarity, if necessary, and standardized.[3] The remaining indicators are not transformed. The sample period for the FCIs used here begins in 1994. Indicators that are not available for the entire period, such as survey data for the euro area, are backdated using the DFM prior to estimation over the full sample.[4]

The indicators used in each economy's FCI and information about how the indicators are classified and transformed is listed in Table 1. The table also includes the estimated factor loadings, λ, which reflect the weight of each indicator in the FCI. Each loading can take a positive or negative value, depending on whether a high or low value of the indicator in question implies a tightening or an easing in financial conditions. The Senior Loan Officer Survey (SLOS) data (for which a positive number indicates a tightening of financial conditions) generally have high positive factor loadings.

[2] We employ a two-step estimation methodology. The results are very similar when quasi-maximum likelihood is used and are available from the author on request.

[3] The quarterly series are linearly interpolated, whereas the daily series are converted to monthly averages. Quarterly log differences are taken of the non-stationary indicators. Note, the in-sample results are very similar if the FCIs are estimated using quarterly data, but using monthly data offers more timely estimates of financial conditions at the end of the sample in real time.

[4] The assumption that ψ is diagonal is relaxed when backdating these indicators.