Keeping track of global trade in real time

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We build an innovative composite world trade-cycle index by means of a dynamic factor model for short-term forecasts of world trade growth of both goods and (usually neglected) services. Trade indicators are selected using a multidimensional approach, including Bayesian model averaging techniques, dynamic correlations, and Granger non-causality tests in a linear vector autoregression framework. The dynamic factor model is extended to account for mixed frequencies, to deal with asynchronous data publication, and to include hard and survey data along with leading indicators. Nonlinearities are addressed with a Markov switching model. Pseudo-real-time empirical simulations suggest that: (i) the global trade index is a useful tool for tracking and forecasting world trade in real time; (ii) the model is able to infer global trade cycles very precisely and better than several competing alternatives; and (iii) global trade finance conditions seem to lead the trade cycle, a conclusion that is in line with the theoretical literature.

The unexpectedly large collapse in trade flows, both in the aftermath of the Global Financial Crisis of 2008–09 and, to a lesser extent, at present, has led to huge shocks to economic agents. Policymakers and scholars alike seemed to learn the lesson and highlighted the need for new tools able to monitor trade developments accurately in real time, owing to the strong association between trade and economic growth. However, in times of uncertainty, when interest in predicting trade is greatest, it remains extremely difficult to project trade conditions frequently. Indeed, tracking global trade in real time is challenging since trade data are published with a considerable lag given the need for input from a large number of countries in order to estimate world trade. The lack of timeliness in releasing this kind of indicator makes it hard to track and predict unexpected and significant shifts in international trade.

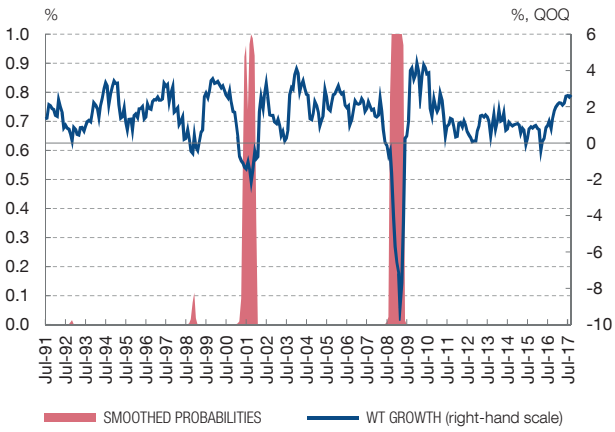
Our study makes a number of contributions to the literature on short-run forecasts of developments in world trade. First, we tested the potential usefulness and flexibility of a small-scale DFM that accounts for mixed frequencies and deals with asynchronous data publication, to predict short-term forecasts of trade growth in real time. We employed the derived common factor to build an innovative composite world trade-cycle index (WTI). In contrast to most existing literature, our model accounts for the trade of both goods and services. Second, we formally tested a large set of trade predictors under an agnostic and multidimensional approach by means of: (i) Bayesian model averaging (BMA) techniques; (ii) Granger non-causality tests under a linear vector autoregression (VAR) framework; and (iii) dynamic correlations. Third, we examined whether it is worth enlarging the single index DFM with leading indicators. To this end, the baseline model was extended to include both leading and coincident indicators, after Camacho and Martinez-Martin (2014).

The dynamic properties of the DFM follow the lines proposed by Aruoba and Diebold (2010), who extended the single-index DFM suggested by Stock and Watson (1991). The main methodological advantages of our new linear DFM with respect to the previous literature are that: (i) it can incorporate information from different series regardless of frequency and publication dates; and (ii) it converts the information in the macroeconomic indicators (and leading indicators) into inferences of the state of the global trade cycle. Hence, it is possible to create a WTI that is easy to interpret and can be automatically updated in a timely fashion.

In the recent past, however, world trade growth has shown signs of nonlinearity, possibly due to major structural breaks (e.g. the latest global financial crisis) and to the asymmetric dynamics that characterize the uneven sequence of cyclical expansions and recessions. To this extent, the WTI itself was tested for the presence of a regime switch. Turning-point detection was assessed through a non-linear extension, namely, a Markov-switching model (Hamilton, 1989). To assess whether the WTI performs well at predicting turning points, the forecasting quadratic probability score (FQPS) was computed. It ranges from 0 to 2, with a score of 0

Chart 1

PROBABILITIES OF WORLD TRADE GROWTH CONTRACTIONS FROM THE COMMON FACTOR



NOTE: Shaded areas refer to (monthly) probabilities of a global trade contraction from the WTI, based on in-sample estimation from 1991-2016. World trade growth refers to the quarterly growth rate on a monthly basis.

corresponding to perfect accuracy. The obtained value of FQPS = 0.21 indicates that the WTI performs relatively well at predicting turning points. This is confirmed by the high correlation between the probability of contraction as indicated by the WTI and actual world growth contractions, as shown in Chart 1.

Summing up, in our empirical analysis we find that the WTI explained more than 92% of the variance of world trade growth of goods and services, demonstrating the potential of the small-scale DFM to track world trade growth. Second, the pseudo-real-time analysis showed that our DFM clearly outperformed a number of competing models, especially when forecasting the next unavailable figure of trade growth. This confirmed that monthly real and survey data provide useful and forward-looking information to forecast current world trade growth. Finally, among the insights that emerged from our in-sample analysis, it is worth highlighting that global credit and trade finance conditions were significant leading indicators of the world trade cycle in the recent past; this is in line with the theoretical literature.

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