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Real-time price discovery in global stock, bond and foreign exchange markets ☆

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Abstract

Using a unique high-frequency futures dataset, we characterize the response of U.S., German and British stock, bond and foreign exchange markets to real-time U.S. macroeconomic news. We find that news produces conditional mean jumps; hence high-frequency stock, bond and exchange rate dynamics are linked to fundamentals. Equity markets, moreover, react differently to news depending on the stage of the business cycle, which explains the low correlation between stock and bond returns when averaged over the cycle. Hence our results qualify earlier work suggesting that bond markets react most strongly to macroeconomic news; in particular, when conditioning on the state of the economy, the equity and foreign

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exchange markets appear equally responsive. Finally, we also document important contemporaneous links across all markets and countries, even after controlling for the effects of macroeconomic news.

Keywords: Asset pricing; Macroeconomic news announcements; Financial market linkages; Market microstructure; High-frequency data; Survey data; Asset return volatility; Forecasting

JEL classification: F3; F4; G1; C5

1. Introduction

How do markets arrive at prices? There is perhaps no question more central to economics. This paper focuses on price formation in financial markets, where the question looms large: How, if at all, is news about macroeconomic fundamentals incorporated in pricing stocks, bonds and foreign exchange?

Unfortunately, the process of price discovery in financial markets remains poorly understood. Traditional "efficient markets" thinking suggests that asset prices should completely and instantaneously reflect movements in underlying fundamentals. Conversely, others feel that asset prices and fundamentals may be largely and routinely disconnected. Experiences such as the late 1990s U.S. market bubble would seem to support that view, yet simultaneously it seems clear that financial market participants pay a great deal of attention to data on underlying economic fundamentals. The notable difficulty of empirically mapping the links between economic fundamentals and asset prices is indeed striking.

The central price-discovery question has many dimensions and nuances. How quickly, and with what patterns, do adjustments to news occur? Does announcement timing matter? Are the magnitudes of effects similar for "good news" and "bad news," or, for example, do markets react more vigorously to bad news than to good news? Quite apart from the direct effect of news on assets prices, what is its effect on financial market volatility? Do the effects of news on prices and volatility vary across assets and countries, and what are the links? Are there readily identifiable herd behavior and/or contagion effects? Do news effects vary over the business cycle?

Just as the central question of price discovery has many dimensions and nuances, so too does a full answer. Appropriately then, dozens – perhaps hundreds – of empirical papers chip away at the price discovery question, but most fall short of our goals in one way or another. Some examine the connection between macroeconomic news announcements and subsequent movements in asset prices, but only for a single asset class and country (e.g., Balduzzi et al., 2001, who study the U.S. bond market). Others examine multiple asset classes but only a single country (e.g., Boyd et al., 2005, who study U.S. stock and bond markets). Still others examine multiple countries but only a single asset class (e.g., Andersen et al., 2003b, who study several major U.S. dollar exchange rates).

Now, however, professional attention is turning toward multiple countries and asset classes.[1] Our paper is firmly in that tradition. We progress by studying a broad set of countries and asset classes, characterizing the joint response of foreign exchange markets as well as the domestic and foreign stock and bond markets to real-time U.S. macroeconomic news. We simultaneously

[1] Notably, for example, in contemporaneous and independent work, Faust, Rogers, Wang, and Wright (2007) use the lens of uncovered interest rate parity to examine the news responses of bond yield curves (in the U.S., Germany and the U.K.) and the corresponding dollar exchange rates.